Housing – A Critical Perspective

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Housing - A Critical Perspective
INTRODUCTION

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This publication is the product of the conference Housing – A Critical Perspective held in Liverpool in 2015. It was organised by AMPS together with the Sociology Department of Liverpool University and the Architecture Department of Liverpool John Moores University. It was a two day interdisciplinary conference on the global theme of affordable housing provision. This publication, and the conference which it documents both form part a broader program of international events, Housing – Critical Futures.

The provision of adequate housing is one of the most important political issues today. Against a background of disparate policy interventions, resistances and conflicting aspirations, the Housing – A Critical Perspective conference sought to bring together disparate voices: architects, planners, developers, sociologists, artists, housing associations, community representatives and policy makers. Reflecting the belief that housing and its social implications are not discipline-specific concerns the conference invited cross-disciplinary and creative thinking from those engaging in research and practice from both inside and outside academia. This publication reflects that perspective perfectly.
Chapter 12
ALTERNATIVE THIRD WAVE HOUSING FUTURES
Dr Rob Macdonald, Bill Halsall

Chapter 13
THE ROLE OF SOCIAL MOVEMENTS IN THE CONSTRUCTION OF HOUSING SOLUTIONS IN RIO DE JANEIRO
Marianna Fernandes Moreira, Rafael Gonçalves De Almeida

Chapter 14
STUDY ON DOMESTIC OCCUPANT ENERGY CONSUMPTION BEHAVIOR AND INCOME LEVEL IN BEIJING, CHINA
Muzhou Wang, Nianxiong Liu

Chapter 15
LONG AFTER THE RING, MASS HOUSING MAY NOT BE APOCALYPTICAL
Mónica Pacheco

Chapter 16
THE HOUSE AS HOME: A CROSS-CULTURAL STUDY IN IRAN AND AUSTRALIA OF HOW ADULTS’ PERCEPTIONS OF THEIR HOUSES ARE AFFECTED BY MEMORIES OF THEIR CHILDHOOD HOMES
Mahnaz Pejam

Chapter 17
CRITERIA FRAMEWORK FOR THE CONCEPTION OF AN ADAPTIVE HOUSING MODEL FOR SUB-SAHARAN REGION
Inês Ramalhete, Miguel P. Amado, Hugo

Chapter 18
UNDETERMINED SPACES
Ines Seixas Pinto

Chapter 19
SENIOR HOUSING: CRITICAL PERSPECTIVES OF RESIDENTS, DEVELOPER, AND ARCHITECT
Amanda Smoot, Dr. Marilyn Bruin

Chapter 20
TRACING RESIDENTIAL PREFERENCES OF SOLO-LIVING. THE FINNISH PERSPECTIVE IN AN INTERNATIONAL CONTEXT
Virve Väisänen

Chapter 21
TERRACED HOUSE TYPOLOGY AS POLIS – SIEDLUNG HALEN AS A LONG-TERM DEVELOPMENT
Claudia Volberg
PARAMETRIC ELEMENTS TO MODULAR SOCIAL HOUSING

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INTRODUCTION

The United Nations expects an exponential growth in Sub-Saharan African region due to its fast economic development, mainly provided by natural resources. However, this growth is associated to the deterioration of urban environment and precarious living conditions for the poorer due to ineffective response to population housing demand. The urban growth and the development of the main urban centres is leading to its densification i.e. internal migrations from the rural areas to urban centres where there is an economic cycle able to provide employment. These rural populations, mainly coming from the poorest countryside areas, had occupied cities outskirts, giving rise to slums deprived of infrastructures and social facilities as well as precarious housing. According to John Beardsley, “Slums are now the dominant form of urban land use in much of the developing world”, meeting the UN-HABITAT recent data that reports about 863 million people living in slums in 2012.

John Turner pointed out an important factor related to slums formation: “The urban poor have to solve a complex equation as they try to optimize housing cost, tenure security, quality of shelter, journey to work, and near job (...) is even more important than a roof. For others, free or nearly free land is worth epic commutes from edge to the centre. And for everyone the worst situation is a bad, expensive location without municipal services or security of tenure.”

This situation is particularly severe in Sub-Saharan African Region where about 62% of the population lived in slums in 2012. Low quality of life and precarious living conditions show, however, two contexts: urban areas are characterized by its massive densification and consequent overcrowding housing for which there is no effective and fast solution by far; rural areas show a context marked by remoteness mostly related to lack of basic infrastructure and mobility. The lack of a development strategy for these lasts is leading to its isolation, desertification and consequent population migration to urban centres, becoming a closed-loop. As a consequence, in both geographical contexts, these populations are socially excluded from remaining society; worsen their social and economic conditions and establishing an obstacle for development.

In this context, governments and public entities are trying to implement urgent solutions for low-income population (re) housing. However, these models are facing difficulties in terms of social, economic and environmental aspects. In first place, the applied solutions are showing social
inadequacy to household dimension and dynamic as well as to its lifestyle and source of income, regarding economic aspects (Teige, 2002). According to Werna, in developing countries, housing is simultaneously a shelter and a basis for income generation 7, which requires a new approach to the dichotomy between housing and informal employment and economy. In second place, the lack of an integrated methodology and criteria for material selection and consequent building process is leading to severe consequences in terms of economic and environmental features: housing affordability becomes compromised due to the construction processes and adopted materials, mainly imported, which results in transportation and specialized labor costs; the inadequacy to territorial characteristics results in thermal inefficiency, which is related not only to occupant’s thermal comfort but also with energy consumption of heating, cooling, ventilation and natural light (Whitehead and Scanlon 2007). The mentioned problematic is aggravated by insufficient funding associated to a weak industrial sector and mobility network, and unskilled labor.

Modular solutions, related to prefabrication, show a potential and opportunity to address this problem. Economically, prefabricated solutions become viable and thus affordable by low-income populations i.e. its production is cheaper, showing a cost reduction of 30% comparing to common solutions 8. Standard elements also turn the construction easy to assembly within an assisted self-construction process. For manufacturer, prefabrication shows advantages, namely in terms of waste reduction and energy consumption. According to Stallen et al. the application of prefabricated elements results in 52% less wasting material and a reduction of 50% of water and energy consumption 9 due the rationalization process in terms of costs and resources. These characteristics directly revert to environmental implications related to management resources, energy and water.

Taking advantage of self-construction potential of slums residents, which in some countries is already institutionalized 10, there is an opportunity to complement prefabricated solutions with local materials in order to accommodate economic premises (reduced transportation costs; improvement of national/local economic cycle; increase population skills and capacities in order to get a formal job) but also environmental concerns due less energy consumption during the whole construction process. The adoption of local materials has also an important social component i.e. its application facilitates its acceptance by the population by an architectural image that they are familiar with; instead of just provide an impersonal housing solution (Jiboye 2011).

Modular housing also allows the implementation of an incremental process for (re) housing through expansion and retraction models enable to suit occupants’ needs. In developing countries, the population cannot afford housing adequate to their needs, namely to their immediate financial capacity, ending up living in informal settlements where they have the possibility to transform the domestic space. 11. However, an incremental process allows the acquisition of a housing core, with all the minimum standard conditions, able to be expanded according to household financial capacity 12. Thus, there is an opportunity to consider a faster and less costly process for social housing solutions based on a parametric approach that integrates social, economic and environmental premises for a modular solution i.e. a solution able to lead to environmental improvement, fair resource management and also to a better quality of life.

**METHODOLOGY**

The present research refers to the development of a parametric framework for modular social housing that considers a set of interrelated parameters associated to housing and construction schemes identified in four countries: Angola, Cape Verde, Mozambique and Guinea-Bissau. Thus these parameters will result into an optimal modular solution that is adaptable to different socioeconomic, cultural and environmental context as an integrated solution.
The methodology consists in an interactive process with three main stages, where the first refers to context analysis and the remaining corresponds to conception process (prefabricated module) and local adjustment (complemented local materials) in order to achieve optimal wall-module. The methodology outputs refer to an optimal module, complemented with local materials that constitute an adequate housing type (Figure 1).

![Research methodology diagram]

Figure 1. Research methodology.

The first stage corresponds to housing stock analysis, namely prevailing layouts, construction methods and applied materials. The analysis identified needs and regional features as well as common approaches to housing and the most adequate solutions according to territorial context. In this stage it is set out the relation between sustainable housing and traditional models. This analysis also aims the study of applied materials, in rural and urban contexts, as well as common and traditional construction techniques that will permit the best options to complemented materials. Thereby, first stage main output is an inventory of the housing stock in terms of materials and techniques, able to complement the modular wall, as well as the prevailing housing types (layout) i.e. adequacy parameters for housing.

Stage one also envisages the analysis of legal requirements for housing and transportation premises. This analysis is determinant because will define and ensure not only quality but also the model optimal dimensioning. In one hand, legal requirements establish the minimum dimension for housing, which is related to the module composition (quantity and joint accessories). On the other hand, transportation requirements will defined the optimal dimension in order to transport maximum number of the modules in a sea container. The outputs from this stage refer to the most conservative requirements for housing and the capacity of a sea container to transport the modules i.e. dimensional parameters for module formulation.

Second stage is the most important research phase and performs the parametric framework for module optimal dimensioning. Through a score method, that interacts the parameters resulted from stage 2, it
was able to build a framework for the optimal module solution (height and length). It is important to refer that the optimal thickness was achieve through mechanical tests to compression and traction made with samples.

In order to maximize the solution adequacy, the last stage (stage 3) proposes complemented materials, whose selection resulted from the context analysis and inventory performed in first phase. Methodology output refers, therefore, to a parametric framework that combines and interact the identified parameters of each research phase, resulting in an optimized module able to perform sustainable social housing solutions and presenting an adequacy in terms of social, economic and environmental criteria.

RESULTS AND DISCUSSION
The housing stock analysis focused in Cape Verde, Angola, Guinea-Bissau and Mozambique and provided not only a diagnosis of the housing conditions but also an inventory of commonly used/available materials and building techniques.

The analysis considered both urban and rural areas and it is important to refer that the urban models are similar in four case studies, where houses are constituted by one/two rooms and built with cement bricks and covered with zinc sheets. This is an important fact related to available materials: in rural areas, the architecture is richer due the diversity of natural available materials and therefore it is possible to observe houses made with wood, sticks and straw, rammed-earth, adobe bricks or basaltic stone (this last only in Cape Verde); urban areas, due the access to low-cost industrial/composite materials and lack of another options, show the same pattern in all case studies.

In terms of needs and deprivations, the urban models observed the most severe situation. While the rural housing showed an adequate performance to territorial and environmental conditions due the adoption of local and natural materials adapt to the site, urban models presented problems in terms of overheating and overcrowding. This is also related to the gross areas whose difference between urban and rural areas is significant: the average housing dimension in rural areas is about 24m² while in urban areas is much smaller, with an average of 14m² (Table 8).
### Housing Dimension (average)

- Rural areas: 24m²
- Urban areas: 14m²

### Housing Layout

- Rectangular or circular only/two one room Cooking area outside
- No sanitary facilities/outside sanitary facilities
- Porch
- Courtyard

### Building Techniques

- Wood structure
- Bamboo structure
- Palm tree stems
- Sticks/canes structure
- Rammed earth
- Masonry

### Wall Materials

- Straw
- Thatch/palm leaves
- Clay and rice shells
- Earth
- Mud
- Adobe bricks
- Basaltic stone (only in Cape Verde)
- Zinc sheets
- Cement bricks

### Roof Materials

- Straw
- Clay and leaves
- Palm tree leaves
- Asbestos-cement
- Zinc sheets

### Alternative Materials for Construction (complements or aggregates)

- Sisal
- Sugar cane wastes (food industry - industry waste)
- Corn wastes (food industry - industry waste)
- Rice shells (food industry - industry waste)
- Chesnutt shells (food industry - industry waste)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>General characteristics: Context analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing dimension (average)</td>
<td>Rural areas: 24m²</td>
</tr>
<tr>
<td></td>
<td>Urban areas: 14m²</td>
</tr>
<tr>
<td>Housing layout</td>
<td>Rectangular or circular only/two one room</td>
</tr>
<tr>
<td></td>
<td>Cooking area outside</td>
</tr>
<tr>
<td></td>
<td>No sanitary facilities/outside sanitary</td>
</tr>
<tr>
<td></td>
<td>facilities</td>
</tr>
<tr>
<td></td>
<td>Porch</td>
</tr>
<tr>
<td></td>
<td>Courtyard</td>
</tr>
<tr>
<td>Building techniques</td>
<td>Wood structure</td>
</tr>
<tr>
<td></td>
<td>Bamboo structure</td>
</tr>
<tr>
<td></td>
<td>Palm tree stems</td>
</tr>
<tr>
<td></td>
<td>Sticks/canes structure</td>
</tr>
<tr>
<td></td>
<td>Rammed earth</td>
</tr>
<tr>
<td></td>
<td>Masonry</td>
</tr>
<tr>
<td>Wall materials</td>
<td>Straw</td>
</tr>
<tr>
<td></td>
<td>Thatch/palm leaves</td>
</tr>
<tr>
<td></td>
<td>Clay and rice shells</td>
</tr>
<tr>
<td></td>
<td>Earth</td>
</tr>
<tr>
<td></td>
<td>Mud</td>
</tr>
<tr>
<td></td>
<td>Adobe bricks</td>
</tr>
<tr>
<td></td>
<td>Basaltic stone (only in Cape Verde)</td>
</tr>
<tr>
<td></td>
<td>Zinc sheets</td>
</tr>
<tr>
<td></td>
<td>Cement bricks</td>
</tr>
<tr>
<td>Roof materials</td>
<td>Straw</td>
</tr>
<tr>
<td></td>
<td>Clay and leaves</td>
</tr>
<tr>
<td></td>
<td>Palm tree leaves</td>
</tr>
<tr>
<td></td>
<td>Asbestos-cement</td>
</tr>
<tr>
<td></td>
<td>Zinc sheets</td>
</tr>
<tr>
<td>Alternative materials for</td>
<td>Sisal</td>
</tr>
<tr>
<td>construction (complements or</td>
<td>Sugar cane wastes (food industry - industry waste)</td>
</tr>
<tr>
<td>aggregates)</td>
<td>Corn wastes (food industry - industry waste)</td>
</tr>
<tr>
<td></td>
<td>Rice shells (food industry - industry waste)</td>
</tr>
<tr>
<td></td>
<td>Chesnutt shells (food industry - industry waste)</td>
</tr>
</tbody>
</table>

Table 1. Summary of housing stock analysis

In terms of layout and housing disposition, the service areas (cooking area and sanitary facility) are located outside or, in severe cases do not exist. This option results, mostly, from two main reasons: the sanitary facilities are located outside due health concerns associated to absence of sewage infrastructure and are commonly attached to a septic tank; the cooking area is far from housing walls due fire risk but mainly because of the heating produced by a cooker or fireplace that compromises indoor thermal comfort.

The four countries mentioned above were also studied in terms of legal requirements related to buildings in order to constitute dimensional standards for housing:

- General Regulation for Construction and Urban Housing of Cape Verde (RGCHU) – Official
Bulletin of 28th February of 2011;
● General Regulation of Urban Buildings of Angola (RGEU) – Executive Decree nº13/07 of 26th February of 2007;

The above-mentioned legislation was the only found so far in these territories. However, local entities have informed that the current new buildings are also applying legal requirements from Portugal and South Africa (this last is significant in Mozambique).

The consideration of these parameters ensures quality and functional requirements, namely in terms of health, thermal comfort and fitness-for-use criteria, performing a main basis for module dimensioning and marking the minimum standards. The following table presents the legislation survey related to social housing in focus territories.

<table>
<thead>
<tr>
<th>Country</th>
<th>Floor height [m]</th>
<th>Bedroom area [m²]</th>
<th>Living room area [m²]</th>
<th>Kitchen area [m²]</th>
<th>Sanitary installation area [m²]</th>
<th>Fenestration area [m²]</th>
<th>Total area - two bedroom [m²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Verde</td>
<td>2.6</td>
<td>10.5</td>
<td>14</td>
<td>6.5</td>
<td>4.5</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Angola</td>
<td>2.8</td>
<td>10.5</td>
<td>10</td>
<td>6</td>
<td>-</td>
<td>1.08</td>
<td>52</td>
</tr>
<tr>
<td>Mozambique</td>
<td>2.8</td>
<td>9</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Guinea-Bissau</td>
<td>2.8</td>
<td>9</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 2. Legal requirements for a two-bed social house.

Transportation parameters were also considered in order to provide an efficient and sustainable operation for the module implementation in different geographies. Thus, it was considered a sea container High Cuba 40’ with 12.36m in length, 2.34m in width and 2.68m in height.

The studied criteria performed the parametric elements for optimal module dimensioning.

**Module dimensional parameters**

It is important to primarily refer the concern about the module structural function, besides its optimal dimensions or characteristics. However, this structural efficiency must be also related to economic and environmental aspects. In order to provide a durable and structural solution, the module is made in concrete. Through this option it is possible to ensure structural safety, identify as one of the main problems in precarious housing, and durability in order to reduce maintenance costs. The selected components materials for the module are commonly used in current constructions and as such, are easily available and affordable: concrete C25/30 or C30/37; structure class A500, type NQ50; steel profiles class S280GD+Z, U shape.
However, it is recognized that use of concrete has several environmental impacts (that must be articulated, although, with its durability) due embodied energy of cement\(^1\). In order to reduced this impacts, several tests were develop, namely by adding earth (soil) to concrete mixture, in an attempt to reduce cement percentage. The tests showed physical and mechanical behavior of several samples with different cement/soil percentages, comparing to current concrete with cement aggregates.

The module optimization in terms of dimension and characteristics was achieved due a parametric framework that interacts the previously mentioned variables. These variables are related to sustainability principles, focusing in low-cost housing, namely social, economic and environmental aspects. All these parametric elements have direct impacts in these fields:

- **Minimum legal requirements for housing**, that integrates the minimum areas for dwellers, room areas, floor height and fenestration width will provide a minimum level of quality, ensuring article 25 from Human Rights: “(...) everyone has the right to a standard of living adequate for the health and well-being of himself and his family.”\(^14\) This parameter is directly associated to social aspects by providing decent housing to the poorer but also to economic and environmental aspects: economically, the adoption of minimum areas reduces housing construction and thus its costs, making it affordable; environmentally, the implementation of minimum areas able to serve human activities (“(...) the minimum of space, air, light and heat necessary to men for developing their own vital functions without restrictions due the lodging.”\(^15\)), shows a concern about resource management (no wasted space).

- **Assemblage** is a decisive parameter for assisted self-construction, which has also direct impacts in terms of social, economic and environmental premises. Besides of being a natural capacity of informal settlements population, building their own houses with technical guidance provide sense of community and social cohesion that is fundamental for low-income population development. Assisted self-construction also improves community skills and capacities, increasing the possibility to acquire a formal job later. In economic terms, this process naturally reduces costs by using local
labour instead of specialized imported workforce. Environmentally, it reduces energy consumption by using mostly human labour rather than machinery.

- The optimization of the number of module’s joints and connectors has direct impacts in construction costs but also in resource management, namely the quantity of material used (specially considering metallic connectors that show high levels of embodied energy).
- At last, transportation requirements are fundamental to reduce housing costs and energy consumption by optimization of export procedures (the transportation of a larger quantity of modules in less trips).

This framework defined the set that compound the standard modular solution, constituted by three variants: wall module, window module and door module. Thus, methodology considered the following parametric elements that result in several dimensional options (Figure 4).

![Parametric framework for module dimensioning.](image)

The first task was the definition the minimum legal requirements by considering the most conservative values. This will enable the module application in all four studied countries, ensure official quality levels and also respect legal mandatory issues (Table 3).

<table>
<thead>
<tr>
<th>Floor height [m]</th>
<th>Bedroom area [m²]</th>
<th>Living room area [m²]</th>
<th>Kitchen area [m²]</th>
<th>Sanitary installation area [m²]</th>
<th>Fenestration width [m]</th>
<th>Total area - two bedroom [m²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.8</td>
<td>10.5</td>
<td>14</td>
<td>6.5</td>
<td>4.5</td>
<td>0.90</td>
<td>52</td>
</tr>
</tbody>
</table>

Table 3. Minimum dimensions for two-bed housing.

Through definition of minimum standards it was calculated the module height with 2.8m, according to the minimum floor height required. The module width resulted from assemblage considerations (ease of handling by user within an assisted self-construction process). Thus, eleven possible widths were selected and combined into a score method that considers: module width; number of modules in x and y (room sides), resulted dimension of x and y; resulted room area; number of joints needed to perform the room; final score considering economic and environmental premises (Figure ).
The following tables 4-7 present the score methodology for each room.

<table>
<thead>
<tr>
<th>Module width [m]</th>
<th>Nº of modules in x</th>
<th>Nº of modules in y</th>
<th>X dimension [m]</th>
<th>Y dimension [m]</th>
<th>Resulted room area [m²]</th>
<th>Nº of joints accessories</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,5</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>3,5</td>
<td>10,5</td>
<td>26</td>
<td>11</td>
</tr>
<tr>
<td>0,6</td>
<td>5</td>
<td>6</td>
<td>3</td>
<td>3,6</td>
<td>10,8</td>
<td>22</td>
<td>10</td>
</tr>
<tr>
<td>0,7</td>
<td>5</td>
<td>5</td>
<td>3,5</td>
<td>3,5</td>
<td>12,25</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>0,8</td>
<td>4</td>
<td>5</td>
<td>3,2</td>
<td>4</td>
<td>12,8</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>0,9</td>
<td>4</td>
<td>4</td>
<td>3,6</td>
<td>3,6</td>
<td>12,96</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>1,0</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>14</td>
<td>8</td>
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<td>1,1</td>
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<td>1,4</td>
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<td>11,76</td>
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<td>3</td>
<td>4,5</td>
<td>13,5</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4. Score table for bedroom: module optimization.
<table>
<thead>
<tr>
<th>Module width [m]</th>
<th>Nº of modules in x</th>
<th>Nº of modules in y</th>
<th>X dimension [m]</th>
<th>Y dimension [m]</th>
<th>Resulted room area [m²]</th>
<th>Nº joint accessories</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>5</td>
<td>6</td>
<td>2.5</td>
<td>3</td>
<td>7.5</td>
<td>22</td>
<td>8</td>
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<tr>
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<td>4</td>
<td>5</td>
<td>2.4</td>
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<td>7.2</td>
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<td>10</td>
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<td>1.1</td>
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<td>3</td>
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</tr>
</tbody>
</table>

Table 5. Score table for living room: module optimization.

<table>
<thead>
<tr>
<th>Module width [m]</th>
<th>Nº of modules in x</th>
<th>Nº of modules in y</th>
<th>X dimension [m]</th>
<th>Y dimension [m]</th>
<th>Resulted room area [m²]</th>
<th>Nº joint accessories</th>
<th>Score</th>
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<td>20.25</td>
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</table>

Table 6. Score table for kitchen: module optimization.
Table 7. Score table for sanitary installation: module optimization.

<table>
<thead>
<tr>
<th>Module width [m]</th>
<th>Nº of modules in x</th>
<th>Nº of modules in y</th>
<th>Nº of modules in y</th>
<th>X dimension [m]</th>
<th>Y dimension [m]</th>
<th>Resulted room area [m²]</th>
<th>Nº joint accessories</th>
<th>Score</th>
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</tr>
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<td>3</td>
<td>9</td>
<td>8</td>
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<td></td>
</tr>
</tbody>
</table>

The score criteria was based on efficiency and cost degree i.e. the maximum score was attributed to modules that perform the nearest resulted area to minimum dimensions defined in Table 3 and thus the most efficient dimension in terms of costs. In different modules cases width achieve equal areas, the option that shows less joint accessories was preferable i.e. got higher score. The optimal module was achieved through a comparison between the scores of the different module width per room (Table 8).

Table 8. Score table for kitchen: module optimization.

<table>
<thead>
<tr>
<th>Module width [m]</th>
<th>Score for width of each room</th>
<th>Bedroom</th>
<th>Living room</th>
<th>Kitchen</th>
<th>Sanitary Installation</th>
<th>Σ score</th>
<th>Rank</th>
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<tbody>
<tr>
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<td>7</td>
<td>24</td>
<td>6º</td>
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<td>1</td>
<td>5</td>
<td>11</td>
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</tr>
</tbody>
</table>

Table 8 shows that 1,1m module had the best performance according to the parametric framework: achieve the minimum housing areas through a balance between assemblage, modules quantity and number of accessories needed. This dimension enables the incorporation of windows (variant B and C) and doors (variant C) according to the current standards, performing the three variants mentioned above (Figure 3).
The selected module shows also a good performance according to transportation parameters. Considering the sea containers High Cuba 40’, it is possible to transport four modules rows in length. However, the quantification of modules to transportation depends also from module thickness. This was calculated through its mechanical resistance considering the layer that covers the module internal structure. Thus, knowing that the distance between this internal structured and the cover layer should not be less than 3cm, the required minimum thickness was fixed in 7cm. In order to validate these values, several simulations were made. Another issue to be considered was the section asymmetry: the module thickness is displaced from its centre in order to allow the application of complemented materials in situ, making the module strictly structural. These metallic profiles, in U shape, with 100mm x 50mm x 3mm and it is place in the middle of the module, leaving 65mm for complemented covering material. Thereby, these structural metallic profiles have simultaneously the function to provide the connection between modules but also between modules and complemented materials.

This modular solutions enables flexibility in housing layout, namely through expansion and retraction possibilities, because all the connections and joints work mechanically and are able to be easily handle by occupants in an assisted self-construction perspective. Within this solution, and considering the African household dynamic and tendency to incremental informal processes, it is possible to provide a housing core that provides shelter and the main infrastructures, able to be evolved according to occupants’ needs and financial capacity.

**Module local adjustment**

The local adjustment is achieved through complemented local materials. The module provides a universal solution that is subject to an adequacy procedure through finishes and coverings made with local materials and built in situ, in an assisted self-construction context. The material selection is provided by first stage referring to context analysis where available and commonly used materials are identified. The main principles for materials selection are economic viability, social/cultural adequacy and low environmental impact. Thereby, the module is complemented with local and durable materials that address the following advantages:
● Contribution to local economy by providing employment and stimulate local material enterprises and local craftsmen;
● Propitiate social/cultural adequacy through the application of local architectural imagery, reinforcing collective identity and social cohesion;
● Reduces environmental impacts due less harmful emissions associated to transport and production.

Due the context analysis, the present research considers the application of earth blocks masonry – compressed earth blocks (CEB) - as external covering and wallpaper as internal finish. According to the housing stock analysis previously made, earth blocks are commonly used within the four case studies and meet premises of economical viability and cultural expression. They can be seen in vernacular architecture and show a good thermal and durability performance besides being an abundant raw material and thus adequate to social housing solutions. Its natural and ecological proprieties and manufacture processes demonstrate low embodied energy (energy consumption in whole process, including transport and production) but, most important, provides an important contribution to thermal comfort. This last aspect is important to refer i.e. energy efficient housing represent less energy costs as well as less energy consumption for cooling and ventilation, which directly reverts to household budget. In this context, several tests were made to a set of samples with different compositions in order to assess the best solution. The samples were produced with different types of soils and additions, namely low percentages of mineral binders as cement or hydraulic lime, construction and demolition wastes (CDW) and other types of non-dangerous wastes, giving a new usage to these types of materials. They were also cured through different manners, which have consequences in durability and thermal performance.

Figure 7. Solution section.
The tested samples used soil from different geographies in order to compare and analyze the different properties according to different type of soil. These samples were subject to the current standard tests and procedures: tensile strength; compressive strength; resistance to wear by dry abrasion; water abrasion resistance; dimensional stability to temperature variations and relative humidity; water absorption by low pressure; water absorption by capillarity; and drying capacity. Aiming the thermal improvement of the complemented solution module, the application of an extra layer between CEB masonry and the structural module in concrete was considered. Once more, the housing stock analysis provided available materials for this purpose, namely the possibility to implement a straw or canes layer as a thermal reinforcement. For internal finish, the research aimed the application of a low-cost ecological material that would not compromise housing affordability. Thus, it is proposed the application of recycled wallpaper composed my agricultural wastes that can be produced locally and also improve wallpaper blending aggregation and its mechanical performance. However, the paper production should be supported by reforestation strategy i.e. paper production needs to be supported by production forests. If so, paper becomes an inexhaustible raw material and thus, economically viable and environmental adequate. However, the sustainability of wallpaper should also considers not only the blending itself but also its application in inner walls where glue, pastes or another kind of chemicals are commonly used which can compromised its sustainable and ecological aspect. These chemicals are usually present in binders, glues and pigments, invalidating, in some cases, paper recycling process and generating harmful emissions not only for environment but also for inhabitants. In order to provide a full recycling process and improve the ecological premises for the solution, it is proposed a natural-based glue made with wood pulp and water – Methyl Cellulose. Apart from being a organic compost, this component does not present health risk nor environmental threats i.e. it is non-allergic and non-toxic. Methyl Cellulose is a natural powder that dissolves in cold water (between 40ºC and 50ºC) and get adhesive properties, which means that does not required much energy consumption for its production and thus, less associated costs. Besides its adhesive properties, this material is also an emulsifier that can be added to paper blending, improving its water absorption resistance.

CONCLUSION
The fast development, population growth and consequent slum formation and expansion in developing countries calls for an urgent solution for housing that should be integrated in a social, economical and environmental long-term strategy. The research presents a possible solution for housing deficit in developing countries that simultaneously contributes for sustainable development. The research focused in four case studies - Angola, Cape Verde, Mozambique and Guinea-Bissau. Therefore, a housing stock analysis and the identification of legislation related to buildings were made in order to identify needs, potentials, opportunities and quality standards. The methodology refers to a framework for the calculation of an optimal module for social housing supported by parametric elements such as the legal requirements related to housing, assemblage premises, number of accessories needed and transportation conditions. All these parametric elements are directly related to social, economic and environmental factors. Through a score method it was possible to compare several possibilities and thereby support the best option for module dimension. The combination of parametric elements resulted into a structural module with 1,1m in width, 2,8m in height and 0,07m in thickness, able to be complemented with local materials in situ. The selected materials resulted not only from the housing stock analysis of each country but also from ecological premises. Thus, the research showed the potential of CEB as external covering and wallpaper as...
internal covering. For the first, there were made samples with different soils types and aggregates that were subject to a set of standard test in order to achieve the better solution. The local adjustment through natural and locally produced materials shows almost no transportation efforts and low embodied energy, presenting economic and environmental benefits. It has also socially consequences through the creation of housing whose imagery is associated to community identify, making it easier its acceptance by population within a (re) housing context.

In order to support the wall thermal performance, several tests will be made through software simulations in the next phase. Further research will also consider life cycle analysis (LCA) of wall components (concrete module, CEB and wallpaper) within a Cradle-to-Grave scheme (impacts from raw material extraction to recycling/disposal). Both approaches will validate the environmental component but also economic aspects namely due thermal performance.

The modular solution aims its application within an incremental housing process supported by assisted self-construction, compatible with the population culture and knowledge, which performs an affordable approach to (re) housing in developing countries.
NOTES

9 Ibid.
13 Paulina Faria et al., “Caracterização de Betão Com Terra Para Aplicação Em Construção Modular Prefabricada,” in 2º CIHEL - Congresso Internacional Da Habitação No Espaço Lusófono (2º CIHEL - Congress Internacional da Habitação no Espaço Lusófono, Lisboa, 2013).
20 Dhani Bogati, “Cellulose Based Biochemicals” (Bachelor Thesis, Saimaa University of Applied Sciences, 2011).

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NEW HOUSING MODELS FOR AN AUTARKIC RURAL COMMUNITY

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Affiliation:
UNIVERSITY OF DUNDEE, UK

INTRODUCTION

“The country can steadily be regarded as a city state...filled with this low density, light weight urban matter lacking a clear form of organisation, consisting as it does of development that has to be varied all over and, perhaps as a result, ends up looking the same. This urbanity is more concerned with quantity than quality” (Koek, Maas & Van Rijs, 1998).

This observation by Koek, Maas and Rijs on urban planning and density highlights the problematic relationship between population, density and sustainability in the planning of cities and their regions in the Netherlands. In FARMAX: Excursions on Density in 1998, they proposed new models and forms of urban development based on Floor Area Ratio (FAR): the maximisation of the ratio of gross floor area of a building to the total size of its plot thereby unlocking a site’s potential through releasing plot area for other economic, social or sustainability enterprises. These new models relied on increased density, concentrated land use with mixed economics and in some cases new hybrid-typologies of urban and agricultural zoning. The proposals were a reaction to the limitations of the Fourth Spatial Policy Plan Extra (Vinex, 1991) (Cousins, 2009). Although being an implicit strategy towards sustainable urban development through a policy of ‘concentrated de-concentration’, the Vinex Policy had failed to deliver higher quality housing and sustainable, economic communities leading to widespread mono-cultural suburban sprawl and the pressurization on valuable agricultural land (Goedman et al., 2008). Similar patterns of speculative development which are driven by mass-market considerations and led by commercial sector developers and volume house builders are in evidence worldwide. In the UK it is particularly prevalent and while legislation is beginning to adapt in recognition of the deficiencies of this approach, much of this focuses on urban contexts while the rural environment receives less attention. And yet arguably the rural environment is an intrinsic component in the establishment of an integrated economic and sustainability framework that is needed to achieve low carbon regions, as first proposed by urban planner and sociologist Patrick Geddes in The Regional Plan in 1909 (Mellor 1990).

The driver behind the need for ‘sustainable’ development is to mitigate the impact that predicted climate change will have on our cities, land uses and infrastructural systems. Additionally, as people’s requirements change, throughout their lives and from one generation to the next, developments that can accommodate individual, collective and cultural diversity without undue impact on the environment will be richer places to live. Currently, more robust planning legislation governing the
quality of our built environments and more onerous energy efficiency standards are making incremental improvements to new and existing building stock and the planning of communities. However, a step-change needs to be made in the conceptualisation, zoning, planning and deployment of future communities and housing to fully integrate buildings and people within a regional low-carbon strategy. Such strategies need to accommodate new forms and typologies of living that are more biological in nature in their ability to absorb such diverse requirements as mixed and hybrid-land and building uses, adaptable housing layouts, alternative live-work practices, varied tenures, self-sufficiency in food production, district heat networks and sustainable power generation. This raises further questions as to the effectiveness of national and local planning policies and how these are interpreted and applied in practice and whether these policies in their current form have the capability to deliver the equitable and sustainable low-carbon neighbourhoods and communities that we need to take us through the 21st century.

One concept that has emerged recently in central Europe that begins to bring these ideas and issues into focus is that of autarky, or the ability for a community to be self-sufficient in their resources and needs. Its roots are in the energy crisis of 1972, and the emerging thinking that followed. The seminal works of the Vales through the building of the Southwell House (1995), a prototype for future sustainable housing, was designed to be net autonomous in heating and power energy demand, water supply and waste treatment, effectively the UK’s first sustainable off-grid building (Burford and Pearson 2013). The principles were covered in detail in the book The New Autonomous House (Vale & Vale 2000). In 1998, the Vales developed this concept for a group of five grid-connected, earth-sheltered, ultra-low-energy terraced houses at Hockerton, Nottinghamshire, an energy self-sufficient development powered from two wind turbines and a solar PV system resulting in very-low total energy requirement. From around the same period, the Vauban district of Freiburg has emerged as a model for sustainable living, exemplifying the integration of renewable energy design from the level of public policy and urban planning to the details of architectural form and technologies (Guzowski 2010). More recently the Voralberg Region of Austria is applying these concepts through legislation at a regional level (Zammer 2005). The following paper explores these issues by examining a conceptual project for a proposed new autarkic rural community at Cottown in the Carse of Gowrie, Perthshire. It proposes a number of new typological models and alternative sustainable spatial arrangements for low-energy rural housing that respond to higher density planning, hybrid land-use, innovative housing models, renewable energy provision and new formal regional languages.

SUSTAINABLE PLACE-MAKING LEGISLATION IN SCOTLAND

In June 2014 the Scottish Government published its National Policy Framework 3 (NPF 3)(2014a) and Scottish Planning Policy (SPP)(2014b) documents which set out the spatial development priorities and the policies to deliver them over the next 20 – 30 years. The outcomes are designed to deliver a “more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth” (Scottish Government, 2014a). The development outcomes to help realise this ambition, are stated as being the following:
- A successful, sustainable place
- A low Carbon Place
- A natural, resilient place
- A more connected place

In all of the above outcomes ‘place’ is the key recurring development theme. Good quality places, in their widest sense, are the foundation to our well-being on both a societal and individual level. A
holistic approach that acknowledges and balances these key components within distinctive locations is the cornerstone of current government policy. Place-making, whether completely new environments, or the regeneration of existing ones, is seen as the social and capital investment that we need to make to ensure our long term prosperity. The legislative framework that has been evolving over the past decade has sought to identify the components of good place-making and through policy documents such as Designing Places (Scottish Government, 2001) and more recently Designing Streets (Scottish Government, 2010a) and the Scottish Planning Policy (Scottish Government 2014b) define these as material considerations in the determination of development proposals. Within the policy document Creating Places, ‘place’ is considered to comprise the following: “The environment in which we live; the people that inhabit these spaces; and the quality of life that comes from the interaction of people and their surroundings” (Scottish Government, 2013, p.10). The legislative criteria on which the success of a place is judged has been reduced to six key components backed up by a body of research and case study material dating from 1999 (Gulliver and Tolson undated). At this point in time Scottish planning legislation defines successful places to be the sum of the following parts: Distinctive, Safe and Pleasant, Welcoming, Easy to Move Around, Adaptable, and Resource Efficient (Scottish Government 2014b, p.13-14). Although the SPP and NPF3 policy documents referred to were only published this year the embodied goals and intents have been established for a number of years. Designing Places was published by the Scottish Government in 2001 yet, except for a few notable examples, there is little evidence in the delivery of the types of places the legislation is aspiring to on the ground. As the Scottish Government’s Council of Economic Advisers commented in 2008, “Too much development in Scotland is a missed opportunity and of mediocre or indifferent quality” (Gulliver and Tolson, undated). We need to improve what is actually built across Scotland. As a goal our planning framework should deliver environments where the initial site analysis will “blend topography, temperature, wind and solar radiation with street pattern, scale, massing and landmarks.” (Thomas and Garnham, 2007).

TOWARDS ENERGY AUTARKIC COMMUNITIES

One of the major drivers for change in the built environment is the Scottish and UK Government’s commitment to reducing carbon emissions. Over the last 10 years, the European Union has developed world recognised carbon abatement policies leading with the Zero Carbon Roadmap 2050 which envisions strategies and policy implementation at national and regional levels for a de-carbonised power sector by 2050 (ROADMAP 2050, 2015) (Figure 1). This is seen as being intrinsic to reducing greenhouse gas emissions, securing supply, and driving sustainable economic development. The policy has a number of key strands which directly impact on new and existing development including: increased building energy efficiency measures, creating cost savings and reducing demand; investments in regional grid inter-connection, minimizing back-up supply and load-balancing requirements and laying the foundation for rapid fuel switch to electricity in buildings and transport sectors. The Energy Performance of Buildings Directive (2002/91/EC) develops broad policy requirements for lowering the carbon footprint of new and existing building stock through the use of improved technical specification and building regulations which feeds into national building standards. Energy and greenhouse gas (GHG) emission policies are defined in Scotland in the Climate Change (Scotland) Act 2009 which sets a target of an 80% reduction by 2050 with an interim target of 42% by 2020. This is manifested in the Building (Scotland) Act 2003 which quantifies these measures, the Platinum Standard being Zero Carbon (detail to be defined). Other agencies are tasked with implementing and writing policies that seek to improve infrastructure, environment, transport and well-being, all significant components of ‘sustainable’ development.
Figure 1. European Union and UK Energy context and legislation (Adapted from Pearson 2014)

Improvements in energy performance are enforced through the Building Standards Technical Handbook (Scottish Government 2013c). However, material and technical design considerations – those where a building is designed to be constructed, and ultimately dismantled, with minimum waste coupled with reduced energy input to maintain its internal environments - is only one aspect of resource efficiency. Resource efficiency is also required in the servicing infrastructure for any development and this needs to be incorporated within the planning legislation in order to apply this strategically. By sharing resources and looking at the issues to be tackled as holistically as possible the capital costs of infrastructure works can be reduced and the energy efficiency of the buildings that plug into that infrastructure can be improved. Along with infrastructure, building fabric and building services, the micro climate of a development will influence the energy efficiency of its component buildings. Therefore, it is very important that a development strategy takes cognisance of the prevailing winds and solar paths. Site planning and solar optimisation are currently absent from both planning and building standards legislation; in the former the requirements are too vague and in the latter average UK climate data is used in the Standard Assessment Procedure (SAP) to quantify energy performance but this acts against a strategy for regional and site responsive design which is in opposition to sustainable place making (Burford & Pearson 2013) (Figure 2). Similarly, it is clear from European legislation that de-carbonised energy sources and, in particular, renewable power generation and storage are at the centre of EU policies but this has still to be recognized adequately as an intrinsic component in both the UK planning policy for new developments or in Building Standards requirements.
Not having to depend on energy imports is a vision that has emerged recently and is gaining popularity in central Europe. Energy self-sufficiency or energy autarky is the ability to meet energy demand through regional renewable sources of energy, saving energy, and using energy more efficiently (Abeg 2011). It is a strategy for dealing with both climate change and energy security to the benefit of the regional economy, society, and environment. Energy autarky can thus be described as a location that relies on its own energy resources for generating the useful energy required to sustain the society within that region or a situation in which a region does not import substantial amounts of energy resources (Owens et al, 2014). The concept can be applied at individual building, community and regional scales and employs technical solutions to optimise energy generation, energy storage and control technologies to achieve self-sufficiency. As such it can be used to strategize planning based on renewable energy generation and low-carbon resource availability at regional levels, and in determining the location, scale and nature of new development based on the sustainable and economic use of local and regional low-carbon energy sources. Functioning autarkic energy systems typically require a micro-grid, defined energy demand and supply characteristics, opportunities for energy storage and controls able to manage the harmonization of system components.
(Owens et al., 2014). A number of European regions are developing strategies for energy autarky including Güssing, Austria, the Jühnde, Germany, Samso, Denmark and the Island of Eigg in Scotland. These pioneer areas are leading the way, not merely to eliminate energy imports, but also to use energy economically and efficiently, meet their own demand as far as possible with renewable energies, and at the same time stimulate the regional economy (Abeg 2011). Often, the objective of becoming a carbon-neutral region is closely linked with this economic goal as revenue from net energy export can be used to re-invest in social infrastructure, growth of local sustainable enterprise, investment in affordable housing with reduced energy requirements and improved agricultural production. Sustainable low or zero-carbon energy can be the economic catalyst for practically delivering autarkic sustainable communities in the broadest sense. This may well be one solution to developing robust regional rural economies, viable affordable rural housing and sustainable rural living practices in Scotland.

PERTHSHIRE HOUSING REQUIREMENTS AND RURAL MIGRATION

The provision of housing is key in the creation of sustainable low carbon communities through the development of alternative spatial and technical concepts appropriate to their environment. Scotland’s population is projected to increase from 5.2 million in 2013 to 5.5 million in 2033, with the effects of inward migration and changes in household structures influencing a predicted 22% increase in the number of households (GROS, 2010a, p3). Around 94% of rural Scotland accommodates only 20% of the population and house prices are increasing more rapidly in rural than urban areas (Scottish Government, 2012, p3). The population in Accessible Rural areas, the definition being settlements of less than 3,000 people and within 30mins drive of a settlement of 10,000 or more, has recently increased by 12% (Scottish Government, 2012, p5, p7) (Figure 3). Classed as Accessible Rural, the Perth & Kinross region is expected to encounter the largest increase in population across the 32
council areas of Scotland at 27%, and a 37% increase in the number of households, with significant implications for housing demand (GROS, 2010a, p1; GROS, 2010b, p1). The problem is compounded by the relationship between higher than average property prices and lower than average annual salaries in Perth & Kinross when compared to national statistics, illustrated by the 22% decrease in real value earnings in the region (GMB, 2013) (Figure 4). Finding the capital to buy available property is being affected by the rise in the average deposit from 10% to 21% between 2001-2011, which has influenced the 56% fall in the number of first time buyers in Scotland (Perth & Kinross Council, 2012). Young buyers in the 16-34 age group, a demographic predicted to increase by 19% in Perth & Kinross, will find it increasingly difficult to build up the required funds (Perth & Kinross Council, 2012).

TAYPlan, the Strategic Development Plan delivered in partnership by Fife, Dundee, Angus and Perth & Kinross Councils, proposes major expansion of the cities of Perth and Dundee between 2012-2032. Main principles include "Supporting sustainable economic development and improving regional image and distinctiveness; Enhancing the quality of place through better development outcomes", with objectives including the provision of good quality housing of mixed type, size and tenure through effective supply of land, the promotion of rural economic development, and the support and provision of renewable energy and low carbon technologies (TAYPlan, 2012). A significant proportion of the future housing allocation is in the Carse of Gowrie, an area of low lying agricultural land, small towns and hamlets sitting along the banks of the River Tay between Dundee and Perth.

LOCAL SUSTAINABLE VERNACULAR TRADITIONS OF THE CARSE OF GOWRIE
The Carse of Gowrie has a long history of being self-sustaining through thriving agriculture, renowned orchards and locally sourced materials, its southern aspect and low rainfall offering ideal growing conditions making it prime high value agricultural land. The area falls within the Perth &
Kinross Council Local Development Plan which identifies potential development sites for the provision of housing and employment through expansion of existing settlements to strengthen infrastructure and networks. Development sites have been identified which reinforce the ribbon development which forms the village of Cottown, a small collection of houses distributed along two minor roads approximately 8 miles to the east of Perth. The larger of the development sites, at approximately 0.9 hectares, is located to the north west of the village, with existing houses to the east and agricultural land typical of the area to the west. Orchards were first planted in the area by Cistercian monks in the 12th century with production from over 50 commercial orchards reaching its peak in the early 19th century. Fruit growing has declined during recent times due to cheaper imports from abroad, and remaining orchards, although of high biodiversity value, are in poor condition. Many have been lost due to clearance for agriculture, neglect and housing development (Hayes, 2011). There is a particularly high concentration of surviving mud wall structures in the area due to the drier climate on the east of Scotland. The success of local industries brought an influx of workers and their families to the area, resulting in an urgent need for housing, the solution being to use locally sourced clay, timber and reed thatch, a sustainable method of construction which is synonymous with the Carse of Gowrie.

![The Old Schoolhouse, Cottown, Carse of Gowrie](image)

The Old Schoolhouse is a single storey structure, approximately 13m x 7.5m in plan (Figure 5). The clay earth was built up in courses of approximately 600mm off a random rubble plinth and compacted by treading, rather than the adobe construction which may be found in warmer, drier climates. The addition of chopped straw to the clay adds to the tensile strength of the mixture. The external surface of the Old Schoolhouse is lime harl and limewash, following removal of unsuitable cement harl, offering some sacrificial protection to the mud wall construction. A timber roof truss supports the local River Tay reed thatching, while ceiling joists run through the wall construction to form the eaves. As a result of the building being vacant for a number of years conservation works in the 1990s included removal of harmful materials such as cement render, and replacement of timber roof members and thatch to reduce water penetration into the clay wall heads. The Old Schoolhouse was purchased by the National Trust for Scotland in 1993 following the Local Authority's issue of an Emergency Listed Building Repair Notice, having been vacant since 1985. Grant funding from the National Heritage Memorial Fund, Historic Scotland and Perth and Kinross Heritage Trust assisted the National Trust for Scotland in carrying out conservation works. Since the conservation works were completed environmental changes and neglect of adjacent Pows, a form of traditional land
drainage, regular seasonal flooding of the Schoolhouse site has resulted in the structure being threatened and in need of urgent repair. The Department of Architecture and Planning were approached by the National Trust for Scotland Little Houses Improvement Scheme to consider conceptual enablement strategies for the site through the provision of new housing. This offered the opportunity to investigate the local planning policies in relation to housing provision within Cottown as a whole and consider a development enablement strategy for the hamlet based on autarkic principles.

NEW HOUSING MODELS FOR AN AUTARKIC RURAL COMMUNITY IN COTTOWN, CARSE OF GOWRIE

Research Aims and Methodology

The aim of this research was to generate new spatial models of autarkic housing and alternative massing arrangements that responded to land-use, density, energy, landscape and current and future Scottish policy frameworks. The main objective in the study was to generate alternative, semi-quantifiable models that integrated the above requirements within holistic conceptual frameworks for rural sustainable living and which could then be used as a primer for further research and development. The methodology is based on previous work by RIBA/CABE in their study of future housing predictions ‘Housing Futures 2024’ (Worthington, 2004). Whilst there has been a distinct bias towards the qualitative in this endeavour, the research has been fundamentally a mixed methods approach with the design process forming a major part of the research method. It is both informed by quantitative data and provides the means by which data was generated for analysis. Design is an iterative process in which the implications of different decisions are weighed against each other in an informal evaluation process, until an optimum solution is arrived at. The criteria used in design development are typically both quantitative and qualitative in nature and the relative importance of each issue is often open to the personal bias of the designer. In light of this inherent subjectivity the designs were tested against specific quantifiable measures to give resistance to the decision making process, which included energy performance, density and floor areas. The scope of the research, developed in collaboration with industry stakeholders and specialist consultants, addresses the relationships between affordability, energy security, food cultivation, sustainable construction techniques, regional identity and spatial quality. The research was undertaken by the Macro Micro Studio, a Masters Research Unit within the department of Architecture and Planning at the University of Dundee along with MSc projects in Physics which investigated and supported the design-based research.

RESEARCH OUTCOMES

Energy Strategy

![Figure 6. Fuel Poverty by urban-rural split and by gas grid coverage](image)
The domestic sector accounts for nearly one third of all energy consumption, meaning it will have a significant role to play in reducing reliance on carbon-intensive generation while sustaining living standards and managing the protection of natural resources if climate change targets are to be met (Department for Energy and Climate Change, 2014, p5). The cost of living in rural Scotland is typically 10-40% higher than elsewhere in the UK, primarily due to the higher cost of food, clothes, household goods, transport and fuel bills associated with the rural climate and fuel sources. Cumulatively these costs are not offset by lower rural property prices (HIE, 2013, p4) (Figure 6). Fuel poverty is a historic problem in Scotland, the three primary drivers being energy efficiency, household income and energy prices, with the Scottish Government forming the definition that “A household is in fuel poverty if, in order to maintain a satisfactory heating regime, it would be required to spend more than 10% of its income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use.” (2015, p8). Over a third of the population was estimated to be living in fuel poverty in 2013, an increase of 12.9% since 2010, while fuel bills have risen six times faster than household incomes since 2003 (Scottish Government, 2015, p3, p9). The Government has set a target to ensure that people are not living in fuel poverty by November 2016 (Scottish Government, 2013b, p4). The vast majority of households in Scotland are reliant on fossil fuel-based traditional energy suppliers, and fuel poverty is exacerbated by suppliers' pricing structures being tied directly to fluctuations of the world energy market resulting in any increase being passed directly to the consumer (HIE, 2013, p4).

Research into existing Scottish Government legislation regarding fuel poverty and micro generation identified a secure, renewable strategy for the Cotswold proposals through establishment of a low energy community energy generation structure. Four methods of renewable micro generation were considered initially in the analysis: 50kw wind turbine; solar photovoltaic array; solar retrofit to existing properties; and combined heat and power (CHP) (Figures 7&8). Research identified a micro CHP plant using local reeds as a fuel source as the most appropriate low-carbon option in that it offered economic and social benefits in addition to efficient energy generation. The Tay Reed Bed is home to rare species of birds and insects, and requires cropping annually to sustain this fragile ecosystem. Each hectare of reeds can produce 5 tonnes of dried matter annually, which provides a potential energy content of 21MWh/t/Ha, making the potential for reeds as a fuel source for a CHP
plant in conjunction with thermally efficient housing a viable proposition (Komulain, K., et al, 2008). Bailing the reeds, as opposed to transporting the reeds to England for compaction into pellets, would reduce carbon emissions, promote local employment and contribute further to the local economy. By sizing the CHP plant to meet the heat demand of the proposed housing, a surplus in electricity is generated which can be exported to the National Grid and could generate up to £12,000 per annum in Feed-In Tariffs. This sum could be used for community use, in employing a manager to run the CHP system, reducing bills, or reinvesting in community facilities.

The number of dwellings and their energy efficiency was determined to establish the total energy demand, and having confirmed housing density through contextual analysis of existing housing developments in the local area, the plot density of 40 dwellings per hectare was adopted as an economically viable model. Three standards of fabric efficiency were analysed: Code for Sustainable Homes Level 6 at 46 kWh/a m²; Code for Sustainable Homes Level 6 + Mechanical Ventilation and Heat Recovery (MVHR) with airtightness to Passivhaus standard at 34 kWh/a m²; and Passivhaus at 15 kWh/a m², the results illustrating the potential number of developments supported being 9, 12 and 23 respectively (Figure 9).

Density
Homes in the UK are the smallest, oldest and most expensive in Western Europe (Table 1). In Germany, which has a similar population density to the UK, the average new dwelling size is 109m², compared with 76m² in the UK. In the Netherlands, which has a higher population density than the UK, new dwellings are almost 50% larger. The UK has a high percentage of dwellings built before 1945 at 38.5% compared with 27.2% in Germany, and these older homes tend on average to be larger in area than new dwellings. Since the 1970s, house prices in the UK have risen faster than in any Western European country, Japan, Switzerland or the United States. Over this time period, house prices in the UK rose by around 3% while those in Germany remained stable. (Evans & Hartwich, 2005).
An analytical study of six recent developments in the Carse of Gowrie by volume house-builders defined a specific attitude towards floor area and number of dwellings per hectare (Figure 10). The current developer model is driven by the financial strategy of constructing on site to a density to provide a profit margin which varies by locality and market forces. The Perth & Kinross Local Development Plan defines low density housing as below 10 DPH (average 5), medium density housing as between 11-25 DPH (average 20), and high density housing as between 26-40 DPH (average 35). The existing local developments studied are all detached or semi-detached properties, ranging from a minimum of 11 to a maximum of 21 DPH, therefore all falling into the Perth & Kinross Local Development Plan definition of average density.

![Image](image.png)

Figure 10. Examples of local density studies in comparison with the Cottown proposal

A density of 16 dwellings per hectare was established as an average developer density for the local area calculated from a survey of recent developments and when applied to the site returned a maximum number of units setting the benchmark for the sites economic viability. Published house plans were studied to calculate average dwelling floor areas and footprint sizes to ensure economic viability for the houses. The resulting floor areas used to inform design proposals were, for a 2 bedroom property 83m²; 3 bedroom property 96m²; and 4 bedroom property 107m².
Subsequently, a re-evaluation of the site keeping the total number of units constant but using an urban density of 40-42 dwellings per hectare facilitated a reduced development footprint which provided the opportunity to release land to be developed for other community purposes such as subsistent farming practices and shared community facilities. The strategic proposals investigated the possibility for like-minded individuals to lead housing procurement as a group, thereby directing funds into raising spatial design quality rather than forming the developer's profit and through shared facilities reduce the costs of essential services. Alternative procurement methods facilitated by Co-Housing and Baugruppe approaches were investigated which allowed the opportunity to re-evaluate the relationships between public and private realms, shared/community spaces and private gardens with all the proposed house types offering defined, private external space as well as access to shared areas. This approach inevitably led to considerations of how to resolve the massing, formal and spatial issues of developing to urban densities in a rural location of high aesthetic landscape value and creating an ‘identity’ for the development that responded to and intensified the intrinsic aesthetic relationships between built form and landscape particular to the Carse of Gowrie context (Figure 11).

**Rural Types**

Historically, rural building forms were largely influenced by immediately available materials, climate and specific use, resulting in regionally identifiable typologies (Figure 12). Maudlin noted that in Scotland traditional single storey dwellings with walls of mud or stone and roofs of thatch or turf were "integrated structures within the landscape" in that they were directly connected to the land through material, orientation and form (2009). More recently, however, characteristics of rural domestic buildings have lost specific regional distinctions due to the mono-cultural suburban residential model currently implemented by volume house-builders in Scottish rural areas. Unlike the regional characteristics apparent in traditional rural buildings, suburban development follows an essentially predefined development strategy irrespective of where it is implemented geographically. This type of development is having a detrimental impact on areas such as the historically significant Carse of
Gowrie, where existing characteristics are at risk of being lost as housing development follows a generic architectural language.

As well as over 40 examples of mud wall construction in the Carse of Gowrie area, more recent typologies with specific rural characteristics include the range of buildings which characterise large country estates and farms. The farm typology is a hybrid of key buildings of different scale and hierarchy, with particular relationships to the form of the landscape in terms of topography and orientation. The detached farm house, steading clusters protecting working courtyards, walled gardens, row housing, agricultural barns and silos all retain particular architectural qualities representative of their location and use. Research and analysis of existing types in the Cottown area, specifically the agricultural barn, walled gardens and farm steading, was carried out to identify key characteristics and principles for use in generating place-specific proposals in response to generic volume house development. Taking inspiration from the regional sustainable building traditions exemplified by the existing mud wall and thatch Schoolhouse and the key characteristics of existing rural building types, the research led to three distinct scenarios for new housing models for an autarkic rural community in Cottown: Skinny Barn; Walled Garden; Urban Steading.

**Skinny barn**

![Figure 13. Skinny Barn: model, diagram and perspective](image)

The Skinny Barn proposal investigates the typology of the regionally identifiable agricultural barn, allowing for higher housing density to be achieved while maintaining a recognisable rural language (Figure 13). The built form is located to the west of the site, releasing land for cultivation towards the east. A protected, car-free, courtyard forms a series of controlled spaces between the varied house types, offering shared greenhouses, raised planters, seating, play areas, tool storage and main entrances to all houses. These pockets of external space relate to activities in the different house types forming the perimeter - the living spaces of the 3 and 4 bedroom types, and the shared facilities located at the entrances to the courtyard. Vehicular access is limited to the north and south edges of the development, with car parking located below maisonettes, maximising pedestrian ownership of the site. Pows, drainage ditches common to the area, define the built form in the landscape and separate public and semi-public areas. The land released to the east of the development site as a result of the higher density approach offers allotments and tool storage for use by the existing Cottown community as well as those living in the new development, connecting the existing and new communities.

The narrow plan of the 4 bedroom house offers visual and physical relationships from primary living spaces to both the shared courtyard and the Carse of Gowrie landscape. The houses are staggered in plan to allow privacy for the external deck cantilevered over the pow offering views across the Carse landscape to the west. Bedrooms are located on the upper level, accessed from the double height
circulation space. The L-shaped plan of the 3 bedroom house locates kitchen and dining spaces towards the shared courtyard and living spaces towards the community allotment. Entrances are aligned with those of the 4 bedroom house types opposite, with all house types having entrances off the shared courtyard area. Shared facilities are located at the north and south entrances to the courtyard area, and include guest accommodation, meeting room, kitchen, laundry, workshop and multi-purpose space. Within the same built form, maisonettes propose ground floor bedrooms with views across the pow to the rural landscape, reeds offering a level of privacy. The upper floors offer living, kitchen and dining space with external balconies to the shared courtyard and rural landscape.

**Walled garden**

![Figure 14. Walled Garden: model, diagram and perspective](image)

The Walled Garden proposal is directed by one of the characteristic elements of landed property in the Carse of Gowrie, forming a contemporary reinterpretation of the walled garden typology. Substantial country estates in the area included various forms of enclosed gardens for cultivation, social activities and education (Figure 14). As country estates have diversified and reduced in scale, new buildings have been located within walled gardens to accommodate a range of private or commercial uses while the perimeter wall remains a constant, recognisable element in the landscape. The proposal considers the potential for new-build formally planned communities based on the walled garden typology. Individual houses are configured in a row to generate the perimeter wall, the collective mass forming a recognisable form in the landscape, enclosing and protecting a secluded space for subsistent living, community use and the reintroduction of the orchards which were historically prevalent in the Carse of Gowrie. The envelope formed by the row houses conceals the garden at the heart of the development, from which the natural horizon is only glimpsed at specific points. The enclosed garden becomes the primary focus, an external room of a different scale to the rural landscape. Vehicular access is limited to the external perimeter of the wall, with each house having an associated parking area on the bridge crossing the pow, adjacent to the main entrance. Pows running round the perimeter of the boundary wall emphasise the reading of the wall as an object in the rural landscape, giving the development identity and mass when viewed from a distance to correspond with existing rural forms. Both 3 bedroom and 4 bedroom house types wrap living spaces around hard landscaped courtyards which mediate between the semi-public community garden and the privacy of the individual house, while bedrooms are located on the upper level with views across the rural landscape.
Urban Steading

The Urban Steading proposal is driven by analysis of the farm steading form, a regionally identifiable typology which reflects the diversity of local farming types, building materials and construction methods as farms develop over time accommodating changing needs, offering a specific approach to community, density and identity in the rural landscape (Figure 15).

An analytical study of Design Codes led to development of strategic and detailed frameworks specific to the Carse of Gowrie in relation to community, density and identity. Influenced by Patrick Geddes’s Valley Section, originally based on the River Tay and its regions, and Andres Duany’s Urban-Rural transect, the strategic master plan was viewed as providing an overview for future development through consideration of the gradual transition from urban to rural as a mechanism for prevention of urban sprawl. At the detailed level specific steading characteristics were identified for interpretation into a language for contemporary housing, including the typical steading’s U or O shape arrangement in plan, volumetric form, proportion and height, elevational relief, and material choice.

Three steading forms are arranged on the site with differing orientation, forming courtyards which respond to their context to offer protected areas for orchards and allotments. These semi-public areas, defined by the built form, promote subsistence living and shared activities to integrate existing and new communities. In addition to this, each dwelling has a private area of external space, its edges defined by the use of pows which reinstate the traditional form of drainage. The U-shaped plan form proposes two storey houses at ground level to east and west, and maisonette flats at first floor level forming a higher element to the north. Maisonette living spaces are located on first floor level accessed by an external terrace, with views both into the courtyard and out to the landscape. Bedrooms are located on second floor level, within the form of the roof, with views over the courtyard. Parking at ground floor level is situated to the rear of communal spaces which address the courtyard, and vehicular access to the site is restricted to two specific points to the north and south allowing pedestrian priority in the courtyards and routes between. For the four bedroom houses, the permeable ground floor addresses the shared courtyard area with large openings to living areas, while bedrooms are located within the roof form on the first floor with smaller, more controlled openings framing views to the rural landscape.

CONCLUSION
A review of European, UK and Scottish legislation has demonstrated the disconnect between planning, carbon abatement, energy efficiency and design quality policies at regional, local and applied scales. With the built environment contributing to 37% of carbon emissions, fuel poverty in rural Scotland reaching up to 40% in some areas and a net annual shortfall of 574 affordable houses in the Perth and
Kinross area alone has resulted in an urgent need for more innovative solutions to the problem. The future sustainable, equitable, low-and zero-carbon communities that will be required to deliver this need alternative forms of housing of all tenures with mixed land uses and economies that are simply not provided by the current mass-market housing mix. A deeper understanding at regional and individual levels of the underlying cultural, environmental and economic requirements of communities may generate more appropriate development frameworks and architectural responses to low-carbon rural living. Autarky principles that have emerged from central Europe recently potentially provide an answer to the rural housing conundrum in that low-carbon energy self-sufficiency can catalyse sustainable economic development providing resilience and the necessary economic means for inward investment in local community infrastructure whilst contributing to regional energy generation requirements through renewable energy exports. However, this will require a rewriting of policy and regulation at national and regional levels cross-cutting between planning, building regulations and procurement policy.

This study has applied these principles to a small development site at Cottown in the Carse of Gowrie, Perthshire where there is a growing demand for new housing. Using practice-based research methods a number of alternative spatial and physical models of sustainable low-carbon housing have been proposed. Skinny Barn, Urban Steading and Walled Garden are three spatially differentiated concepts integrating energy autarkic solutions, with higher density planning and new regional languages that respond to the unique high value landscape of the Carse of Gowrie.

Whilst the proposals take very different approaches, a number of common architectural issues have emerged from the study. Density and intensive use of land are needed to create clearly defined hierarchies and high quality external spaces. In all schemes, clustering of the built fabric allows very precisely controlled public spaces with clear boundaries and thresholds to be produced whilst achieving higher densities than suburban models. The perception of enclosure (and therefore density) is generated by the boundaries (walls, hedgerows and drainage pows). A more intensive use of land pockets relieves pressure on remaining land which can be released for alternative uses: green-space, wildlife corridors, swales, waterways, farming and allotments. An ordered landscape framework, based not on the primacy of the car, but on alternative land uses can achieve a scale of association with the existing rural landscape with built densities more in-keeping with the existing village. The primacy of the grid is used to deliver five main characteristics: order and regulatory, orientation in space and to elements, simplicity and ease of navigation, speed of layout, and adaptability to circumstance. An abstracted order does not replicate the organic formation of the village but seeks rules based on underlying factors more in keeping with contemporary requirements whether these are urban or rural. Identity and character can be achieved by the sensitive manipulation of the built fabric, material language and landscape form.
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SHARE HOME @ LONDON’S HOUSING STRUGGLES

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“Architecture should have little to do with problem-solving – rather it should create desirable conditions and opportunities hitherto thought impossible.” Cedric Price

More than 80 social housing estates being currently demolished! More than 200 000 residents affected, i.e. evicted!

More than 20 km2 of land in London changing ownership from public to private entities, the value of this land being £52 billion!

London is in a permanent state of crisis in term of housing.

A crisis with no beginning and no end, as London is being owned by disconnected interests creating holes in the fabric of the city and divisions among its users.

How is the notion of home responding to this condition of permanent crisis within the context of the “extrastatecraft”, the very fast evolving technological infrastructures, or rather the infrastructural technologies we live in today?

How can the existing conditions be modified, in order to create opportunities for a home that would be a space of collective attention instead of individual evictions and never ending invisible profits? On one hand, the hidden realities of the housing struggles need first to be uncover and mapped, while on
the other hand the connections between the different actors involved, (such as planners, developers, architects, politicians, activists and residents) needs to be made. #Share home @ London’s Housing Struggles is a project made of several trends, such as mapping, making objects for direct actions, setting up a wiki-leak website for architecture (Concrete action) to counter the regeneration planning processes and designing a home as a space of collective attention. Each trends is an attempt to respond to this lack of knowledge and connections.

Designing a home as a space of collective attention is leading into the territory of common ownership and extreme sharing. What possibilities would offer a series of discreet architectures for sharing, based on not usually valued activities?

**MAPPING THE BATTLEFIELD**

Information about regeneration scheme is supposedly public as it is part of the planning process, but it is actually buried in the labyrinthine process of planning. Each piece of information has been collected from each London’s council websites. Mapping the existing battlefield took one month of intensive on line research, in order to make the struggles visible in a series of maps and a website. The website was launched in November 2014 and has been widely used by campaigners and residents to oppose regeneration schemes in their local area.

There are three maps published to date: the “battlefield”, the developer and the local campaigns fighting back. The first one, the “battlefield map” is tracing the different sites of struggles and the actors. It takes two appearances, as a folded printed map or as an online interactive map using an open source software (u-map), so that it can be modified by each users. Every estate is being listed with the number of residents affected, the demolition intent and eventual regeneration scheme, the value of the land, the name of the developers and architects, along with the council involved.

The second one, the “developer map” is delivering an overview of the current change of ownership of London, by revealing the various joint venture partnerships, the amount of land being exchanged…

London is going through an historical moment, whose scope is similar to the 1946-1948 period, except that this time, the process is reversed: land is changing ownership from public to private entities, including developers and housing associations.

The third map is celebrating the diversity and the strength of the local residents lead campaigns currently fighting back in London, with more than forty local campaigns and a series of organizations
building up an horizontal network that has the ability to organize and pop up anywhere anytime.

MAKING OBJECT OF PROTEST
Architects could be involved in a constant dialogue with users, ie residents, rather than clients. One local campaign Focus E15 located in Stratford is an opportunity for architects to be on the ground and explore alternative to regeneration and evictions.
Focus E15 campaign started in September 2013, when a group of young mothers decided to organize themselves after receiving eviction notices from East Thames Housing association due to Newham Council cutting its funding to the Focus E15 hostel for young homeless people. The group was only offered by the council private rented accommodation in Manchester, Hastings, or Birmingham. Due to cuts in housing benefits and lack of affordable housing in the borough, Newham Council was ready to displace them far away from their families and support network. Since then Focus E15 have been fighting back, demanding “social housing and not social cleansing”, with a weekly stall in Stratford, a protest to Newham Town Hall, while also building a network with other local campaigns opposing evictions and with the organization of the occupation in September of one maisonette on the Carpenters estate in Stratford. This incredible networks of campaigns and residents can be supported by architects, by participating in different protest and pursuing this attempt of rendering information visible by making objects of protest as trigger for social change or awareness.
Figure 4. Carpenters Estate’s occupation, Focus E15, Stratford, London, 21 September 2014

Figure 5. series of banners made for Feminist Fightback

Making objects of protest is an opportunity to explore the economy around eviction generated by regeneration scheme. How to displace in the streets the architectural elements of the conflict, such as the Sitex security steel screens? What if the architectural elements of eviction could become new objects of protest, participating in the knowledge broking process?
Figure 6.

Figure 7.
Figure 8.

**TURNING PLANNING’S OPACITY INTO A DESIGN OPPORTUNITY**

**The Opacity of the Planning Process is its Own Flaw**

The opacity of the planning process is its own flaw. A series of loopholes⁶ have been identified. Unfortunately these loopholes are being used by developers and housing associations to implement luxury developments under the cover of regeneration schemes.

Figure 9.
What could be the conditions to turn these loopholes into design opportunities? What if some documents, such as the viability assessment, could be publicly disclosed? The viability assessment seems to be the main mechanism exploited by developers. The viability assessment is key, as it is illegal to disclose it. It takes place after the planning permission has been granted. It is a document which inform the negotiations between the council and the developers. It is kept secret as it contains commercial clauses.

The viability assessment is produced by consultant firms and assesses the deliverability of the scheme, the land value and its competitive returns. It is in the viability assessment that quantifiable factors are being applied to assess the deliverability of a housing scheme.

“Competitive Returns: To a willing landowner and a willing developer to enable the development to be deliverable, a competitive return for the land owner is the price at which a reasonable land owner would be willing to sell their land for the development. The price will need to provide an incentive for the land owner to sell in comparison with the other options available. Those options may include the current use value of the land or its value for a realistic alternative use that complies with planning policy.”

Within the planning process, it is when a home becomes quantified. When it becomes a commodity, a house, assessed by quantifiable factors only, ie economical factors related to a neo liberal understanding of the economy as stated by Joseph Grima: “As the markets seeps through its walls and into the bedroom, the paradigm of the home as a space of intimacy, separate from work is replaced with that of the home as an asset, in which no distinction exists between the private sphere and the marketplace: the ultimate realization of the neoliberal idea of making everyone an entrepreneur of themselves.”

What if viability was to be replaced by livability, by unquantifiable factors?

Already in 1981, Lucius Burckhardt was hinting at the possibility of livability, of taking into account what he called “invisible needs”, therefore criticizing the quantitative analyse of needs which is the base of the viability assessment today. Lucius Burckhardt was calling for the recognition by planners and architects of unquantifiable factors such as mutual aid and participation which are the social mechanisms turning houses into homes.

How to counter this viability discourse? What if some documents, such as the viability assessment, could be publicly disclosed, could be made visible?

Concrete action, a website to counter regeneration schemes

Concrete Action is an independent network of professionals working in architecture and its related industries. Concrete Action aims at disseminating information to communities under threat of development, at providing alternative plans for development based on community participation, at being a catalyst for reflection within the architectural community.

Concrete Action is actively linking with historical figures who have implemented similar views in the United Kingdom in the seventies or eighties, such as John Murray who was part of the New Architecture Movement. The Nam was tightly connected to the Arc, which was launched by Brian...
Anson at the Architectural Association in 1974. Some traces of the actions lead by the ARC and Brian Anson in the 1970s can be found in the Architectural Association archives, such as supporting the Save Covent Garden Campaign, questioning the role of the RIBA or the ethics of architects.

Figure 11. Arc posters, 1974-75, Architectural Association Archives

As Brian Anson stated it in a letter to the archivist of the Architectural Association in 2008: “So long as there is blatant injustice in the way land is developed and construction is created (and goodness knows such injustice is rife these days) there will be a need for revolutionary thinking in architecture. I mean revolutionary in the social sense. (...) I condemn the (architectural) profession, which, to my mind, has become the image-maker of Global Market Capitalism which is, literally, destroying our small planet and, specifically, the myriad of communities which inhabit it.”

The first public presentation of Concrete Action was held with with John Murray on the 25th March at the Peer Gallery in London.

Figure 12.
As a first step Concrete Action is setting up a website to allow currently undisclosed planning documents to be available publicly for campaigners and journalists, a sort of wiki-leak for regeneration. We are creating a secure drop on the dark web, similar to the model of the secure drop coded by Aaron Swartz.13 Concrete Action’s website allows councilors, architects, consultants to download anonymously documents that, if disclosed, might be a turning point in regeneration schemes’ implementation.

As a second step, Concrete Action is developing the alternatives to regeneration, by organizing
workshops with local residents and campaigns groups based in London in order to “translate the planning process” and to imagine alternative regeneration proposals, that would include residents desires and dreams: imagination and action as opposed to speculation.

THE HOME AS A SPACE OF COLLECTIVE ATTENTION
Common Ownership and Extreme Sharing

Nevertheless, the question remains: how to create the conditions for a home that would be a space of collective attention instead of individual eviction and never ending profits? What are the conditions that need to be created to turn highly privatized houses, commodities into homes? The provocative work of Superstudio in the seventies was already addressing the domestic realm and its connection to social changes, while being fascinated by technological innovations of its time. Colombo’s Total Furnishing Unit in 1972 was a pragmatic attack on the commodification of the interior, while the collages produced by Superstudio for the New Domestic Landscape exhibition at the Museum of Modern Art in New York in 1972 were a radical attempt of “anti-design”.

In London in 2015, common ownership and extreme sharing appeared to be part of an alternative way of thinking about a home as a space of attention. The idea of common ownership draws on the long tradition of cooperative housing in London and the notion of common ground, with the tradition of the commons as a shared public space devoted to communal activities.

Sharing is already a contemporary condition of the neoliberal economy which more and more people are willing to experience as it has been rendered easy by peer to peer technologies and the Internet. Airbnb is a example of sharing a home within the neo liberal economy, when the notion of “home” itself is the product which is shared against a money retribution.

What if sharing was to be implemented at a more extreme level as a social structure based on constant exchanges excluding money exchanges. Could extreme sharing be a mean to achieve a feminist home? What if, rather than a kitchen-less home, domestic tasks were to be undertaken by the community, involving in the domestic tasks each member of the community according to its abilities?

The carpenters estate in a state of frozen crisis

The Carpenters Estate in Stratford is in a state of frozen crisis and therefore can be used as a testing ground for architectural speculations on common ownership and extreme sharing. It was built by Newham council in 1968. Since more than ten years, the Carpenters estate has entered a state of crisis.
Preceding a series of master plans drawn up by the council, a decant process was started in 2004, followed by a bid from UCL to buy the land to implement a campus in Stratford. This bid fell through in 2013. Since then, the situation on the estate is frozen. It has been partly decanted, with only 800 residents remaining out of 2,000. The residents are located mainly in the low-rise maisonettes, while the three towers are nearly completely empty. The size of the estate is 93,000m² and its value estimated at £265 millions, which is probably underestimated as it sits in front of the Olympic site. On the figure ground below, the white space indicates the public space available, the black space are the private property or development, along with the ongoing construction site. The Carpenters estate appears as displaying the biggest amount of public space compared to the surrounding developments.

Figure 16.

Some not usually valued situations are about to be erased by the Stratford Masterplan put together in 2011 by the council. The public spaces, the pub, the community center and more important the network of interactions of the existing community are under threat, while the Olympics legacy have become an endless series of luxury empty developments surrounding the Carpenters estate, a visual testimony of the “boom and bust” speculation currently operating in London.

Figure 17.
The on-going process of evictions has become another testimony of oneself possessions or goods. What would happen if everyone were to agree to a scheme of common ownership and would be willing to share everything from the private space to the fridge to the socks? In the context of London being in a state of permanent crisis, what possibilities would offer small architectures for sharing, based on not usually valued activities?

**De minimis**

Could some discreet extreme sharing architectures tune into the existing not usually valued activities of the communities living in the maisonettes? Rather than producing a monumental master plan to solve the Carpenters estate or the London housing crisis, a series of small, mobile and discreet interventions using camouflage and remote effect can be tried out. By disturbing the current conditions, these design speculations are closer to implement new situations, or to be a set of instructions, in fact to act as plugin software trying to modify interactions and to create reciprocal exchanges within horizontal organization. Could it be a way to value and reorganize the existing in order to extend the home to the estate, potentially to the city? Like dropping a pebble stone into apparently still waters, #share home @ London’s Housings struggles is an on-going project working with remote effects, counting on the ripples to destabilize the current conditions and creates opportunities for design.
NOTES

2 “Yet today, more than grids of pipes and wires, infrastructures includes pools of microwaves beaming from satellites and populations of atomized electronic devices that we hold in our hands. The shared standards and ideas that control everything from technical objects to management styles also constitutes an infrastructure. Far from hidden, infrastructure is now the over point of contact and access between us all- the rules governing the space of everyday life.” Keller Easterling, *Extrastatecraft, The Power of Infrastructure Space* (London: Verso, 2014), 11.
3 mappinglondonshousingstruggles.wordpress.com
4 https://umap.openstreetmap.fr/en/
5 http://focus15.org
8 Joseph Grima, “Home is the Answer, but What is the Question? ” in *SQM, the Quantified Home*, ed. Space Caviar (Zürich: Lars Müller publisher, 2014).
10 Concretaction.net
11 “The New Architecture Movement (NAM) was founded in 1975 and arose out of a conference organised by the more tightly knit ARC. NAM also took an explicitly oppositional stance to normative architectural practice: it set out to criticise the conventional notions of professionalism and the internalised structure of the profession, and in particular the system of patronage where the designer of a building has little contact with its user. NAM also called for the unionisation of architects, claiming that the RIBA failed to represent the majority of architects working within the private sector, dominated as it was (and still is) by private practice principals rather than their employees.” http://www.spatialagency.net/database/newarchitecture.movement.nam
13 refer to : freedom.press/securedrop
18 Joel Stein, “Tales from the Sharing Economy,” *Time*, 9th February 2015
21 Retrieved from the internet: newham.gov.uk/Pages/ServiceChild/The-Carpenters-Estate-Stratford.aspx#Theroadtoregeneration
23 De minimis
From the Latin de minimis non curat lex (‘the law does not deal with trivial matters’). This is a term accorded to activities or changes too minor to fall within the legal definition of development. The local planning authority would decide that such changes would make no difference to the outward appearance of a building. This generally includes installation of equipment such as television aerials, microcells or small antennas.
24 « When the object of design is not an object form or a masterplan but a set of instructions for an interplay between variables, design acquires some of the power and currency of software. This spatial software is not a thing but a means to craft a multitude of interdependent relationships and sequences – an updating platform for inflecting a stream of objects. » Keller Easterling, Extrastatecraft, the Power of Infrastructure Space (London: Verso, 2014), 80.

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HISTORICAL MILITARY HERITAGE AND SOCIAL HOUSING:
A SUSTAINABLE OPPORTUNITY

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INTRODUCTION
This study aims to prove that the restoration and refurbishment of ancient cultural buildings could represent a key opportunity for Social Housing. It specifically references historic military sites already decommissioned or are likely to be decommissioned in the coming years. During this relatively peaceful period military sites all around the world, especially in Europe and in the USA, are being transferred to civilian use. This means that entire quarters, villages and large architectural complexes are going to be available for new purposes. Military decommissioning is not only an Italian issue so an international debate is required.

Italian military sites are very often located in areas with outstanding landscapes or inside historic centres. The buildings are usually well designed and of safe construction. They are also characterised by a simple style with interesting ornamental features and they are often declared national monuments. Moreover, many of these buildings are modular and some have already been residences of military personnel. For this reason, they are potentially ideal for conversion into housing.

The case study of Sardinian military heritage is relevant to the topic and a strategy a sustainable conversion of these sites is urgent. In order to manage this process a detailed knowledge of the entire heritage is necessary, both in terms of historical and material aspects of the buildings.

The present paper illustrates the commencement of a specific scientific research project dedicated to the investigation into possible adaptive reuse of military sites as housing. This is only one aspect of a wider study dedicated both to the maintenance of military sites still in use and to the reuse of decommissioned areas.

The first part of the research focuses on the inventory of Sardinian military heritage and the definition of a knowledge plan designed to guide the planners in the conversion process. The second part is dedicated to opportunities and general criteria for housing conversion. Finally, the paper references a Sardinian case study. Unfortunately, there are not any examples of this kind of reuse in Sardinia or indeed Italy, so that it is not possible to show a real case history. However, some practical examples are discussed here as a possibility of future projects.

THE KNOWLEDGE PLAN FOR MILITARY HERITAGE REUSE
Italian military heritage offers an interesting variety of architectural typologies such as coastal towers, bastions and fortresses, strongholds, citadels, garrison stations, barracks, former prisons, World War II sites and NATO headquarters (Fig. 1-2).
The island of Sardinia has a strategic location in the Mediterranean which has lead to it being ruled by various foreign powers throughout its history. This has resulted in an extraordinary variety of military architecture\(^3\). The earliest types of defensive architecture are those related to the four medieval autonomous kingdoms called ‘Giudicati’ (XI-XIII centuries). In this period, the contemporary alliance of these kingdoms with Pisa and the Republic of Genoa for the defence of the coasts from the Arabs had the direct effect of attracting important merchant families because of the foundation of fortified citadels mainly located on rocky hills. The most important citadel is the one in Cagliari\(^4\).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Ancient Sardinian defence structure: Acquafredda Castle in Silica (CA), Burgos Castle (SS), Cagliari fortified citadel}
\end{figure}

From around 1570 several coastal towers were erected at the behest of the Spanish Crown, as part of a defensive plan against the Saracens. The Royal Administration of Towers, established in 1581 by Phillip II of Spain, managed the entire defensive system. This institution continued during the Savoy period (from 1720 to 1861) before being finally abolished in 1842.

The new military forces related to the unification of Italy constructed new military stations such as garrisons, prisons, large complexes and entire villages. In addition, during World War II several sites were fortified and at the beginning of the 1950s NATO base camps were installed.

A database system has been prepared to store a census and details of this wide defence heritage\(^5\). The database considers the following general information: identification, qualification of typology, chronology, historic notes, illustrations and technical information. Current and historical uses are also considered in order to reconstruct the historical military network each asset belongs to; this is particularly relevant for the conservation of the authenticity of the historic military sites.

The database also includes the recording of the state of conservation and specialist assessment on historic and artistic values. This is really useful for the definition of possible future redevelopment. Furthermore, each building is required to be analysed in detail by means of a geometric, material and morphological survey. For this reason, the first step of the study is a new architectural survey of each building. It is often the case that sites lack a sufficiently detailed survey. Plans, facades, sections, constructive details are absolute necessities to enable site reuse.

The historical knowledge of the building and the different phases of construction is also essential\(^6\).
Information can be found by the archival investigation and by the analysis of documents related to past worksites. Historical plans and documents can then be compared with the current situation to define the chronology of structures. It is possible to overlap the current survey with several ancient plans belonging to different periods. This is very useful technique for recognising items in the plan evident in the historical and current surveys as well as identifying elements illustrated in the ancient plan that no longer exist. Infrared thermography is a very useful technique to visualise extinct elements which become apparent due to the differences in specific temperature of materials. Infrared thermography is also useful for checking electrical, water and gas services, for identifying constructive elements, for studying heat transmission and the presence of humidity, etc.

However, the core of the study is the definition of the different types of constructive elements. The database considers examination of the foundation, masonry, roof, window, paving, plaster and decorations. The examination also foresees the assessment of the fitness for purpose as well as the evaluation of damages by means of a sequence of codes. This accurate and complete survey is the only method to reveal the possible historical assets that are available for preservation. With this purpose, a scale of historical and artistic interest has been defined in order to identify the consequent level of possible transformability. This scale includes four degrees of interest, identified by the codes 'Isa', 'Isc', 'Itc', 'Iti'7.

Isa has the highest degree and refers to 'historic and artistic interest'. In this case, the item is authentic and has relevance for material, style, technique and aesthetics. As a consequence subjects with this code have the highest priority for preservation.
‘Isc’ is the code for ‘historic and constructive interest’. Sites with this code have original and authentic constructive and structural elements. They represent material evidence of historical construction and of the coeval material culture and are worthy of restoration and preservation. Masonries, walls, roofs and other technical elements very often have a remarkable historical and constructive interest.

The third level is 'Itc'. This refers to the 'testimonial interest' and includes architectural elements or finishing preserved in their material authenticity. They are testimony to material culture so should be preserved through the restoration or through the preservation of the typology where the element is no longer able to fulfil its functions.
The final code is 'Iti' which refers to 'typological interest'. This categorises architectural elements that no longer exist but are recognizable via historical and archival documentation. For example, something rebuilt in the same position and for the same purpose as the previous element. Although, because it has been totally changed, it does not present any direct interest in material and constructive aspects it should be preserved in order to keep memory of the ancient structure.

The database set up for this project also records the state of conservation and includes a vulnerability data sheet with a similar set of codes to the above. The sequence of codes, associated to a single element gives complete information on its condition and effectiveness and qualifies possible degradation. Figure 3 is an example of an analysis of a paving, using the illustrated double code.
At the end of this complex codification of each constructive elements, the planner can count on a detailed map of ‘restrictions’ and ‘degree of freedom’. Every planned transformation for the adaptive reuse is supposed to be coherent with this fundamental assessment. This means that only incongruous components of the buildings or items of any interest could be removed or replaced, while every interesting component of the historic building has to be preserved. Following these criteria, the quality of the reuse project can be easily evaluated by checking the correspondences between demolitions and transformation and the just described assessment degree of historical interest.

**OPPORTUNITIES AND CULTURAL CRITERIA FOR HOUSING CONVERSION**

Italian military properties become regional property at the time of disposal and, on request, they can be transferred at a symbolic price to municipalities to be used for public purposes. Nationally, several plans have been presented in recent years concerning the conversation of military heritage into civilian use. These have often been oriented towards student housing. These innovations come from the latest law for Italian economic enhancement, which contains advantageous measures for military decommissioning with social housing aims. This is a unique opportunity for refurbishing abandoned military monuments whilst keeping them in a good state of maintenance and providing much needed low cost housing at a time of economic crisis.

For this reasons Turin, Rome and other municipalities are working hard to achieve this goal, following interesting international examples such as the German cohousing project of Vauban in Friburg. The main problem is that refurbishment entails providing facilities to improve the quality of the building and to create better living conditions. The transformation could involve environmental, sanitary, functional, structural and energy supply measures. Every choice requires awareness, effectiveness and consideration to the fact that buildings involved in this process are very often monuments.

What are the criteria for the conversion and reuse?
The Venice Charter for the conservation of cultural heritage (1964) recommended compatible reuse in order to limit demolitions and damage to cultural structures. In fact, in article nr. 4, it declares that *It is essential to the conservation of monuments that they be maintained on a permanent basis*, and moreover, at article n. 5 it states that *The conservation of monuments is always facilitated by making use of them for some socially useful purpose. Such use is therefore desirable but it must not change the lay-out or decoration of the building. It is within these limits only that modifications demanded by a change of function should be envisaged and may be permitted.*

The reuse of ex-military sites for social housing could ensure the maintenance of these historic buildings and, at the same time, ensure that social housing is of the highest quality of historical architecture in terms of values and materials. Undoubtedly, this kind of strategy needs the synergic work of a multidisciplinary team of restorers, architects, historians, designers, economists and sociologists. However, results have to meet the needs of both politicians and residents.

This theoretical construct of sustainable and integrated conservation comes from the Amsterdam Declaration (1975) and represents our starting point. It states that *Conservation requires a pool of qualified planners, architects, technicians and craftsmen to prepare conservation programmes.* Furthermore, integrated conservation involves the responsibility of local authorities and calls for citizens’ participation.

In practice, the main and most important and generally recognized criteria include the following action: to maximize conservation; to remove incongruous elements; to discover solutions that come from the building; to act for addition, never for subtraction; to ensure reversibility and distinctness; to carefully check and manage the worksite; to use consolidated techniques that have already passed the proof of time, to consider and plan future maintenance.

An analysis of the context is also necessary, especially in case of reuse of entire headquarters, where only an accurate master plan could avoid the creation of slums or dormitory quarters.

Turning to technical compatibility of this adapting reuse, the strong point is that military bases and especially barracks offer inner spaces – room’s dimension, staircase features, windows and doors sizes, wall’s thickness, structure’s stability – that easily fulfil the higher standards for a comfortable living. In addition, the general symmetry of plans makes the buildings easy to be divided into different living units. Furthermore, the repetitiveness of the project in the entire national territory stimulates the outline of a general programme of conversion.

**SARDINIAN CASE STUDY**

What kind of Sardinian military architecture can been considered for residential purpose?

Among the typologies above mentioned, the ones, which can be considered most compatible with a residential use, are barracks, built by the end of the nineteen century and in the beginning of the twentieth century, but also the big complexes related to Italian Army or NATO base camps.

An interesting case study is that of the Carabinieri station barracks. The Corps of the Royal Carabinieri was instituted in Turin by the by Royal Warrant of the King of Sardinia, Vittorio Emanuele I, on 13th July 1814. This military Corp had the dual function of first-line national defence and policing using special powers and prerogatives. The Force was given a territorial task and was organized into divisions, one for each province. The divisions were called Companies and they were subdivided into Lieutenancies which commanded and coordinated the local police stations, and were distributed throughout the national territory to maintain direct contact with the public.

Carabinieri barracks were designed to house the Marshal (the head of the station), his family and the military stationed in the municipality. They consist of small buildings that are usually located in the historic centres of small municipalities, close to the Town Hall and the church to form a sort of
institutional square. These buildings are usually characterized by great stability and simple decorations. Typically, they have a modular plan which was designed by the central government and repeated all over Italy. Constructive features, such as the thickness of the walls and strong building materials, ensure excellent performance levels. The only adjustments that may be required are windows and main services such as electricity, plumbing, air-conditioning, etc.

Figure 4. Carabinieri barracks in Sardinia (CA): the case of Ballao (abandoned), Villasalto (used for social activities) and Narcao (still military)

Several barracks are now owned by Municipalities. Many of these are still abandoned and only a few have been restored and reused. Their reuse has mainly been oriented to public, representative and cultural functions such as town halls, museums, charitable and voluntary association premises and schools. Very often reuse has caused heavy transformations such as consolidations, demolitions and enlargements works.

The best restoration work is that of Villasalto (CA) station, carried out in 2007, where the original building has been converted into a public library and offices for volunteers. This restoration work has maintained structures, shape and dimensions of rooms, original staircases, roofs and decorations.

It has not been possible to find a Sardinian example of barrack already converted into social housing. This fact seems to be strange, if we consider the above mentioned modularity of this buildings and their historical residential use. The only examples are the projects for the Carabinieri station of Dolianova and Guasila, but they haven't been carried out.

In the last thirty the municipality of Dolianova, a small village near to Cagliari, has developed significant social intervention which includes social housing plans. The project for the conversion of the barracks into housing was called 'The Social Courtyard' due to the traditional type of residences widespread in Italy.

This ex-military complex is composed by two main buildings of two floors each, some ground floor rooms and two courtyards. The reuse of this architecture as housing seems possible with minimal transformation, following the criteria of conservative restoration. The only new works are in regard to energy efficiency, bio architecture and environmental sustainability. The buildings are particularly adaptable to small residences for young couples, elderly persons, small families in economic difficulties. The historic city centre location is particularly convenient for community services. This project dates back to 2010 and can be considered a good starting point for Sardinian housing in terms of aims and criteria, but it is affected by several technical and cultural problems to be solved, mainly related to a very lacking preliminary knowledge plan and to the inadequate assessment of cultural values.
Turning to future researches, it seems interesting the case study of the old garrison and Carabinieri station of Macomer (NU)\textsuperscript{13}, also used as school in the Fifteens. It is located in the historic centre of a small town in the north of Sardinia and it consists in two main buildings of two floors, resting on an area of around 255mq. The urban plan for the historic centre allows in this area the project of public services and indicates for the building a conservative restoration, with a low degree of possible transformability.

The architectural complex, probably build in XVI century and later transformed, is currently abandoned. The plans of the two floors are regular and easy to be divided into six small residential units, restoring traditional techniques (Figures 6 - 7). The illustrated preliminary study is the first step of the investigation protocol for the definition of its sustainable reuse that is still in progress.
Figure 6. Photogrammetric survey, analysis of materials, decay and conservative restoration of the facade (edit F. Meloni)

Figure 7. Macomer old Garrison: plans of the first and second floor. Possible solution for the settlement of six small temporary accommodation.
CONCLUSION
Historical military heritage represents a tangible and remarkable opportunity for housing. However, the conversion has to balance the needs of social requirements and fundraising programmes. Initially, a deep knowledge of this heritage is essential, together with the analysis of risks connected to reuse. For this reason effective transformations can only be the result of a multidisciplinary working group composed of architects, town planners, historians, scientists, economists, sociologists and anthropologists, coordinated by the institutions involved and politicians. A preliminary analysis of the context is also necessary, especially in cases where entire headquarters are reused. Only an accurate master plan can evaluate possible equilibrium between public and private use and to avoid the creation of slums or dormitory quarters that are deficient in terms of services and social exchange. The aim of this cooperation should be the definition of possible scenarios, in order to discover and understand advantages and disadvantages of each transformation and define concrete reasons for investment by public and private institutions.
NOTES

1 Paola Pellegrini and Christina Conti, ‘La valorizzazione delle caserme dismesse, un metodo per affrontarne la restituzione all'uso’, TECHNE no. 3 (2012): 224-237.


3 Foiso Fois, 'Castelli della Sardegna medievale' (Milano: Silvana Editoriale, 1992); Donatella Rita Fiorino and Michele Pintus, 'Verso un Atlante dei sistemi difensivi della Sardegna' (Napoli: Giannini, 2015); Fernando Luigi Codonesu, 'Servizi militari modello di sviluppo e sovranità in Sardegna', (Cagliari: CUEC, 2013).


6 Donatella Rita Fiorino, ‘Chapitre II. Conservation et entretien, in AA.VV., in Manuel Technique des interventions pour les jouissance des sites fortifiés (Genova: Sagep 2013), 32-53.

7 The complex protocol of investigation has been developed during the research programme financed by the Sardinia Regional Government (P.O.R. Sardegna F.S.E. Operational Programme of the Autonomous Region of Sardinia, European Social Fund 2007-2013 - Axis IV Human Resources, Objective 1.3, Line of Activity I.3.1 “Avviso di chiamata per il finanziamento di Assegni di Ricerca”). The illustrated codification was successfully tested on the Cascino military base (Cagliari) during a specific research study on chronological evolution of the architectural complex and the preliminary assessment of single constructive elements for the definition of the restoration project. General research coordinator for the knowledge plan: D.R. Fiorino; commissioner: Italian Ministry for Infrastructures and Transportation – Agency for Public Works.


11 A specific document entitled ‘Determinazioni’ (Disposals) indicated the main features of the military buildings planned for hosting a Carabinieri station. They can be consulted at <www.carabinieri.it>.


13 A first study of the old garrison in Macomer (NU) has been carried out by the Eng. Francesca Meloni with the supervisor of the lecturer Donatella Rita Fiorino Fiorino, during the academic course of Restoration at the University of Cagliari (2014/2015).

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INTERNET LINKS

INTRODUCTION
This paper presents ongoing studies on urban regeneration as part of the OIKONET network, a three-year project supported by the Erasmus Network’s programme of the European Union. A major challenge of the project is to find ways to intertwine research, pedagogy and participation. The first step in this direction has been to create a platform for sharing information on research expertise and interests of OIKONET partners. As a result synergies between research, pedagogy and participation as well as potential affinities among partners were identified; one of these is housing regeneration which is the topic of a collaborative learning space currently being carried out by a group of partners. The next sections will present urban regeneration strategies in the UK, Hungary, Serbia, Slovakia and Russia that were examined as part of the research and pedagogic activities conducted by OIKONET partners during the last 18 months.

THE UK CONTEXT
“Urban development practice in the UK often is labelled as urban regeneration”\(^1\). Additionally, regeneration in the UK has become a major element of urban policy, and since the 1990s this policy considered a crucial element which is the environmental sustainability\(^2\). The idea behind this new dimension to urban policy is that new development should make the areas “more attractive places in which to live and work”\(^3\).

Urban developments in the UK are generally private sector-led inner-city mixed-use developments such as Bristol Harbourside and Liverpool One\(^4\). A case study of Liverpool’s Duke Street/Bold Street revealed that economic regeneration and more precisely property redevelopment is the main driving force regenerating the area, while environmentally sustainable regeneration process will most likely
take much longer to be achieved. Nonetheless, development plans offer protection to key aspects such as townscape, landscape and built heritage. Good urban design and aesthetic considerations are also important drivers of these urban developments, but stakeholders’ involvement in these processes is still modest.

The Urban Task Force commissioned by the UK Government during the 1990s proposed the development of compact cities using mixed use developments and higher density. The UK government was also aiming at reaching 60 percent of additional housing should be developed on brownfields by 2008. Not surprisingly there are significant regional differences in meeting this ambitious target, given that in some cities such as Liverpool, there is a large amount of previously developed land available, and the anticipated demand and associated growth in housing is small.

Several authors argue that urban compaction as part of the regeneration process may not be feasible or acceptable in the UK context and that people in general are not aiming at this type of urban renaissance or aspire to the opposite. High density urban living may also have negative impacts on quality of life of residents such as smaller living spaces, less opportunities for walking, and potential for more crime. Research shows that people prefer to live in quiet neighbourhood, nearer the countryside and with low crime. Others argue that high density limits socio-spatial segregation but increases rates of crime.

The UK government introduced the Sustainable Communities Plan in 2003 to provide a vision for developing these communities over the next 20 years. This plan aimed for instance to regenerate northern England’s industrial urban belt acknowledging thus the need for urban development and regeneration programmes in cities like Liverpool and Manchester. It is argued that “new sustainable communities can be a driver of urban regeneration, and sustainable communities are the essential ingredients of any regeneration scheme”, and that regeneration particularly in deprived area can be a mechanism for creating sustainable communities. This will require demolition of empty properties, creation of new towns, and improving the physical, environmental, social and economic conditions which are necessary to achieve sustainable communities.

More research is needed to establish the effects of contemporary urban renewal and housing regenerations strategies in the UK on communities in order to identify the challenges facing the creation of sustainable communities and the type of physical environments needed for their development. This is with the belief that urban regeneration or renewal should in principle improve the physical, social, environmental and economic conditions of neighbourhoods and communities.

Research exploring these themes is timely in light of recent increase urbanisation of cities in the UK. In the UK, interesting case studies to examine in more details are the regeneration of the Liverpool and London Docklands in terms of their challenges, achievements, and physical regeneration.

THE HUNGARIAN CONTEXT
An interesting environment full of stimulus influence may play a role in attracting and keeping residents, enterprises and tourists in the inner city. This is integrated in the planning document in many cities as i.e. “cultural” or “cultural flagship” developments.

Such transformations in the inner city can be realised in different ways. Besides the intentions of urban planning offices, there are spontaneous processes changing the environment temporarily or for a longer period of time. In some cases the cultural ‘milieu’ lasts long enough to raise demand for the area and the market processes can raise real estate prices so high that the initial artistic use gets displaced, and the area undergoes gentrification.

The engines of change are on the one hand the local authorities that use these tools in city
development strategies. On the other hand there are bottom-up initiatives, which are based on the unique and alternative milieu of a neighbourhood and play important role in the formation of a cultural cluster. These clusters are usually related to a physical centre, a building or a neighbourhood. Zukin (1982) noted in the early 1980s, that despite positive intentions creative quarters can become exclusive consumption places of the middle class, excluding lower social groups and dissolving the ‘milieu’ that was once a factor in the development of these neighbourhoods. The economic success of a fashionable neighbourhood may also bring about changes in residential composition resulting in the displacement of the poor, so the groups of a lower status cannot be the recipients of (often public) inner city investment.

The Hungarian case study attempts to demonstrate these transformations from the point of view of the residents affected by the cultural investment on the example of District VII of Budapest (Erzsébetváros). The local authority of District VII was consciously looking for tools that can render the neighbourhood more attractive for certain social groups and accelerate the gentrification processes. This interest is understandable since the population of the capital - especially the inner city of Budapest and the inner Erzsébetváros - was decreasing substantially until the late 2000s. On the other hand, the policy is questionable, since this type of interventions may result in the disappearance of affordable housing and retail places that are attractive for cultural producers and new (usually younger) residents. These changes are effected by two methods: reconstruction and changing the function or intensifying one of the functions of the area, usually supplemented by the rehabilitation of public spaces. The first method was facilitated by the increasing interest from the side of the investors for the area, the second by the urban rehabilitation funds of the European Union. The spontaneous changes were made possible by the large number of empty buildings that were rented first from the local authority and then later (after the privatisation of the remaining local authority owned buildings) from private investors. The empty ruins of those buildings became first temporary and later stable hospitality venues and cultural places, establishing the so called “ruin bar scene” in Budapest. The ruin bars were followed by a swarm of customary small and cheaper pubs, more expensive wine bars, “economy ruin bars” targeting young and less affluent people, large and more expensive “ruin night clubs”, as well as smaller clubs. In parallel with these developments, the projects supported by the urban rehabilitation funds of the European Union were launched. One of these projects was named “Street of the culture”, meaning a thematic profile for a section of a street, treating culture as a form of entertainment. But the project failed to facilitate cooperation between cultural activities and was not able to support the cultural and creative use of empty retail spaces and buildings. A further problem is that there was no other form of support for culture in the strategic documents of the local authority, possibly because the local authority was mostly against such spontaneous projects since they first emerged, therefore, to invite them to support the local authority project was now out of the question.
Figure 1. Map of Budapest and the map of neighbourhoods in Inner-city area Source: Adapted by the authors.

Figure 2. “ruin bar scene” in Budapest Source: G. Csanádi
THE SERBIAN CONTEXT

Housing development has been an increasingly important issue in Serbia after World War II, when the process of industrialization attracted significant number of workers from rural areas towards large industrial centres, like Belgrade, Niš, Novi Sad, Kruševac, Kragujevac, Smederevo, Šabac, etc. An intensive industrialization in socialistic period required a quick solving of housing issues for thousands of newcomers. The housing developments from that period are still in use, in majority of cases with no significant changes. The turbulent political period in the region in 1990s, required solving housing problems for numerous refugees from the region of ex-Yugoslavia, mainly from Croatia, Bosnia and Kosovo. Together with the recent economic crisis, this resulted in a lack of wider planned housing regeneration activities. In addition, the post-socialistic era in Serbia has witnessed the challenges of market-driven urban movements that significantly affected the housing stock in both new housing developments and intentions to regenerate the existing ones. The most popular kind of such regeneration of the multi-story housing buildings was through various extensions, mainly by constructing an additional story or a loft space. In some cases this contributed to better physical performance, but for a significant percent of buildings such interventions meant a degradation of ambient characteristics. The issues of energy consumption increased in recent decades, and several micro-level housing regeneration examples started to appear, mainly initiated by international institutions (GIZ, World Bank, European Development Bank, UN Habitat Sirp) and supported by international funds (IPA). Climate change in the region (2014 Southeast Europe Floods), that led to severe floods in May 2014 affected Croatia, Bosnia and Serbia, is moving the focus from the mitigation issues (saving energy and decreasing the CO2 emissions), to the problems of low resilience and a need to adapt to the new climatic circumstances.

The School of Architecture of the University of Belgrade selected the affected town of Krupanj as a case to develop a regeneration strategy working with students. A prospective visit to Krupanj in June 2014, gave the opportunity to witness flood destruction, but also to notice some mistakes in planning and construction that could be avoided in the future. It was evident that the existing houses needed some measures of adaptation to new climatic circumstances (Figure 3).

The pedagogical work has been carried out in collaboration with other OIKONET partners, in a shared learning space under the name “Habitat Regeneration Strategies”. This way, it has been possible to compare the Serbian case with other regeneration cases identified in Bratislava, Slovakia and Volgograd, Russia.

Figure 3. Krupanj, Serbia, June 2014; the destroyed and damaged housing examples and immediate, spontaneous adaptation measures
Prior to the site visit, the students learned about the principles of sustainable development, integrative urban planning, and were introduced with several European habitat regeneration examples, each with different strategies and approaches. They also collected precedent information on Krupanj and its surrounding area (Figure 4).

Figure 4. One of the precedent analysis of Krupanj and its surrounding

The students were asked to propose visions for regeneration of Krupanj, based on the lessons learned from the disaster and considering the immediate conversations with citizens and the municipality officials. Having in mind the integrative principles of urban regeneration, the five groups of students tried to take different visioning approaches, with the aim to contribute to a sustainable regeneration strategy. The visions included:

- Improving housing resilience with technical measures (Figure 6)
- Redesigning riverbeds
- Designing retentions within the public spaces/green areas (Figure 7)
- Encouraging economic growth through small food production businesses
- Stimulating tourism through revitalization of surrounding villages connected by funiculares.
Figure 6. Habitat regeneration actions/design for Krupanj, Serbia; students Tamara Mihic, Iva Teodora Vukovic, Milan Ostojic

Figure 7. Habitat regeneration actions/design for Krupanj, Serbia; students Andjela Ristic, Jana Kulic, Marija Zdravkovic, Miljan Okuka
THE SLOVAKIAN CONTEXT
Regeneration processes in Slovakia consider historical, geopolitical and socio-economic development in this Central European country. In Slovakia, substantial differences in the regeneration processes in urban brownfield areas arise from the transition from a centrally controlled economy to a market economy, new environmental standards for industrial production in residential areas, restructuring of economic activity, post-revolution ‘wild privatization’ and restitution of property to its original owners.\textsuperscript{46} Regeneration processes should address the problems caused by specifics of society development, which are physically reflected in the actual conditions of built environment (including the issues of city brownfields, gentrification, suburbanisation, densification), and reflect the relationship of citizens with the built environment and public spaces. One important challenge is the physical and social reconstruction of large prefabricated residential areas and the rehabilitation of public spaces within these areas.

One of the biggest housing estates in Slovakia, and in Central Europe, is Petržalka, which lies on the bank of Danube River in Bratislava, Slovak capital. Former rural settlements with about 20,000 inhabitants before World War II have changed to large panel housing settlement for about 120,000 inhabitants in 1970s and 1980s and became thus the most densely populated residential district in Central Europe. The construction of Petržalka was preceded by an international architectural competition in 1966 with 84 submissions from all over the world. The winners were not accepted and Petržalka complex settlement was built using a different concept. At that time and with little experiences in design of large housing estates it was well designed, and even had a visionary idea.

There is no national concept of urban development at city level, and no comprehensive strategies. Best cities are based on the land use plan, but bold conceptual vision is mostly missing\textsuperscript{47}. Building interventions in the area are regulated by the master planning, which is processed at the city level. Zonal master plans, which detail the development of public spaces, are missing. The concept of development of public spaces, together with mapping the current state is absent as well. In such situation two basic ways of realization of regenerative processes in the area are identified: top-down (or local authority driven) and bottom-up (led by civil initiatives). Activism, encouraged by the intensified interest of citizens in public spaces and the strengthening of their quality, creates interesting concepts for environment regeneration (e.g. Urban interventions – free designs from mostly young architects\textsuperscript{48}, or the initiative ‘Vnútroblok’\textsuperscript{49}, regenerating the courtyards and creating community gardens).

Large housing estates have considerable problems but also significant potential for development. The question however is the extent to which the development should be regulated. Regeneration concept should rather encourage flexible, open, resilient, variable and sustainable processes. Municipality should encourage experts from all sectors affecting spatial planning and design, who will comprehensively examine the impact of the design on the environment. Much attention should be paid to the urbanity and the creation of valuable supporting spatial structure and network of public spaces. Public, communities, users of urban space, civic associations and NGOs should play an important role in the process of regeneration and transformation of large housing estates.

“Despite the known negatives large settlements remain here, and the people in them will live on” Vítkova (2009). The actual research on regeneration of large housing estates deals mostly with the humanization of the built environment and the development of human scale.
Figure 8. Petržalka – structures of large housing estate from Bratislava castle (photo by author).

Figure 9. Petržalka in connectivity analysis (prepared by FASTU Bratislava).

Figure 10. Petržalka central development axis with water biocoridor (photo by author).
THE RUSSIAN CONTEXT

The process of creating social and recreational areas as part of coastal territories is quickly developing in many Russian cities situated along sea coasts and river banks. Relying on the European experience of creating and designing socially-oriented recreational areas of coastal territories in major Russian cities, Russian architects create interesting projects of coastal territory. The project of Krymskaya Embankment in Moscow is considered to be an interesting and successful example of creating social and recreational areas on the Moscow river embankment.\(^{50}\)

The problem of creating social and recreational areas of coastal territories in Russian industrial cities situated along major rivers is presently one of the principal urban planning tasks which directly affects urban planning development of these cities. An interesting and important example to comprehend the problems of Russian urban planning development is the one of Volgograd situated on the right bank of the Volga River. Regarding urban planning, especially valuable coastal territories are occupied by plants, storehouse and public utilities zones. It is the coastal territories that are one of the principal components of its landscape and urban planning infrastructure and they must be the major accelerator of steady urban development. For historical reasons, industrial enterprises in Volgograd were situated along the Volga on its backshore. The basis of Volgograd coastal industrial enterprises system is out-of-date. The planning structure of the existing coastal territory is characterized by the presence of randomly located territories of different purpose, low density of industrial development, and vast disrupted areas not using coastal territories as active public areas (Figures 12-13).\(^{51}\)
Figure 12. Krymskaya Embankment location in Moscow (By Moscow Architectural and Artistic Project Institut named after Academician Polyansky and Wowhouse Bureau: architects – Dmitry Likin and Oleg Shapiro)
Figure 13. Plan of landscape and recreational territories of the Volgograd Embankment and the one of locating the existing industrial zones situated on the coastal territories of the city, the most part of which are presently degrading post-industrial areas.

Figure 14. Competition project “Urban planning concept of Volgograd’s Central 62nd Army Embankment development”, 2012 (Green Art Architectural and Landscape Centre LLC, by E. Krasilnikova, N. Yarovaya, Y. Ivanitskaya, L. Kusina, O. Shtro) – “Silver Diploma” of the Russian National Awards for landscape architecture and garden and park art within the frameworks of “Zodchestvo-2012”; “Golden Diploma” of the Union of Architects of Russia at the XI Forum of Southern Russia Architects; First place diploma at the competition named “Landscape Architecture – view from a house. House at Brestskaya” – Moscow, 2012.

The project named Urban Planning Concept “Tsaritsyn Valley landscape and urban planning complex” in Volgograd relates to one of the most troubled places in the city and sets a goal to arrange the area of the Tsaritsa river flood plain which is a natural axis connecting with the Volga. At the moment this territory is partially developed. The project suggests preserving vast green areas and recreating the environment to increase the power of this ‘green foundations’ of the city (see figure 15).
At present, the modern landscape and urban planning activities are outrunning creation of theoretical basis and concepts of developing and creating public and recreational coastal territories. The project of Zariadiye Park in Moscow may be considered a good example (Figure 16). The basis of creating public areas of the park includes the principles of landscape urbanism which allow to transfer flexibly from an urbanized environment to the natural one. Such an approach united the Zariadiye Park and the surrounding China-town district by means of a street and area system that is convenient for pedestrians.

Figure 15. Urban Planning Concept “Tsaritsyn Valley landscape and urban planning complex” in Volgograd. Architects – Professor A. V. Antyufeev, V. V. Tolochko, I. A. Kagaikin, N. A. Litvinenko.
CONCLUSION

This study summarised current activities and cases within the OIKONET project, and highlighted that regeneration is an important issue driving the production of contemporary housing in Europe. These cases are part of wider research, pedagogic and participatory activities around housing and urban regeneration strategies within the network. Cases showed in the selected European countries, UK, Hungary, Serbia, Slovakia and Russia have similar features in terms of drivers and actors, and highlight the need for bottom-up approaches to achieve sustainable housing regeneration and sustainable communities.

Reading and coursework material produced as part of these exercises will be used in the pedagogical, research and community participation activities planned by the network. These case studies have provided network members with topical themes which can be addressed in a pedagogical/research/participatory processes.

The challenge of the OIKONET project is to intertwine these three aspects - pedagogical, research, participation - so the issues that were identified from this comparative study should consider these three components. Therefore, the issues identified in this study may give rise to further research, pedagogical and participatory activities to be carried out during the rest of the project, and to increase the knowledge base on contemporary housing regeneration in Europe.
NOTES

22 P. Hall, “Creativity, Culture, Knowledge and the City,” Built Environment 30, no. 3 (2004): 256-258.
23 S. Musterd, M. Bontje, C. Chapain, Z. Kovács, and A. Murie, ACRE Report 1 (Accommodating Creative Knowledge – Competitiveness of European Metropolitan Regions within the Enlarged Union). (Amsterdam: AMIDSt, University of Amsterdam, 2007).
25 It is also influenced by national level governance typically in the form of representative investment, government level support for arts and enterprises and also by the national level changes of authority and the funding system of the local power.
26 Cluster means the geographical concentration of similar or related producers (Porter, 1998 cited by Musterd et al., 2007).
28 It is also important to note that cluster is also a legal category and type of institution, also supported by the EU.
The research was funded by the OTKA grant nr. 84051 „New Trends in Suburban Development “. The interviews used in this paper were recorded between 2008 and 2012. Students of the ELTE Faculty of Social Sciences also participated in collecting the interviews.


In addition, mostly higher status residents left the city and chose the suburban lifestyle of districts in the outskirts of the city.


**BIBLIOGRAPHY**


DENSITY: A NUMBERS GAME, BUT WHAT’S THE ALTERNATIVE?

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INTRODUCTION

The city is manifestly a complicated thing. Part of the difficulty we experience in dealing with it can be attributed to this inherent complexity. But our problems can also be attributed to our failure to conceptualize the situation correctly. If our concepts are inadequate or inconsistent, we cannot hope to identify problems and formulate appropriate policy solutions. One set of problems arises from academic and professional specialization on certain aspects of city processes. Sociologists, economists, geographers, architects, city planners, and so on, all appear to plough lonely furrows and to live in their own confined conceptual worlds.

At its most basic, density is a simple ratio of matter to space. Typically, in the planning and design of the built environment, that ‘matter’ is defined in terms of dwelling units, floor area or people. Space is measured in abstract hectares. Yet, in spite of its relatively narrow definition, the concept of density is implicated in a vast range of issues and attributed a range of social, economic, ecological, psychological and architectural consequences. The frequent and familiar debate about where we build and what type of housing we build wields the terminology of density to infer something about the physical attributes of the housing and its environment. This is not new. Myriad studies have sought to investigate, prove and disprove the relationship between density ratio and built form. Arguably the most rigorous of these is the recent Spacematrix study carried out by researchers at TU Delft which established a complex parametric model that accounted for the critical physical of the built environment dimensions that contribute to the measured density ratio. In demonstrating this complex model the study clearly showed that without supplementary information in regards to site area, distance to adjacent buildings, and the size of the dwellings themselves – density ratios on their own are relatively dumb measurements.

We might begin by asking why this is important. There is a long and a short history to the subject of density in UK planning and development. The recent history began with the publication of the Urban Task Force (UTF) white paper Towards an Urban Renaissance in 1999. The UTF report called for a more ‘compact’ model of urban development intended to bring about the best qualities of the city centres of Paris, Barcelona and Berlin in UK towns and cities. These were taken as models of ‘compact city’ urbanism, characterised by mixed-use - residential, commercial and institutional buildings close together rather than segregated in to their respective zones as in the twentieth century
Modern city - good public transport and public open spaces. Richard Rogers, lead author of the UTF report defined the compact city as:

A dense and socially diverse city where economic and social activities overlap and where communities are focused around neighbourhoods.6

The UTF report ushered in a wave of changes to UK planning policy within which density was given a key role. Higher urban densities were attributed with a range of environmental benefits such as reduced travel distances and generating the physical proximity required to develop and sustain public transport and other services. There were assumed social benefits, too. The ‘dense city’, wrote Rogers, offered the opportunity to reconsider the “social advantages” of proximity and living in each other’s company.7

In London this shift spurred an increase in the density ratios of new housing, from 50 dwellings per hectare (d/ha) in 2001 to 103d/ha in 2009.8 The pattern has been similar in other UK cities. The city centres of Leeds and Manchester for instance have been transformed by new residential developments with very high density ratios. The intended consequences of the higher density ratios may be realised: the concentration of people to support public transport, the additional population revitalizing the city centre (as long as these apartments are occupied), but there is continued debate over the long term suitability of this housing.9

In the context of the current critical shortage in housing supply, however, higher density is equated with increased quantity. This is the political angle. The economic angle is that it is a vehicle for speculation. I am not an economist, however, but I am an architect. This paper therefore sets out to do two things. Firstly, it sets out to demonstrate the limitations of using density ratios – instruments of economic viability and strategic planning – as an indicator of the qualities or character of the built environment. Secondly, it proposes an alternative conception of density that responds to designerly concerns for the tangible and experiential qualities of our urban, and particularly our residential environment.

MEASURING DENSITY

Since it was first introduced to the discourse of architecture and planning at the beginning of the twentieth century both the concept of density and the way that it is measured have undergone multiple transitions. These different measurements were predicated on different ideas about the implications of density and different applications for its measurement. Depending upon whether density was being used as an index of overcrowding, congestion, built form, or urban vitality, the way that it is measured (units) and the way that it is interpreted within architectural and planning practice has shifted repeatedly.10

There are many patent differences between a high density of people during rush hour, and a high density of under-occupied apartment buildings, yet in most references to density the terms of measurement are not stated. The former scenario is a dynamic and changing phenomenon, generated by the concentration of people, their activities, their vehicles and the space that they share. The latter meanwhile is a more static measurement, but one which might be perceived differently depending upon the units used to describe it. Historically, bedspaces per hectare might have been used to describe a residential environment and give an indication of the number of inhabitants.11 But these are problematic because they can only ever measure the designed occupancy and are therefore distorted by over and under-occupancy. Habitable- rooms-per-hectare (hr/ha) is the measurement commonly used in London. It is intended to give a greater idea of the population within a given development than dwelling densities. However, habitable rooms not only lack a clear and universal definition, but as with dwelling densities, provide no indication as to the size of the rooms and
therefore the amount of building that is being described.\textsuperscript{12} Whilst elsewhere in Europe, floor area ratios and plot ratios are the primary measurement of density used in urban planning and development, in the UK dwelling densities (along with habitable room densities in London) continue to be the most prevalent measurements used.

Both have intrinsic problems. Neither measure gives any indication as to the size of the dwellings or the layout of the site, or accounts for any other, non-residential land use.\textsuperscript{13} Therefore, when measuring mixed developments, only the residential use is measured and even then, not very accurately. It is argued that the dominance of dwelling densities as a favoured density measurement is a product of the way that we measure and sell housing; that is by number of units or rooms rather than by floor area. It has also been shown that, far from benign measurement, the use of dwelling densities and habitable room densities to prescribe limits on the amount of development permitted directly affects the type of housing that developers will choose to build. Maximum limits on the density of dwellings, incentivise developers to build the largest houses possible, thereby maximising the resale value of the land purchased.\textsuperscript{14} Meanwhile, as Duncan Bowie has demonstrated in his review of planning consents granted in London, a quota based on habitable rooms per hectare encourages the development of greater numbers of small dwellings, with an optimal ratio of non-habitable to habitable rooms.\textsuperscript{15}

This correlation between increased density and increased land value was acknowledged by Raymond Unwin in one of the earliest recorded applications of density ratios as an instrument of (what was then the emerging) disciple of town planning. Unwin predicated his twelve-to-the-acre manifesto on the principles of land economics, determining that prescribed density ratios for the Garden Cities and Suburbs would only encourage housebuilders to build the largest houses possible in order to maximize their economic return. He advocated therefore that density quotas ought to be supplemented by limits on the size of the houses that could be built to prevent over-development and maintain diversity within the new neighbourhoods.\textsuperscript{16}

Unwin’s thesis clearly highlights the potential economic implications of maximum and minimum limits on density ratios. He recognized that density ratios, whilst having capacity to affect the character of a development, in the context of housing production driven by market economics, density ratios are first and foremost an economic instrument. Furthermore, he recognized that limiting the density of new housing was by no means an adequate mechanism through which to ensure the quality of the housing or its environment. He therefore supplemented his thesis on density with a design guide setting out the principles for development in the Garden Cities. What we have lost today is the coupling of quantitative measurements for economic calculation with qualitative measures as a way of appraising the spatial qualities associated with these density quotas. Whilst numerous studies have set out to demonstrate the fallibility of using density ratios as a descriptor of the amount or type of building on a given site, presumptions about the type and size of housing associated with a given density ratio prevail. In spite of the variety of approximations and generalisations required in order to translate dwelling densities (or any ratio measure) as a descriptor of the form or organisation of the built environment as were expanded in the previous chapter, there persists a general understanding that density X will produce building typology Y, with a given amount of garden space and parking ratio.\textsuperscript{17} The American scholar Ernest Alexander refers to these assumptions rather romantically as “a kind of ‘folklore’” that relates density ratios with specific dwelling types.\textsuperscript{18} Yet these preconceptions colour understanding about density and have a potentially normative effect on the design of new housing. The Callcutt Review into housing delivery verified this, stating that the use of dwelling and habitable room densities as the primary measurements of site capacity requires (and makes necessary) assumptions about the size, layout and massing of different dwelling types. The report states:
Standard house types are also designed to allow the optimum compliant densities to be achieved. Optimum density is not necessarily the highest density, but the combination of house types and densities which yields the highest value per hectare at a given rate of sale. By positioning density ratios as instruments of economic calculation and viability, it becomes clear their application as a means of understanding or appraising the social, spatial or experiential qualities of the built environment is limited. Instead, it is necessary to establish a spatial conception of density as a means of giving weight to these concerns.

SO, WHAT’S THE ALTERNATIVE?
This counter index aims to define those spatial qualities of density that are evaded by the ratio measures. It is proposed as a means to shift the debate about density away from simplistic, polarizing models of towerblock versus suburban arcadia. It has been developed out of a detailed historical and theoretical study, drawing on architectural theory, environmental psychology, fictional and artistic depictions of conditions of density. Three conceptions of density were identified (to supplement the abstract, numeric measures).

The first, ‘physical density’, is concerned with the perception of density in the built environment. Whilst it has been demonstrated by various studies that density ratios are by no means a determinant of built form, there are aspects of built form that popular opinion associates with the notion of density. Perhaps the most obvious of these is building height. However, it is not as simple as an equation of height with density. There are numerous examples of pavilions-in-the-park which have a very different character to the Hong Kong landscape for instance. It is complicated by the subjective nature of the perception of density. However, by articulating qualities associated with density, such as the number of people (or evidence of them), perceived anonymity, the physical proximity between buildings and perceived intensity of development, as a designer, one is able to begin to design for an experiential quality of density.

The second concept is that of ‘communality’. The impetus for this as a way of thinking about the impacts of density arose from the early modernists and their attitude towards the design of high density housing. There was a notion, advocated most viscerally by Walter Gropius and later by Ludwig Hilberseimer, that the concentration of dwellings into larger, taller blocks would liberate large areas of land to provide public parks and open space – a broader public good as a consequence of more compact housing typologies. The collective benefits of compact living were elaborated further by Le Corbusier, who utilized the proximity generated by apartment living to enable the provision of modern conveniences such as concierge services, on-site health services and childcare.

The third conception of density was that of ‘social proximity’. Aspects such as social encounter, proximity, privacy and the hustle-and-bustle generated by a density of people are all frequently cited in experiential portrayals of the city, but rarely referenced in design discourse – particularly that around housing. Yet, these conditions fundamentally affect the experience of living in the city, and ought therefore to be considered as part of the design of new housing environments. These alternative conceptions of density have the potential to change the way that new housing is designed – particularly in an urban context. The notion of communality, for instance has great potential for promoting shared space and infrastructure as a socially and economically sustainable housing model. In the case studies used to test the development of these indices, it was clear that in order to achieve the higher density ratios demanded, new, higher density housing is being designed to cater for increasingly individual dwelling habits. There are few opportunities to bump into one’s neighbours, to casually look out for whether neighbours are at home. If future residents can be persuaded that these are positive social norms, then the integration of shared space, shared
infrastructure and services can potentially enable more compact housing forms with an embedded social infrastructure. Indeed, co-housing, where residents have actively bought into the idea of communality to a greater or lesser extent is perhaps one of the most useful models in terms of designing for proximity and compaction.

There is a body of socio-geographic research that posits proximity and encounter as one of the essential social logics of the city.\(^\text{24}\) Architects too, expound the value of proximity and encounter. Dutch architect and writer, Rudy Uytenhaak suggests that proximity between people, promoted by different types of space designed for different uses and activities promotes complexity which is the essential ingredient of the bustle and ‘urbanity’ of the city.\(^\text{25}\) The architect and activist Teddy Cruz makes a strong case for an index of encounter as an alternative way of thinking about density arguing that by thinking of density in terms of a density of encounters per area, the social propensity of design can be measured and given weight in deliberations over density. Furthermore, these deliberations necessitate the engagement of agencies other than those economic forces that currently dominate housing production.\(^\text{26}\) That is to say that developing social indices for the appraisal of the built environment and the housing that we are designing and delivering opens up the debate not only about what we build and where, but who is engaged in the process.

The economic implications of density are inherent. Higher permitted density ratios increase the value of land and it is clear that, in London at least, the maximum quotas set out in the London Plan have rapidly become minimum values. These quotas were borne out of the Urban Task Force report which promoted an increase in urban density not on economic grounds (although it would be naïve to assume that this was not a recognized and intended consequence of the planning proposals). It is also clear that density ratios on their own have little veracity as a means of describing the physical experience of the city, or the phenomenology of density.

The alternative index of density is proposed as a counter to the numeric measurements that predominate in planning, and particularly in relation to new housing development. Density in terms of its social and phenomenological implications is one of the defining characteristics of the urban. In failing to identify and value these qualities, the character and organization of the city as a place of interaction and integration could be changed significantly. It is apparent that increased numeric densities have implications for the design – that is the spatial organization of new housing which is not, as might be expected, inherently more social. Yet, the conception of density as an organizational or social characteristic of the urban environment requires a shift in how we, as designers approach the notion of proximity between neighbours, the scale of large developments, the relationship that homes have to their immediate environment. Perhaps most importantly, it introduces these other conceptions of density alongside the numbers and opens up the space for designerly concerns to be part of the debate about density.
NOTES

1 David Harvey, Social Justice and the City (London: Edward Arnold Publishers, 1973), 22.
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AGEING POPULATION GROWTH AND CRITICAL HOUSING QUESTIONS IN NEW ZEALAND

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INTRODUCTION

The question of ageing population growth in the built environment is one of several societal realities in the world, and its importance to housing cannot be ignored. The sense of living in a multi-generational society is now becoming real to many people, and the unparalleled ageing of individuals of virtually all advanced and emergent nations lends credence to the fact that the world is facing a momentous demographic change.\(^1\) Population ageing is not unique to any nation; it is observed as an inherent aspect of the demographic transition from comparatively high fertility and mortality rates to comparatively low fertility and mortality rates.\(^2\) Going by the United Nations’ forecast, virtually one-third of the world population will be aged sixty-five or older in 2050.\(^3\) According to Rosenberg and Everitt, the Organisation for Economic Co-operation and Development Countries (OECD) has acknowledged that, in future decades, ageing individuals will be the quickest growing sections of their population.\(^4\) Also, the International Institute for Applied Systems Analysis (IIASA) estimated that Europe will have One hundred and seventy three million persons aged sixty-five and above by 2050.\(^5\) This was substantiated by the submission of Wiener and Tilly that although the United States of America is ageing just like the rest of the world, the proportion of the ageing population in Europe is greater than that of the United States.\(^6\) In the context of the global ageing population, the case of New Zealand is significant as well. Lupis, McVeagh, and McGarr observed that New Zealanders are constantly growing old, and that Auckland’s population is estimated to rise by one million over the next thirty years, and an ageing population with specific needs will constitute a substantial percentage of that increase. According to them, one in four of the NZ population will be over sixty-five by 2051.\(^7\) This fact was supported by Davey\(^8\) and Grant\(^9\) who affirmed that New Zealand’s ageing population will have unparalleled impact on all facets of the society; one of these facets is housing. Therefore, the reality of the world’s ageing population cannot be unclear.

The relationship between housing and ageing population is currently being observed by scholars; and with the increasing population of older individuals, housing crisis seems to be more of a lifetime question. Unfortunately, the housing situations of ageing individuals are multifarious and challenging to address because housing needs comprise an intricate array of changing factors.\(^10\) It is noteworthy that challenges, ranging from mental (memory loss) to physical incapacitation, insidiously characterize the everyday life of the aged. In spite of this, most of them prefer to stay in their homes.\(^7\) In New Zealand, just as in the rest of the world, old people’s obvious preference to live and age in their old private homes which are not adapted to their changing needs contributes to housing
challenges in its social and design form. Such homes are not aged-friendly because the consideration for behaviour and response patterns of the aged were not conceptually and practically integrated in their design and construction. However, various governments have observed this challenge and employed several interventions to ensure quality of life of ageing individuals in the built environment; this is seen in the following section. This paper therefore identifies some critical housing questions within the context of population ageing in Auckland, New Zealand. It accentuates the necessity for an appropriate housing strategy that best meets the needs of the ageing cohort and suggests a systematic approach that can help in meeting these housing needs.

**ACTIVE, POSITIVE AGEING INTERVENTION**

Active ageing is understood in various ways by different countries, however, its interpretations are similar. The idea of active ageing started in the early 1960s in the USA as successful ageing in which impractical optimisms were placed on old individuals to stay in the same activity level as the middle age people. Later, in the 1980s, the concept was seen as productive ageing which was narrowly based on a life course perspective of the continuous engagement of the experiences of old people in the production of goods and services, until the 1990s when a new concept of active ageing developed. Active ageing as a concept seeks the connection between activity and healthy ageing.11 12 Planned activities to guarantee the protection, dignity, social, physical, social, and economic needs and rights of the ageing population was underscored in the active ageing vision; it however challenges the undue outlooks of old people characterised by passivity and dependency, but emphasises independence and involvement.12

“The process of optimising opportunities for health, participation and security in order to enhance quality of life as people age” is active ageing.13, 14, 11 Other competing definitions for active ageing abound; however, there is no consensus definition for it.13 The World Health Organization has identified various determinants of active ageing; these are culture and gender, health and social services, behavioural determinants, economic determinants, social determinants, personal factors, and the physical environment (See Figure 1 and Table 1). It is remarkable that safe housing is part of these determinants (under the physical environment).

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**Figure 1. Determinants of active ageing**

*Source: adapted from Malanowski, Özçivelek and Cabrera*
Determinants | Indicators
---|---
Culture and gender | Cross-cutting
Health and social services | Promotion and disease prevention
| Curative services, Long term care.
Economic determinants | Income, social protection, work
Behavioural determinants | Tobacco use, physical activity, healthy eating, oral health, alcohol, medications.
Social environments | Social support, violence, abuse, education and literacy
Personal factors | Biology and genetics, psychological factors.
Physical environments | Transportation, safe housing, falls, clean water and safe food.

Table 1. Determinants of active ageing Source: adapted from Malanowski, Özcivelek and Cabrera

Interestingly, about eighty percent of human activities are performed indoors; therefore, ensuring that older people are kept active can be associated with safe housing. This is evident in the study of McLaren, Turner, Gomez, McLachlan, and Gibbs that elders living in nursing homes or assisted facility, compared with those who stay at home, are more likely to exhibit low level of sense of belonging; and low sense of belonging is associated with high level of depressive symptoms. It also confirmed that house type and sense of belonging interact to influence symptoms of depression among older adults. This indicates that housing type among older adults plays a vital and dynamic role in the quality of life.

For some time, many research efforts have been looking at this area and environmental gerontologists have particularly looked at sociological factors affecting the older people and their home environments. For instance, Oswald, Wahl, Schilling, Nygren, Fange, Sixsmith, and Iwarsson studied the relationship between housing and healthy ageing, the survey detailed the findings related to housing and healthy ageing in five European countries (Germany, Hungary, Latvia, Sweden and UK).

It was discovered that healthy ageing is related to both objective and perceived aspects of housing. According to the study, participants “living in better accessible homes, who perceive their home as meaningful and useful, are more independent in daily activities and have a better sense of well-being.”

Though cross-sectional and involved only old people living alone, it emphasised the fundamental importance of housing in the life of the ageing population. It is therefore imperative to further explore how suitable and sustainable accommodations can be provided for the ageing population.

The Positive Ageing Strategy, which was launched by New Zealand Government in 2001, is regarded as a life time process which commences at birth. It sketches central policy principles and sets out precedence objectives and key actions in ten areas. Among these objectives is to ensure “affordable and appropriate housing options for older people.” Up till now, achieving this objective is still a challenge. Currently, reports have shown that though New Zealand is one of the world’s liveable countries, yet the housing stock is still characterised by poor affordability, poor dwelling design and performance, residential instability, and poor economic and social connectivity and isolation. What are the emergent residential concerns and needs of the ageing population? How can buildings and neighbourhoods that meet the needs of the ageing population be provided? These are questions that must be examined in order to explore how to ensure optimum relationship between older individuals and housing. This paper therefore discusses some of the contemporary housing questions relating to the ageing population in Auckland, New Zealand.
INFLEXIBLE HOUSING AND OLDER INDIVIDUALS
An unreal perception and impression of sustainability is merely created if a building is not flexible enough to accommodate change and reuse.\textsuperscript{17} Buildings were once designed and constructed as static structures, many of which are existing rigid constructions used for specific purposes.\textsuperscript{18} Scholars substantiated that buildings have been constructed to meet specific needs such as comfort, income estimate and function. These needs dwell on the “uses and conditions of the moment, and therefore usually require remodelling or replacement when needs or circumstances change.”\textsuperscript{19} This relates to the condition of the existing housing stock in Auckland and New Zealand in general. However, the continuous transformation of the environment\textsuperscript{20} – built or unbuilt - seems to have recently necessitated the perception of buildings no longer as static structures but as one of man’s dynamic and interactive products.\textsuperscript{18,19} Buildings experience progressive and constant change over time, and their interactive nature is expressed in their ability to be influenced by the activities of man.

CHANGING ENVIRONMENT, PERFORMANCE AND ACCESSIBILITY OF EXISTING HOUSING STOCK
The suitability and performance of the existing buildings in New Zealand are bordered by significant questions relating to the deterioration in the performance of the stock built between 1970 and the first decade of the 21\textsuperscript{st} century. The performance, physical conditions and location of ageing people’s houses are critical to their health and quality of life.\textsuperscript{9, 21} In Auckland, some newly-constructed buildings show certain design and construction defects, and are subject of controversial issues of weather-tightness.\textsuperscript{22} The National Institute of Water and Atmospheric Research in New Zealand have outlined the expected climatic changes by 2090 resulting from the anthropogenic emissions of greenhouse gases and aerosols as “decreased frost risk, increased frequency of high temperatures, increased frequency of extreme daily rainfalls, decreased seasonal snow cover, and a possible increase in strong winds.”\textsuperscript{23} With the challenge of climate change, the need for modifications, repairs and maintenance of existing housing for the ageing population is indisputable and essential. The home maintenance surveys performed by the Centre for Research, Evaluation and Social Assessment (CRESA) showed that one-third of one hundred and sixty-three old people living in their own homes in Auckland, Christchurch and Wellington often delay undertaking repairs due to the expenses involved. Certainly, this action is at the risk of their health and in contradiction to their common aspiration to maintain physical independence. According to this survey, “deferring repairs was statistically significantly associated with age.”\textsuperscript{24} The French policy called “Plan solidarite” viewed ageing as the onset of physical frailty and dependency,\textsuperscript{25} this shows that disability increases with age. Therefore, ageing population growth indicates an upturn in the number of the physically-challenged with major implications for planners, policy makers, homebuilders and built environment professionals.\textsuperscript{26} With the gradual experience of disability, the conditions of ageing individuals who have mobility challenges are worsened by ill-maintained old stock which perform poorly in relation to accessibility, cold and damp.\textsuperscript{27} The requirements for accessible, safe, warm, comfortable housing that work well for young and old people with impaired mobility are not met and are predicted to increase with the increasing population who are physically-challenged. Furthermore, merely a small number of new houses have barrier-free features that ensure accessibility for the physically challenged.\textsuperscript{28} Therefore, going by the projection that the proportion of ageing population suffering from severe disability is expected to be above seven and half percent in 2050, the housing situations of older individuals cannot be overlooked.
ETHNIC DIVERSITY
New Zealand people comprise the Europeans, Maoris, Asians, Pacific and few Africans; and many families have multi-national relationships. This cosmopolitan nature finds predominant expression in Auckland which, according to the 2013 Census, has a population of about 1.5 million people (thirty-one percent of the total population of New Zealand). Although all ethnic groups are ageing, but due to ethnic differences in fertility, the broad European population is ageing faster than the young others. The consequence of heterogeneous ethnicity is revealed in diverse housing needs of the ageing population. The living arrangements, housing design preferences, neighbourhood, support and home care vary across all cultures. It is difficult to relate culture or society to housing or the built environment because of the abstract, broad, and general nature of the concepts; only when culture is broken down into precise variables is when it is found to be related to housing preferences, housing choices, group differences, etc. Consequently, the intricacy and ethnic nuances of the heterogeneous ageing population poses a great challenge to research in this area.

INCOME
In Auckland, as in the rest of the cities and towns in New Zealand, the retired are known to be asset rich but cash poor, and they live on fixed income termed superannuation. They own houses but lack enough liquid assets for home maintenance and some living expenses. Unfortunately, the rates of owner-occupation are dwindling. Compared to the currently fewer than sixty-five percent, seventy-two percent of households were owner-occupiers thirty years ago, and this relates to the increasing bane of housing affordability. When homes no longer suit their living, some old people downsize by selling off their property to move to rented apartments. Some are faced with huge costs to procure modifications which could have been avoided at the initial design stages through universal design principles. Those who cannot afford spatial modifications stay put in their homes at the detriment of their health.

NEIGHBORHOOD
Aucklanders and New Zealanders in general have ambition to live in detached suburban housing, and this remains a barrier to the visions for a compact city as expressed in the Auckland Plan. Houses on the urban fringes are often not served by public transport, consequently travel time and costs are higher for people who live there. Also, the Auckland landscape is experiencing burgeoning retirement villages and rest homes, especially in the North Shore. Regrettably, inadequate suitable housing for some who need higher level of care and support, land shortages, and rising costs are subjects of concern for developers.

SUGGESTED SYSTEMATIC APPROACH
Since housing is a key mechanism for the promotion of active ageing, it is essential to develop a concise systematic approach (see figure 2) that is based on deductions from relevant literature and is part of an on-going doctoral research on appropriate housing for the ageing population in Auckland. This approach begins with identifying the target population (ageing cohort) and classifying them into age-groups. The importance of this is to identify their needs which vary according to age-groups. Furthermore, it is also essential to assess these needs in order to know the appropriate interventions to adopt. The outcome of this intervention is then subjected to rigorous appraisal by the stakeholders involved. During occupation, users are expected to use a needs-report template to communicate their changing needs; this will ensure the assessment and subsequent satisfaction of such needs. It is hoped that this approach will be useful for policy review and
improvement for the built environment. It can also serve as a reference base for future studies on related researches.

CONCLUSION
This paper has highlighted some needs of the ageing population in Auckland, New Zealand; these needs relate to accessibility in homes and neighbourhoods, cultural diversity, income and changing environment among others. The paper also acknowledged the intricacy and vicissitudes of these needs. This complexity implies that the provision of appropriate housing solutions may not be in the exclusive preserve of built environment professionals alone. A cross-disciplinary effort is essential to deliver buildings and neighbourhoods that can appropriately express the value and needs of users. Therefore, the understanding and analysis of older people’s needs require additional input from numerous disciplines such as medical, social, psychological, behavioural and other relevant and related disciplines. Knowledge from these areas will guide in the provision of appropriate approach in meeting the housing needs of the ageing population.

Figure 2. suggested systematic approach
NOTES

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SYNERGIES OF A SHARED HOUSEHOLD

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INTRODUCTION
HOUSING: THE SITUATION TODAY
At the Universal Declaration of Human Rights in 1948, housing was identified as part of the human right to basic standard of living.¹ The home, as the very manifestation of shelter represents the fundamental value of safety and privacy. In large urban centres today however, housing has lost its actual value, becoming a commodity with an exchange value. As David Harvey said in a recent interview: “Then all of a sudden a lot of people find they can’t have the use of value of the housing anymore because the exchange value system has destroyed it.”²,³

As we shift from the perception of housing as a right to that of an investment, great issues of housing affordability come up. In the US, a house is considered affordable when its expenses do not overcome 30% of the household gross income. Nonetheless this threshold, called the affordable rent burden, is far from reality in many US cities today. Housing prices and expenses have increased to a point that they are not affordable even for the middle class, let alone the lower-income one, creating a crisis for the future living of a growing population. In 2013, Los Angeles was the most unaffordable city in the US to rent a house, with the expenses equalling to 47% of the median household income.⁴ Affordability troubles do not pertain only to large metropolitan areas, but to smaller towns as well; College Station in Texas has seen one of the largest increases in rent since 2000, reaching 41.8% of household income in 2013.⁵ In Europe the affordable rent burden is higher than the US; a house is affordable when the housing expenses do not overcome the 40% of the gross household income. Even so, in 2013, one out of three Europeans could not afford their house.⁶

It seems like the cities are becoming a viable option only for the ones who can afford it, losing, on the way, their diversity in income, age and race, which makes them liveable places.
SHARING AS AN EMERGING SOLUTION

Under this pressing affordability issue, people try to minimize their housing expenses and find ways to adapt their everyday lives by altering the idea of what a household means. One of the emerging solutions to affordability over the last 5 years is the act of renting out personal spaces or even other personal goods and resources. Even though such practices existed since the wide use of the internet, the founding of AirBnB in 2008 was a catalyzing factor to turning them into common practice. People rent out empty spaces in their house, their couch for couch-surfing, their tools through tool libraries, their driving skills on Uber and Lyft, their bikes through Cycleswap. It seems like online sharing economies have found a fertile ground in urban centres, where both supply and demand for such practices are abundant, by just providing security to users through online platforms and a system of review on performance. The recession of 2008 was the turning point that forced people from different ages and backgrounds to share their personal belongings even though they normally wouldn’t. Renting a room in your house was common practice in the Great Recession, and history seems to be repeating itself.\textsuperscript{8, 9}

However, there are methods of sharing that go beyond renting, that people are implementing in order to deal with issues of affordability. Doubled-up households, which have been increasing significantly over the past 5 years, are one of those ad-hoc solutions. Doubled-up are called the households which are shared between people who are not related. Only in 2011, 18.3\% of all US households were doubled-up, meaning that they were inhabited by non-related people who decided to live together to minimize housing expenses.\textsuperscript{10}

Additionally, it is not only shared households by strangers that are increasing, but there is also a paradigm shift in family household trends. As young adults are being hit harder from the recession, it seems like they are having trouble leaving the family nest early on. Within just 4 years since 2007, the number of US adults between the age of 25-34 years old still living with their parents increased by 14.2\%, reaching 4.7 million.\textsuperscript{11}

In a different generational stage of life -that of retirement- there is another set of opportunities to minimize living expenses by sharing. Senior community housing developments provide people with the benefits of low cost housing in addition to safety, companionship and easy access to services.
However, it is not a model that works for all; certain people prefer the comfort of their own home and homeownership gives them a sense of entitlement and achievement. In that case, sharing a house with friends or acquaintances becomes a viable option. It seems that there is an increased interest over the last couple of years in the US from older people thinking about their retirement plans to consider owning and sharing an apartment with other people at the same stage of life. Women, who also tend to live longer than their male partners, are more prone to the idea of sharing a house later in life.\textsuperscript{12,13}

**SYNERGIES OF SHARING**

Sharing becomes an increasingly significant tool to tackle financial hardships within an unsustainable capitalistic system. But it should not be confused with renting. Sharing, for the sake of this paper, is defined as the capability of more than one individual to have access to common resources; where a resource can be jointly used by more than one individual. The act of doing so has significant financial easements for those involved, but not direct economic profit. The opportunities to share can be classified in three main categories; sharing of a. spaces, b. goods and c. services. Even though the springboard for sharing might be the financial easements that the de-individualization of some resources brings, there are significant environmental and social benefits that come along with sharing resources, let alone large assets such as a house. Those ideas are not new; the model of cohousing that started in Denmark in 1964 and has now expanded in different countries across the world, is promoting the same set of principles; the privately owned resources are minimized to the maximum possible, and the rest of the individual needs are served through community shared resources available to all. There has been done significant research on the benefits of cohousing as well as sharing in general and it is worth looking at an aggregated analysis of those in order to understand the cumulative benefits and how we as architects could design in a manner that promotes rather than inhibits sharing. This paper intends to create a comprehensive analysis of the economic, but mainly environmental and social benefits of shared living via a thorough literature review on cohousing, shared housing and sharing in general.

**Economic benefits**

Apart from the apparent financial benefits of splitting costs and saving in resources, there are several additional economic benefits when it comes to share a household.\textsuperscript{14} Firstly, there is greater financial stability; sharing a household with others and especially non-relatives can increase the level of accountability towards the shared household responsibilities, leading to sustained financial stability. Moreover, if trust is established among housemates, a support network is created between them especially during moments of crisis.\textsuperscript{15}

In the case of cooperatively owned households, and not rented, the stability is even greater for residents, as rent increases or displacement is not possible; there is no third party that seeks to profit from the house as a piece of real estate. Ergo, a cooperatively owned home facilitates ownership by splitting costs and provides a sense of autonomy to residents to create their own rules of self-regulation.\textsuperscript{16}

The second most important economic advantage of people living together instead of alone is that they can benefit from economies of scale; the larger the group of people the better. What this means is that residents can buy resources as a group in bulk for lower prices. This is an extremely beneficial factor, especially in the case of larger pools of people like in cohousing.
Environmental benefits

Nowadays, human beings seem to accumulate a significant number of goods necessary for their everyday lives; from big assets like a house and a car to smaller ones such as a vacuum cleaner, a laundry machine and an electric drill. Even though most of those things are very useful, they stay idle most of the time. This signifies that they have “excess capacity”, which is not taken advantage of when those assets are privately owned and used by one individual. The greatest environmental benefit of sharing is that groups of people can utilize that excess capacity to the maximum, while minimizing the number of such assets owned per individual. From a survey at several cohousing communities, where sharing such assets among households is common practice, it has been proven that the ownership per household of washing machines, tumble driers and freezers was reduced by 25% compared to the average household. The private ownership of lawn mowers was also 75% less compared to the US average. In general, when people share a household or live within a sharing community, they tend to merge belongings and allocate resources leading to a general 8% savings in goods. Apart from possessions, there is also a reduction in space usage; sharing a house means sharing a living room, a kitchen and often a bathroom. In the case of cohousing, the private dwellings are significantly more reserved in footprint giving the opportunity to create larger shared spaces, leading to 31% of space savings. Furthermore, when people start sharing, they tend to achieve energy and water savings too. Two people sharing a house are consuming less than double the energy of a single occupant household. For the cohousing households, that reduction has been measured to reach up to 57% of electricity savings compared to the US average. Sharing does not only contribute to the fact that we are consuming less, but coherently we are producing less waste because of that.

In general, through sharing people learn to better manage resources; by involving themselves into sharing habits, they turn towards practices of responsible consumption and degrowth. Belonging in a group facilitates such pro-environmental behaviours, especially if the social norms of the group support analogous behaviour. In the case of cohousing, such environmental goals become a great part of the core values of the community and initiatives of conservation, recycling, smart transportation and sustainable food are common practice.

Moreover, in cases of extended groups of people, the incorporation of innovative energy production and water conservation systems becomes feasible. With three or more sharing a household, costly initiatives, such as better air-tight windows, low-flow faucets or even implementation of PV and solar water heaters, are a more viable option as costs are shared among residents and savings are distributed among all. Furthermore, because economies of scale are a prerequisite for the wide adoption of such systems, doubled-up households could become a viable target audience for policy change; tax easements and incentives that promote the incorporation of sustainable building features can be offered to them.

Social benefits

No matter how important the environmental benefits of sharing are and despite the fact that the springboard for sharing a household might be financial hardships, the greatest benefits of sharing are social and are radically change residents’ everyday life. When people live under the same roof, even though they might not be related, they create a social network that grows stronger every day because of their active involvement in all aspects of the management of their property. Sharing a household offers a feeling of stability and belonging that is rare in individual households. Due to the interconnectedness between the residents, there seems to be a strong sense of emotional support that resembles to that of a family. And because trust-building is necessary and inevitable at the same
time, when sharing a house turns out to be successful, housemates tend to be supportive of one another leading to greater durability of this housing model. Apart from the sense connectedness, there are significant social benefits to the everyday life of the residents of a shared household that spur from the simple dispersion of responsibility among many than just one person. All of the sudden, household chores are split between residents, cooking and sharing meals become regular and pet sitting might be an option offered by other housemates. When responsibilities are split, then there is more time available for personal growth and relaxing. That is the basis of cohousing communities too; creating a more active social life while minimizing the burdens of everyday life. Assistance in several tasks might not only come from splitting household responsibilities, but also from mutual assistance between residents. For example, in cohousing it has been proven that residents adopt a more collaborative lifestyle and they tend to assist each other in different occasions, either through formal events and groups but informal ones as well. Accordingly, when people are sharing a household, there is significant willingness to share and collaborate among them to the fullest. This might result to various offers of informal services between residents like carpooling, pet-sitting opportunities and skills exchange. It is shown that personal growth and development are an integral part of shared housing situations as residents tend to learn and benefit from each other. In cohousing communities this might happen in a more formal, intentional way through the development of workshops, learning and sharing events. However, sharing of skills, knowledge and assistance in an informal way is apparent in all cases of a shared living condition, thus creating a strong support network for the residents. That support network of sharing and collaboration has been proved to significantly increase the levels of happiness and personal satisfaction. It is noticed that people are more positive when sharing and the social cohesion that is built among individuals can help them address more effectively situations of pressure and stress that come up. This self-confidence springs from the confidence of the group and the ability to rely on others. Hence, it is evident that social interaction and support created through sharing has shown to have great benefits to both the physical and mental health of the constituents. Ultimately, a shared living situation can have different significance for people of different age, income, background etc. It might be that for individuals of lower income, the primary benefit of a shared household is affordability and the sense of financial stability. On the other hand for students and young professionals, the financial easements might be the motive for home-sharing combined with the sense of belonging in a “family” as they are trying to make it on their own for the first time in their lives. For older, more economically stable folks, it is a grand solution for retirement and companionship might be the utmost benefit of their moving in together. In a survey of more than 100 older homesharers, they reported a happier and healthier state while sharing a home compared to living alone. Even for people with children, who might seem a population that is not appropriate to share with non-related people, it can be beneficial to share resources and live in a close knit community where they can rely on others. Such a living condition can create great opportunities of kids growing up together, parents having a more sociable life and enjoying easements of occasional baby-sitting by friends. For example, it seems that because of the housing boom, there are cases where single parents in London, have created opportunities of sharing a house and raising their kids all together.

**CHALLENGES**

Based on the above, it is evident that everyday life in a shared household entails significant benefits for the residents across all levels because of the closeness and socially engaging lifestyle it promotes. Moreover, it promotes a sustainable lifestyle that minimizes the resource consumption. Nevertheless, it does not mean it is an effortless alternative or that it is appropriate for everyone. There are
significant challenges in sharing a household. Firstly, attention needs to be paid on issues of overcrowding; one of the main challenges of a shared household is to balance between communality and privacy. Studies have shown that minimizing the private area per individual, can significantly affect their level of happiness and satisfaction. Apart from privacy, in order for a shared household to succeed, it needs time, effort, resources, good management as well as a suitable group of people; skills and investments that not everyone can afford. We realize that a shared housing model can be demanding and entails a great amount of risk, preventing people from engaging in such endeavours. Hence, there are certain limitations when it comes to applying the model of a shared household as a solution towards more affordable, sustainable and social engaging housing options, limiting it from becoming available to the mainstream.

So the question is how can we create places and communities that benefit from the assets of the intimate and socially engaging lifestyle of shared housing, without demanding that people start doubling up across the board? Is there a way to promote sharing and collaboration in an urban scale, rather than in the micro-scale of the housing unit? Future research needs to test exactly that; recreating relations of collaboration and sharing on a neighbourhood scale. The objective should be to examine what are the opportunities of sharing outside of the household and if those will recreate social and environmental benefits that yield from shared households? Can we move from a self-contained household to a “network” one without just renting our properties but rather sharing in a meaningful way as a manner of enjoying the environmental and social benefits?

Figure 2. From the Self-Contained Household to The Network Household
TOWARDS FUTURE MODELS

Such examples of sharing on an urban scale are not novice ideas; communities across the world come together and reclaim public spaces, share goods and *co-create the everyday commons*. From community gardens and carpooling to exchange of goods and social kitchens, neighbours extend their private households creating a hyper-space in the middle where they can share, collaborate and communicate. Even though, those ideas exist across the globe giving hopes of an ideal human-centred society, they are niche examples and do not manage to build the necessary capacity in order to become part of the mainstream reality. In order to move towards the network household model, we as citizens need to explore ways to amplify such community initiatives and make them inclusive for all. These methods will demand both policy changes on a higher level of decision making and local action with design.

Firstly, in order for sharing practices to scale up in the city, “invisible” sharing systems previously practiced by friends and neighbours might now need to become “visible” by a larger pool of strangers. So, one effect that needs to be considered in the expansion of such sharing systems is their visibility in the city and their physical manifestation. A way to move towards such practice would be through the use of existing obsolete infrastructure. A good example of such a case study is the micro-library within an old phone booth in Lewisham, UK presented in the paper “Design for Sharing”40. Quite different from other little free libraries that have been trending both in the US and Europe, the Lewisham micro-library is a worth-looking at because of the smart use of a previously obsolete infrastructure; the public payphones. This means that given the necessary support by the community, there is an interrelated physical system already dispersed within the city, that due to the obsolescence of its previous use, it can now be used for the wide replication of a new sharing system across the UK. And because unused old payphones exist in most cities, it is something that can be easily replicated in other cities too. Secondly, this project started as an individual initiative and was eventually embraced by the community.

Another way to support sharing practices within the city is by the use of existing infrastructure in combination to policy incentives. A good example for that is carpooling. Carpooling is defined as the act of riding existing privately-owned cars by more than one person at once. Carpooling currently happens by chance and based on private initiative. It can be locally supported by the use of physical infrastructure, such as signage for dedicated reserved parking spaces at the parking lot of LEED buildings41. However, such incentives are not enough to promote carpooling on a larger scale. A more effective approach to the promotion of carpooling has been the high-occupancy vehicle lane (HOV lane) that started in the US around the 1970s-1980s. Here, by reserving one lane out of highways and roads of high traffic (through the necessary policy regulation) specifically for carpooling, citizens are more prone to carpool with friends, acquaintances or even strangers. Even though there is no monetary benefit in the exchange of either the driver or the passenger(s), both parties are benefited from carpooling as they will get to their destination faster just by using the HOV lane42. As such models can be very successful and are actually of minimal costs (the roads and cars exist, they only need to be signed as HOV), we understand that the use of policy incentives in order to promote a more sharing approach to existing infrastructure and resources can be one of the most effective strategies to be used towards the expansion of sharing practices. For example, policy incentives could greatly benefit another sharing system that currently exists widely in the US and it is not recognized as much by the “hype of the sharing economy”; the shared laundry facilities in the multifamily buildings. Most apartment buildings use their basements as shared laundry facilities. A system like that could be expanded to the extreme, where having a shared laundry facility in the basement is mandatory for an apartment building and incentives could be given to the landlords in
order for them to have high performance Energy Star appliances. Moreover, through policy incentives both in retrofits, or new construction of apartment buildings the provision of such services could be offered for free or at least included in the rent. In that way, the residents would be prone to use the free shared services rather than buying a private appliance.

Finally branding and place making are another way to amplify sharing practices within the city, just by mere engagement, communication and visibility. Local sharing practices that are organized through just the use of internet and social media can become rather exclusive to all ages and backgrounds. Moreover, by visibly exposing sharing practices, even when the activity is not there, allows residents to engage and learn more easily about specific initiatives that might be taking place within their neighbourhood. A great example of sharing that is organized via online paths is Huiskamerkantoor or else called Hoffice in Sweden. Hoffice is when home living rooms are used like co-working spaces for freelancers or students. This system takes advantage of the excess capacity of a living room large enough to host more than one person to work. The visitors might bring cookies or coffee in exchange and the system is regulated by an online platform. Even though the network of available living rooms that can host people is regulated online, more spontaneous sharing opportunities could take place within a neighbourhood, just by adding a “Hoffice-branded” sticker at the entrance of the houses / apartment buildings connected to the network.

These are just some preliminary schemes that can be used in order to move towards the network household. Realizing the synergies that occur on all levels, social, environmental and economical, when people are sharing is the first step towards making the case for the network household model. However in order to achieve an ideal and inclusive model like that, more detailed design and policy schemes will be necessary. More extensive ideas like the ones mentioned above should be applied on the ground through extensive engagement processes in order to test viability and success.

Nevertheless, those design and policy schemes should not be prescriptive or used in non-transparent processes to serve other causes. Creating the everyday commons is not something that should be prescribed on citizens, but rather create a viable space where such practices can prosper. Often enough policy and physical space can be prohibiting for people to share and collaborate in the urban space. In such cases transforming laws and using design to allow for sharing practices to take place, will assist in the process of turning the network household into a reality.
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THE LOCAL DIMENSION OF HOUSING EMERGENCIES*

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INTRODUCTION
Housing problems have always informed a cultural debate, transcending the sphere of formal research to that of moral and social issues on the right to housing. Today, the debate, still containing the usual topics, is enhanced by new challenges and questions, some of which have reached such a dimension, in terms of number of people interested by them, that they deserve more space in the debate. Following a brief overview of the main forms that the housing question adopts, this paper will describe two strategies, one Italian and one Spanish, that claim to tackle housing problems. As discussed in the last section, the comparison with the Spanish case reveals the Italian policy weaknesses and the missed opportunities to deal with the housing issue without committing public resources.

A BRIEF OVERVIEW OF THE HOUSING PHENOMENA
Some challenges, such as the very high migration rate of Chinese rural population to the cities, the international agreements put in place to reduce the consumption of non-renewable energy or the need to quickly rebuild entire sections of cities after natural disasters, are dominating the debate around housing emergency. All of them are widely represented both in publications for professionals and in that purely informative.

However, there is another side of this multifaceted issue that is embracing a wide range of cases: the access to decent and affordable housing ¹. Its extreme expression is configured as a real social and environmental emergency: by 2030, one in seven will be living in unplanned settlements. If nothing changes, in 2050, one in three people will live in an unplanned settlement or a refugee camp². But the lack of affordable housing takes another form in the costliest cities, where even households earning far above the median income find themselves financially suffocated by mortgage payments³.

The enlargement of the hardship area calls the attention on a new housing question⁴, that is not only generated by inadequate level of income: the “housing hardship” assumes a multidimensional connotation that reveals the crisis between the existing building stock, the demographic changes and the behaviours and lifestyle of the population.

Given the multiple dimensions of the several components that contribute to create the “housing hardship” in different territorial contexts, it appears clear that the concept of “affordable” must be defined in the context, but it is not enough: it should be necessary to cross the data with social
dynamics, economic trends and environmental issues trying to achieve a holistic vision and not working on independent issues.

**AN ITALIAN CASE IN POINT AND ITS SPANISH COUNTERCHECK**

According with the Eurispes (Annual Report - January 2005) nearly five million Italian families feel threatened by the continued growth of the cost of living, cost against which housing plays a major role\(^6\). They are qualified as “affected by poverty in suits”.

On the other side, there is a stock of 40 000 social housing vacancies that remain unused because the agencies that deal with the management of public housing do not invest for the renovations\(^6\). In addition to these there are over 5,000 unoccupied private houses\(^7\).

Given these data, the Italian policy adopted in 2009, and renovated until now, represents the attitude to implement public policies without investigating the possibilities to multiply its effects and benefits through a more sensitive and strategic analysis of its multiple potentialities. Its description will be followed by the one of a Spanish strategy, generated by a private company initiative, that will highlight the missed opportunities of the Italian one.

Sixty years after the approval of the national law n. 43/1949 “Measures to increase employment, facilitating the construction of houses for workers”, better known as “Piano INA Casa”\(^8\), on the 1\(^{st}\) of April 2009, the Italian Government, signed an agreement with regional and municipal administrations in order to promote initiatives aimed at reviving the economy, to meet the housing needs of families and to introduce incisive procedural simplification measures in construction \(^9\). Each Italian regional government would have implement the directives in the respective regional legislative framework within the following 90 days in order to choose the most effective way to revitalize the local building sector\(^10\).

The regional laws were called “Piano Casa”, and their original mission is reminiscent to the one of the “Piano INA Casa”. This choice for a name sounds extremely bizarre considering that in Italy, in the same year 2009, a “Piano per l’edilizia abitativa”\(^11\), also known as “Piano Casa”, had been approved, to “increase the residential real estate through the housing supply, to be implemented in accordance with the criteria of energy efficiency and reducing polluting emissions”\(^12\).

While the national initiative was mainly a financial program to produce new houses for vulnerable social groups\(^13\), with many controversial steps, the regional plans were mainly dedicated to revitalize the economy through the building sector. The memory of the most effective conceptualization of the Piano INA Casa, and its successfully integrated goals, had been lost. While the national plan for housing has registered significant delays in implementation revealing its anti - economy\(^14\), and has not yet met its goals, the regional plans for housing had a smoother deployment. According to the agreement between State, Regions and Municipalities, the measures to be adopted were:

- Volumetric increase (to allow numerous families to earn some more square meters \(^15\), improve the architectural quality and energy efficiency of the existing buildings);
- Demolition and reconstruction with enlargement for residential buildings within the limit of 35 % of the existing volume, with the aim of improving the architectural quality, energy efficiency and use of renewable energy sources;
- Simplification of the procedures to obtain building permits faster\(^16\).

These generic indications were transposed in different ways by each Regional government. Commonly in all of them it seems to be lost, or at least deliberately trivialized, the declared aim “to meet the housing needs of families”. Instead of prioritizing family “needs”, they have tended to meet “some families’ privileges”. Taking as an example the Sardinian regional law\(^17\), it contained
"Provisions for the extraordinary support of the economy by the revival of the construction industry and for the promotion of interventions and programs of strategic importance for the development". The law has been annually renewed, but keeping for the most part the same contents. Its latest draft (2015) has changed the name, becoming "Rules for the improvement of existing buildings", but not the former strategy.

By limiting the analysis to the measures provided for urban residential areas, it accepts:
- Volumetric increases of up to a maximum of 20 per cent of the existing volume for each housing unit. (The increment can reach 35 per cent if it is a first home).
- Recovery of the attics in existing central area through modifications of the heights of the ridge and eaves and lines of slope of the water, to ensure the achievement of an average height of 2.70 meters for dwelling accommodation.

It is specified that the volumetric increase cannot be used to generate new units.

It is evident that the highest use of the standard works in favour of the owners of top floor apartments with terrace in multi-level buildings, or in favour of single-family houses with gardens to achieve significant expansion. Considering that in the main city centres, where houses prices are highest, most buildings have a flat rooftop, the implementation of the law is limited to new volumes built on terraces.

In Spain, since 2012, it is operating a private company named “La Casa por el Tejado”, from now on LCT. It builds new houses on the Eixample roof-tops where the projected buildable area was never exhausted in compliance with current building renovation. Their strategy is pretty simple. After mapping the buildable spaces in the city centre, LCT offers to property owners the opportunity to revalue the entire building through improvements in common areas, as well as renovating and upgrading the roof-top terrace to comply with current regulations. In exchange, the owners sell or rent the buildable area. LCT, after a deep investigation of the building structure potentialities, designs the penthouses. The design team creates plans for two simultaneous construction activities: the preparation of the roof-top terrace, and the construction of the modules in a factory. Quickly thereafter, the penthouse modules are transported to the building by truck. A special crane hoists the modules onto the terrace while a team of specialists directs the operations of positioning and anchoring. Once the penthouses are in place, the finishing touches are added and the service installations are connected. In a few days’ time, the flats are ready for use. Each unit incorporates green areas on roofs and walls and through certification systems established in Spain, such as LEED (USGBC) or VERDE (GBCe), and hence it is possible to classify the penthouses with an independent environmental rating.

DISCUSSION

The Italian policy, generated by public initiative, not only has no bearing on the issue of the housing problems, but, in step with the last European trends, it rewards the private entities, without any even indirect benefit for the local community. Actually, as we’ve observed, the regulation favours those who already own a home by allowing them to increase its enjoyment and value. The 10 points percentage of volumetric increase bonus for energy efficiency improvement represents a very marginal success.

The Spanish case shows that the strengthening of the construction industry, with all those involved in the process, could be pursued with a more virtuous strategy, perfectly compatible with the means and aims of the Sardinian case. Indeed in the Spanish case
- new penthouses have a smaller size than the average of the apartments in the Eixample, so they
integrate the assortment of housing supply without compromising further ground;
- execution of the housing modules at the factory enables certain times of delivery times, minimizes the generation of waste and the noise arising from processing in situ;
- it is ensured the renovation of the entire building (facades, stairwell, elevator, etc.) with the benefit extended to all tenants who hardly bear the high costs of maintenance;
- green roofs and exterior walls are designed to counter the urban heat island effect;
- the building process is required to be innovated to meet the stringent requirements of the certification LEED (USGBC) or VERDE (GBCe).

The Italian policy, as public initiative, could have been not just designed according with the Spanish principles, without betraying its principles, albeit ambiguous, but improved even further. For instance: the roof-top of social housing properties could have been given to builders to build up new penthouses to be sold or rented, at controlled prices, in exchange of common parts renovation and lift installation when necessary, improving the entire building conditions and facilities. It would have represented also a great opportunity to activate that social integration by grafting of young couples, with or without children, who are abandoning the expensive major urban centres in favour of the cheaper residential area in the suburbs. At regional level, according to the current law, it is not allowed to even generate independent units, but only the enlargement of existing properties. However, at the municipal level, it is allowed to fractionate the new unit generated by enlargement, provided that the additional surface is divided proportionally between the two generated by fractionation. Beside the tortuosity of such an administrative misalignment, the management of alienation or rent remains in private hands, thus subject to the rules of a market that, in Italy, forces 4 million households to use much of their income to pay the rent; while at the same time they join the lists of applicants for public housing, currently containing 600 thousand households23. It is also a source of controversy whether the building sector needed to be supported or not: according to the last housing census (Istat 2011), buildings and complexes surveyed in 2011 amounted to 14,515,795, 13.1% more than in 2001, while the proportion of the unused housing stock has slightly decreased from 5.7% to 5.2% in the same period.

The comparison between the Italian and the Spanish strategies, clearly demonstrates that it is possible to figure out win-win strategies, or at least multi-objective strategies, with consciousness in regards to the local conditions, and the ability of identifying a wider set of goals that can be satisfied at the same without any loss in effectiveness for the main objective.

*This paper is subject to an additional copyedit for issues of English language expression.
NOTES


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9 See more at Gazzetta Ufficiale 29 aprile 2009, n. 98


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15 It might seem redundant but in Italy the average number of children per woman has never overtaken 1.42 in the last 15 years, according with the ISTAT analysis.

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19 So, for instance: an apartment of 50 square meters can be extended up to 67,5 square meters; an apartment of 90 square meters can be extended up to 121,5 square meters, and so on.


21 In the last version of the law this bonus is conditional upon planning compliance under municipal responsibility.

22 “The proliferation of apartments for rent by airbnb, especially in the Eixample, reveals that the property can not afford to confirm them as a residence, because expensive, often without elevators and large area, compared to the average size of households” Oriol Nel.lo, Professor of Urban Geography at the Autonomous University of Barcelona, interviewed on February, 2015.
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[FAVOURIT HOUSING] HOW TO CREATE NEW ARCHITECTURAL COMMUNICATION METHODS - COSTUMIZED FOR THE DEVELOPMENT OF FUTURE HOUSING

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WITHIN WALLS

INTRODUCTION
Future housing – the consumption of space
How do we consume space? This is one of the key questions in the discussion of the development of our future housing. With a growing population in the cities, environmental challenges and a lack of not only affordable but also decent homes, a whole new mindset has to take form regarding the way we live. In today’s society, inhabiting a space is not just to have a place to dwell it is also a capital investment and a reflection of your personality and your wealth. Our homes exhibit our happiness and success, and our social status is directly measurable in square metres. Can this architectural behaviour be changed? We need to set a new urban agenda together with the public by introducing a new mindset on how we consume and inhabit space. How do we communicate these kinds of questions?

During a ten-year period from the sixties to the seventies, a political decision was made by the Swedish government to build one million homes. This became known as the Million Homes Programme
1. The intention of providing affordable housing to the masses was good but the end result was areas with poor architectural features without a human scale. Today these housing areas are the most challenged areas when it comes to criminal records and unemployment.2 Today, there is once again an excessive need for new homes in Sweden.3 The question is: how do we avoid repeating history?

At the same time, anthropologic studies in Denmark reveals that square metres of housing per person has increased from 29m² to 52m² from 1960 to 20004 and nothing indicates that this expansion is about to slow down. The study states that the Danes desire the impression of ample space in their homes; the square metres needed for this is an assessment made by each individual. At the same time the study states that too much space can be a stress factor; it leaves the inhabitants with the feeling of empty, uncanny rooms, hoarding of things, or rooms without function. Spacing is good, void is bad. Quite often the most valued zones in our homes are the tiny ones: the cosy nooks and corners.5 The contradiction lies in the fact that the Danes prefer inhabiting tiny nooks and small spaces, because they consider them to be homely, but at the same time pursue larger homes because they consider the amount of square metres to be a direct reflection of their economic and social success.
You are what you inhabit or in other words: You inhabit, what you are
- Klaus Rifbjerg

**QUANTITY VERSUS QUALITY**

Is it time to suggest a new way of perceiving our homes? Change the perception in order to start seeing our home as a collection of favourite spots, nooks and corners? Is it possible to introduce a new equation where personal selection equals homeliness, happiness and status?

As the cities grow and the density increases, a new mindset amongst planners and the public has to take form. One of many parameters in the future of housing is not only to build attractive and affordable houses but also to critically discuss the values of a home. If social status continues to be measured through the mere size of ones home, we will have a problem that will grow at the same pace as the growing housing problem. Can we challenge the perception that increasing square metres is equal to increasing social and economic value as a member of a modern society?

One of the challenges is how we as city planners and architects construct this mind shift. Instead of just dictating dense living through our design we need to start concentrating on constructing a public understanding of living more dense and change the attitude towards our homes. This requires setting up an environment where the dialogue can lead us to new solutions of how to inhabit space. This necessitates new planning tools where the public is engaged from the very beginning of the planning process, not just in order to fulfil the growing expectations of ‘user participation’ in the design process but also to form a new urban agenda.

A critical debate about our future housing has many factors but one that should be important is the public. The challenge is how to introduce a new architectural agenda of square metre quality versus square metre quantity in a format that inspires rather than instructs.

**HOW TO START AN ARCHITECTURAL DEBATE?**

Most of us are born inside architecture, we work within architecture, we raise our families within architecture and we most often die inside architecture. Especially in Denmark – it is almost impossible to find a piece of land that is not designed or controlled by humans, quite often by architects or engineers. Architecture is almost omnipresent.

Still, the broader public considers architecture to be abstract and pretentious. They do not see architecture as something that has anything to do with them, which may be the reason that it is most often the same small homogenous part of the public that engages in the architectural discussions. But the public do, contrary to what they think, have something to say about architecture. They are the super users, the experts. Without public opinions and user experiences, architects and engineers will not have the inside knowledge that is necessary to improve and evolve our built environment.

**Give People A Language Or Maybe It Is The Architects Who Need To Learn How To Speak?**

As for every profession, architecture needs its own terminology, tools and methods. But architects cannot necessarily use the same language and sketching methods outside the profession. Just like engineers, lawyers and doctors, our work affects people’s everyday lives. We, as architects, create surroundings that quite often shape social behaviour. But how can we improve the built environment if we are not able to discuss the spatial symptoms with its users?

If we want to challenge and develop our housing situation, an equal dialog must be established between those who design and those whom the design is for. Otherwise previous mistakes will be
repeated. User participation in the building process is not something new but as the challenges of the future changes, methods to establish these dialogues must be changed as well.

These new planning methods should not only cover the demands of a dialogue for the sake of dialogue itself. They should be taken seriously; research shows that public dialogue used in the planning process as a cover up to “sell” an already drawn plan can undermine and threaten the democracy. 8 This makes it even more important that these dialogues both fulfil the feeling of participation for the public and provides new insight to the planners.

How do we initiate these abstract, creative and informative interdisciplinary architectural dialogues? Architects need to critically review their traditional representational tools and vocabulary. When introducing new design and communication methods these have to be customized in relation to the specific challenge. In this case, methods that enable discussions about our future homes and the way we live. Discussions such as; what is a home? What makes you feel at home? What values does your home represent? How does your home reflect you? What is homesiness?

Through this dialogue a new set of architectural potentials can be outlined. Potentials that include not only quantifiable values but also values that comprise the psychological effects space have upon us. Hopefully we can come closer to new ideas about what our future homes should be like by establishing design methods that derive from a combination of these values.

NEW ARCHITECTURAL COMMUNICATION TOOLS

The architectural process will always depend on its representation methods. Unfortunately the written word, drawings, plans, sections and 3D visualizations can be excluding for the layman. Even though the technical progress has reached a point where we can almost sketch in 1:1, these often only represent the structural frames and lack the ability to represent the atmosphere of the lives lived within.

When you [the architect] are not working with your familiar representation formats like models, drawings and descriptions, you end up with a very significant insight: in hope of making yourself heard, one needs to crystallize the train of thought to something directly appealing. – Jury Panel, Bo Tæt, discussing the communicative possibilities and obstacles that lie within exploring architectural representation through film9

If we want to initiate a public discussion about the concept of a home, we need to construct new communication methods. Methods that can address the classic architectural structures parallel with the emotional impact that the space these structures create have upon us.

The complexity of space needs the simplicity of a clear language. In this case simplicity should not necessarily be understood as graphic simplicity, such as simple diagrams to communicate spatial considerations, but simplicity in regard to a clear abstraction that can communicate the poetic and atmospheric values of architecture. There is a need for new methods that can supplement the classical architectural representation formats when they reach their communicative limit.

Figure 1. Example of diagram
NEW MEDIA TO FRAME THE ABSTRACT VALUES OF SPACE

Architecture consists of spatial relationships, movement, rhythm and time, as well as the relation between materials, light, sound, acoustics and aesthetics. No media can represent the full architectural experience, the atmosphere, the structure and the spatial relationships. But we may be able to improve the architectural representation by critically evaluate our formats and try out new combination of media.

Architecture exists, like cinema, in the dimension of time and movement. One conceives and reads a building in terms of sequences. To erect a building is to predict and seek effects of contrast and linkage through which one passes… –Jean Nouvel

The film media holds the possibility to capture materials, sound, light, time and movement in one. But beside these obvious representational references to the experience of architecture, film also holds the ability to represent atmospheric interpretations and abstractions. The majority of people are capable of filmic interpretation. The level of abstract information in film can be extremely high and still be understood by the broader public.

Architecture operates in the borderland of practice and theory, as well as art and the ordinary, and it needs a language that can contain these dynamics. The film as a media can enable a twist of the architectural language. With humour, abstraction and allegory this media can operate with heavy subjects and create a vocabulary that equalize the hierarchic relation between the architect and the user. Film is one example of a media that can develop the architectural communication toolset.

The Film Yndlingsbolig [Favourite Housing] as an Example

In 2010 the film Favourite Housing won first price in the Danish national competition ‘Bo Tæt’ [Dense Living] announced by The Danish Arts Foundation. This was the first architecture competition in Denmark where the submission format was film. The aim of the competition was to change the public perspective on the explosive expansion of the square metres used in housing. The film presents a modern urban collective accommodation where prestige is no longer measurable in square metres but in quality of life. Favourite Housing tries to capture space, not by presenting the structure that creates space, but by presenting the life that is lived within. The essence of the film is to focus on the rooms that are important to us, to address the discussion about how we feel at home.

The best home doesn’t always equal the biggest home. If you only take your favourite pieces there will be plenty to go around

- Favourite Housing

Instead of expanding the home with spatial quantity in order to reflect your personal success, the film tries to twist the perspective, and suggest that we ought to show our personalities through spatial choices. In a world where time is one of the most valued commodities, the film suggests that smaller homes ought to be considered prestigious. The film suggests investing in personal time instead of empty square metres. It addresses the discussion of how a lower rent enables us to work fewer hours, and how smaller homes do not take as long to clean. If time is a commodity, and dense living frees our time, this could be an alternative expression of social status.

By using ironic metaphors such as a recipe on how to cook your own perfect home full of square metres, the film highlights the topic of how we consume and inhabit space. The film literally puts the "petty bourgeois" dream of the perfect housing coated with prestige and ideals through a meat grinder. Through preposterous aesthetics the film reach the conclusion that size doesn’t matter. Different people have different spatial needs, and the film suggests that future housing should focus upon the meaningful value in adaptation.
Recipe for a family home (four persons): Start your dream house with happiness, a dining kitchen, an entertainment room, a bedroom, a carport, hospitality, open space, a bathroom, clean lines, a summer room, a computer room, an utility room, a guestroom, a laundry room, prestige, a dining room, a game room, a wine cellar, space… Lots of space…

- Favourite Housing

**Figure 2 & 3. Film stills from Yndlingsbolig [Favorite Housing]**

**HOW TO DISCUSS OUR FUTURE HOUSING AND HOMES**

In regard to creating an equal and diverse discussion about our future housing conditions, the discussion needs a twist - a positive twist. But the population of Scandinavia today, do not like being lectured or instructed. Especially considering people do not react well to architectural master plans – designed by architects who can afford to live in spacious villas far away from their vast concrete creations. It is not enough to rely on us wanting to live denser just because the planet cannot support our extreme consumption.

In order to create a change of attitude towards the concept of a home, we need to change the perspective within the public and within city planners. It is not about renouncing the possibility to live a good life, with plenty of space and freedom; it is about choosing to live dense in order to be free; economically, materially and socially. Shifting the perspective from square metre quantity to square metre quality, dense living has to be a choice, not an economic misfortune.

**WHAT ROLE IS LEFT FOR THE ARCHITECT TO PLAY?**

What role do the architects play in the matter of changing public perspective? There was a time when the architect would be considered the mastermind, and (s)he would only have to convince one constructor or benefactor, but time has run out for the Master Planner. We executed our grand housing experiments in the sixties, now it is time to analyse, start a discussion with the inhabitants of the housing projects and evaluate.

In many ways we have moved away from modernism, but when it comes to our buildings we still live with modernistic planning methods and that is contradictory.
- Christer Larsson

The housing projects of the future need to be founded on a dialog with its users and not by a master plan designed only by architects. We want the city to grow dynamically, fertilized by the people, but at the same time using the vast knowledge that architects hold. Architecture is complex and consists of equal parts theory and practice. Architecture without theory is hollow and plain and architecture without human practice is intimidating, hostile and simply not homely. How do we enable cities to grow on a symbiosis of architectural knowledge and practical experience? And how do we build an environment where ‘amateurs’ and ‘professionals’ talk a common language, a common language deriving from the urge to develop the space surrounding and filling our homes.

If we wish only to develop the technological potential without touching human relationships, we end up with something like mass housing. - John N Habraken

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NOTES

1 The definition of the concept Million Homes Programme is a summary title of the building- and housing policy that were conducted in Sweden between 1964-75 Jörnmark. Miljonprogrammet [Million Homes Programme]. (Nationalencyklopedin, 2015) http://www.ne.se/uppslagsverk/encyklopedi/tång/miljonprogrammet

2 Statistics shows that areas with low socioeconomically status such as the Million Homes Programme has a tendency to have a higher rate of criminal activity and mental illness. Joachim Vogel, SCB + Perspektiv på välfärden [SCB + Perspective on the welfare] (Örebro: SCB-tryck, 2004):127

3 According to statistics, there is a deficient of 25.000 to 92.000 homes in Sweden; the exact number varies, depending on how the statistics are calculated. Boverket: Myndigheten för Samhällsplanering, byggande och boende Bostadsbristen ur ett marknadsperspektiv [Housing crisis from a market perspective] (Karlskrona: Boverket intern, 2012):14

4 Vlylesbech, Great Living! En undersøgelse om at have god plads [Great Living! A study about spacious living] (Copenhagen: Film bureauet and Statens Kunstfonds Arkitekturudvalg, 2010): 2

5 Kyllesbech, Great Living! En undersøgelse om at have god plads [Great Living! A study about spacious living] (Copenhagen: Film bureauet and Statens Kunstfonds Arkitekturudvalg, 2010): 3-9


7 When considering that most Danish forests are agricultural, the total area controlled or design by humans in Denmark is more than 85%. In 2014 the land use of Denmark consisted of 66% farming, 16% forest and moorland, 10% town, road and construction and 7% lakes, meadows and bogs. Statistic Denmark. Denmark in figures. (Denmark: Statistic Denmark, 2014)

8 Tahvilzadeh, Framtiden är redan här – Hur invånare kan bli medskapare i stadens utveckling [The future is already here – How the public can be co-creators in the development of the city] (Gothenburg: Majornas Grafiska AB, 2013):18-21


10 Pierluigi Nicolin, Jean Nouvel Director and Architect (Milan: Lotus B4, 1997)

11 Within Walls. Favourite Housing. Film. Directed by Moa Liew, Christel Nisbeth, Annemie Sandahl and Agnes Mohlin (Copenhagen: Within Walls, 2010)

12 Within Walls. Favourite Housing. Film. Directed by Moa Liew, Christel Nisbeth, Annemie Sandahl and Agnes Mohlin (Copenhagen: Within Walls, 2010)


14 Within Walls. Favourite Housing. Film. Directed by Moa Liew, Christel Nisbeth, Annemie Sandahl and Agnes Mohlin (Copenhagen: Within Walls, 2010)

15 Christer Larsson, City planning director Malmö. Quote from the film Ung Bo. Within Walls. UngBo. Film. Directed by Moa Liew and Christel Nisbeth. (Malmö: Within Walls, 2015)


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http://www.ne.se/uppslagsverk/encyklopedi/lång/miljonprogrammet.
THE ROLE OF THE GOVERNMENT IN SUBSIDISING AFFORDABLE HOUSING

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INTRODUCTION
No matter which definition of affordable housing you adopt, there is no doubt that there isn’t enough of it, particularly for low and middle income households; one in five families now claim housing benefit as rents increasingly exceed incomes and as demand increasingly exceeds supply. Around 195,000 to 290,000 new homes are required each year to keep pace with demand, yet since 1990, at its highest rate, new supply has only achieved 176,650 a year and in 2010-11 only 116,000 new homes were built.

Aside from an increasing housing benefit bill, there are many other important costs and consequences that result from a lack of affordable housing, indeed underinvestment in housing creates costs for non-housing services, as overcrowded homes can be a detriment to educational performance, crime increases in poorly designed and marginalised environments and transaction and production costs increase and regional economies suffer as essential, low paid workers are displaced from centres of economic activity.

Indeed, both an inclusive and civilised society and our economic and social wellbeing are dependent on a balanced housing market that provides ample supply, quality and choice of affordable homes, in well designed and sustainable communities.

The lack of affordable housing results from a combination of factors; significant reductions in the object subsidies available to the social housing sector and an increase in subject subsidies is one of these. Statistics regarding completions by the social housing sector during periods of low and high grant funding speak for themselves: around fifteen thousand per year in low periods and around twenty-five to thirty thousand in high periods.

Reasons given for this shift towards subject subsidy since the 1970s include: the end of enormous housing shortages; a reassessment of the key housing problem as one of affordability; and a change in the political and economic outlook particularly the belief in market solutions to public and social policy problems.

There are numerous advantages and disadvantages of both object and subject subsidies, however, King and Webb warn that we should not view the market and the Government, and object and subject subsidies, in oppositional terms; it is a case of finding the desirable and effective balance of each.

The £1.8 billion 2012-15 Affordable Rent programme represents the latest approach to object subsidies; it provides smaller grants and requires the social housing sector to plug the funding gap by
‘sweating’ their assets, charging higher rents and securing private sector investment. This is seen by some as the privatisation of the sector and, indeed, the end of social housing as we know it.

Furthermore, it is contributing to a substantial increase in the housing benefit bill (predicted to be £25.4 billion by 2019) as the market has not responded as the Government expected, i.e. to adjust supply to meet government-supported, increased demand from lower income households. The Government also expected Affordable Rent tenants to have moved from the private rented sector, meaning a reduction in any housing benefit expenditure on these households. In fact, these tenants have moved from family or friend’s homes or institutions, which has resulted in housing benefit expenditure funding the expansion of the market, including rogue landlords and substandard properties, rather than being invested in public housing.

Against this background of a severe housing shortage, unprecedented levels of un-affordability across all tenures, sky high housing benefit expenditure and rock bottom capital investment in housing by the Government, this paper provides an essential and timely review of the role of the UK Government in subsidising affordable housing.

This paper draws on both secondary (literature review) and primary (questionnaire of housing professionals) research; firstly the context is considered, including some of the reasons for, and impacts of, the affordable housing shortage. Secondly, it considers why affordable housing is important including if and why there is an affordability problem and what the costs and consequences of this problem are. It also considers why affordable housing subsidy is required and discusses the arguments for and against Government intervention in the provision of affordable housing and the advantages and disadvantages of an object subsidy approach. Next, current and past Government approaches to object subsidy are discussed and finally the impact of the current Affordable Rent programme is examined.

Following this thematic comparison and analysis of the primary and secondary research findings, this paper concludes with recommendations on what an effective Government subsidy programme would look like; the prevailing view from the research findings suggests that the most effective role for Government is providing substantial amounts of object subsidy to the social housing sector. However, the findings acknowledge that in times of austerity, where a return to substantial object subsidy programmes is highly unlikely, the most effective role a Government in these times can play is to support the sector to become self-financing and to deliver mixed communities.

**METHODOLOGY**

**Literature review**

In conducting the literature review, a systematic and targeted search for relevant materials was carried out; keyword searching was effectively used to identify: academic books; academic journals; reports, reviews, policies and statistics published by central and local government, housing membership bodies and lobby and research bodies; and articles from the housing media, commentators and practitioners. Searches were largely conducted using the De Montfort University library catalogue and the online search engine Google. The following keywords were used during the search: housing, affordable, social, subsidy, object, subject, rent, grant, public, capital, revenue, bricks and mortar, housing benefit, investment, finance, development, supply, central, government, UK. The following search techniques were also used: using alternative spellings, searching in the singular and plural, using quotation marks, combining terms using AND and OR, using wildcard searches. Additionally, citations were searched and cross referenced to identify further and key pieces of literature.
PRIMARY RESEARCH
Following the literature search and review, a survey was conducted amongst housing academics, practitioners and policymakers to validate the findings of this literature review. The required primary research data was both quantitative and qualitative in nature, whilst surveys are usually more appropriate for quantitative date collection only, a survey was chosen as the most appropriate data collection method for this research, i.e., it allowed a broader range of results to be collected in the time available and a survey is easy and low-cost to set up.

However, the survey method required careful design to overcome the problem of collecting both qualitative and quantitative data through a method typically used for collecting quantitative data only. A questionnaire was conducted electronically via the website www.surveymoz.com (rather than face-to-face, or over the telephone) as this is an approach popular with respondents because it offers a quick response time and familiarity. An electronic questionnaire was also cost-effective to develop and distribute and removed the logistical problems associated with surveying respondents across a wide geographic area.

A non-probability sampling approach was used as a specific group of housing academics and practitioners were required to respond to ensure that valuable and relevant data was obtained. As there is no database or register of the sample, they were identified by the researcher through both a purposive and snowball approach, i.e. respondents were identified both through existing contacts and through their contacts.

It was important to hear the views, opinions and experiences of senior housing professionals from across the housing sector and associated professions. To achieve this, the questionnaire was initially circulated via email amongst internal colleagues including board directors; amongst external colleagues from partner organisations; fellow Chartered Institute of Housing East Midlands board members and fellow alumni.

Additionally, the email made a general request for all of the above colleagues to forward on the questionnaire to others. More specifically, certain colleagues were asked to contact certain contacts to complete the questionnaire, for example one colleague directly contacted the editor of a housing magazine and the chief executive of a housing lobby and representation organisation, both of whom completed the questionnaire.

Furthermore the questionnaire was promoted via LinkedIn and Twitter. A link was posted to the questionnaire in relevant social housing groups on LinkedIn and also for all the author’s contacts to see. It was also promoted on Twitter with a general tweet containing the questionnaire website link. Additional tweets were posted that mentioned social housing individuals and organisations such as Chartered Institute of Housing, National Housing Federation, Guardian Housing, 24 Dash and De Montfort University Centre for Comparative Housing Research as these tweets would then be seen by a wider audience. Finally, a number of individuals were tweeted to directly ask them to complete the questionnaire.

Through this approach, the recommended minimum sample size of thirty was not only achieved but far exceeded, with eighty respondents completing the questionnaire. Nonetheless, care has been taken to avoid the use of generalisations or complex scrutiny of these responses in their analysis.

ANALYSIS
Why affordable housing is important
Defining affordable housing
The literature review revealed a variety of definitions of affordable housing, ranging from those that equate it to social housing, or more generally to sub-market housing across all tenures by an
assortment of providers. Others considered a person’s financial means, whilst some regard it as for those who cannot secure good quality housing, particularly home-ownership products, for themselves through the market.

Seventy-five percent of questionnaire respondents agreed that the role of social housing is to house those who cannot access affordable and quality housing through the market. However, like Hills (2007), some respondents commented that there is not one tenure for this group; they should be helped into a variety of tenures through the benefit system.

Both Whitehead et al. and Diacon et al. define affordable housing as being within the financial means of the households, whereas Whig argued that such a definition is arbitrary. Some questionnaire respondents agreed with Whig, explaining that what matters is having enough money to live on after housing costs are paid. The majority (41.25%) of respondents said that twenty-five to thirty percent of a person’s income is an affordable amount to spend on housing.

Thus, whilst many people equated affordable housing with social housing, which exists for those excluded from the market, some highlighted a wider definition of housing across all tenures, offered by a variety of providers, at a price which leaves households with sufficient money to live on, and assisted by subject subsidy if necessary.

Whilst the literature identified that social housing exists to house those whose needs are not met by the market and that there will always be households that require this assistance, it did not identify the proportion of households affected. Consequently, the questionnaire asked respondents what proportion this might be; the most popular response was ten percent, however the mean response was twenty-four percent and the median was twenty percent. Respondents added that this figure will increase in areas with high house prices and also in boom cycles.

Thus, respondents think that up to twenty-four percent of households cannot secure quality and affordable housing through the market; if social housing exists only to assist these households, and social housing is the only option available to these households, this suggests a social housing sector that accommodates 6.3 million households, compared to the 3.8 million it does now.

If and why there is an affordability problem

The literature review left no uncertainty that there is an affordability problem, as evidenced by an increase in housing benefit claimants (particularly in-work claimants), social housing waiting lists, households experiencing in-work poverty, households accepted as homeless and use of temporary accommodation. Several causes of the affordability problem were highlighted, such as the credit crisis, rising house prices, market failure, lack of new supply compared to household formation and a high cost of living compared to incomes, suggesting that the problem is a multi-faceted one requiring a multi-faceted solution.

The impact of this affordability problem is not only an increasing housing benefit bill, but others such as overcrowded homes can be detrimental to educational performance, crime increases in poorly designed and marginalised environments and transaction and production costs increase and regional economies suffer as essential, low paid workers are displaced from centres of economic activity.

Kate Barker summarises the overall situation well:

“I do not believe that continuing at the current rate of housebuilding is a realistic option, unless we are prepared to accept increasing problems of homelessness, affordability and social division, decline in standards of public service delivery and increasing the costs of doing business in the UK – hampering our economic success.”

The problem is likely to be further compounded by issues such as the ageing population, increase in single households, welfare reform and increased housing need resulting from the recession.
The questionnaire asked respondents their views on the reason for the lack of affordable housing, the majority (42.5%) attributed it to a lack of supply, whilst 26.25% said it was due to both a lack of supply and low households income. 28.75% gave other reasons, such as Government policies regarding land, the Right to Buy, subsidy reductions, focus on homeownership, residualisation of social housing and demonization of its tenants, lack of mortgage finance, planning legislation, lack of incentives for investment, costly building standards, lack of affordable housing development by private housebuilders, lack of political will and a general lack of a long-term, national housing policy. Several respondents agreed with the literature that there is more than one cause and therefore more than one solution to the affordable housing supply problem. Therefore, the literature review and the primary research findings agree that a lack of supply is major factor in the affordable housing problem; however, there are other factors to consider and tackle when designing an effective solution.

**Why affordable housing subsidy is required**

*How should the Government subsidise affordable housing provision*

This literature review has identified a number of arguments for and against the Government intervening in the provision of affordable housing: because of social responsibility, its importance to the well-being and the welfare of citizens and because previous attempts by successive governments to leave housing in the hands of the market, led to an explosion of slum housing and rogue private landlords. However, Hawtry argues that a commercial based system is preferable to a post-welfare state in the long term and the role of Government should therefore be essential, minimal and time-limited, acting as catalytic, not supplementary, nurturing the housing market to become self-sustainable. To balance and conclude the arguments for and against, King explains that the key question is not markets or Government, but rather how much of each is desirable and effective.

The literature highlighted a number of direct and indirect solutions to the lack of affordable housing and discussed the advantages and disadvantages of each.

The Table below summarises the approaches suggested by the literature regarding Government intervention in affordable housing provision:

<table>
<thead>
<tr>
<th>Interventions using subsidy</th>
<th>Interventions without subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object subsidy</td>
<td>Fewer and more flexible planning restrictions</td>
</tr>
<tr>
<td>Subject subsidy</td>
<td>Incentivise private investment in affordable housing provision</td>
</tr>
<tr>
<td></td>
<td>Address low public sector pay to ensure housing affordability for these groups</td>
</tr>
<tr>
<td></td>
<td>Market driven solutions only; remove politically driven solutions</td>
</tr>
<tr>
<td></td>
<td>Adjust interest rates to control affordability</td>
</tr>
<tr>
<td></td>
<td>Introduce rent controls to ensure affordability in the rented sector</td>
</tr>
<tr>
<td></td>
<td>Reducing regulations, e.g. on minimum housebuilding standards</td>
</tr>
<tr>
<td></td>
<td>Address the unequal distribution of housing</td>
</tr>
</tbody>
</table>

*Table 1. Possible Government interventions in affordable housing provision*
When subsidies were first introduced, the Government favoured object subsidies to increase supply; since the 1970s policy has shifted to subject subsidies to increase demand as the enormous housing shortages came to an end and the key housing problem was assessed as one of affordability and the solution as lying with the market. 

Whilst many argue in favour of a return to a focus on object subsidies, others caution against it due to the downsides of social housing, such as the constraint on mobility and high levels of unemployment and low levels of educational attainment. Although it is unclear whether the latter is a result of the needs-based rationing system imposed on the social housing sector. Additionally, Webb highlights that object subsidies can lead to polarization as they are tenure specific, they limit choice in terms of type and location of housing and they lack of means-testing.

Arguments in favour of object subsidies include, they are more socially and politically acceptable as a Government intervention than a cash payment, they provide great control over the quality and quantity of outcomes, they are targetable and avoid the problems of sub-one-hundred percent take up rates, poverty traps and work disincentives of subject subsidies, they smooth regional market inequalities particularly for low income households in high cost areas and that over a thirty year team investment in object subsidies rather than reliance on subject subsidies is more cost-effective to the public purse.

However, like King, Webb cautions that we should not view object and subject subsidies in oppositional terms, but rather look for the balance between them. Questionnaire respondents agreed (sixty-six percent) that a mixture of direct and indirect intervention is required. However, it was difficult to identify which solution the literature agreed would be either the most or least effective. Therefore, the questionnaire asked respondents to rank 8 solutions proposed by the literature in order of most to least effective; respondents clearly ranked object subsidies highest out of all the proposed solutions.

<table>
<thead>
<tr>
<th>Solution</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public investment in public housing providers</td>
<td>1</td>
</tr>
<tr>
<td>Private investment in public housing providers</td>
<td>2</td>
</tr>
<tr>
<td>Increased employment</td>
<td>3</td>
</tr>
<tr>
<td>Planning system reform</td>
<td>4</td>
</tr>
<tr>
<td>Private investment in private housing providers</td>
<td>5</td>
</tr>
<tr>
<td>Increased wages</td>
<td>6</td>
</tr>
<tr>
<td>Public investment in private housing providers</td>
<td>7</td>
</tr>
<tr>
<td>Increased housing benefit budget</td>
<td>8</td>
</tr>
</tbody>
</table>

*Table 2. Ranked solutions to the lack of affordable housing, most to least effective*

The literature supported a subsidy system that offers both object and subject subsidy in appropriate measures, however, there was no discussion as to the extent that each should be offered. Thus, the questionnaire asked what percentage of the total subsidy available should go towards subsidising bricks and mortar; respondents said approximately two thirds (mean response sixty-one percent, median and mode seventy percent).

The literature identified that some believe the expansion of social housing through object subsidies is an inappropriate Government response to the affordable housing problem. Questionnaire respondents were asked whether they agreed with these arguments made in the literature; only a small majority (fifty-seven percent) disagreed that the expansion of social housing is an inappropriate solution to the lack of affordable housing given its downsides. However, some respondents agreed
with Hills\textsuperscript{63} that the drawbacks are a result of the way social housing is allocated and also emphasized the need for mixed tenure communities. This suggests that some of the arguments against expanding the social housing sector would be addressed though reform of the allocation restrictions and by ensuring developments create mixed communities.

The literature highlighted a number of arguments against Government subsidies as a solution to the affordable housing problem, either because they are ineffective or because they don’t tackle the true cause of the problem. If these arguments were accepted by the Government, the result would be the end of subsidies (indeed, object subsidies for social housing have already disappeared). Moreover, Williams et al\textsuperscript{64}, argue that the government’s long term objective seems to be to create a self-financing social sector.

Consequently, the questionnaire asked respondents if it is a) desirable and b) possible for the social housing sector to become self-financing. In both cases, the majority of respondents said yes (seventy-seven and seventy-one percent respectively).

Conversely, when asked if it is time for the social housing sector and the Government to part ways regarding object subsidies given the maturity and financial capability of the sector, over three-quarters (seventy-nine percent) of respondents disagreed.

These responses are difficult to reconcile as on the one hand respondents agreed that the expansion of social housing is an inappropriate solution and that a self-financing sector is not only possible, but desirable, but on the other hand said the Government should continue to offer object subsidies for social housing, that object subsidies are the most effective response to the lack of affordable housing and that up to seventy percent of available subsidy should be spent on bricks and mortar.

These contrasting findings suggest a number of conclusions:

● object subsidies are the most effective response to tackle the housing shortage
● but the sector recognises the political reluctance towards object subsidies
● the sector believes in this world of ever-reducing object subsidy, a self-financing sector is a desirable alternative
● the sector still wants object subsidies, but not to develop traditional estates of social housing; instead it wants to create mixed communities and to have freedom regarding their allocation
● problems of welfare dependency, unemployment and low educational attainment should be addressed through government policy

These conclusions are important in determining the most effective role the Government can play in subsidising affordable housing; they suggest that the most effective role is providing substantial amounts of object subsidy to the social housing sector. However, the most effective role a Government in austere times can play is to support the sector to become self-financing and to deliver mixed communities.

**How the government subsidises affordable housing**

The literature review considered the Government’s current approach to object subsidies for affordable housing and identified that, for a variety of reasons, since 1975, the Government policy has been to focus on subject rather than object subsidies, most recently demonstrated by the Affordable Rent programme.

The Affordable Rent Programme provides smaller grants and required housing providers to plug the funding gap by charging higher rents and by ‘sweating’ their assets\textsuperscript{65}. Additionally, the private sector is expected to plug part of the funding gap\textsuperscript{66}. It is argued that high rates of subsidy are no longer required in a mature social housing sector as loan repayment rates exceed acquisitions\textsuperscript{67} and because housing associations are achieving efficiencies through economies of scale \textsuperscript{68}. However, it is
conversely argued that the Affordable Rent Programme reduces the capacity of housing associations to increase supply and leaves them with a greater proportion of the risk. The primary research asked whether respondents thought the trend identified in the literature review of ever decreasing object subsidy is likely to continue; a strong majority (seventy-seven percent) of respondents said they do not anticipate an increase in object subsidies at all. However, some respondents commented that it will have to happen when the housing shortage becomes chronic and there is public outcry. Again this contrasts with their earlier response that a self-financing sector is both possible and desirable.

It occurs to the author that should the Government recognise both the potential of the housing sector to become self-financing and the possibility of public outcry regarding the housing shortage, that the Government will, sooner or later, be calling upon the sector to fulfil its potential. It may even try to shift responsibility for the shortage onto the sector.

Furthermore, whilst ever the sector continues to develop affordable housing, either with or without whatever object subsidy is available from the Government, it suggests that the funding options available are effective. However, as the literature review highlighted (but not the primary research), there is a correlation between the reduction in object subsidies and the reduction in new affordable housing development. Therefore, whilst a reduced object subsidy model such as Affordable Rent may be judged to be effective in terms of being financially viable for the housing provider and cost efficient for the Government, it cannot be judged to be effective in terms of supplying enough homes to meet demand.

The impact of government object subsidy programmes

The questionnaire asked respondents for details of their development pipeline by tenure type in order to understand the impact of the above described shift from object to subject subsidy; it revealed that the majority of developments will be for Affordable Rent (thirty-seven percent), followed by social rent (thirty-two percent), followed by market rent (twenty-four percent).

The Affordable Rent programme was only introduced in 2011 and already the impact is that over a third of developments will be for this tenure and properties for social rent have been relegated to less than a third of development plans. It’s important to note that a similar amount of market rent development and social rent development is planned by the sector; this means that already more houses are being developed for Affordable and market rent housing than social rent. As such, the social housing sector will be contributing to the further expansion of the private rented sector, which has recently overtaken the social rented sector in terms of the number of households it accommodates (3.84 million in 2011-12).

This trend is supported by the literature which highlighted that the current trajectory of affordable housing policy will result in a growing affordable housing sector housing moderate-income, working households, and a static social housing sector housing the lowest income households.

The literature raised concerns that the Affordable Rent model may only be short-lived for several reasons, e.g. gearing required from housing providers, the level and continuing availability of private finance required (which excludes smaller housing providers), regulations, requirement for asset growth, unviable markets in the North and Midlands due to low rents and in the South due to high land values, further welfare reforms and the ability of tenants of all income types to afford Affordable Rents. Indeed, for housing associations, it could result in higher rent arrears, increased voids, higher borrowing costs and prioritization of private interests over public interests; for households, it raises questions about who will house them and where, how they will afford the rent (particularly if further
action is taken to limit benefit expenditure), the quality of the accommodation available to them, rising spatial inequality and how easily they could escape benefit dependency through employment. However, as shown above, respondents plan to mainly develop Affordable Rent housing and made no comments that it was an unsustainable model. It is concerning that respondents did not highlight any of the numerous issues identified in the literature; this suggests that either these issues have not arisen, that the sector has not realised these problems are present, that these issues have been appropriately mitigated for or are considered insignificant compared to the benefits gained from developing Affordable Rent housing.

The literature also identified advantages of the increasing use of subject subsidies and private finance, including that it requires housing providers to become more agile, innovative, efficient and flexible. A small number of questionnaire respondents also recognised this: “[it] will drive efficiency, lower bureaucracy and create clear purpose.”

The questionnaire also asked if respondents thought this shift to increased subject subsidies (which they are supporting though their development plans) is resulting in the end of social housing as we know it. The literature review revealed King’s argument that the move away from object subsidies as the primary solution to the housing problem signals the death knell of social housing, because the housing shortage only required temporary Government intervention until the markets were reinvigorated, which they now are.

Sixty-six percent of respondents either disagreed or strongly disagreed that social housing was a temporary measure required to tackle the post-war housing shortage whilst the market re-established; sixty-two percent of respondents either disagreed or strongly disagreed that the market has now re-established.

The latter response shows that even if social housing was a temporary measure to tackle the housing shortage, the market is not yet re-established so it would still be required currently. Some respondents commented that the market will always fail some, suggesting the social housing will always be needed for these households. This is consistent with their earlier response and the findings of the literature review regarding defining affordable housing. Additionally, respondents highlighted social housing’s pre-war history in arguing against the suggestion it was a temporary, post-war measure.

CONCLUSION

The paper has sought to recommend the most effective role that the government can play in subsidising affordable housing. Thus, a literature review and primary research have been conducted, which have considered:

- why affordable housing is important, including how it is defined, if and why there is an affordability problem and the consequences of unaffordable housing;
- why affordable housing subsidy is required, including the arguments for and against Government intervention;
- how the government can subsidise housing and the advantages, disadvantages and impacts of these approaches;
- the impact of government object subsidy programmes in England, with a focus on the current Affordable Rent programme.

The research found that, whilst definitions of affordable vary, there is no doubt that the market consistently fails to provide a proportion of the population with housing at a price that leaves them with enough to live on. The primary research suggests this proportion is ten to twenty-five percent of the population and that housing should take up no more than thirty percent of a household’s income.
There is therefore a role for the Government to ensure the needs of these households failed by the market are met elsewhere. The research considered what this role could, has and should look like, something that very much depends on what is considered as the root cause of the problem. Lack of housing supply featured heavily in both the primary and secondary research as a main cause of the affordable housing shortage, which contrasts with the current Government policy focus on subsidising incomes rather than supply.

That said, the research highlighted more than one cause of the problem which therefore requires an appropriate mix and balance of Government policies, which should include both direct and indirect intervention and object and subject subsidy programmes. On the latter point, the primary research suggested a seventy:thirty balance between object and subject subsidies. This is despite the disadvantages of object subsidies and social housing discussed in both the literature and questionnaire responses, as it was felt these can be overcome through more freedom in allocations of social housing and development of mixed tenure communities, for example. As well as this change to current Government policy on subsidies, the research also identified a call for changes to planning and minimum wage policies as other root causes of the problem.

However, whilst there may be a call for seventy percent of available subsidy to be directed at bricks and mortar, the literature review did raise concerns that the Government’s long term aim is for the affordable housing sector to become self-financing, indeed, questionnaire respondents said that this is both possible and desirable. Respondents did, nonetheless, still make the case for object subsidy from Government as the most effective solution in the long term to the housing affordability problem. Although, the research recognised that a return to substantial object subsidy programmes is highly unlikely in the current economic and political climate. As such, programmes that focus on subsidising incomes rather than supply and facilitating private investment such as the Affordable Rent programme are expected to continue. It should be noted that the literature review raised concerns about the viability of the Affordable Rent programme in the medium-long term, although the primary research did not. It is suggested that this is an area requiring further research to ensure its strengths and weaknesses are fully understood and reflected in future Affordable Rent programmes.

Not only has the Affordable Rent programme failed to keep pace with demand but it is also seen as the end of social housing and the beginning of a privatised affordable housing sector. As a result, both the primary and secondary research agreed that what remains of social housing will be reserved for only the most vulnerable and poorest households.

In terms of recommending an effective Government subsidy programme for affordable housing, taken together, the above suggests there is a need for the Government to directly and/or indirectly provide affordable housing for those 6.3 million households not catered for by the market which costs no more than thirty percent of their household income. There is a strong call from the social housing sector for a significant object subsidy programme as this is the most effective long term solution despite its disadvantages, however, questionnaire respondents acknowledged the current political and economic circumstances and reluctantly agree that a self-financing sector is possible. Whilst in some respects the Affordable Rent programme is working as it is delivering new homes, there are question-marks around its ongoing viability and its ability to keep pace with demand which therefore suggests it is an ineffective solution.

Thus, in an ideal world, the research findings suggest providing substantial object subsidies to the social housing sector is the most effective response to tackle the affordable housing shortage, but the sector recognises the political and economic situation prevents a return to large-scale object subsidy programmes. As such, it is suggested that in times of austerity where the cost to the public purse must be considered in constructing an effective policy, there is support for a self-financing sector but with
indirect Government support, such as policies to tackle problems in the planning process, in-work poverty and mono-tenure developments to ensure there is a multi-faceted solution to a multi-faceted problem. Without this mix and balance of Government intervention, an effective solution is impossible to achieve.

It is, therefore, recommended that the Government introduce a number of policies to achieve this effective solution, including, but not limited to:

- Provide as much object subsidy as possible to the social housing sector, ideally achieving a seventy:thirty balance of object:subject subsidy;
- Allow the social housing sector more freedom to set rents that are truly affordable for their local communities and to allocate their stock;
- Ensure households can access housing that leaves them with enough to live on after their housing costs;
- Ensure all developments are mixed tenure;
- Review the planning system to identify any required reforms;
- Review the 2011-15 Affordable Rent programme to understand its strengths and weaknesses and ensure future programmes take these into account;
- Develop a mechanism to allow new funding instruments proposed by the sector to deal with the funding gaps;
- Ensure those households (6.3 million) not catered for by the market can access affordable and decent housing
- Recognise that the lack of affordable housing is a supply problem rather than a household income problem
- Devolve the administration of subsidies to a local level to ensure local solutions for local problems
- Enable private sector investment into the social housing sector

Overall, it is vital that the Government provide a long term housing strategy, with cross-party support, that addresses all facets of the affordable housing supply problem.
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ALTERNATIVE THIRD WAVE HOUSING FUTURES

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INTRODUCTION:
A DEFINITION OF COOPERATION

"Cooperation means concert for the diffusion of wealth. It leaves nobody out who helps to produce it. It touches no man's fortune. It seeks no plunder. It causes no disturbance in society. It contemplates no violence. It subverts no order It accepts no gift nor asks now favour. It keeps no terms with the idle and it will break no faith with the industrious. It means self help. Self independence and such share of the common competence as labour shall earn or thought can win."
George Jacob Holyoake, 1885.
Brass Rubbing of a monument to cooperation found in the Seward Park Social Housing Project, New York City.

PART ONE
This paper considers the urban and historical circumstances in which housing cooperatives developed democratic approaches to creative urban design in Inner City Liverpool. The cooperative housing movement in Britain has deep historical foundations and in the 1960s cooperatives had a significant role in spatial design and social housing procurement in the City. In 1972 John Turner, working in The South American Flavellas, famously said "Housing is a Verb" and the focus turned towards process over product. Nicholas Harbracken published "Support Systems" and Sherry Arnstein revealed the influential "Ladder of Citizen Participation". There were new groupings of architects, residents and activists who were prepared to work with people in generating ways of community design through creative Participation.
Democratic and cooperative dwelling design represented a form of creative self help, mutual support and co-education which was close to Colin Ward's (1974) self organising societies. Today we might call it "co-production". The Liverpool housing cooperatives are an important example of user controlled, self educated and active democratic society, with implications for future social housing design.
In 1987 there were 37 housing cooperatives, owning or designing 2000 dwellings in Liverpool. The development of the first new housing cooperative is well described in "The Weller Way" which is the
cooperatives own account of their seminal project. The Cooperative Development Services (CDS) booklet "Building Democracies 1984-1987 presents a full account of both the history of the movement and more recent developments.

Retrospectively, we can see that the Liverpool cooperatives are significant examples of working class democratic and creative organisations that set out to meet dwelling needs in deprived inner city neighbourhoods. Many were family based and some met the specific needs of the elderly. One housing cooperative served the needs of the black elderly.

These dwelling cooperatives had their origins in The SNAP (Shelter Neighbourhood Action Project) in 1969. SNAP helped groups of residents to set up cooperative associations to improve housing in the Toxteth area of Liverpool. Their objective was to control and manage the modernisation of existing terraced housing and Liverpool's first cooperative was called The Granby Housing Cooperative which was serviced by Neighbourhood Housing Services (NHS).

Weller Streets were the most progressive group of private tenants and they built 61 family houses and flats in 1982. Hesketh Street was the second housing cooperative. Overall, at their peak 19 to 150 houses, on different sites were built. However, a Militant City Council took control of Portland Gardens Cooperative and effectively "municipalised " the group of residents. This was a highly charged time for housing development in the City. The words "cooperative" were struck out from sign boards effectively air brushing democratic creativity. Some cooperatives had re-cause to take legal action to protect their projects; for everybody involved this was a low point in the history of social housing in Liverpool.

The cooperative philosophy was "Professionals on tap not on top". To enable large groups of to collectively design their dwellings it was necessary to develop various participatory design techniques. This is because the cooperatives demanded a controlling influence on the urban design and interior design. A variety ways of working evolved including cardboard model making, creative drawing and visits to housing and landscaping projects. These techniques were developed in response to each unique cooperative; organisation, size, personality, nature and context of the site. The variety of the various solutions is an indication of the responsive nature of the design process.

The various design techniques were not arbitrarily applied to an inspecting group of people but rather they evolved in group discussions. These techniques represent useful ways of communicating and developing creative ideas and as design tools they enabled the cooperatives to be in control and determine their own dwelling and urban design.

PART TWO

In part two, we discuss how the Housing Cooperatives have come to influence later approaches to social housing design. It is over thirty years since the development of the unique cooperatives. In that time, The Eldonians have seen their own rebirth of Liverpool. The World Heritage Site was declared, Liverpool was European Capital of Culture and Liverpool One changed the retail fortunes of the City. Peel Holdings have released plans for Liverpool Waters and A Deep Water Dock is under construction at Liverpool Two. Despite all this progress, large areas of the inner city remains dormant and a reflection of further urban shrinkage.

To revisit the housing cooperative experience and to re-evaluate the contemporary relevance of the model as a potential component of future housing policy, we must start by examining the background of the times and the circumstances of the birth of the movement in Liverpool in more detail.

The housing cooperatives in Liverpool and elsewhere owe their genesis to a number of key circumstances of the time.
FIRSTLY THERE WAS A NEED
Communities in Liverpool in the 60s and 70s were living in neighbourhoods which were characterised as 'slums' - very poor housing conditions which included outside toilets, no amenity space, proper kitchens or bathrooms. Previous waves of slum clearance, which had moved people to overspill estates and new towns, had scattered communities removing the pillars of family and community support and causing heartbreak. In the words of the song: 'Don't want to go to Kirkby, don't want to go to Speke, don't want to go from all I know in Back Buchanan Street'. Communities had been split, not only through slum clearance, but through major infrastructure projects such as the construction of the Mersey Tunnel and the Inner Ring Road.

‘Cathy Come Home’ a TV film by Ken Loach (1966) had created a national reaction to the problems of homelessness in the inner city and led to the creation of Shelter, a national charity. Shelter set up SNAP (Shelter Neighbourhood Action Project), the first neighbourhood based action project in the UK. SNAP was based in an old police station in the Granby Triangle in south Liverpool and began work to try to regenerate the neighbourhood using improvement grants, adding bathrooms and kitchens to small terraced houses and improving the fabric of the properties and the neighbourhoods. This work was later taken over by housing associations who took over portfolios of properties from slum landlords and began improving them within the newly designated Housing Action Areas.

The first housing cooperative in the country was Granby Housing Cooperative, set up to renovate Victorian terraced properties in the Granby Triangle in Liverpool 8. Some neighbourhoods, including the Weller Streets, were acknowledged to be 'too far gone' to be improved. The threat of demolition brought communities together. Liverpool has always had strong communities held together by bonds of family and friends but also by mutual support in the face of economic pressures.

The need was clear; new housing to modern standards but for the community, keeping the bonds and relationships intact while replacing the housing and the neighbourhood.

SECONDLY, HELP WAS AT HAND
The housing associations in particular Cooperative Development Services, built on the culture of working in neighbourhoods for communities and, powered by highly motivated individuals, wanted to help the communities and to lead the process of urban renewal from a community base. They were supported by architects and other professionals who were keen to try new approaches. The background was that overspill estates were perceived to be failing and post war confidence in Modernism had taken a knock following the collapse of Ronan Point and other disasters. The professionals were keen to explore new approaches to the problem in different ways.

THIRDLY THE FINANCE COULD BE ACHIEVED
The Reg Freeson Housing Act had identified funding for housing cooperatives. The Housing Corporation could allocate housing association grants to approved projects. CDS and later MIH wanted to facilitate the funding opportunities through helping to set up and provide services to housing cooperatives. The coops and particularly the Eldonians, had to 'fight' for their housing futures and to negotiate a seemingly endless series of hurdles: registration as a housing association, acquiring sites, planning permission and funding. They also had to deal with their internal dynamics - issues of leadership and of decision making, which had to be seen to be democratic and fair to all the members. There were many frustrations and resistance from some quarters to the coop ideas, but key priorities emerged:

1. We want to keep the community together
2. We want to be involved in the design of the houses
3. We want to be in control of the management and the process. For the professionals involved there was a tremendous commitment required but also a prime need to build trust with groups who had always viewed the ‘Corpy’ and professionals with distrust. Quickly, approaches were evolved to tackle involvement; hands-on modeling techniques based on ‘game theory’ were used to explore alternative layouts, and visits to other schemes were arranged to explore ideas. There was a strong educative process at work both in terms of design development and management and the design process was used as a social catalyst and visionary ‘tool’ to motivate and consolidate the coop groups as well as to enable and facilitate the projects.

Figure 1. The Weller Street Housing Cooperative design committee working in participation with their architect Bill Halsall

Figure 2. Weller Street One of the completed courtyards. The final scheme consisted of a series of interlocking courtyards. All of the living rooms and gardens had to face south so that all members would get an equal share of the sun.

In Liverpool, this all took place against a background of decline in the economy and the population. The early enthusiasm of the sixties, ‘City of Change and Challenge’ became a very big challenge, and
more of a major change than anyone could have anticipated, as a significant part of the city's industrial base collapsed. These effects were particularly felt in north Liverpool, still struggling today from the failure of many of the traditional dock related industries. The tenement clearance programme of the early 80s led directly to the role of the Eldonians in regenerating the Vauxhall area. In the first instance communities from the Portland Gardens and Hopwood and Ashfield blocks were assisted to form housing cooperatives and to develop a series of sites to the east of Vauxhall Road. The residents of Eldon Street, in a later phase, looked to developing the former Tate and Lyle site, where many of them had worked before its closure.

The politics of this period became extremely polarised between a Thatcherite government pursuing extreme monetarist policies and a militant tendency run council, elected in 1983, with an extreme left wing agenda. The militants saw the coops as being elitist and self-selecting and embarked on a large scale programme to build 5,000 new council houses. The coops were to be scrapped but were eventually 'municipalised'. The Eldonians were in the 'eye of the storm', battling the government for land and money and the council for planning approval.

Through this period the designs for the Eldonian Village evolved step by step. A model of the new housing layout evolved through many long model making sessions and design meetings. It was based on a series of informal courtyards off a more formal curving avenue. All the spaces were overlooked to enhance safety and security. Individually designed houses were pre-allocated and plotted. Layers of detailed choice involved exterior appearance, interior layout, kitchens, bathrooms, staircases, landscaping, gates and external materials. Over three years of struggle to acquire the land, and to achieve planning approval, the process of design continued, assisting the community to hang together and to believe in their 'dream'.

Eventually, planning permission was achieved through a public enquiry. The Eldonians avoided 'municipalisation' because they were building on government controlled land. The scheme developed a strong sense of place and identity, and pride of the coop members. All members of the community were designed for, including bungalows, for elderly care; and disabilities were catered for and integrated into the scheme. The overall environment was enriched through individual contributions and shared decision making. A second phase continued in this tradition including canal-side housing, the Village Hall, offices and sports facilities.

The Eldonian agenda was more than just housing, they wanted to control every aspect of their lives and the bigger plan, as outlined in the 1982 Ideas Competition (entitled – 'The Self Regenerating Community'), included 3 'planks':

- Housing
- Environment
- Employment.

The Eldonian ambition was always bigger than to form a housing coop - this was to be community-led regeneration and sustainable development on a big scale.
THE LEGACY

The heritage of the Eldonian project has been to consolidate a strong cohesive community in an attractive convivial environment conducive to community life. Crime is low; the village feels safe and secure. The Eldonians have attracted investment and development into this neighbourhood of the city. The design has influenced the progress of standards in housing nationally, in particular ‘Secure by Design’ and ‘Lifetime Homes’ standards, and supported thinking about sustainable communities and community engagement, as well as the role communities can play in regeneration.

The planning system has also been influenced. Community and stakeholder engagement is now required as standard and the approach and techniques of community involvement have entered into general practice.

While ideas about design have evolved over time and higher densities would now be promoted in urban renewal, the sustainability of the Eldonian Village has been demonstrated through success including the award of a World Habitat Award in 2004. Of course the wider economic issues must be tackled on a bigger scale, at least regionally, for bigger impacts to be felt at a neighbourhood level but communities have shown that they can take a role in this and ensure that the benefits of economic investment are shared. A strong entrepreneurial spirit has been demonstrated by the Eldonians and they continue to pursue their ambitions.

The question inevitably arises - is the Eldonian project replicable - but would we really want to replicate the circumstances of its birth? In the current environment should people need to fight for a house?

Many of the problems of poor quality housing persist. In Anfield and Granby the problems of decline are still being tackled and there are many estates in many parts of the UK where communities are
under threat and housing conditions are very poor. Perhaps the type of working class community represented by the Eldonians, where everyone lived, worked and socialised together with strong family and religious ties holding everything together does not exist in the same way and the strong cohesiveness of the Eldonians is unique. However, there are other types of communities and HLP have worked with many different groups in different parts of the UK over many years.

An important part of the legacy of this era is demonstrated by the way in which the approaches and techniques developed by architects such as HLP, working within the housing cooperative movement have entered the mainstream and been disseminated and utilised in different contexts and scales. HLP has used design participatory techniques in large scale masterplanning projects to build consensus around 'shared vision' bringing together different, even conflicting interests, around consensus based plans and strategies for regeneration. While these plans may not always be community-led in the way that the Eldonian Village was they are certainly community based and community 'buy in' is regarded as a key determinant of viability, deliverability and sustainability by clients and planners. This field of work has acquired its own terminology, e.g. capacity building, stakeholder engagement etc, and can unfortunately be viewed as an unwelcome but necessary 'add on' to projects, rather than as an inherent part of the design process. It can also be seen legitimately as a kind of 'market research' in a housing industry not overly given to researching 'core products' with its customers. At HLP design participation comes naturally as part of 'process design' and communities are treated as partners in redevelopment and regeneration projects.

The participatory model has also been used successfully to achieve a range of different project types including, health and education buildings, public realm and park designs - even a railway station. In all instances the views of the public have influenced the final design and improved its responsiveness to context, social effectiveness and long term sustainability.

Figure 5. Chinatown Masterplan & Chinese Arch, Liverpool
HLP's work with the Chinese community in producing a masterplan and themed public realm design culminated in the construction of Liverpool’s Chinese Ceremonial Arch. Now a major landmark and tourist attraction for the city, the Arch is a result of Liverpool’s twinning with Shanghai. HLP’s role included project management of the process as well as design of the public realm setting. HLP arranged for a team of artists and craftsmen to come to Liverpool from Shanghai and integrated the design through close attention to materials, colours and orientation in accordance with Feng Shui principles.
Figure 6. Sunderland Arc ‘Event in a Tent’ In Sunderland, HLP was appointed to carry out one of the largest community visioning programmes ever undertaken in the UK, covering a population of 65,000 people. A series of community planning events were carried out in eleven neighbourhoods within a fast-track programme of five months. The events were supplemented by numerous focus groups, meetings and community workshops, as well as liaison with key stakeholders. The programme provided a platform of public opinion to form the basis to develop a regeneration strategy for Sunderland ARC and a clear agenda for action with identified strategies and programmes.

Figure 7. Olive Mount Gardens is a new modern linear park forming the centrepiece of the Olive Mount development and linking the elements of the project. The design creates a distinctive themed environment, based on the symbolism of a river-like journey through life. The gardens comprise five transitional spaces enhanced by high-quality planting, hard landscape and sculpture. The design develops its theme through integration of carefully chosen materials and art installations, and the experience of individual gardens such as the sensory garden and the memorial garden. Extensive community engagement and design participation was carried out to accommodate the requirements of various resident groups living around the gardens and to reconcile different interests into a unifying ‘vision’
Figure 8. Cleadon Park was a problematic inter-war local authority housing estate in South Tyneside. HLP has been involved in the redevelopment of the estate for many years, initially drawing up a bold and ambitious masterplan through consultation with the community. HLP proposed a new model approach to design which embraces government agendas on density, is based on Home Zone principles, and a seamless approach to tenure. The design creates a visually rich and integrated environment, enhancing value and community ownership. The early phases are now complete. Cleadon Park has been recognised as an exemplar regeneration model.

Figure 9. Anfield and Breckfield have a high profile connection with Liverpool Football Club but the neighbourhood has suffered from long term decline and now requires a major stimulus to promote transformational regeneration. The Masterplan responds to the local issues through the creation of a hierarchy of Boulevards, Avenues and Streets which will provide a robust framework for redevelopment. Our proposals increase permeability and legibility and impose a new scale, appropriate to the neighbourhood’s importance as a much visited part of the city. A clear landscape structure underpins the plan and links the new residential neighbourhood through a network of green spaces and parks. The plan also enhances the setting of key heritage buildings which are to remain. The proposals for the redevelopment of LFC are integrated into the Masterplan and the impacts of match day traffic and pedestrian movement have been tackled through a well considered movement strategy within the Masterplan. The Anfield and Breckfield Masterplan and Design Code were developed in consultation with the community and stakeholders and were approved by L.C.C. Later phases have been redesigned to renovate terraced housing adjacent to LFC with imaginative conversions and integrated open space proposals.
Figure 10. Stockbridge Village Masterplan, Knowsley Stockbridge Village is a peripheral estate which demonstrates a range of physical, social and economic issues including high reliance on benefits, and a history of anti-social behaviour, compounding its isolation and poor image. HLP tackled the challenge of producing a masterplan and community vision by developing a ‘transitional’ philosophy towards sustainable development. A model for a sustainable community was used to develop a flexible, multi-stranded, joined-up regeneration strategy. Building on the assets of a strong community and land availability, the plan describes a range of interventions which can be achieved through multi-agency collaboration and community enterprise over a twenty year period. As a core element of the process of preparing the plan, HLP undertook extensive and in-depth consultation with the community including working with local schools and residents groups. The centre piece of the consultation strategy was a road-show with exhibitions, models and videos which toured all parts of the neighbourhood. Outputs from all strands of consultation including web based surveys, provided a strong basis of support for the plan from community and stakeholders.

THE HOUSING COOP MOVEMENT IN LIVERPOOL

The Housing Movement and the Housing Cooperative Movement were national in scope. So why did the idea find such fertile ground in Liverpool in the 70s and 80s? Liverpool had its strong traditional communities, people housed together in dense terraced streets or in crowded tenements, but who also worked together in the dock related industries of a port city. The communities were resilient, enterprising and independent minded. Women traditionally played an important role, not just socially but economically, when the men could be away at sea or unemployed for long periods.

The coop idea spread through pubs and wash houses as much as through the housing associations. The drive to keep communities together while the redevelopment of poor quality housing areas progressed was a key motivation. The parallels between the experiences of the community of Stockbridge Village for example, re-housed in the 60s and 70s from various parts of the city and the coop communities are quite stark. In Stockbridge, fractured communities have struggled through riots, high crime levels and economic deprivation with a prevailing sense of isolation, even invisibility. In 2012 there was something like 40% benefit reliance in spite of many initiatives, investment programmes and everyone’s efforts over the years. While the coops have also suffered economically through the recession, they have retained the advantages of mutual community support and accessible city living.
Liverpool also had the professionals and organisations ready and able to help. The 80s and early 90s were a very dark period for Liverpool and Merseyside and the coops provided a life-raft and anchor for some communities and families.

The next question is, why did the Housing Cooperative Movement not continue to grow and develop? Obviously the effect of the Militant Tendency didn’t help, but this was a brief interlude. Of course, in a sense, the movement didn’t stop. The coops and in particular the Eldonians (now a community based housing association) have carried on their work and managed their own affairs. In the Eldonians case there has been a continuing drive to carry on a development role. Critically there is a factor of scale. At the time of the Eldonian’s inception the prevailing wisdom was that coops should be small – say 40 families, to work cohesively as a group.

The Eldonians have a much larger housing stock which enables them to operate independently. Although their project was criticised at the beginning for being too big. (Phase I was 145 properties, Phase II was 150 properties), in fact this critical mass has been the key to being able to employ their own management staff, to develop a significant rent pool and an extensive waiting list. The Housing Cooperative Movement then, by no means ‘died out’, but it did not become again a central part of the Council’s policy or the Government’s housing agenda.

In the meantime, the housing associations have also changed. In the 70s they formed part of a wider ‘housing movement’. Through the 80s the focus changed to being housing businesses, taking over the traditional role of the local authorities for social housing provision. Housing grants have been successively reduced, requiring associations to borrow against their own assets. This trend makes the housing cooperative option less attractive to the associations and more risky. Tenant management coops were tried, providing the advantages of coops but without ownership of the houses by the coop.

As the management responsibility of social rented housing stock has generally changed, from being led by local authorities with restricted borrowing powers, management of rented housing has generally improved. ‘Decent Homes Standards’ have been widely achieved and issues such as fuel poverty tackled, removing some of the urgency and motivation.

PART THREE
So what could the housing cooperative model offer in the context of the current housing crisis?
The current crisis is generally described in terms of:-
● Not enough new houses are being built each year;
● Lack of available land;
● House values are too high so that the younger generation can’t afford to get on the housing ladder;
● The planning system is too slow and restrictive.

This definition identifies very real problems, but is very focused on the issues of London and the south east and other cities with rapidly expanding populations and economies. In the midlands and north there are different dimensions to the problem, eg
● The cost/value ‘squeeze’ producing lowest common denominator solutions
● A low wage economy means that many people are unlikely to be able to afford to buy
● An aging population
● Low occupancy and small household sizes (the ‘bedroom tax’ penalises tenants who live in larger properties, while there is an inadequate supply of smaller ones, driving single people into the private rented sector) and houses of multiple occupation
● Poor conditions still in many neighbourhoods and estates
● Homelessness
● Repossession (owners who can’t keep up their mortgage repayments)
● Empty homes and poor conditions of repair in the private sector.

What could the housing coop / community based housing associations model offer today?
● Good quality housing and environment at reasonable rent
● Safety and security of a supportive community
● Stability and self-confidence
● Long term sustainability – socially and environmentally
● Supporting people to work and contribute to the local economy
● Self determination – getting it right for members of the community, reducing dependency on services, particularly for the elderly and for young people (because the coops generally provide a community mix and good accessibility)
● Reinvestment in improvements and repairs
● Capacity building and social capital
● Community stability and mutual support.

However, there may be downsides because of the membership structure of the housing cooperatives and this needs closer study. For example:-
● The model generally used (par value) may reduce social mobility and people’s individual capacity to build up personal equity in their housing
● The stability of the membership, while contributing to cohesiveness may also be restrictive to people’s movement or the development of a wider social mix
● All the issues associated with an ageing population, as the original members get older.

The proposition that emerges is that the housing cooperative model still has much to offer in an economy where it is unlikely that everyone can aspire to home ownership and the burden of home ownership itself on the wider economy may also have negative effects without a flexible, multi-stranded, national housing policy.

The coop experience should be revisited. Can some of the downsides be addressed by exploring equity building and equity sharing models, promoting easier mobility for the members?
Can comparisons be made with other European countries’ experience where the cooperative sector is bigger? Are there more lessons to learn?

While the house building market continues to be dominated at a national level by the house builders and the banks, there must be an opportunity for initiatives which generate community autonomy and cohesiveness and which are more sustainable, viable and cost effective in the long term. Housing cooperatives can play a role satisfying housing and community needs as a key priority, rather than leaving it all to big business, driving ever higher house prices and making home ownership unobtainable by a large section of the population.
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THE ROLE OF SOCIAL MOVEMENTS IN THE CONSTRUCTION OF HOUSING SOLUTIONS IN RIO DE JANEIRO

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INTRODUCTION
Historically, and up to the 1920’s, the issue of social housing in Brazil included a liberal approach in which the state favoured the private sector and did not intervene in the housing market (except with tax exemptions to private companies). Between the 1930s and 1960s another approach was tried in which the production of social houses by the state was predominant. More recently, an approach marked by a policy of high state subsidies to the private sector has been tried. During the Brazilian military dictatorship this involved the National Housing Bank (BNH) and, more recently, it is centred on the current Program “My House My Life” (MCMV) which was created by the Workers Party (PT) in 2009.

Although the offer of subsidies and credit of these recent schemes have helped to increase the stock and availability of housing, and facilitated its acquisition by the middle sectors of society, it has not been able to meet the needs of low income sectors of society. However, since the 1990s, local governments linked to the Worker’s Party initiated policies such as the FUNACOM Housing Program (Municipal Program to support Housing for Low Income Groups through self-management) in São Paulo1, inspired by the Uruguayan experience of housing cooperatives.

With the election of president Luís Inácio Lula da Silva in 2002, federal programs began to invest in self-managed projects as well, creating the Solidarity Credit Program (SCP) in 2004 and the MCMV-Entities2 in 2009. Nevertheless, these programmes count with only three percent of the total amount of resources to be invested in housing while the remaining ninety-seven percent is spent in subsidies to the private sector. Moreover, they present a number of problems such as complex and unclear bureaucratic requirements which are not well adjusted to the needs and possibilities of the cooperatives; the separation of the entity that is to receive the resources (i.e. the cooperatives and associations) from the beneficiaries; and the non existence in Brazil of a legislation that recognises collective property.

Furthermore, the state funding of housing cooperatives face other problems regarding the influence of state interests over social movements and the limits of self-management within the cooperatives. In the first part of the paper, we will examine two experiences of housing cooperatives and associations in the city of Rio de Janeiro that are linked to popular housing movements in order to discuss the difficulties of implementing state funded policies of cooperative housing. First, we will describe the experience of the Cooperative Shangri-lá that became a model for other experiences and took place at
a time when no public financial resources were available. Second, we will discuss the experience of the Esperança Group that was the first initiative in Rio de Janeiro to make use of public funds through the Solidarity Credit Program (PCS) and, later, through the Program My House My Life-Entities (MCMV-E). In the second part of the paper, we wish to discuss problems that arise from the inside of the movements regarding the relationship between the Coordination (board of directors) of social movements and the state, as well as the relationship between the coordinators and the other members of the movements. In order to do so we will base our analysis on a third experience of housing cooperative called Quilombo da Gamboa that gathered residents from different parts of the city, including a self-managed occupation known as Quilombo das Guerreiras that has recently been evicted. The tensions that arouse between the former self-managed group and the coordinators of the cooperative, we believe, may illuminate some of the limits of the alleged self-management of cooperatives financed by the state and with strong ties to political parties. Nevertheless, we conclude the paper with a brief assessment of some the advantages of such experiences for the construction of a solution for the housing deficit in the country and the struggle for the right to the city.

The work here presented was produced by over five years of participative observation (including attendance at meetings and demonstrations) and eight years of engagement as activists of the squatting movement of Rio de Janeiro. In addition, we conducted interviews with members of the cooperatives and the coordinators of the movements, and researched documentary and bibliographical data.

THE HOUSING COOPERATIVES AND THE STATE

The Cooperative of Shangri-lá

The “Housing and Mixed Cooperative of Shangri-lá”, was the first experience of housing cooperatives in Rio de Janeiro. Composed of 29 families the community is located in the West Zone of Rio de Janeiro. The original group was formed by sixteen families, who rented precarious wooden shacks in a lot of the slum “Garden of Shangri-la”. In the early 1990s, residents began to organise meetings in order to develop joint strategies to generate employment and income and improve living conditions.

The Shangri-lá residents were invited, along with the NGO Centre for Defence of Human Rights Bento Rubião (formed by architects, social workers and lawyers) to visit the Uruguayan experience of housing cooperatives and, in 1995, the Cooperative of Shangri-lá was created and soon joined the National Union for Popular Housing (UNMP), founding the Union for Popular Housing of Rio de Janeiro (UMP-RJ). The cooperative obtained a donation of seventy thousand dollars from the German international cooperation agency MISEREOR, linked to the Bishops of the Catholic Church, and created a Rotating Fund to be managed by the Foundation Bento Rubião together with a council of representatives of other three communities, including the residents of Shangri-lá.

However, unlike Uruguay, the Brazilian Constitution does not provide for collective property or communal forms of land management. Therefore, the big challenge was to find ways to approach the Uruguayan model without counting with a legal model that contemplates collective ownership of land. The alternative was to form a cooperative that "has as an initial activity the construction of houses for the use of its members" and divide the social capital into quota shares. The shares have a double role in Shangri-lá, while they represent the division of the social capital of the cooperative, it also serves as a counterpart (measured in working hours and monthly instalments) that the members have to pay in order to maintain membership. The resident of a housing unit in Shangri-la is not a property owner, but the owner of a quota share of the cooperative. The housing unit is, thus, linked to the management of all members of the cooperative. The quota shares are also non-tradable to non-
members, and it is necessary to join the cooperative in order to have access to housing. In other words, one has to be accepted by the community (by the coordinators and the general assembly) before acquiring the right to live in one of the housing units.

Nevertheless, the alternative found also presents problems. Cooperatives in Brazil are governed by the general law of cooperatives No. 5764 of 1971 which regulates all cooperative activities. This law was created during the military dictatorship and establishes the "political neutrality" of cooperatives as a condition for its operation. Moreover, cooperatives must pay an annual fee to the OCB (Organization of Brazilian Cooperatives). Even in the case of Shangri-la, where there are no activities of generation of income, there are still annual fees that must be paid for the maintenance of that legal entity and, because of that, the community decided to keep their National Register of Legal Entities (CNPJ) inactive. The capital of a cooperative with inactive CNPJ is not affected or dissolved; it only forbids the cooperative to perform trading operations or any type of transfer of assets to non-members, which is not a problem for Shangri-la. On the other hand, if there was the need for a court order to enforce the statute to prevent the marketing of a housing unit, the cooperative would find little difficulty to do so. Even with an inactive CNPJ, members do not lose rights over the assets.

The Cooperative Shangri-la became a model for other housing cooperatives in the country at a time when there was no state support for such initiatives. However, this lack of public support brought some advantages that, as we shall see, will not be replicated in the experiences that rely on public resources. First, the solution to implement a cooperative land ownership (though far from ideal) allowed residents to break with the logic of individual property; secondly, given that the resources for the construction of houses were obtained through donation, residents were able to organise the initiative without the intervention of state requirements as in the case of cooperatives that rely on public funds, such as the analysis of the capacity of indebtedness or the cadastral analysis. Third, since the resources did not originate from bank loans, members of the cooperative were able to pay part of the debt with working hours. Therefore, although the experience of Shangri-la was not supported by state housing policies, it was still able to build a relatively horizontal and successful process that continues until today.

**The Esperança Group**

The case of the Esperança Group, however, was different. Formed in 2000 (and also linked to UMP-RJ) with the intention of following the footsteps of Shangri-la, the group was the first housing cooperative in Rio de Janeiro to use resources from a state program - the Solidarity Credit Program (PCS), created by the newly elected government of the Workers Party (PT). The PCS was the first federal program in the country to contemplate housing cooperatives, but it encountered a number of practical and institutional problems. The experience of the Esperança Group is, in fact, a metonymy of what the PCS was in Rio de Janeiro. Of the 40 projects approved in 2004 (first year of PCS), none of them were implemented by 2009 (year the program was extinguished in practice).

Unlike the experience of Shangri-la, the Esperança Group had to go through long and arduous bureaucratic procedures to have their application approved by Caixa Econômica Federal – Federal Savings Bank (state bank responsible for the administration of housing resources). First, the group could not enrol in the program as a cooperative because the bank refused to sign a contract with a collective entity, since the program provided for the individualisation of contracts. Second, to receive credit, the group members had to go through a cadastral analysis (which should ensure that none of the candidates were indebted to other institutions) and a debt capacity analysis (that certifies the ability of the candidate to pay for the loan). In addition, the value of the loan was linked to the borrower’s ability to pay. Considering that the families had very low income, the value provided by
the bank was not enough to buy the land and build the houses. Thus, the social movement opted to negotiate a public land for their settlement, unlike what happened with other experiences where there was access to land through collective purchase.

After going through all these technical disputes required by the Federal Savings Bank to sign the admission agreement in the PCS, the group finally signed with the bank on December 2007. However, during the final adjustments, the city claimed the land as a recreation area and required the group to change their place of construction. The group imposed a few conditions, accepted by the municipal government, but did not show the expected combativeness, since the exchange of land would greatly delay the beginning of the construction. In 2009, the PCS was replaced by the new federal program called Minha Casa Minha Vida (which had an offshoot for housing cooperatives - the MCMV-Entities) and the Esperança Group had to migrate to MCMV-E in December 2009, signing the loan on February 20, 2011. After almost twelve years, in March 2012, the Esperança Group finally received funds from the program MCMV-E to begin construction of houses for seventy families. Despite the impossibility of establishing cooperative ownership as in Shangri-lá, the group was able to notarise a statute that provides for collective property. Even though it cannot be legally enforced, they claim that the collective agreement will be kept after the completion of the homes.

Both programs follow the same scheme represented by figure 1. However, MCMV-E presents some advantages when compared to PCS. First, it allows the creation of a notarised “residents’ association”, responsible for managing the resources of the program in its construction phase. Second, the program does not require any credit evaluation, because not only does it secure subsidies of up to 90% of the final value of the property, as it also establishes fixed fees in the amount of 10% of the family’s income. In that sense, the monthly payments are established by the capacity of the family to pay the loan and not by the total amount of the loan. However, there are still several obstacles that have to be overcome by the cooperatives. For starters, the analysis criteria presented in the internal manuals of the Federal Savings Bank (called "Black Boxes" by social movements) must be disclosed in order to avoid prolonging the process of approval. Moreover, it is necessary to overcome the predominant concept of private housing production, in which the entity is viewed as a third party unidentified with the beneficiaries, since in the case of self-managed housing cooperatives, the beneficiaries are also agents.

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**Figure 1. Housing Cooperatives Policy Circuit (PCS and MCMV-E)**
Finally, for the model of housing cooperatives to succeed it is essential the establishment of a legal framework that allows collective ownership. The model of the associations, although important in practical terms (since it allows the collective management of resources in the construction phase) does not have any legal relevance after private property titles are granted. In sum, the guidelines of MCMV-E weakens the legitimacy of collective decisions because once the members receive property titles they are no longer obliged to follow any of the rules decided in the general assemblies. In this sense, the marketing of housing units, the lack of attendance in meetings and other punishable offenses cannot be enforced by the collective.

Even though some progress has been achieved towards the alleviation of bureaucracy, there is still a lot of work to be done in order to make cooperative housing a viable option in the struggle against the housing deficit in Brazil. Nevertheless, the format of programs such as MCMV-E also creates difficulties within the realm of social movements that put in check the independence and autonomy of housing cooperatives, as we shall see in the next section of this paper.

THE PROJECT QUILOMBO DA GAMBOA AND THE LIMITS OF SELF-MANAGENT

The Project Quilombo Gamboa began in 2009 and was organised by the UMP-RJ in partnership with the Centre for Grassroots Movements (CMP), with technical assistance from Foundation Bento Rubião in the context of MCMV-E. Although six years have passed since the project was finalised by the team of architects, construction has not yet began. Many bureaucratic embargoes (not to mention political) hamper the start of the construction of the housing complex. This experience, however, is important for the purposes of this paper because of what it reveals in terms of the problems related to the internal organization of self-managed cooperatives.

The project involves the resettlement of 116 families from four different communities in Rio de Janeiro. One of them is the Occupation Quilombo das Guerreiras, a group formed by squatters that organised themselves through self-management but were soon to be evicted due to a massive project of urban renewal called “Porto Maravilha”. Unlike other groups of residents, the group emerged from the direct action of a housing movement that for seven years managed to maintain a highly organised and horizontal political organisation. However, since they could not independently access public resources through MCMV-E, they decided to join a national movement (CMP) in order integrate the housing program in question. Nonetheless, the organizational model adopted by CMP and UMP-RJ, although participative and fairly decentralised, maintain a Coordination (formed mostly by non-residents) that mediates the negotiation with the state and decides on the topics to be discussed during the assemblies. Even though most of the work is organised by committees (finance, work and mobilization), the model of a hierarchical organization differs from the model adopted by Quilombo das Guerreiras, causing conflicts between the group and the coordinators of the project.

The former residents of Quilombo das Guerreiras often criticise the political and electoral appropriation of the project by entities that are able to have access to the program. The main point is that only the so called “national social movements” have access to the resources of the program and the criteria used to characterise such movements is not clear. Organisations such as UNMP (National Union for Popular Housing), CMP (Centre for Grassroots Movements) and MNLM (National Movement for Housing Struggle), all of which have ties to political parties (even though maintaining critical towards the government), concentrate most of the resources destined to MCMV-E. The criticism concerns the use of the project as political capital. Members of the Collective Quilombo das Guerreiras recognise that these entities focus their organizational strengths to achieve a solution to the housing deficit, but they question the extent to which such political affiliations favour these organisations in the competition with other movements for resources from the program.
Another criticism regards the reluctance of these movements to take firm actions against the state, as seen in the case of Esperança Group when a sudden and authoritarian decision of the municipal government (run by a political party that is the main national ally of the Worker’s Party) simply ignored all previous agreements with the movement, took away the land that was intended for the project and faced almost no resistance from UMP-RJ. According to the former residents of Quilombo das Guerreiras, information about negotiations with state bodies is restricted to a Coordination that previously selects what will be passed on to the whole group. Such practices serve both to mobilize residents for acts of protest, but also to contain the level of dissatisfaction towards the state. We witnessed several times the dissatisfaction of the residents during the assemblies and the effort of the coordinators to justify the actions of the government and blame the setbacks on the “lack of mobilization” of future residents.

Moreover, the lack of funds available for the program creates competition between different organizations of social movements dedicated to the housing struggle rather than a strategic cooperation to demand for more resources. In this sense, these movements become "organizing entities" of public policy, and their political agendas end up being guided by its institutional relationship to the state and its political interests, renouncing the more combative strategies of pressure and direct action.

CONCLUSION

Even with all the criticism wisely pointed out by members of the Collective Quilombo das Guerreiras, the recent policy to encourage housing production through cooperatives is still an important step towards solving the housing deficit. However, the clear choice of the state for private production of housing (even for the lowest salary range) is justified by the government with the argument that popular movements have little capacity to respond to a large-scale demand, and suffer from technical difficulties and delays in the execution of their works. Thus, the state ignores that there are ways to reverse the bureaucratic obstacles that hinder the cooperative production and strengthen the popular associations.

Fix and Arantes (2009), in their research on housing cooperatives of São Paulo, state that the production of private developers for the lowest income range produces habitations for approximately forty-eight thousand dollars per unit, a value that is up to two to three times the cost of self-managed efforts of popular movements, as they benefit from the free labour of future residents (representing the order of 10 to 20% reduction in cost), as well as from a profitless production and the participation of technical advisory services, small contractors and labour unions. In addition, since the projects carried out by popular movements are not led by a commercial perspective, they manage to obtain larger housing units, different typologies, new architectural and constructive characteristics, collective spaces and communal facilities.

The struggle against the housing deficit cannot be reduced simply to the production of new homes but must also question the conditions under which they are produced. The option of private production for lower income families not only depend on high state subsidies but also results in homes of lower quality, higher cost and located in the periphery of the cities where health, educational and cultural infrastructure is lacking. Therefore, cooperative housing represents not only a viable alternative in the struggle against the housing deficit, but also an alternative that offers a possibility to produce homes of higher quality, lower cost and at the same time help mobilising large sectors of the Brazilian society towards the struggle for the right to the city.
NOTES

2 The Program My House My Life-Entities is part of the larger program My House My Life directed specifically to self-managed cooperative housing initiatives.
3 The board of directors (called “Coordenação” – “Coordination”) is composed of leaders from the following movements: the União por Moradia Popular – Union for Popular Housing (UMP) and the Central de Movimentos Populares – Central for Grassroots Movements (CPM).

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INTRODUCTION

Environmental Kuznet curve (also known as EKC, shown in Fig.1) illustrates the dynamic relationship between pollution and economic development. Afterwards, the connotation of EKC was expanded to represent the correlation between energy consumption and income level of inhabitants. But according to actual worldwide research on this topic, such as Azlina in Malaysia[1], Cayla in France[2], Druckman in the UK[3], Ekholm in India[4], Rosas in Mexico[5], Zheng Xinye in China[6] and so on, EKC was not always well validated. This research aims to demonstrate how energy consumption behavior is influenced by different household’s income and whether the EKC is validated by convincing data or not.

The concept of energy consumption behavior was first proposed by western socialists. The basic theoretical framework of research on human behavior in residential buildings had been developed in 1992 by Lutzenhiser L[11] and Hitchcock G[22]. Since then many researchers and institutions have been carrying out detailed research in this particular area. For example, AIJ (Architecture Institution of Japan) investigated 80 families comprehensively, using questionnaires and field tests in Japan 2002-2006. As a result, large amount of reliable data was accumulated[13]. In terms of China, in 2012 Li Zhe from Tsinghua University systematically studied how behavior influenced energy consumption in the
regions with warm summer and cold winter in his master’s thesis *Investigation and analysis of the relationship between residential energy use behavior and energy consumption in China*. The data obtained from the field investigation and computer simulation which he had carried out in this thesis concluded that the energy consumption have a strong correlation to the household income level in certain regions[^4]. More specifically, Huo Yan, in his essay *Low Carbon Lifestyle and Its Determinants: An Empirical Analysis Based on Survey of Household Energy Consumption and Community Environment in Beijing*, had carried out deep study, exploring different factors which could influence the household’s energy consumption. And the household income level can be seen as one of the factors which has an important effect on daily energy consumption, shown in Fig.2.[^5]

![Figure 2. Correlation between carbon emission and income level (Source: Li Zhe's master's thesis)](image)

Recently, with the rapid development of urbanization process and increase of income level of inhabitants, new characteristics and challenges arise. Also, the previous research focused more on quantized index like energy consumption, indoor thermal environment, carbon emission and so on. Income level is mentioned, if mentioned, as one of the contributing factors. But there is little research on the actual behavior with strong flexibilcy, which influences energy consumption directly and is influenced by income level remarkably.

According to the problems stated above, we conduct this investigation in order to elucidate the correlation between energy consumption behavior and income level of urban inhabitants in Beijing. The results and conclusions of this research provide significant database and theoretical foundation to ecological design strategy of residential buildings and promotion of energy saving projects.

**OUTLINE OF INVESTIGATION AND BASIC INFORMATION**

**Outline of the Field Investigation and Analysis**

Field investigation is conducted as main method in this study. Carefully designed questionnaires which contained more than 60 questions were used to collect essential data regarding people daily routine and living habits which are closely correlated to energy consumption. The questionnaires divided into six categories, focusing at different aspects such as heating in winter, cooling in summer, washing and shower, transportation behavior, energy saving renovation and energy consumption. 119 sample families were selected to participate in this research. The results obtained from the questionnaires had been analyzed and filtered, the number of effective questionnaires was narrowed down to 84.

On each aspect of the six topics mentioned above, quantized energy consumption behavior was conducted corresponding with income level. At last, energy consumption including electricity, gas and water have been analyzed as supporting evidence to review the characteristics of correlation
between energy consumption behavior and income level.

**Basic Information of Samples**

119 families have been selected and contacted within the urban area in Beijing furthermore to ensure data obtained from the questionnaires are reliable and less biased, the survey have been carried out across different residential districts within Beijing. And through analyzing these questionnaires, the results show that 84 families out of 119 are effective and taken into consideration in further analysis and study. Fig.3-6 shows some basic information of the 84 selected samples of families including occupation, income level, family sizes and education level.

![Figure 3. Occupation proportion](image1)

**Figure 3. Occupation proportion**

![Figure 4. Income level proportion](image2)

**Figure 4. Income level proportion**

(Source: drawn by author)

![Figure 5. Family size proportion](image3)

**Figure 5. Family size proportion**

(Source: drawn by author)

![Figure 6. Education level](image4)

**Figure 6. Education level**

(Source: drawn by author)

In terms of occupation (see Fig.3), 53% selected samples work in education industry and others are researchers, managers, civil servants and so on. Income level of samples (see Fig.4) is following the normal distribution that groups with income at middle class make up a high proportion of 56%. According to the results (see Fig.5), proportion of families with one to four members is relatively in a balance and each takes up 14% to 20%. Families with five or more members are rare. And the other 26% families skip the question for privacy reasons. Education level of householders and their spouses...
(see Fig.6) is also following normal distribution. Numbers of householders with undergraduate degrees is 42, taking up more than 50%. Among the undergraduate householders, those whose spouses also accepted undergraduate education take the largest proportion.

**ANALYSIS AND RESULTS**

Among all 69 questions in the questionnaires, 20 questions which directly influence the daily energy consumption are classified into seven main categories and analyzed. Results are as follows.

1.1 Heating in Winter

Central heating system is utilized as main heating source in winter time by 72.6% (61 out of 84) selected families. As shown in Fig.7, in the group of “less than 50k” only, more families use individual heating system. Also, the heating expenditure of this group is slightly higher than the group with yearly income of 50k-200k, except for which, the higher the income of families is, the more money they spend on heating (Fig.8). On the contrary, Fig.9 indicates that there is a negative correlation between additional heating days and income level. Families with yearly income less than 50k need additional heating for 134 days, which is 4.74 times the families 500k to 2000k. The reason is that dwellings of families with higher income always perform better in thermal insulation and heating system and are able to keep the indoor thermal environment comfortable without additional heating.
Cooling in Summer

Fig.10 and 11 show the habits of using air-conditioner and specific operating hours per week. Based on the four presupposed using pattern - 24 hours on, on in daytime and off at night, off after cool enough and others, the answers given by the samples does not reveal any assured relation between how they like to use air-conditioner and their income level. Case is the same on operating hours. This phenomenon indicates that the using of air-conditioner is not directly influenced by the income level, but probably their concept of health and other elements.

Washing and shower

Fig.12 and 13 shows the frequency of washing clothes and time spent on taking showers per week, which are the main consumption of water in daily life. Frequency of washing clothes has limited relevance with the families’ income level according to Fig.12. Families with the income of “less than 50k” and “200k to 500k” wash clothes at a higher frequency of about 3.5 times per week than “50k to 200k” and ”500k to 2000k” at about 3 times per week. Clear correlation between minutes of taking showers is shown by the diagrams.
showers and income level, however, can be illustrated in Fig.13. Along with the income getting higher, the time of taking showers presents a “U”-like curve. The group of “less than 50k” spends 160 minutes on shower on average per week, 21.21 minutes more than the “50k-200k” group. The “500k-2000k” group spends the longest time of 337 minutes per week among all the groups. The time of “200k-500k” group falls between the “50k-200k” group and “500k-2000k” group. It can be concluded that families with higher income spend more time and energy on self-cleaning.

**Transportation Behavior**

Fig.14 shows the relationship between average percentage of frequency of cooking at home or having dinner outside and income level, which follows a “U”-like trend. Groups of “50-200k” eat outside at a highest frequency of more than 12 times per week. The percentage of cooking at home of “200k-500k” group and “500k-2000k” group are both over 80%. Car emission, although it’s not taken account in energy consumption at home, composes a large part of the total energy consumption and...
carbon emission of a family. Fig.15 shows how total car emission changes with different income level. The “U”-like curve is once again presented clearly. Except for “less than 50k” group’s exceeding “50k-200k” group, car emission goes up with the income level increasing. For the high income group of “500k-2000k”, the total car emission is roughly 50% more than other groups, which means an obvious higher gas consumption and carbon emission.

**Energy saving renovation**

In terms of energy saving renovation, including building envelop, pipelines, windows and doors, and balcony, the results are shown in Fig.16-19. Only a few families renovated the building envelop, pipeline, windows and doors to promote the thermal performance of their dwellings and the correlation between renovation and income level turns out to be inconspicuous. On the contrary, 59.52% families choose to renovate their balcony and the higher their income is, the more percentage of families conduct the renovation (group with the yearly income between 500k and 2000k could be ignored because of the little number of samples).
Energy consumption

![Energy consumption graph](image)

**Figure 20. electricity consumption (Source: drown by author)**

![Water consumption graph](image)

**Figure 21. water consumption (Source: drown by author)**

![Gas consumption graph](image)

**Figure 22. gas consumption (Source: drown by author)**

Fig. 20-22 shows the energy consumption of the selected samples of families. It should be declared that all the consumption results are based on the questionnaire filled out by the inhabitants but not measured data. Strict positive correlation between electricity consumption and income level is shown in Fig.20. Families with higher income level consume more electricity than lower income families.
And the difference between the highest electricity consumption and the lowest one is about 1000 KW·h. On the aspect of water consumption, there shows another “U”-like trend that “50-200k” group consumes the least water among all groups. In terms of gas consumption, no dramatic correlation is shown with the income level. The group of “less than 50k” leads all the groups with 1172m³ gas consumption in a year. In all, daily consumption of electricity and water is closely related to income level, but gas doesn’t follow the pattern.

CONCLUSIONS
After analyzing the results of the 84 effective responded questionnaires, we come to the conclusions as follows.

(1) According to the results of this research, we can conclude that income level of urban residents have direct influences on some aspects of the energy consumption behavior, even though not all of them show clear correlation. Behaviors including heating cost and using of additional heating in winter, habits of window opening, renovation of balcony, time needed on shower, frequency of cooking at home and total car emission, are all directly correlated with income level. Some other behaviors, however, show little relevance with income level like using of air-conditioner and frequency of washing clothes.

(2) Energy consumption behaviors which are influenced by income level are mostly following an “anti-Kuznets curve” pattern, meaning a “U”-like curve. Urban residents with income at middle class perform the best on saving energy through daily behavior. Considering that the group of middle income occupies more than half the whole society, researches with more specific investigation should be undertaken to reveal the interior rules of energy consumption. On the contrary, groups with both low and high income hold the greatest potential of energy saving in daily life. Once fundamental living condition like quality of their apartments and basic human needs on comfort are taken into consideration, the more energy consumption behavior of low income groups makes sense. So improving the dwelling condition of low income inhabitants can help to energy saving.

(3) In terms of actual energy consumption, electricity and water consumption is correlated to income level while gas is not. Specifically, electricity consumption is positively correlated with income level and correlation between water consumption and income level follows the “U”-like curve.

(4) As is shown in the study, higher income level does not directly lead to more energy consumption. On the contrary, people with higher income level always have better background of education and are more aware of the importance of energy saving. So more policies on energy saving should be proposed and have wider effect on citizens.

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NOTES


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LONG AFTER THE RING, MASS HOUSING MAY NOT BE APOCALYPTICAL

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INTRODUCTION
Charles Jencks proclaimed the “Death of Modern Architecture”, metaphorically through the demolition of the Pruitt-Igoe housing estate (1972), more than 40 years ago, - precisely at a time when the private sector started to take over the welfare state almost everywhere. The contradiction between claiming an “architecture for the people” while an economic-driven market was being promulgated, obliterating the moral ambitions of architecture, is outlined in the case study of the present paper, the urban plan of Portela de Sacavém (1960-79), designed by architect Fernando Silva (1914-83).

The project is a mass-produced housing complex – one of the principles of Modern Architecture – developed by the private sector¹, in the outskirts of Lisbon, for the upper middle class.² Built over the 60’s and 70’s, the project is paradigmatic of a self-representing image that arrived in the capital from the ex-colonies and was “broadcasted” for and by the emergent middle class at the time – paradoxically linked with the provision of cheap houses for the working classes.

The idea of a modern lifestyle was welcome. It included the car, the garage, the lift, the motorway, and even the stereotyped anonymous character of architecture - as opposed to the ‘ideal’ of detached suburban houses with private gardens. But, despite the modern character of the urban plan, the dwellings enclose a bourgeois Victorian vision of how private life should be lived. Given its wide acceptance and the satisfaction of its inhabitants – many of them still living there – it became the model of the housing approach in the years to come. Thus, this paper will argue that “housing for the biggest number” in the periphery of cities is not necessarily synonymous of ‘miserabilism’, as is the case with countless examples elsewhere.

The reasons for this attractiveness might be manifold and deserve a rigorous scrutiny. It also opens up a wider question about how the socialist ideals behind modernism could be so easily absorbed by liberalism and the private sector.

HOMES FOR THE BIGGEST NUMBER
Many studies have been developed around the issue of mass housing projects during the 20th century, with a special focus on social housing. The middle class has indeed been ignored within this debate, with the general assumption that this model was only intended for housing or relocating lower classes. And, generally speaking, collective housing and detached houses have been, as a laboratory of experimentation and discussion, very different, not only because of their scale and programme, but also because of the themes that congregate around them, more sociological, political and strategically in the first case, and more disciplinary centred in the second.
The “biggest number”, the masses, have always been related to public policies and social housing programmes, not only in Portugal but elsewhere. While the reality in many European countries was shaped by the ruins of World War II, and the need of mass production, from where modernism found its privileged way of emerging as a discourse, this was not the case in Portugal. On the one hand the fact that the country did not suffer spatial consequences of World War I, and did not participate in World War II resulted in a totally different reality in what concerns the urge to rehouse entire populations. On the other hand, the country was under a dictatorship that ruled for over than 40 years (1933), using housing as a way of promoting the regime.

In fact, in the capital, many neighbourhoods were built in peripheral areas of the city, somehow recreating the atmosphere of villages, most of them with semi-detached housing with private courtyards, cultivating the rural image with which most of the families were familiar, at the same time developing the idea of a “Portuguese house”: Encarnação (1940), Caramão da Ajuda (1938), Alto da Serafina (1940), Alvito (1937), Madre Deus (1942). This was, in a country economically behind its European peers, the Portuguese version of “The American Dream”.

In the mid 40’s, given the interventionist climate of the government at the time, an urban plan was developed for a neighbourhood, Alvalade, that would become paradigmatic of the Portuguese urbanism. The long period that its construction took accommodated many transformations to the original design of Faria da Costa (1906-1971). Designed for 45.000 people and organized according to 8 urban cells, in line with Clarence Perry’s Neighbourhood Unit, the housing schemes were more urban, organized in three storey blocks around big communal courtyards. Those hide the still non-urban character of so many people to whom owning a piece of land was very important, as well as keeping coops poultry, vegetable gardens and small orchards, etc. The hierarchy of the street system was coincident with those of the apartments. They were divided in three series and each one, in turn, into three typologies. If the interior arrangement recalls some of the theories of the existenz minimum, reducing circulation areas to the minimum, providing separate bedrooms for parents and children, and for boys and girls, and turning the living room into the main distribution space. In series II there was already the inclusion of a study room and in series III, besides that also an ensuite bedroom, closer to the kitchen, for the servant. More often than not there were no servants and these rooms were sublet for an extra income. Nevertheless, they suggested to the low middle classes the possibility of a better life. But the idealized collective housing described by Yorke in “The Modern House”, “grouped in large blocks and with a moral and ethical dimension that characterized the ideology of the International Style, could only be opened up for discussion with the First National Congress of Architecture in 1948³, where Portuguese architects claimed the urban planning of cities and the application of the Athens Chart. The Congress addressed both “The Portuguese Problem of Housing” and “Architecture at a National Level”. In the same year, the first Master Plan was produced and approved. Another event of extreme importance was the Enquiry to Popular Architecture (1955-60) with the goal to prove the inexistence of a Portuguese style, – so much defended by the Regime – and wake the ethical and moral dimension of architecture. Those paved the way for the first modernist expressions in Portugal.

**LATE MODERNISM OR DRESSED TO LOOK MODERN**

From the transition of the 1950’s onwards, the architects started to criticise more openly the current architecture and Alvalade, in Lisbon, was the perfect laboratory for many experiences, so much so that the neighbourhood itself became a kind of catalogue of housing experiences right in the dictatorial regime.
On the one hand, those were not replicas of previous models explored worldwide but rather informed and critical, on the other hand they were hybrids of modern urban images dressing almost Victorian interiors, such as the nationally famous complex “Vá-Vá” (1952-57). Recalling Le Corbusier’s Unité, even with the intermediate “street” (that in this case remain in the facade design but was never built), and despite the “modern outfit”, it accommodates flats with separate circulations and entrances for servants with their own bedrooms next to the kitchen, laundry and pantry, living room, dining room, study room, tea room, etc.

In 1960, Fernando Silva and Ruy D’Athouguia were commissioned for the intersection between two of the main streets of the plan – Avenida da Igreja and Avenida de Roma. They adopted a strong critical position towards the existing housing schemes assuming monumentality that from an urban point of view emphasized the importance of that node: four massive housing blocks, two with a “Y” shape and the other two with an “L” shape, each with 18 and 10 storeys respectively. The “Y” buildings, despite their shape, remind Ludwig Hilbersmeir’s drawings for a “Skyscrapers’ City” and Le Corbusier’s Unité d’Habitation. The buildings were designed on pilotis but over a common squared basement/plinth, clearly separating the circulation between pedestrians and traffic, and at the same time modelling the square according to the traditional traffic road system. It was as if the architects had taken the best out of three worlds.

In addition, despite the monotonous facades, with no hierarchies or variations, emphasized by the disposition of the openings, their almost abstract character accommodated luxurious flats that not only followed the 18th century Victorian floor plans but also benefited of all 20th century facilities: the modern kitchen, the lift, the garage, the storage room. It was an upgrade of the existing housing schemes of the neighbourhood, both in terms of areas and technology but what is more, in the understanding of a contemporary urban inhabitant. One was the caricature of the other. Whether this was possible thanks to private enterprises might be true, but that does not change the fact that the project reveals Fernando Silva’s wide reflection on urbanism, and a critical position turned into a proposition. Only one year after (1961) Jane Jacobs would publish “The Death and Life of Great American Cities”, and it is curious to note how Fernando Silva and Ruy D’Athouguia combined both the ideal of modern housing with the recovery of some of the traditional urbanism principles, where buildings design streets and the other way around. Some controversial subjects such as separating or not different activities, what is a proper mix and so forth were also addressed. The two housing complexes incorporated commerce and services in the lower floors, while the other two buildings, primarily were devoted to offices with a shopping centre on the ground floor, something that was rare at the time. And although it was a requirement of Faria da Costa’s plan to enhance the street intersection, the design of the complex not only achieved it, but marked definitely the centre of the neighbourhood. During the previous and the following years other examples could be pointed out, but none combining the traditional urbanism with modern architecture.

**FREEDOM NEIGHBOURHOODS**

From the mid 1950’s, with the founding of the MPLA (“Popular Movement for the Liberation of Angola”), instability began to be felt on the Portuguese territory. By Portuguese territory we mean mainland as well as the colonies, territories that since the abolition of the Colonial Act in 1951 – which was an adaptation of the UN Charter – were then called overseas provinces, namely officially members of Portugal. In the early 1960s with the creation of FRAIN (“African Revolutionary Front for the Independence of Angola”), supported by the anticolonial positions of the ONU General Assembly, the political climate culminated in the beginning of the colonial war in 1961. Like all revolutions, this was a slow process and for which contributed in a decisive way the “25th of April” or
“Carnation Revolution” as it was also called the political event that put an end to the dictatorship government in 1974. Moreover, it paved the way to the subsequent decolonization that occurred between "April 25th" and "November 11th" of the next year (1975), when it was proclaimed the independence, the cessation of Portuguese sovereignty and the immediate liberation of the colonies. It is important to note that the decolonization of British and French Empires had happened much before, between 1946 and 1960, partially due to urban strategies that are not within the scope of this paper.

The political climate proper of a dictatorial government, the civil war in the so-called overseas provinces; the subsequent decolonization; the poor conditions in which people lived; the return of many families from the ex-colonies to a country that for most of the second generation was unknown, had a strong impact in the territory from the point of view of housing and urbanism.

During the 70’s the number of slums in the city fringe of Lisbon increased significantly given the continuous flow of people from the interior of the country to its capital that started in the previous decades, in search for a better quality of life. Consummated the decolonization in Angola and the consequent return of the descendants of original white settlers from the former colonies to the capital (amounting about 305 000, approximately half of whom settled in the region of Lisbon), together with the gradual process of rural depopulation, and to a lesser extent the return of emigrants from Europe, had an extreme impact on the overall urban shape of Lisbon during the last five decades. Indeed, more than a decade after the start of the first Master Plan of the Lisbon Region (1961) the housing situation in 1974 was described as extremely serious: aged and poor housing, poor public sector involvement in housing promotion, having been calculated the need of 600 000 dwellings. Where have these populations, in particular the more educated ones, with higher financial capacity, established? The middle class had other aspirations as there was an increase in the average salaries. Gradually the family structure changed, reducing themselves to the nuclear family, the use of the car became generalized, with new consuming patterns. Many of them tended to fix around the second ring of the city for geographical reasons. The location of the river Tagus on the south of the city privileged its expansion towards the north and, as a natural consequence of urban growth, but also given the lack of housing offer in the city centre with the conditions that these populations sought, and consequent land speculation.

If in the years that followed the revolution, the country witnessed a greater state intervention, particularly with regard to underserved populations, during the 1980s housing policies tended to promote the use of credit systems for purchase of proper homes that have resulted, over time, in increased land speculation. Indeed, these factors significantly contributed to the sprawl of the suburbs and the development of peripheral territories that represented opportunities to experiment with new urban typologies. The sprawl of the suburbs and the redefinition of the metropolitan area were also possible given the development of the existent infrastructures, partially given the structural funds that came from CEE between 1986 and 1991 to expand the economy to the level of the former partner countries, resulting in drastic transformations of the landscape with a long term impact on the transformation of the territory.

Furthermore, given the gap between Portugal and other countries, these post-revolution middle class neighbourhoods express a singular dialectic between modern and the so-called post-modern. We cannot forget that it was precisely when Portugal was able to cut the ties with the past that the first Biennale of Architecture in Venice took place (1981), curated by Paolo Portoghesi, paradoxically entitled “The Presence of the Past”, and the catalogue’s introduction “The End of Prohibitionism”. And so, in a way, this paradoxical situation enabled Portuguese architecture a freedom and distance without falling in any kind of orthodoxy.
LOOKING BLUE DOES NOT MEAN BEING BLUE
One of such examples in the outskirts of Lisbon is the present case study, Portela de Sacavém, which prompted important questions about urbanism, the contemporary city and the city dweller, that are still part of the contemporary architectural and urban agenda as they imply a rethinking of ongoing problems through drawing and the cross over between multiple scales.
Housing can be understood as a major element articulating the individual and society, the neighbourhood and the block. The spatial arrangement as a whole has a social content and therefore stands as an object of reflection.

Neighbourhoods for the “happiest families in Europe”
At the time much had been said and written about housing, modernism and post-modernism, urban sprawl or compact city, the need for public spaces, and so forth, and Fernando Silva was probably aware of the debates outside the national circle. Drawn after the advent (and fall) of modernism, Portela’s urban plan is probably one of the most eclectic within the Portuguese culture, and can be analysed as an exercise that reflects over more than one century of urban theories, combining and reinventing new relations between those, revealing awareness and deep knowledge of the history of urbanism which led him to take the opportunity to design an entire site as an exercise to rethink major urban strategies, being simultaneously heir and a challenge to previous models through the way it combined features that, when looked carefully, are not only anachronistic but also coming from disparate discourses. After Fernando Silva and Ruy D’Athougia commission in Alvalade, the first was again in a position to explore and continue the research started at the time.
Although, as referred previously, the middle class has been almost ignored, in most of the housing and urban studies, the truth is that this social group was responsible for the expansion of the city towards outside its 2nd ring, i.e., to the suburbs. In fact, a significant territory was built by the strength of liberal pressure for economic privatisation, private interests and promises of a new life style to those that benefited from the general rise in salaries; widespread use of the automobile; transformation of the family structure, from an extended group to its reduction into a nuclear family; new cultural experiences and practices of consumption as well as the transformation of the housing market, increasingly aggressive; and the spread of an easier access to bank loans for the acquisition of private dwellings.
Portela was designed 6km away from the city and though now it has clearly defined borders, both visual and physical, that was not the case when it was built in a “space-endlessness” of 5 farms (Ferro, Casquilho, Vitória, Alegria and Carmo), and a seminar. Strategically located between the municipalities of Lisbon and Loures, it had at the time important connections crossing it, such as part of the first motorway connecting to the north; and in the south the first ring of the city connecting Moscavide (a locality nearby with the airport; and at Easte the train line Sacavém-Benfica (a Lisbon’s borough).
Conceived as a satellite city, Portela’s current physical borders are mostly speedways, connecting it with Lisbon and other sites and in that sense, it can be seen as an interpretation of Howard’s Garden-City – replacing the railway and the train with roads and cars, and the houses with blocks of flats. It has a centre as well from where everything else is organized. That centre though, has an ambiguous character. It is not the park that Howard envisioned and, like in medieval cities, it has a church, but it became slightly peripheral, stressing the importance (both in terms of position and scale) of the shopping centre. Together with other facilities such as tennis and football courts, the centre does not stress the importance of intensifying a sense of collectivity but promotes the occasional encounter of those sharing the same interests. What seems to join Mumford and Francisco Silva’s understandings
about the meaning of sharing the same territory is what both saw in the principles of the Neighbourhood Unit, of which he was an advocate, an instrument to enable occasional association as well as to promote “freedom, pleasure, and effectiveness in meeting the needs of family life”, “the only practical answer to the gigantism and inefficiency of the over centralized metropolis” (Mumford, 1968: 70-72) that, if nothing else, would be justified in economic terms. Mumford counters this: “The fact that many of the significant activities of the city are occasional ones, and lie outside the neighbourhood, or that a large part of an adult’s life may be spent far beyond his own domestic precincts, does not lessen the importance of neighbourhood functions. Nor does the coming and going of population of a big city lessen the formative result of good neighbourhood design” (Mumford, 1968: 73).

Portela could be a satellite city in its very beginning; a district, since the sprawl of Lisbon led to a gradual homogenization of the territory changing the logical relationship between centre and periphery; or even a Neighbourhood Unit. However, the project does not reassemble the modern principles of zoning or follow any kind of Functionalist logic of this sort. In fact it does not try to achieve an ideal combination of work, dwelling and leisure in a perfect, if not autonomous, environment, nor a non-segregated social equilibrium. Louis Wirth suggested that the city dweller only became a neighbour if forced, reinforcing the idea that the metropolis does not develop on the basis of proximity relations. However, the theme of the “urban village” remains an important issue in current analysis, theoretical debates and actual proposals. The urban is at the heart of an enlarged and ever-renewed sociability and needs to address and adapt to multiple lifestyles. The urban village, as a concept, is interpreted in a different way, through the strong image of the blocks that tie together the all complex.

The structure of the urban plan constitutes what Kenneth Frampton coined of “megaform as urban landscape”, a “form-giving potential of certain kinds of horizontal urban fabric capable of affecting some kind of topographic transformation in the megapolitan landscape” (Frampton: 1999, 16).

The block: “the reality of the future”

It was around the years from 1920 to 1930, that the design of collective housing became part of a clear international agenda for architects, urbanists and other professionals. Architectural typology was, to a large extent, bound up with the whole idea of the city. From Corbusier’s Ville Radieuse to Hilbersheimer’s Vertical City and from Gropious’ studies for city dwellings to May’s urban design in Frankfurt, the residential schemes of those years were indissolubly linked to radical perspectives for the renovation of the city. The new modern movement represented both a style and social break; and assumed a symbolic role indicating a real and emphatic shift in how life was to be lived.

With a few exceptions, European architects have remained faithful to the modern movement in one form or another ever since its emergence as a dominant force, so much so that “modernism has effectively become the vernacular in Europe” (Doubilet et al., 1999: 8). Although in a variety of ways architects draw upon the whole history of modern architecture and therefore in order to understand their work it is necessary to understand the legacy of modernism that shapes the intellectual and physical context within which they build.

The block owes more to Hilbersmeier than Alvalade project. In fact, the original design provided aerial passages that linked housing, the commercial centre and the transport stops, with a 2m width. Nevertheless, the aerial passages were never built, and the reasons are yet to be found.
The dwelling: “the nobility of the past”

The same applies to Fernando Silva who designed apparently modernist blocks, perpendicular to the streets. Paradoxically, behind their strong socialist aesthetics, the flats have generous areas and, were considered at the time to have high standard materials, and clearly propose a bourgeois lifestyle, implying what we would like to call a new “code of civility”, one century after “The Gentleman’s House”: there are proper parking places, collective rooms specially thought for the owners’ meetings, clothes were not to be hanged outside, there were guest toilets and a separation of the bedrooms by gender and the eventually study-room, rescuing some Victorian principles of privacy at home. But are those same external aesthetics that give a certain recognizable identity to Portela, a certain feeling of belonging to, of being part of that same community of people behind those carefully designed stripes. Fernando Silva provides a notion that a sense of belonging to a space could be achieved through a certain coherence of architectural expression, both through the general plan and through the individual design of buildings. What people can share is unbuilt, it is rather a lifestyle.

The project emphasises the intimacy of each dwelling, and public spaces in the rest of the plan suggest a de-problematization of the urban organisation of certain sociability. Individualisation does not necessarily refer to individualism, but rather to the possibility of producing an identity-related space for all. This desire may even extend to a reconsideration of the boundaries between public space and private space. The question of de-territorialisation does not address simply the social question, by assuming a mono-functional territory it also expresses a will to extend the city to all its inhabitants and stresses the importance of an idea of diversity on a broader scale. In a sense it accounts for the unavoidable importance of the city centre and the impossibility of creating an autonomous district given the contemporary way of living. What happens to local facilities when increasingly both partners in a couple work full time? Who uses those local facilities on a daily basis?. The blocks define the streets very precisely, while the rows give continuity and structure to the overall plan, creating visual relations with the surroundings and introducing a variety into the urban fabric, thereby establishing a different system of hierarchies and relations. While the overall plan resembles early modernist schemes of parallel rows, unlike it (which progressively tended to abandon the traditional relation block-street to favour alternatively blocks placed on site according to sun exposure, rather than following an existent pattern) the blocks follow the system of streets through a kind of platô.

"Absorbing modernity": when upper classes rescue modernism

The strength of Portela project lies in its reflection on urban design as a discipline, rejecting any strategies derived from fixed assumptions, establishing a dialogue with modernity and, at the same time, reinterpreting some of its formal proposals, and challenging some of its propositions and ambitions.

Addressing the unfinished task of imagining post-modern democracy, democracy in an age of mass media, technical instrumentality, commodification, and social heterogeneity, Fernando Silva, far ahead of his own time looked for ways of conceiving how the modern urban life should be lived, responding to the irreducible diversity of identity, adequate to the connectedness of power, the politically uncompromising consumer culture of global capitalism, at the same time “instructing” Portela’s inhabitants of what he might imagine it was a good “code of civility”. After more than 40 years of its completion, and although this debate was brought to stage some decades ago, the ghost of community is still obscuring urban debates and suggesting the return to old models. Likewise Portela keeps its pertinence as it still addresses most of the discussions on housing and urbanism, centre and periphery, on privacy and community. Implicit in his project is the conviction that sociology itself is unable to define the city.
Was it a disbelief in utopia? We believe it was an optimistic way of looking at suburbia through the careful construction of what we could also call a *cadavre exquis*, a montage or collage that reinvented their original purpose:

“First, the base is an address, to be connected with the infrastructural networks, both mass media and physical transport systems. It welcomes the car, the bypass and the free-way culture. The base should be designed as a drive-in, a drive-on, a drive-over. The convenience of the car and the beauty of the car are an elementary inspiration for its design.”

“Second, the need for individuality, intimacy and privacy. In the hectic contemporary life with hundreds of decisions and fragmented landscapes, it should be a safe and defined spot that prioritises enclosure before the view. The base is probably introverted and incorporates nature within instead of exposure to it (...) the entrance is the gate to the hectic life. The architecture is not a complicated composition but expresses simplicity and clarity and tries to catch the daylight without losing privacy.”

(Adriaan Geuze)

**CONCLUSION: THE DEMOCRATIZATION OF IMAGE?**

Modernism was probably never in a pure state in Portugal. However, its image was necessary to show how the country was modern despite the suffocating 40 years of dictatorship. Nevertheless, Portuguese “modernism” was always a post-modernism, a reinvention of its principles, a reconfiguration of its ideas, but a special combination, many times eclectic, of different design reasoning.

Portela could be regarded as a collage where the paradoxical design of modern urban blocks and the traditional urban design were reinvented in a new whole that clearly neglected any idea of *existez minimum*, both in terms of areas and spatial distribution and/or circulation. The idea of a modern lifestyle was welcome. It involved the car, the garage, the lift, the motorway, and even the stereotyped anonymous character of architecture - as opposed to the ‘ideal’ of detached suburban houses with private gardens. The design, so many times ignored by the elite of critics, was able to combine simultaneously qualities that contemporary urbanites look for: the anonymous, the intimacy of the domestic space and the virginian dream. Furthermore, it represents an image of auto-representation of a high middle class and the “returnees” from the ex-colonies and of an idealized life style.

Portela, regarded as a symbol of anonymity, could look exactly as an answer, a refuge from an uncontrollable society, a materialization of an ideal of community, because it denies the ontological difference, the basic asymmetry within and between subjects, through its undifferentiated design, in the most socialist tradition. Nevertheless, and ironically, community has been preconized as an alternative to liberal individualism and to welfare capitalist society, where individuals are able to occupy private and separate spaces as propelled only by their own private desires.

The fact that so many of the arguments that made up modernist urbanism and architecture could be adapted more easily by the private sector and by more liberal urban politics is per se a contradiction of its original idealism. Modernism was fundamentally a vision of society remade through architecture. But what happens, what is left when there is nothing of utopic, epic or heroic? What remains when the moral and social ambitions of architecture vanish? Just architecture itself. Nevertheless, the nation rebuilt and represented itself through architecture that wanted to mirror a certain, and yet not so much, ideology.
EPILOGUE
History can be sometimes very perverse. In 1974 there was a need of 600 000 dwellings\(^9\). A few days after the 25\(^{th}\) of April’s revolution, 1000 inhabitants from Chelas, a very poor area in the outskirts of Lisbon, squatted 23 new and empty housing blocks. Today there are in Portugal 735 000 empty dwellings, almost the reverse situation. Slums are still a reality and the number of homeless people is difficult to precise. If the city centre recovers from its slowly abandonment in the last decades, we might be experiencing a phenomenon of city shrinking and the gradual abandonment (?) of the suburbs. Are we on a borderline of a housing revolution of this kind, but with a much wider scale? Portela does not point out in that direction since it is as lively as it used to be. For that reason it stands as an object of reflection on many of the (still) current debates about the historical centre versus the suburbs, the compact city versus city sprawl, and might inform further urban strategies.

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NOTES

1 In This Case It Was The Influent Constructor And Promotor Manuel Da Mota.
2 The Word Portela Means Precisely “Door”, In This Case A Lisbon “Door” To Sacavém.
3 Exactly Between The First Post-War Meeting Of The CIAM In Bridgewater And The CIAM 7 In Bergamo, That Though Representing The Start Of A Shift From The Focus On The Functional City And The Questioning Of The Designation International Style, Was Unable To Live Behind The Pre-War Promise Of A Mass Architecture.
4 In The 1960’s Only 18% Of The Population Had Sewer System And Almost 8% Of The Capital Lived In Slums.
5 In 1900’s, Lisbon’s Population Amounted 365,000 And By 1960’s It Doubled To 802,000 With A Step Fall To 750,000 In 1970 (França, 1997:116-18). The Majority Came From Places Without Sewers, Piped Water Or Even Electricity.
6 From A Newspaper Add To The Housing Complex “Parque Europa”.
7 From An Add To The Housing Complex “Parque Dos Príncipes”.
8 From An Advertisement Of The Housing Complex “Parque Dos Príncipes”.

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THE HOUSE AS HOME: A CROSS-CULTURAL STUDY IN IRAN AND AUSTRALIA OF HOW ADULTS’ PERCEPTIONS OF THEIR HOUSES ARE AFFECTED BY MEMORIES OF THEIR CHILDHOOD HOMES

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INTRODUCTION

A basic need of people is having some degree of comfort in their houses as they spend a considerable amount of time there. "Home" seems to imply many social and psychological aspects beyond the meaning of house. Pallasmaa¹ suggests that home is not, perhaps, at all a notion of architecture, but of psychology, psychoanalysis and sociology. Psychological comfort could be one of the aspects which differentiate a house from home. Affordable residential developments may offer people simple and small size houses however designers by creating the feeling of home in those houses may provide the inhabitants with some degree of satisfaction. UN Committee in ‘The Right to Adequate Housing’² notes that house must provide more than four walls and a roof and housing is not adequate if it does not respect and take into account the expression of cultural identity.

This paper suggests that just providing physical comfort in a house would not be enough for the inhabitants and that their psychological comfort and cultural backgrounds need to be considered as well. In that regard this paper presents the result of the PhD research³ in identifying the roots of people’s preferences of the house as home.
HOUSE AS HOME

Norberg-Schulz\(^2\), writing about the importance of house as home and its degree of openness and also importance of one’s memories, notes that “home” is a place that “validates one’s identity”, it has security and safety, it is the “mirror of the soul”, an “indivisible field of memory”. As Norberg-Schulz\(^5\) notes that the relationship between outside/inside of the architectural environment is fundamental to the identity of a place. Tschumi\(^6\) asserts that defining space literally means defining boundaries. Cooper\(^7\) refers to the importance of the threshold of house, including the way one may enter a house in some traditions, the importance of the location of the threshold, and its direction in different cultures. An important aspect of a “home” is its boundaries. These boundaries of home may include social and psychological boundaries related for example to privacy and security as well as physical ones.

A child may learn about these boundaries in his/her childhood home. According to Purcell\(^8\), the quality of the house in respect to offering values to a user would, become a basis for a child’s education on the architectural environment of his/her house. These values include the degree of openness of the house. The research focuses on the relative ‘openness’ and ‘closedness’ of the house. Openness and closedness refers to the apparent transparency of division between interior parts of a house and between inside and outside of a house\(^9\).

First contacts with the built environment, especially the house environment, are largely made during childhood where a child starts to recognize and establish his environment as his first world. These first contacts, according to Custera and Aarts\(^10\), may have an extensive impact on one’s attitudes toward built environments at later stages of life. Also what one learns of cultural messages arising from the built environment are acting as signifiers of the common world among people from the same culture, so that this common language facilitates the connection to a particular social surrounding. Each person may have a different definition of the world to some extent based on his/her perception. However Hubbard\(^11\), Costonis\(^12\), Epistler\(^13\) and Rapaport\(^14\) claim that there are cultural groups which share more of the same images.

SELECTED CULTURAL GROUPS FOR THE RESEARCH

Three groups of people having different cultural backgrounds were engaged for collection of data. The groups included 30 people from Iran, 30 people from Australia and 30 people who migrated from Iran to Australia, giving a total of 90. Each group included 15 males and 15 females.
The researcher uses in-depth individual interviews addressing problems of adjusting to changes in the home environments since childhood because of migration, from rural to urban high rise living for Iranians in Iran and for Iranians who had migrated to Australia, and for a comparable group of Australians brought up in similar locations. Keats\textsuperscript{15} emphasizes the effectiveness of a multimedia approach in data collection for research. In this respect the participants are asked to draw their childhood and adulthood houses while describing them verbally.
INTERPRETATION OF THE QUANTITATIVE ANALYSIS

Keats\textsuperscript{16} refers to the importance of considering individual differences in cross-cultural interviews which is considered in the process of interviews and their interpretation. The result of the analysis (parametric correlations “Pearson’s r” and hierarchical multiple regression) shows the importance of connections between childhood experiences of home and adulthood perception of house. Preferences in regard to the degree of openness of a house in adulthood are strongly related to one’s childhood experience of home and its environment (natural, man-impacted and social environments).

One of the main findings of this study is that those adults (N=90), who had a higher degree of contact with the natural environment in their childhood house, perceive their houses in adulthood to have a higher degree of openness and the adulthood houses are perceived to be more favourable. The result indicates the importance of facilitating one’s connection with the natural environment in the home for today’s children who will be the next generation of adults, in order to increase the feeling of satisfaction of their houses in adulthood.

The comparison between the correlation patterns between childhood and adulthood for males and females in the total group (N=90) shows that males and females do not have significant differences about respective aspects of the house and its environment between childhood and adulthood.

QUOTES AND DRAWINGS BY PARTICIPANTS

Reviewing direct quotes from some sample cases and their drawings of their childhood and adulthood houses assists in clarifying the results for the reader. This section is divided into five parts as follows:

SIMILARITIES BETWEEN THE ISSUES IN CHILDHOOD AND ADULTHOOD

The similarities between childhood experience and adulthood preferences which is one of the outcomes of the quantitative analysis are directly recognizable in the participants’ descriptions.

One of the male Iranian participants (IMK) told about his childhood house and also his preferences of a place to live in adulthood through different parts of interview:

(IMK): Look there was a mountain here at the back of our house (Childhood house). We didn’t have any windows toward that but if we would go to the roof or yard we could see the mountain. (Fig. 9)

(IMK): I don’t know where (preference to live in adulthood) exactly but it is better to be closer to the mountain as much as possible.

![Figure 9. Drawing by (IMK) - Site plan of childhood house](image)
There are many parameters involved in the situation in which one lives in childhood or in adulthood. When one talks about the number of people living in a house another parameter like size of the house is involved in the experience as well. An Iranian female (IFS), was not happy with the number of people in relation to the size of the house in childhood. That childhood experience was reflected in her perception of her house in adulthood. In the interview she said:

(IFS): The house I grew up in, my parents are still living there….We were two families including my uncle’s family living there. As we were many, the place was too small for us……I just had a small suitcase under the wardrobe there in which I kept my stuff. (Fig. 10)

After marriage she designed a house and built it with her husband. What was interesting for her was the size of the house. She said:

(IFS): We had a very very large garden….A very large kitchen (adulthood house). The kitchen was quite spacious. We had lots of space. Our parking was very large in which we could park two cars and we could store many things there. (Fig. 11)
A participant from the Australian group (ASG) who was living in a small flat, with his family of four in his childhood, did not have any problem with that size of house as there were plenty of room and places to enjoy outside of the building. He said (while drawing) about the size of his childhood house and his perception of the size of the present house:

(ASG): Here in our little flat (childhood house) on the side,… a little tiny bathroom and this bedroom, a little tiny kitchen dining room, this was our bedroom here. So this was our flat …. It might be 80 square meter. (Fig. 12)

(ASG): I’m convinced that more well designed smaller spaces, … in my experience better than larger spaces that don’t necessarily suit the use of the space.. for example if our lounge room (adulthood house) is too big …. once you put lounge chairs around the space the people might not be able to communicate if the space is too big. (Fig. 13)

**DIFFERENT PERCEPTIONS OF THE DEGREE OF OPENNESS OF THE HOUSE IN ADULTHOOD BASED ON DIFFERENT CHILDHOOD EXPERIENCES**

The childhood experience shows its importance in differences between people’s perceptions of the house. Each case follows his/her own reasoning to describe a situation which is based on his/her own experience of childhood home. Here are some examples of the way that some participants perceived the issue of “level of building in comparison to its surrounding environment or yard”. These examples show that these participants perceived the present situation of home based on their experiences in childhood. Differences among their choices were based on having a pleasant environment in childhood as well.

A male participant from the migrant group (MMJ) perceives the house as if it should be elevated from ground level in the same way as it was in his childhood house. He said:

(MMJ): It was an Iranian traditional style house (childhood house). Here, there were a few steps. Verandah and living area were about one meter higher than the yard. (Fig. 14 & 15)

(MMJ): I prefer elevated space for living (adulthood house). I like the living area to be higher than
outside, in comparison to the yard.

In contrast to this case was that of another participant, Iranian female (IFA). The living area in her childhood house was a few steps lower than the yard, according to her a pleasant experience of house in childhood. She said (while drawing):

(IFA): Here (living area in childhood house) there was a stair going up to the yard, …..It (living room) was a very open and comfortable room. It had windows opening to the yard. It was a very very comfortable room.

(IFA): I go there (yard) sometimes, rarely. A yard is good which overlooks the building (elevated yard), here the yard is in a lower level.

**PEOPLE FROM THE SAME CULTURAL GROUP AND THEIR SIMILAR PERCEPTIONS IN DIFFERENT ENVIRONMENTS**

Participants from the same cultural background showed same attitudes toward the degree of openness of house even though they are living in different environments. In this research the Iranian group and the migrant group share the same cultural background but are now living in two different environments, Iran and Australia. These two groups show similarity in their perceptions of the degree of openness of yard and building. These degrees of openness are recognizable in preferences for the height of the walls or fences surrounding the yard and the openings of building in regard to privacy inside the house. Also they showed the same tendency clearly toward the material of building, control over temperature inside the building and having sunlight inside the building. Materials which are common for building in Iran are brick walls with concrete or steel structures. Houses mostly have cooling and heating systems or in traditional houses were designed to moderate the extreme change of temperature in different seasons. Bringing in the sunlight is one of the important aspects in housing in Iran both for modern and traditional styles. Migrants from Iran who are living in a different physical and social environment are showing the same tendency toward the named aspects as Iranians.

An issue for the migrants is that they mostly do not feel completely safe and secure in the new environment of Australia. They respond to researcher’s question on the issue of security with uncertainty as “some say it is safe” but doubt about security is in their mind.

Below are some examples of what migrants mentioned in their interviews. (MFN), female migrant is living in a brick veneer house and she says:
(MFN): It was better if it (building) was made of a stronger type of materials like Iranian houses.....Brick is good.... I think it is more stable and stronger than these wooden ones (houses). About her problem of the heat in summertime and cold in wintertime in the building (her present house) she said:
(MFN): Yes, a great problem (about heat and cold in the building), however we added thermal insulation in the ceiling..... but here (Australia), walls of houses are very thin, they are not more than one layer of brick.
(MMR), male migrant said:
(MMR): It is fine (height of fences), just there is one part which is low and finally it should be elevated sometime. We have to talk to our neighbor about this in regard to privacy.
(MMR): The quality (of housing) is very low in Australia. Houses they (Australians) built is ridiculous and you can’t compare it with Iran.

DIFFERENT ATTITUDES OF PEOPLE FROM DIFFERENT CULTURAL BACKGROUNDS TOWARD THE DEGREE OF OPENNESS OF HOUSE IN A SAME ENVIRONMENT

Differences between perceptions of the house and its environment could be studied based on cultural differences. The two groups, migrants and Australians, who participated in the research, have some differences in their perception even though they are living in a same environment. The issues of perception about the material for housing, degree of openness of house including its yard and security reflect differences in their cultural background and/or differences in childhood experiences. The Australians are mostly looking for higher degree of openness of house, especially in the yard. Also they feel more secure in this environment. Openness of house to sunlight has less importance for the Australian group and it could be considered as a positive option but not essential in a house, in contrast to the migrant group. Perception of the material for housing varies for the Australian group and many would prefer a light type of material or especially a cladding roof. For the same issue migrants do not trust light-weight material and they think that houses made of light types of material do not have enough stability. Here are some examples of the way that some Australian participants described their preferences of openness of the yard in relation to fencing and privacy.

(AFH), female Australian said:
(AFH): .... and the garden just merges with the garden next door and it makes you feel more spacious rather than the constriction of the fence.....we’ve just got a bunch of azaleas between us and the neighbour. (Fig. 16)
(AMP), male Australian about overlooking neighbours said:

(AMP): Um,… neighbours on the opposite side of the apartment …. you can see all of their windows and you can look at their apartment ….. but I don’t think it influences how we live or changes anything we do …… Yes we actually leave it (curtains) open.

DIFFERENT EXPERIENCES IN CHILDHOOD OF THE DEGREE OF OPENNESS OF HOUSE MAY RESULT IN A DIFFERENT PERCEPTION THAN ONE’S CULTURAL GROUP

This case from the Australian group who lived in childhood in South Australia in a double brick house shows the same response to the material of housing as the Iranian and migrant groups. She (AFT) said about her favorite material in housing:

(AFT): Definitely brick and not weatherboard ……Yes it (present house) is double brick. It is like my childhood…….Because my father was a builder and he would have nothing less than double brick houses….. Because we, in my perception it is the best, for sound, solid structure.

Another case from migrant group (MFS) who lived her childhood in a town in Iran where yards were separated by low height greenery found it favorable to live in a house with low fences in Australia. She was feeling completely safe in the environment of her childhood house and she said that her present house (in Australia) is in a very safe environment as well.

PREDICTIONS FOR ATTITUDES TOWARD HOUSING

This study shows that people’s attitudes toward housing do reflect their childhood experiences of home for all three groups of Iranians, Migrants and Australians. For each group the influence of childhood experience indicates that the individual seeks similarity to his/her childhood home by creating similar environments within the (adult) house. This similarity may include at least one space or an aspect having a significant character that recreates the same feeling as in childhood. However, although people who had a difficult time in childhood try to create a different environment in their houses in adulthood, there were still similarities to their childhood houses. People in adulthood create modified versions of their childhood houses, by which the positive characteristics of the adulthood house are similar but the negative characteristics of childhood house are eliminated.

This research shows that childhood home is an important environment and has a lifetime effect on one’s perception of the house as home. The environment of home involves many important psychological aspects. In this respect it is important to provide an adult with a house in which one sees a reflection of him/herself stemming from childhood.

THE OUTCOME AND ITS BENEFIT TO THE PROFESSION OF ARCHITECTURE AND PEOPLE

Cowdroy17 asserts that misunderstanding between the architects and clients may result in a sense of guilt about professional failing for architects, and reinforcement of public images of architects as impractical and ineffectual. Recognition of clients’ self-identity and self-expression is an important aspect to be considered in architects’ designs for houses, especially in regard to meeting their cultural requirements. The boundaries of home as one of the degrees of openness of house is an important matter to be considered in designing houses for people having different cultural backgrounds. This is particularly important for architects designing mass housing for people from various cultural
backgrounds.
Creating a healthy physical environment in a house assists in providing children with appropriate environments. As the results of this research show, the degree of openness of house to its natural, man-impacted and social environments has a lifetime effect on children. Control of openness becomes an essential objective in the architectural design of a house.

FURTHER STUDIES BASED ON THE OUTCOME OF THIS RESEARCH
Considering the lifetime influence of their house on children suggested by the outcomes of this research, there is an urgent need to undertake further research to clarify the healthy ranges of degree of openness of a house in different environments. For example, the results show that high exposure to man-impacted environment within one’s house creates dissatisfaction and unfavourableness of the house environment. The results also show that exposure to the social environment needs to be controlled by the inhabitants of the house, otherwise it has a negative effect on occupants, especially children. These ranges of degree of openness could be used to establish guidelines for house design with respect to the psychological health of inhabitants of a house. However in establishing such guidelines, the cultural background of occupants needs to be considered.
NOTES


BIBLIOGRAPHY


CRITERIA FRAMEWORK FOR THE CONCEPTION OF AN ADAPTIVE HOUSING MODEL FOR SUB-SAHARAN REGION

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INTRODUCTION
The present paper refers to a low cost adaptive housing model for Sub-Saharan African region in order to contribute for the solution for the housing deficit and precarious conditions. According to the United Nations reports about the housing and living conditions, in the next four decades it is expected that the populations from Sub-Saharan African region will have a rapid growth due its fast economic development, which is directly related to slum expansion and growth 1. This situation, combined with political contexts, namely civil conflicts, leads to massive migrations from rural to urban areas. Sub-Saharan African region shows the most severe and urgent case with 62% of the population living in slums in urban areas 2, where the accelerated development and consequent densification compromises an efficient solution by public entities. The rural areas also show precarious conditions due its remoteness resulted from lack of infrastructures and a mobility network. Mostly distant from urban centres and sparsely populated, most of the public investments aim urban areas, worsening living conditions, hampering development and increasing migrations to urban areas 3. These informal settlements, are characterized by precarious housing, namely in which refers to the absence of infrastructure (potable water, electricity and sewage), lack of structural safety, healthiness and thermal comfort, where most of times, lives more than one family, resulting in overloaded spaces 4. Overloaded spaces and precarious housing is a mostly prevalent situation in urban areas while the infrastructure network shows much lower coverage within rural areas 5.

The solutions currently applied by public entities are based on imported models, namely Asian and western, which are showing inadequacy to African social and economic reality as well as environmental and territorial inefficiency. This situation has two aspects: on the one hand, the densification models with multi-family housing does not suit population needs in terms of social aspects as the household dimension and dynamic and cultural habits, much related to environmental conditions. On the other hand, the single-family models, usually associated to rural areas, do not consider the local economic activities, which hampers the development and subsistence activities of local population 4.

In terms of social aspects, the main issues are linked to household dimension and dynamic, where the imported models presents a restriction to these cultural characteristics that leads to overloaded
housing space. The social habits related to outdoor living are another issue in multi-family imported models, namely the inexistency of common outdoor areas able to hold the existing social relations of slums. This is an important aspect related to social inclusion and cohesion that housing is able to propitiate.

The economic inefficiency of imported models is mostly related to existing subsistence activities, mainly those associated to informal. Most single-family housing imported models do not accommodate the adaptability to these aspects, keeping a layout related to developed countries mostly marked by services economic activities.

Environmental and territorial inadequacy is directly related to social and economic aspects mentioned above. Some of these models do not consider local climate, which in Sub-Saharan African region is marked by housing overheating, and thus unhealthy indoor environment, which leads to the usage of mechanic solutions to cooling and ventilation. This has several impacts in household budget but also in environment due energy consumption, mainly fossil fuel based. The main problems of thermal comfort are related to building materials but also the housing layout.

The absence of criteria for material selection has direct impacts in thermal comfort but also in housing affordability. Imported materials non-adaptable to local conditions are one of the main reasons for housing price increase, namely due transportation costs and building process, restricted to technical and specialized labour. Thus, housing becomes unaffordable to the poorer, keeping the housing deficit to be unsolved and propitiating slums growth and expansion.

**METHODOLOGY**

The research refers to the formulation of an adaptive housing model for Sub-Saharan African region, namely Angola.

The model aims the creation of an integrated solution that considers social, economic, environmental and territorial criteria that will allow the identification of parameters for an adaptive housing model able to provide an adequate solution to local context.

Social criteria are usually related to household characteristics, namely its dimension but also cultural habits, lifestyles and economic activities. These aspects are directly linked to housing layout, dimension and, specifically in developing countries, the housing is inherent to economic informal activities, which, in many cases, have place in domestic space. In turn, these economic activities are associated to household income and thus to housing characteristics in informal settlements.

The adaptability to territory is associated to geographical and climate conditions and its impact on housing i.e. should consider geographical aspects as risks to adapt or as a potential opportunity. In turn, environmental adaptability is related to territory, namely the available resources and its potential in low-cost housing solutions. The selection and adequate application of local materials show adequacy to territorial conditions, namely the climate characteristics, which have direct implications in environmental solutions through the adoption of passive solutions for cooling and heating, providing thermal comfort. Local materials application has also economic consequences due the associated costs to transportation but also by developing local economy, helping local communities to improve their quality of life.

The present paper refers to the definition of criteria framework for an adaptive housing model, constituted by parameters and the resulting/expected outputs, which, in further research will be applied in Angola.

Due the connection between several Sub-Saharan African countries with Portugal, the methodology considered a case study approach that studied the evolution of social housing in Portugal through
social, economic, environmental and territorial criteria for housing solutions, and its repercussions in Sub-Saharan African Region former colonies.

The methodology considered the analysis of housing criteria of three political and historical periods for social housing in Portugal. Thus, it was possible to identify, through case studies of each period, the criteria for housing formulation in terms of social, economic, environmental and territorial aspects.

This analysis was then crossed with the main strategic premises for housing in developing countries, mainly defined by World Bank and UN-HABITAT, but also with public housing programs from several Sub-Saharan countries to create a first approach to focus area.

![Figure 1. Methodology for Criteria Framework for low-cost housing.](image)

**DEVELOPING A FRAMEWORK CRITERIA FOR HOUSING**

**Case-study: Criteria Analysis of Social Housing in Portugal**

Low-cost housing initiatives in Portugal resulted from the Industrial Revolution and consequently rapid growth of main cities\(^{12}\). The government and municipalities were enabling to respond to massive migrations of the new working class to industrial poles, which have created housing deficit and precarious conditions.

The first housing initiatives came from industrialists in order to perform housing for their working class, whose housing conception considered only the shelter function near job site and affordability. In order to reduce the investment but also maintain the housing supply affordable for workers, these housing types were integrated inside existing plots and perform small dwellers units with 16m\(^2\) with no access to the main road and, consequently, no infrastructures nor health conditions \(^{13}\).

Due public health problems, that started to spread all over the city, public health and housing regulations were introduced together in Portuguese legal framework in the beginning of the XX century\(^{14}\). These documents defined regulation for all new buildings, namely health aspects, infrastructures and licensing, showing, not only economic principles but also concerns about public health and quality of urban and indoor environment.

The First Republic government in 1910 develops the commonly called social housing. Decree nº4137 of 24\(^{th}\) April of 1918 and Decree nº16055 of 22\(^{nd}\) October of 1928 defined the principles for what was designated as social housing: (1) houses should had service areas connected to the public infrastructure network (2) number of rooms according to household dimension; (3) single-family
housing models with backyard with an intention to adequate the housing layout to a mainly rural population; (4) multi-family housing models, more affordable; (5) specific materials and construction techniques to apply provide thermal comfort, durability and safety against a potential earthquake.

The principles mentioned above had formal application during *Estado Novo*, between 1933 and 1974, although with an update and adaption to African former colonies. One of the main examples that perform these principles is Alvalade Neighborhood in Lisbon, built under Economic Income Housing Program in 1945. This project is an effective example of social, economic, environmental and territorial adequacy, where many options considered had long-term positive impacts.

Housing layout optimization was based in European tendencies with the prefabrication process and optimal minimum areas according to Portuguese household dimension, performing solutions between 1 to 5-bedroom. Prefabrication was one of the major actions in Alvalade housing models through the application principles with economic consequences: (1) use of new materials and techniques according to costs and quality; (2) prefabricated and standard elements that would reduce construction costs and housing value in order to improve its affordability.

Alvalade also showed an important role for environment, even if some options were unintentional. In multi-family models, it was adopted a four-storey building in order to dispense a lift, according to legislation at the time. Thus, it would reduce construction and maintenance costs but also energy consumption, showing long-term impacts. The implementation of passive solutions would have important repercussions in reducing energy consumption and associated costs. These solutions were complemented with urban strategies, namely the implementation of deciduous trees to protect against solar radiation during summer and allow solar heating during winter.

The principles applied in Alvalade were then transposed to African former colonies through an adaption process. Aware of the different context of African former colonies, Portuguese architects applied several principles of local traditional housing to imported model, resulting in so-called *architectural regionalisms*. This adaption process crossed social, economical, environmental and territorial criteria at the same time and with the same importance.

In former colonies, the House acquired a symbolism related to colonists and natives. The combination between Portuguese housing model and local traditional housing thus presented two paths: (1) to colonists it was expected that the introduction of local architectural elements would help in integration process; (2) for native population, the introduction of new building technologies and new housing layouts would represent a *modern way of living*. Both multi-family and single-family models were adopted. However, this last was the preferred one due local lifestyle, directly connected to climate characteristics but also cultural aspects of African settlements.

The housing adaption process was achieved through the application of the minimum areas, space optimization and prefabrication elements presented in Alvalade models but introducing new components as: (1) housing built on stakes and constituted by a porch or balconies in order to provide cooling and cross ventilation due the specific climate conditions in these African countries; (2) new layout disposition, namely using a courtyard as housing *familiar core*, respecting cultural habits of local population and their relation between indoor/outdoor; (3) Application of local materials with better performance to territorial and environmental conditions, namely local wood or thatch for roofs; (4) incorporation of elements/layout to prevent endemic diseases as nets or cross ventilation.
The use of local materials was able to reduce housing costs, namely due transportation, and also observe better performance to climate conditions, presenting economic and environmental formulation criteria. Socially, the housing appropriation process would be facilitated through combination between housing to local culture and imagery, having consequences in terms of social inclusion and collective identity.

CRITERIA FRAMEWORK FOR LOW COST ADAPTIVE HOUSING MODEL

In order to formulate a criteria framework for low-cost housing for Sub-Saharan African region, the criteria identified through Portuguese low-cost housing case studies was crossed with the main premises for housing, defined by social housing strategies of several countries from this region but also from UN-HABITAT and World Bank experiences in developing countries 23. One of the main premises that have been applied in developing countries, in order to solve the housing deficit and simultaneously develop local communities and improve social inclusion is self-construction process. This method, already institutionalized in several countries 24, is no more than the exploitation of informal settlements population capacity to build their own houses under technical guidance in order to ensure quality and optimal solutions.

Another strategy related to assisted self-construction is evolutive and incremental housing, integrated in site-and-service schemes 25. The major difference between the initial solutions of incremental housing and the current approach is the new role of technical team in the whole process (Greene and Rojas 2008).

Thus, assisted self-construction and incremental housing were added to the framework considering as parameters the household and/or community skills and capacity in terms of self-construction. However, observing the development schemes as well as demographic dynamic, evolutive models should not only consider expansion but also retraction. Through household development related to education and employment, the household has shown a tendency to retract that will consequently change needs and ambitions related to housing.

Beside parameters associated to local characteristics as cultural habits related to housing or required minimum standards of each country, it is intended that should be used international standards in order to support the model effectiveness. This situation refers to international criteria for overcrowded housing 26 and the use of International Standard Industrial Classification Codes in economic activities survey.

Public participation should be also considered as global criteria to all fields in order to achieve the effectiveness of an adaptive housing model 27.
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Parameter</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diversity of housing typologies</td>
<td>Household dimension and dynamic; International criteria for overcrowded housing</td>
<td>Affordability to various social levels; Adequacy to household needs</td>
</tr>
<tr>
<td>Housing flexibility (evolution, retraction and transformation of internal housing space)</td>
<td>Household dimension and dynamic; International criteria for overcrowded housing</td>
<td>Adequacy to household needs</td>
</tr>
<tr>
<td>Optimisation of housing layout</td>
<td>Household cultural aspects and habits; Household economic activities</td>
<td>Adequacy to household lifestyle and cultural characteristics; Improving individual and collective development</td>
</tr>
<tr>
<td>Assisted self-construction process</td>
<td>Household/community skills and capacity</td>
<td>Facilitates the appropriation process; social inclusion; collective identity; Skills improvement; Individual and collective development</td>
</tr>
<tr>
<td>Application of local materials</td>
<td>Inventory of local materials considering its cost and quality</td>
<td>Facilitates the appropriation process; social inclusion; collective identity</td>
</tr>
<tr>
<td>Architectural elements to prevent endemic diseases</td>
<td>Identification of local endemic diseases</td>
<td>Quality of life; Public health; Reduced mortality rate</td>
</tr>
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</table>

*Table 1. Social criteria, parameters and outputs for housing adaptability.*
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Parameter</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization of multi-family housing</td>
<td>Maximum height/floors, according to legal mandatory issues, in order to dispense a lift</td>
<td>Less maintenance costs; Less Costs associated to energy consumption</td>
</tr>
<tr>
<td>Adoption of required minimum areas</td>
<td>Required minimum areas for dwellings, according to legal mandatory issues</td>
<td>Optimization of housing layout; Less construction costs; Affordability</td>
</tr>
<tr>
<td>Optimization of housing layout</td>
<td>Passive solutions for cooling, ventilation and natural light</td>
<td>Less energy consumption costs</td>
</tr>
<tr>
<td>Housing flexibility (evolution, retraction and transformation of internal housing space)</td>
<td>Household dimension and dynamic</td>
<td>Affordability (incremental process according to population needs and financial capacity)</td>
</tr>
<tr>
<td>Optimization of housing areas (rooms vs. circulation areas)</td>
<td>Required minimum areas for dwellings, according to legal mandatory issues; Household cultural aspects; Household economic activities</td>
<td>Optimization of housing layout; Less construction costs; Affordability</td>
</tr>
<tr>
<td>Centralization of service areas and infrastructures (kitchen and sanitary installation)</td>
<td>Infrastructure housing core</td>
<td>Optimization of infrastructure network; Less construction and maintenance costs</td>
</tr>
<tr>
<td>Standardization</td>
<td>Prefabricated materials and elements</td>
<td>Construction process optimization; Quality control (durability); Less construction and maintenance costs; Affordability</td>
</tr>
<tr>
<td>Application of local materials</td>
<td>Inventory of local materials considering cost, quality and performance</td>
<td>Less construction costs (transportation and labor)</td>
</tr>
<tr>
<td>Architectural elements to prevent endemic diseases</td>
<td>Identification of local endemic diseases</td>
<td>Reduced health costs</td>
</tr>
<tr>
<td>Assisted self-construction</td>
<td>Household/community skills and capacity</td>
<td>No costs related to specialized labor</td>
</tr>
</tbody>
</table>

*Table 2. Economic criteria, parameters and outputs for housing adaptability.*
### Table 3. Environmental criteria, parameters and outputs for housing adaptability.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Parameter</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization of multi-family housing</td>
<td>Maximum height/floors, according to legal mandatory issues, in order to dispense a lift</td>
<td>Less energy consumption</td>
</tr>
<tr>
<td>Optimization of housing layout</td>
<td>Passive solutions for cooling, ventilation and natural light</td>
<td>Less energy consumption; Thermal comfort</td>
</tr>
<tr>
<td>Standardization</td>
<td>Prefabricated materials and elements</td>
<td>Resource management; Less waste; Optimization of energy consumption</td>
</tr>
<tr>
<td>Application of local materials</td>
<td>Inventory of local materials considering cost, quality and performance</td>
<td>Less energy consumption; Thermal comfort</td>
</tr>
<tr>
<td>Centralization of service areas and infrastructures (kitchen and sanitary installation)</td>
<td>Infrastructure housing core</td>
<td>Resource management (less material to infrastructure network)</td>
</tr>
<tr>
<td>Adoption of indigenous vegetation species in single-family housing backyards</td>
<td>Inventory of indigenous trees</td>
<td>Reduced thermal range – thermal comfort and less energy consumption (as a complement of passive solutions)</td>
</tr>
</tbody>
</table>

### Table 4. Territorial criteria, parameters and outputs for housing adaptability.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Parameter</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimization of housing layout</td>
<td>Adequate layout to territorial conditions (floods, sea level rising, among others)</td>
<td>Better performance to biophysical conditions – durability, less maintenance and household safety</td>
</tr>
<tr>
<td>Application of local materials</td>
<td>Inventory of local materials considering cost, quality and performance</td>
<td>Better performance to climate conditions</td>
</tr>
<tr>
<td>Adoption of indigenous vegetation species in single-family housing backyards</td>
<td>Inventory of indigenous vegetation species</td>
<td>Benefits to local ecosystem</td>
</tr>
</tbody>
</table>

### CONCLUSION
Low cost housing is usually related and assessed only in terms of economic viability. Household income and housing expenditure relation, which corresponds to a quantitative measurement easier to implement, support housing affordability, ignoring social and environmental aspects directly related. In terms of adaptability criteria, the Portuguese cases-study showed that economic factor was determinant but not exclusive in order to solve the housing deficit and to responds to housing demand, indeed, the environmental and territorial aspects were equally important in adaption process on former African colonies. The historical and cultural relation between Portugal and some countries of Sub-Saharan African region, namely Angola where the model is intended to be applied in further research, was able to
provide a first approach to housing adequacy to those territories. In order to conciliate these criteria to current strategies and initiatives for low-cost housing were considered international standards but also the main premises for housing in order to formalize an effective solution.
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UNDETERMINED SPACES

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INTRODUCTION

Most of contemporary housing offer is still marked by the understanding of the house as a machine, aimed at responding to a list of predetermined functions (the modern matrix of housing), focused on a given model of social fabric and of family structure and values which if coincident with statistical data (averages), hardly ever match the real people.

Functionally predetermined housing does limit the occupant’s freedom to interpret, use and reorganize the space in accordance to his/hers ethos.

Rather than continue to build social housing in terms of quantity, how to develop housing that is sustainable, that has the ability of interacting with its occupant?

To understand what this alternative housing might be, this paper will study the evolution of the domestic interior’s matrix, from the house formed by functionally undetermined spaces to the epistemological rupture that will culminate in the Modern Movement, and which will, until the Present, affect the way of thinking and designing the domestic interior.

UNDETERMINED SPACES IN HOUSING UNTIL THE END OF THE NINETEENTH CENTURY

Udine

The Antonini Palace, of Palladio (figure 1), is an example of functionally undetermined spaces – one can only tell which function was assigned to each space through the history of its use.

Figure 1. – Antonini Palace, Udine, 1556. Andrea Palladio.
It can be observed a **physical and visual continuity between all compartments**: the doors are located in the same visual axis - if they are all open, a visual continuity from the first to the last bedroom is created. Physical in that there is not just one way to go from one room to another; there are a number of possible routes, of movements that intersect. This liberty of movements is possible because **each room has more than one door to access it**; one can go directly from one room to the other. The **rooms are interconnected**: the modern concept of privacy was unknown.

**The fact that each room opens to the other eliminates the need for corridors.** In fact, the corridor will be a space / function invented later, as an answer to privacy issues.

**The house isn't divided in public and private spheres**: as much as one can imagine, one can move from one compartment which is the living room to another that is a bedroom.

![Figure 2. – Antonini Palace, Udine, 1556. Andrea Palladio – circulation matrix – physical continuity between the spaces.](image)

Until the sixteenth century rooms were connected with each other through passages and doors, which contributed to the **space’s functional uncertainty**. The house was formed by **multipurpose spaces** - they were all **public areas, not serving any functional hierarchy**. There was no permanent furniture arrangements inside the house, there wasn’t any **specificity of use**.

**The introduction of the corridor**

From the end of the XVI century it begins the insertion of the corridor, while at the same time there are still houses with interconnected spaces. The corridor came from the purpose of making independent routes for the servants (who used the corridor, very narrow) and the owners of the house (family), which were established directly between compartments. **This marks the birth of spaces with a specific function** (circulation), **something that, until now, was unknown for housing**.

The introduction of the corridor brings a very important consequence: the **specialization of the route**. One of the first homes in England to include the corridor dates from 1597 and was designed by John Thorpe - Beaufort home in Chelsea1 (figure 3).
From functionally undefined spaces, linked through doors, with several possible paths to be made within the house (there wasn’t any route hierarchy - each route had the same relevance as the other), one passes to the example of an English house from the XVII century (Figure 3) in which there is a hierarchy of movements: the path of the house owners and their guests is the most important; the route of the servants is secondary and should remain hidden. A functional zoning appears as a consequence of this division of routes: the area of the servants (servants’ spaces) and the area of the owners of the house (spaces served). The corridor serves the purpose of making the social distinction within the dwelling and nothing else. Spaces are not yet functionally predetermined.

This division is a consequence of a conscious need to incorporate privacy - need formulated from the conclusions of the Council of Trent. Not only should each family have its own privacy, but so should each member of the family.
The transition from the xix to the xx centuries in lisbon - avenidas novas

Despite the existence of the corridor as an element of circulation within the house, it does not separate movements, i.e., it does not yet segregate the apartment into private and public spaces. Here the corridor takes on a different social significance – it only serves as a mean of access to different spaces.

Figure 5. – Typical apartment from the Avenidas Novas, Lisbon, XIXth century.
A – Kitchen; B – bathroom; C – Internal courtyard.

There is no functional pre-determination of spaces, instead there is a functional indeterminacy. The break with functional indeterminacy and the introduction of the corridor and functional pre-determination is not something that comes at the same time and everywhere. It is something that will start from the XVII century, as a consequence of a growing need for privacy and intimacy within the house.
Figure 6. – Typical apartment from the Avenidas Novas, Lisbon, XIXth century – circulation matrix.

THE FUNCTIONALISM IN THE TWENTIETH CENTURY – THE APPLICATION OF BEHAVIOURIST THEORY TO THE ORGANIZATION OF THE HOUSE

The Industrial Revolution of the XIX century will worsen the population’s well-being: there is not enough housing to accommodate all the people who have moved from the countryside to the city. A single room is shared by more than one family: there is no sense of privacy, and promiscuity prevails inside the house. In 1840 the architecture is considered to be the main culprit of all the immorality that characterized the interior of the house, and blamed for all the ill health that was observed in cities. The moral reform would be made through the house’s interior reorganization - the fact that the rooms communicated with each other and thus had access in many ways, was seen as an incitement to immorality and a lack of privacy, since what was done in a room could be observed by a number of others, unknown.

Henry Roberts presents at the Great Exhibition of 1851 a model house for 4 families – this is the turning point, where the reform of morality through domestic architecture begins, through the specialization of movement and functions.

The interior of the housing unit (Figure 7) focuses on the living room, the larger space, around which are organized 3 bedrooms (one for the couple, one for girls and one for boys - children have now their own rooms) – it proceeds to the separation of gender. Each room has only one door and the children’s bedrooms are accessed through a common space, where parents can control it - the living room; there is no longer any connection between rooms (this link was considered a contribution to the moral degradation). This example is a turning point in the history of domestic interior: functional pre-determination was implemented, consciously, for moral reasons: it arises to ensure the absence of promiscuity within the housing unit.
The notion of privacy reigns in housing, reshaping the way to think its interior and its spatial organization. The primacy is now given to the introduction of independent access to each different space that constitutes the house - each room has now only one door. A conscious hierarchy of movement begins to be developed, the definition of destinations within the house, a hierarchy of rooms’ location. The movement becomes the shape generator.

From this moment on, the organization of space within the house is made in order not only to achieve the separation of family and servants, but to achieve as well a separation between the family members themselves. Each person has their own place in the house.

After the First World War, there is a need to respond quickly to housing shortage, since most of it has been destroyed.

Alexander Klein develops the rationalist’s ideals, and becomes adviser of the edification in Berlin. His function is to study the house and develop economic and rapidly achievable proposals. He begins a series of scientific studies on the housing unit, creating a method to build an economic housing type. This method will be first presented in Paris in 1928 and the following year in the CIAM II, in Frankfurt.

In 1930 the government of the Reich decided to finance the construction of housing, and provides that the area of the housing unit must be kept between 32 m$^2$ and 45 m$^2$.

“The justification for Klein’s plan was the metaphor hidden in its title, which implied that all accidental encounters caused friction and therefore threatened the smooth running of the domestic machine: a delicately balanced and sensitive device it was too, always on the edge of malfunction. But however attenuated this logic appears to be, it is nevertheless the logic now buried in regulations, codes, design methods and rules-of-thumb which account for the day-to-day production of contemporary housing.” Evans

For Klein, the organization of the activities in plan is the starting point for reaching an economic and efficient house. Therefore, the circulation spaces acquire great significance (they should be as concentrated as possible) - if the functions inside the dwelling are not well organized, this will result in a housing with wide corridors (which will result in an area larger than really necessary) or a housing in which there are intersecting movements, which, for Klein, prevented the proper functioning of housing. The kitchen should be separated from the dining space (this is the most hygienic and aesthetic solution for Klein), as small as possible, since the smaller it is, more space is left for the other rooms.
Klein makes the separation of functions within the housing unit through **binomials**: cooking/eating; sleep/body treatment; leisure/rest. Furthermore, it can be observed a **division into two more general parts**: a **private** part / night zone (comprising bedrooms and bathrooms – figure 8 blue area) and the **public** part / day zone (consisting of the living room, dining room and kitchen – figure 8 grey area). These two different parts can be directly accessed from the entry hall, without any intersection between the two – for Klein, the intersection of routes would promote a negative effect on its inhabitant. The functions must be capable of being carried out without having any intersection between them.

**There is a new reading of the house internal layout**: having to be reduced to the minimum possible size, Klein believes that there must be a **maximum of functionality**, within each compartment as well as in the relationships between each of them.

**The architect has now the duty to educate the public**: he must teach them how to live in the unit. To each space it is assigned a specific function, which can not be changed. **There is therefore a limitation and reduction of the possibility of space ownership by its inhabitant.**

![Figure 8. - Alexander Klein – division of the house in 2 parts.](image)

In 1929 it is presented in the II CIAM the principles of the 'Existenzminimum': the housing unit is now composed of a large living / dining space, with double height, with a kitchen with minimum dimensions, understood as an appendix to this large space (designed only to prepare meals and wash the dishes, such as the kitchen of a train) - the Frankfurter kitchen, designed by Greta Schütte-Lihotsky (Lawrence6); the bedrooms, with minimum dimensions, enough to hold a bed and a wardrobe; and a bathroom.

**As a result of the need for massive housing construction** (due to the massive destruction of buildings on the Second World War), **the architecture will be based on a set of rules** (housing division in night area and day area, etc.). **minimum dimensions** (living room maximized at the
expense of minimizing the kitchen) and invariant relations for the spaces of the house. These are the rules that still persist in most of the architecture of social housing today: quality housing is understood as a synonym of functionality.

CONCLUSION
From an understanding of the house formed by functionally undetermined spaces, the transition to the twentieth century is characterized by a scientific approach (very influenced by theories of behaviour), giving rise to a house comprising functionally predetermined spaces. This thinking was based on the anticipation of the needs of its future occupant, shaping the way to inhabit the house - the dimensions of the spaces are a direct result of the function that each one of them should accommodate.

If, by one hand, the anticipation of the needs allowed the conviction of an optimized home, on the other hand it resulted in a limitation of the possibilities of appropriation of the space by its occupant, as well as a limitation of the interpretation and use of space, leading to a decreased level of interactivity between the two. It is an architecture that gives primacy to function (providing the spaces with the minimum areas for its proper functioning) and results in a functionally rigid house.

In order to respond effectively to social housing shortage, it is imperative to think of a model that counteracts modern living. Described below are some points, based on the early examples shown on this article, which could characterize the sustainable house:

1. **Undetermined / generic spaces** - the functionally undetermined house, in which Functions are to be established through usage.

As Hertzberger advocates, whenever a space is too specific in terms of use, the possibility of being interpreted in other ways is very limited. The spaces of the dwelling should be polyvalent - it is this polyvalence that allows its occupant to interpret the space, to question himself about which use he wants to attribute. This value of use can be changed at any moment (contrary to a house formed by functionally predetermined spaces).

According to Lerup, there is an interaction between people and space, and this relationship can only be established through use. If the use is predefined, this relationship can not take place. The sustainable house reacts and responds to its occupants’ necessities.

2. **Homogeneous spaces** – the sustainable house is formed by rooms with similar areas and dimensions and which are structurally identical – homogeneous spaces. The rooms are not predetermined neither in terms of function or location (abolition of hierarchies), creating multifunctional spaces. The house isn’t divided in public and private spheres.

3. **Rooms with different types of access** – the corridor isn’t the only way to access a room; some rooms can be accessed through others. The routes/movements will be determined by its occupant, according to the uses he gives to each space. **Rooms with more than one door**, which allows the combination of two rooms, for ex., to create a new room, a big one, with a different function. Interconnected spaces. Visual and physical permeability.

4. **Possibility to add space** – not just through combining rooms within the same apartment but, for ex., adding rooms that may belong either to an apartment or to another.

5. **Neutral façade** - the façade that is independent of the interior functions/layout of the house. This is one way to ensure both the versatility of the housing unit as the building itself.

6. **A house like the office building**, with false ceiling and pavement (the interior layout becomes very easy to reorganize at any moment, since the kitchen and the toilets are no longer fixed elements), increasing the possibilities of space appropriation.
7. An unfinished house, defended by Ignacio Paricio\textsuperscript{9} - the house is sold with filling according to the economic capacity of its occupant (it may be sold without a finished kitchen, for ex.). A house, like Habraken\textsuperscript{10} suggested, formed by two independent parts: the support, comprising the permanent, which includes infrastructure, structure and access, and the infill, the changeable part, which is left to the care and choice of its owner. Housing must be able to receive and reflect the identity of its occupant.

8. Exploration of the Japanese house, embracing a different understanding of the private and public spheres. The space is changed throughout the day through the participation of its occupants, according to their needs - a place that in the morning was the bedroom, by simply packing the futon it can become a study space in the afternoon or a space to have dinner at night\textsuperscript{11}. The size of each room is not fixed (one can increase or decrease the size of the spaces through the shoji panels), as well as its function – the Japanese house is therefore formed by multipurpose spaces, becoming a polyvalent unit.

Housing sustainability can be achieved more successfully with an interactive approach, through spaces that give back to its occupants several spatial interpretations, allowing the space to be appropriated in different ways - this is the undetermined, the adaptable house. House is no longer defined by the modernist list of functions: eat, sleep, work, treatment of the body, cook. Hierarchies are abolished. A rethinking of the uses and the way home is used will have to take place. It is up to its occupant to interpret the polyvalent space and give it its own value through usage. This quality and understanding of the space should not be lost in the urge to answer quickly to a housing construction need.
NOTES

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SENIOR HOUSING: CRITICAL PERSPECTIVES OF RESIDENTS, DEVELOPER, AND ARCHITECT

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INTRODUCTION
This study seeks to understand how senior housing meets the needs of African American elders. We examine how one non-profit provides affordable senior housing by interviewing six low-income African American elders, the developer/manager, and the architect to describe how housing influences the health and well-being of residents.

Saint Paul, Minnesota
Minnesota, with a population of 5.4 million, is the largest state in the North Central U.S. With almost 300,000 residents, Saint Paul is the state capital and is situated adjacent to another large city, Minneapolis. Saint Paul is characterized as more diverse than Minneapolis; 86% of residents have a high school degree, 23% fall below the poverty line, 60% are homeowners, 60% are White, and 16% are African American. The proportion of residents aged 65 years and over is 16% for the state and 9% in Saint Paul.¹

Affordable senior housing
The three developments in this study benefit from multiple funding sources, including 202 funding from the U.S. Department of Housing and Urban Development. The Section 202 program was created by the Housing Act of 1959 to build appropriate rental housing for moderate and low-income independent older persons. Such housing oftentimes includes support services and safety features. According to Pynoos, Bressett, and McCleskey, “housing providers and advocates have judged … Section 202 to be relatively successful in terms of high levels of tenant satisfaction, the formation of new friendships, an absence of serious management problems, and the provision of supportive environments.”²

THEORETICAL FRAMEWORK: PERSON-ENVIRONMENT FIT
A well-established theoretical framework in gerontology, Person-Environment fit (P-E fit)³ has been developed and applied by many researchers to describe and evaluate the fit between persons’ biological and social characteristics, and the built environment. This framework conceptualizes the importance of congruence between users and defines the concepts of balancing resources, deficits, changes in health, and adjustments to living situations.⁴ In this research study, P-E fit served as a framework to develop interview questions and structure the initial coding schemes for data analysis.
This study addressed a gap in the literature applying P-E fit among low-income African American elders.

**METHODOLOGY**

To recruit participants the researcher worked with trusted advisors in the African American community and snowball sampling. From the total sample, six elders from subsidized rental housing lived in three different HUD 202 properties owned and managed by the non-profit, Episcopal Homes. Initial analysis of data from the elders suggested they felt Episcopal Homes was a place to thrive. This prompted the researchers to delve deeper into understanding how Episcopal Homes developments influence well-being. To that end, the researchers interviewed the developer/manager (CEO) of Episcopal Homes and the architect to determine how design, location, and mission contributed to residents’ perception of thriving. This case study describes how well-designed, mission-driven senior housing combined with individual and neighborhood resources supports resilient residents.

This research is guided by a generic qualitative approach defined by flexibility and iteration rather than explicit philosophical assumptions from a single qualitative orientation and underpinned by characteristics represented in all qualitative approaches, such as the objective of providing a deep understanding of a phenomenon from the perspective of the research participants. The flexibility and iteration in a generic approach may help to overcome frameworks that have portrayed marginalized groups as deficient and fits the transformative-emancipatory paradigm of the research.

**Member checking and transcription verification**

To increase validity of data, participant member checking better ensures that their experiences are adequately represented. Creswell encourages member checking of interpreted data, such as themes and patterns. However, Carlson found that when participants reviewed their actual transcripts, some felt uncertain, embarrassed, and unwilling to continue. Thus, Carlson suggests that researchers summarize narratives and share those summaries with participants. Based on these suggestions, elders were mailed a written summary of their interview to confirm and provide additional comments. Interviews were audio recorded with permission of the participants. Transcriptions of interviews were verified for accuracy in meaning and intent. Field notes helped in verification and interpretation of contextual aspects of the interviews.

**Qualitative data analysis**

Marshall states, “the process of bringing order, structure, and interpretation to a mass of collected data is messy, ambiguous, time-consuming, creative, and fascinating . . . it is not neat”. In an effort to triangulate the findings, one researcher focused on analysing data from elders; the other on analysing data from the CEO and the architect. Each reviewed their set of data transcripts by interview question and coded for themes. Next, each reviewed for additional themes across questions and then re-examined the transcripts for deviant cases and comments. After summarizing the themes, the researchers met to compare similarities and differences in themes and exceptions between participants.

**Findings**

Themes identified in interviews with elder participants are described first, followed by themes from the CEO and the architect. We present themes in descending order of importance, as identified by the elder participants. To emphasize the voices of participants, direct quotes are in italics and centred.
Themes included thriving in old age, reciprocal relationships with property staff, and important design and neighbourhood characteristics.

**Elders**

The participants demonstrated individual and collective resiliency. They had “made it” and expressed a strong sense of well-being achieved in old age. Later life resilience appeared to be linked to the built and social environment; participants described feelings of empowerment in relation to how housing and staff fit their physical and psychosocial needs. They also described a long-standing sense of community attachment strengthened by their life-long experiences as members of a marginalized group that overcame multiple stressors by building resiliency.

**Thriving In Old Age**

Participants described a sense of peace, satisfaction and self-actualization realized in old age. When asked what they liked best about their current home, they most often mentioned a sense of peace. They commented,

I’m at peace living here…it’s one of the best moves I’ve ever made for myself. It’s peaceful to me. I’m 84. And I never dreamed [off] the peace…I had to get used to it.

...All I want right now is peace of mind and respect, and I’m fine. So I don’t have a lot of overall expectations because, if I die tomorrow, my life has been fulfilled. I have a beautiful family, ... I’ve worked a long time, I’ve been around the world. What else can you ask? Now I’m in peace.

...Oh, I don’t like Los Angeles. I stayed there for too many years, mainly because of them [children], and then mainly because I didn’t have enough gumption to just pick up and come back here with family and friends. But I did now And I came home. I’m happy here. For the first time in my life, I am happy. It’s taken 80 years.

**Property Managers and Staff**

A strong theme that emerged for participants was a feeling of being valued, empowered, and accepted by their property managers and staff; for some this was a new feeling in their lives. Residents from all three Episcopal Homes strongly valued their reciprocal relationship with their property manager and staff. For instance,

I love living here [in Episcopal Homes] [name omitted] is the best resident manager ever. She’s always willing to help anybody; no prejudice; she’s just a beautiful person every day, every year.

The most important thing to me is the staff and how you’re treated by staff people here’s really interested in your welfare and your care and help, and all of that. [The Property Manager] is the greatest; she really is. You don’t find many apartment managers like that.

The fact that they’re [the staff] interested in us, that makes a big difference.

Some participants combined descriptions of the built environment with descriptions of the property manager and staff:

I’m comfortable here, it’s a beautiful place...the best resident manager anybody would have. She’s an understanding person, and you can feel the love from her. Honestly, she gives you a hug and it means so much; that’s the kind of person she is; anybody approach her she’s just precious to me because ...

[there are] some places where people don’t have patience with a lot of people when...they have to deal with different situations. But whatever situation, [it] never changes her.
“Yes, I really like living here. I love my apartment ... the staff here are just beautiful people. And they make it nice; wanting to live here. They're just always there for you.”

**Good Design**

The elders described their homes as well-designed to meet their physical and social needs. Complaints were minimal; common complaints were about a lack of storage and the desire for a walk-in bathtub. 

[The homes are] very comfortable and convenient. And the ones that need handicap equipment, they can get it....And you can see how beautiful they are.  

I get around really good in my apartment....The way they’re made everything is directed towards the needs that you might have.  

Very comfortable, well-situated, very good location. Attractive...I’ve had people say this looks like a four star hotel.

**Neighborhood Attachment**

The Episcopal Homes building and its design may have played a role in attracting residents. However, it was the attachment to their neighborhood that participants valued more than their beautiful, well-designed homes. Participants described feeling connected to the neighborhood, that their friends are there, and that they valued the diversity. They described importance of neighborhood connections:  

... Why take us out of our environment and put us off way out someplace else because that’s where you’re building the houses....When you build them in our neighborhood, we can stay in our neighborhood.  

I like the idea...of it [Episcopal Homes] being here And you’re not taken way out somewhere....I think they need to get 'em [these residences] in the neighborhoods, and put people in here that are from the neighborhood, so they can all still be friends.

**Racial Diversity in the Community**

All of the participants discussed their general experiences with racism. However, they all described that they feel accepted and that there is little to no discrimination at Episcopal Homes. When asked about discrimination in their current home, participants shared the following:  

If it [racism] were here, I would address it. And hope that it would be addressed but I have not felt it.  

I don’t expect to feel it, not at this point in time. We have Asian people here, we have Black people here, we have White people here, we seem to all get along, say hello.  

[What] I like best about my neighborhood is the diversity. I grew up in a [diverse] neighborhood...So I like a [diverse] neighborhood.”  

It’s a nice little community...it’s versatile...it’s pretty well a mixture of people....We learn a lot about other cultures in here because we got some people that don’t speak English and we don’t speak their language either. But we figure out how to get along and talk.

**CEO**

The CEO is the developer and he manages the on-site property managers. He joined Episcopal Homes in 1999 with a Master in Business Administration degree and experience working in health care. He described himself as a natural leader. Although he did not articulate it, he appeared confident in his ability to choose collaborators. He expressed admiration for the one architect he worked with,  

“Super guy, very helpful, first rate...Obviously he has limitations because 202 is prescribed, but he still finds ways...He does magic.
The CEO described his personal value and family background growing up on a small family farm; “he knows poor.” He spoke about his parents to explain how he feels about senior housing and his commitment.

My parents worked seven days a week. When they sold the farm, they got $60,000. That will not buy a year in a nursing home. They deserved quality and dignity, not opulence. So I think about my parents and people like them when I think about what kind of housing to provide.

[Episcopal Homes is] serving the urban core, serving the most in need; that really is just in my DNA. One of the principles we live by here at Episcopal Homes is that diminished income does not mean diminished quality of life.

When asked about changes over time, he mentioned the shrinking of public funds and leveraging twenty-five funders on a project. He highlighted factors that enhance his ability to raise funds: 1. Transit-oriented redevelopment of the urban core with increased density fits and HUD goals; and, 2. Inclusive design and programming that build community across income levels; appealing to foundations. As city staff and elected officials change, he spends time rebuilding networks, The people I need support from I have to get to know. I am constantly relationship building.

Architect

The architect for all of the Episcopal Homes HUD 202 properties graduated as one of the top five in the class at a top five school. As such, he stated, “I have a pretty high level of design.”

He began working at several small firms, but then transitioned to large firms. Twenty-five years ago he started a new job on the same day the firm merged with a firm specializing in senior housing. After one of his first low-income senior projects opened, he recieved a letter from a resident, The letter said that it was the nicest place he had ever lived, nice to hear. I have done fifteen 202 projects . . . 202s are fun and simple, making a facility that make a difference for people. When an opportunity is given to you and you take it and run with it.

The architect created a sense of safety for residents in a relatively high crime area. He described design features such as gates and locking doors to keep residents safe and feeling secure.

I am always cognizant of security, but I don’t want to overdo it. I think with seniors it becomes secure because there are 50 pairs of eyes watching. In that way, senior housing can help the entire neighbourhood.

When asked to describe his design process, he resisted taking credit for innovation. He talked about the abundance of affordable regulations and guidelines simplifying the design process. However, later when talking about features included in the Episcopal Homes buildings he mentioned adding fun to the design and the challenges of designing accessible kitchens.

Design process on low-income senior 550 sq. ft. units, there is only so much you can do. . . Have to work around guidelines and codes but that’s a part of design. Parameters help set design. I have been doing it long enough I can ignore the budget, I know enough it just comes out within the budget.

. . .Every project we try to do a little nice . . .better . . . we do not want people to walk it and say “This is HUD housing.” We are not making a cheap housing project.

It is an impressive ceiling in the community room and I thought what can we do for fun . . .[The] goal is to build something impressive and not 10 ft. ceilings with acoustic tiles. [The ceiling is] also a testament to Saint Paul’s willingness to pay for extras. [The] community is more open to a nice building.
DISCUSSION
There were an abundance of positive comments from elder participants about individual property managers and staff, which the CEO reiterated in his goal of hiring great staff. The CEO’s leadership value of autonomy and hiring goals were also meeting residents’ needs of feeling valued and accepted. According to the CEO,
*I work hard to hire competent people with a diverse set of skills and then work hard to create an environment where they can be successful.*

Each building seemed to have an individual ambiance and programming that met the residents’ needs and linked to their pride in place. The CEO and the architect spent time learning about the neighborhoods, conducting focus groups with potential residents and talking with community leaders. This demonstrated their commitment to recognizing the importance of place for a diverse community, in addition to design and function. For example, one building has an Art Deco façade because a community leader wanted it in her neighborhood. The architect explained that he added color not typical in Art Deco because he did not want it to “look like a poor building.” He listened to the community, added his design expertise, and the result is a building called exemplary by local and national housing experts. We feel the exemplary housing comments are the result of the connections of both attractive and functional design, linked with a thorough commitment to understanding and valuing the needs of the community and residents. These linkages were made apparent in the residents’ comments about feeling accepted, connected to place, and thriving.

Finally, participants preferred living in economically and racially diverse neighborhoods that are often overlooked by profit-driven developers. Residents, the CEO and the architect all feel Episcopal Homes is unique and something truly special, in part because of the dedication to building great homes in the community. According to the CEO,
*In many ways we have no competitors. I hope it stays that way for a long time. University Avenue . . . crime . . . all the ground along University Avenue is contaminated . . . None of those things are scary . . . you mitigate crime as best you can and build to mitigate noise.*

And, as a resident stated,
*Apartments don’t need to be] raggedy...because you’re in the city. Make them nice, too; just like this one.*

The PE-Fit model posits the importance of well-designed and supportive built environments with a variety of challenges will fit many elders and encourage competency. A home with an appropriate level of environmental press interacts with psycho-social resources. We found multiple indicators of quality of life, familiarity, belonging, and attachment that encouraged individual and collective community resiliency resulting in successful aging in place. In this study, the six African American elders, the CEO and the architect achieved their goals to provide the residential ambience, amenities, and inclusive community that helps create peace and a sense of self.
NOTES


5Kate Caelli, Lynne Ray, and Judy Mill. "'Clear as Mud': Toward Greater Clarity in Generic Qualitative Research." International Journal of Qualitative Methods 2, no. 2 (2008), 2.


10Marshall, "Designing Qualitative Research, 214.


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TRACING RESIDENTIAL PREFERENCES OF SOLO-LIVING.
THE FINNISH PERSPECTIVE IN AN INTERNATIONAL CONTEXT

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INTRODUCTION
The functionalist housing innovation – the organization of space around the model of a nuclear family – still defines the spatial organization of today's dwellings in Finland¹. Meanwhile, households and domestic life have changed drastically. Living alone has increased significantly in the last decades along with socio-economic changes, such as urbanisation, rise in standard of living and population ageing. In a way, living alone is a global social experiment – all around the world people live alone more than ever before². The most common household type in the EU is the single person living alone³. In Finland – a country of five million inhabitants with over one million one-person-households⁴, and one of the highest levels of solo-living amongst the EU – the amount of one-person-households is going to be rising up to almost half till the year 2025⁵.

Architectural studies on the field of solo-living often focus on special housing designed for the phases of living regarded transitional, such as senior or student housing. However, living alone at working-age – more conventionally associated with living with a partner and children – has increased in the 'western' countries in the last decades, often dramatically⁶. Deka⁷ emphasizes focusing on the solo-living working adults for the the potential impact on the economic wellbeing they provide of cities today and in the future. Also my research focuses on trend of living alone among the urban working-aged population.

In this paper, I use the term 'solo-living' for defining the distinct social and spatial arrangement of home environment. Jamieson et al.⁸ have defined solo-living as analytically separate from 'being single'. Klinenberg⁹ emphasizes that 'singles' may or may not live alone – some live with romantic partner, roommates or children. Furthermore, 'solo-living' lacks the potentially negative connotations of being 'alone' referred as being lonely. Nevertheless, in my study I consider 'living alone' as a neutral term, as well as 'one-person household', and use them as synonyms for solo-living.

My aim in this paper is to trace out and understand Finnish solo-living of working-age adults in urban settings in European and in broader international contexts. My aim is to capture the current discussions and questions about solo-living through literature review by using the most topical scientific periodicals and existing statistics. I search for the residential preferences of solo-dwellers through re-reading existing preference studies from the viewpoint of solo-living. Likewise, I take into consideration recent studies on solo-living from the viewpoint of residential preferences. Regarding
these preferences of living alone, there are both similarities with other residential groups and distinct features.

In my study I have overall emancipatory interest of aiming to improve the solo-housing in practice. In this paper my aim is to lay out the foundation for scenarios as to meet the preferences and needs of solo-dwellers in light of existing references. In this regard my research will involve developing design concepts by using research-by-design approach. The design concepts will be studied in iterative processes together with the group of solo-dwellers. The intention is to improve the socio-spatial quality of solo-living environments and architectural quality of solo dwellings.

**URBANITY ATTRACTS SOLO-LIVING**

The concept of ‘residential preference’ made a debut in Finnish intellectual discussion and research on housing in the early 2000’s: studies based on extensive quantitative surveys draw a picture of a preference monoculture, where living close to nature, peacefulness and detached single-family housing repeatedly occurred as the salient residential preferences regardless of residents’ education, income level or professional background. On the other hand, qualitative approach and dweller interviews have revealed a more complex and varied scenery on Finnish housing preferences. In economics, preferences are variables behind the consumer's behaviour. According to urban economists Loikkanen et al., residential preferences describe consumer's valuations on housing and depend on household size, the number and the age of children, income level and the way of life. Preferences affect both on the proportion of household income the consumer is willing to spend on housing costs and on the combination of housing attributes the consumer chooses, such as location, size and quality of the home. However, the viewpoint of urban economics is mostly on quantitative contents and in an architectural approach and design process also the qualitative aspects would be valuable. A preference is an optimal and potential choice – both the objectives and the realized actions can be considered as residential preferences. Nevertheless, every choice is not a realized preference; therefore more careful inspection of preferences is needed because realized choices give too narrow overall picture of solo-dwellers’ penchants.

Residential preferences of solo-dwellers diverge from the preferences of population groups in other life phases and situations. According to Strandell, all residential groups in other life phases value peacefulness as the most important comfort factor in a residential area, except people living alone – among whom location, transport connections and the availability of services are the most important comfort factors. The preferred location is urban: living alone in Finland is more common in cities than small towns or rural municipalities. Solo-living favours urban residential locations similarly in other western countries. Inside the cities, living alone concentrates on the inner city and other central and high density areas. For example, the eastern parts of inner Helsinki have the highest population density in Finland, along with the highest ratio of solo-living: in the neighbourhood of Alppiharju, three-quarters of households are of one person. Apparently, people living alone seem to prefer living in the urban centres, regardless of higher housing costs or housing shortage.

Solo-living is retrofitted in the city; the dwellings once designed for families are to be occupied by one person only. The rise of one-person households and thus the rise in average housing area per person leads to smaller population density, even when the dwelling density stays the same. Question arises on the impacts of solo-living on the city and its’ service structure. However, solo-dwellers socially meet friends, relatives and colleagues more than people living with others and use more local services. Consequentially, the social interactions taken place in the urban fabric seem to have a pronounced role in the case of solo-dwellers. Whether the lower population density of solo-living has a potentially negative effect on the local services, or if the more outgoing lifestyle and preference for

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using services within a walking distance has a potential to liven up inner cities, would be interesting to study together with the social scientists. The awareness of both dwelling density and person density is by all means important for architects and planners when designing urban infill for solo-living.

**CONTRADICTORY HOUSING TYPE PREFERENCE**

In survey on Helsinki inner city habitants, half of 'singles' and 'dinks' (childless couples) chose block of flats as their preferred type of housing\(^\text{21}\). What Tuominen finds surprising is that nearly half of this residential group – in the most urban habitat in Finland – found detached house as their preference. A national survey 'Residents' barometer 2010' gave similar results; approximately one third of solo-dwellers under 65 years old chose detached single-family house as their favourite type of residence, whereas almost as many preferred block of flats\(^\text{22}\). The preference for detached housing among the one-person households is not just a Finnish phenomenon\(^\text{23}\). An interesting question is, whether urban solo-dwellers really want to live in detached houses – generally perceived as a housing solution for families with children, or is this due to the lack of more suitable alternatives. Part of the results can be explained by the factor that younger solo-dwellers have a tendency to choose single-family house as their preference based on the expected future stage of life\(^\text{24}\), not necessarily for their prevailing conditions. A solo-dweller may be content with living in a block of flats in an urban setting, but wish for a family life in different residential conditions\(^\text{25}\). As Klenenberg states, many young adults who live alone see it as a stage, not an end point, and expect to find a partner eventually\(^\text{26}\). Those who live alone after separation may have children residing elsewhere, thus accommodating their preferences accordingly. Solo-dwellers' preference for the detached housing decreases with age: two thirds of under 25-year-olds who live alone prefer detached housing, whereas from over 65-year-olds only one-fifth prefer the detached house\(^\text{27}\).

It is worth noting that people living alone prefer housing block as their favourite housing type almost as often as the detached house – the ratio being significantly higher than in other residential groups, where the preference for the detached house is notably more dominant. However, the existence of solo-dwellers who would prefer to live in a detached house is unexpectedly high. Wulff et al. suggests that in Australia the preference for a free-standing dwelling is associated with the preference for home ownership, as the medium or high density housing is more likely rented\(^\text{28}\). In Finland, the dwellers in blocks of flats experience less ability to influence on their residential conditions than dwellers in detached houses\(^\text{29}\), which likely is associated with the detached house preference.

Despite the common preference for detached housing type, it is unlikely that the residential neighbourhoods of detached houses would be ideal for solo-living. There seems to be a contradiction between the preferred urban intensity and the suburban structure the preferred detached housing generates. Further research and analyze is needed to define the particular qualities or contents – whether it is the spatial versatility of the home, surrounding garden, the autonomy of living, the distance from neighbours, the accompanying family life or some other aspect – that cause many solo-dwellers' preference for detached housing type. From the viewpoint of housing design it would be valuable to find the forms of manifestation for the preferred qualities in other, more urban, types of housing.

**ECONOMY OF SOLO**

The social and economic status of living alone vary globally. Deka's analysis shows that higher education, a middle-class income and central-city residence are positively associated with the likelihood of living alone in US\(^\text{30}\), whereas in Nordic countries – countries with the most one-person households – living alone is common on all income levels, also (and especially) in the lower end.
Living alone and low income level are strongly interconnected in Finland. However, when only ages 35-64 are regarded, living alone is quite evenly common among all income levels. Majority of Finnish working-age adults who live alone do not yet live in a dwelling they would consider to be the ‘goal-dwelling’, which is distinctly fewer contented than of adults same age living with partner, or partner and children. Households with two income have more potential to realize their preferences. According to Finnish Residents' barometer 2010, solo-dwellers are one of the residential groups whose residential preferences on housing type have realized the least. Presumably the often preferred detached house is not a realizable option for many solo-dwellers neither financially – nor for practical reasons like maintenance. Home ownership is another often unrealized preference of Finnish people living alone, although one-person households do prefer renting more often than people living with others.

Is a solo-dwelling considered to be small? According to Tiihonen, less than half of Finnish one-person households live in one-bedroom apartments, one-third in bedsits and almost as many in apartments with two bedrooms or more. In Finland, the average housing area per person in all kinds of households is distinctly lower than in western Europe. Small dwelling is usually not a preference: residents prefer larger dwellings if they can afford it. However, as most Finnish solo-living working-age adults find the size of their current dwelling to be just right, the architectural quality of solo-dwellings ought to be improved by other means than up-sizing apartments. One-person households already spend a larger proportion of their income on housing expenses than people living in two-income households.

**SUSTAINABILITY AND THE RESIDENTIAL PREFERENCES OF SOLO-LIVING**

The rise of living alone is not only a social change, but a change in consumption patterns. A body of research suggests that the increase in small households has lead in grown environmental impacts. The average housing area per habitant in one-person households is larger compared to multiple-person households, and goods like household appliances are allocated to one person only. However, in the light of commuting – which constitutes roughly as large part of the material footprint of an average Finnish person as housing – solo-living appears more sustainable compared to the way of living in multiple-person households. The preferences for good transport connections and the availability of local services seem to lead in more sustainable commuting and consumption patterns: people living alone tend to use more services located near home, as they live in central locations and do not own cars. The phenomenon of people living alone being more likely to use public transit and walk, being less likely to use personal vehicles, and commuting shorter distances and times compared to people living with others is consistent in many car-dependent societies. The residential location placed to the urban inner city has potential to act as the foundation for sustainable solo-living. As the suburban sprawl is a current problem both in Finland and in cities globally, some features of urban solo-living, like mobility patterns, could set an example of a sustainable urban way of life.

Deka states that the environmentally sustainable travel patterns of people living alone are due to the lower level of living in detached houses and the higher level of renting, which enables moving for job proximity. If this is also the case in Finland, it means that the unrealized residential preferences of many solo-dwellers – detached housing and owner-occupancy – are potentially in conflict with sustainability. Moreover, the more sustainable travel patterns of solo-living are not to be taken for granted in the future, as a mild trend for longer commuting distances and times and reduce in the use of public transport can be found within the one-person households in US. It is all the more important to develop novel housing concepts that both meet the preferences of solo-living and maintain the environmentally sustainable travel patterns.
One-person households are easily scapegoated in the issues of unsustainability; however, the household income level and the individual consumption patterns play a more significant part in the material footprint than the size of a household\textsuperscript{48}. Furthermore, a recent Finnish study states that a sustainable level of natural resource use cannot be achieved in Finnish society merely by changing individual consumption patterns, but that it requires institutional changes, as the material footprint of the studied low-income one-person households was in the most cases considerably lower than the Finnish average, but exceeded the level estimated as ecologically sustainable at least by a half\textsuperscript{49}. Awareness of the ongoing shift from multiple- to one-person-households is needed when outlining institutional actions in order to reach sustainability, such as regulation for resource efficient housing, and planning of urban structure that supports efficient public transport and local services.

Juntto\textsuperscript{50} suggests that in the expensive urban central locations the quality of housing could be improved in the future by investing in services, thus 'outsourcing' segments of domestic life. Novel concepts of shared commodities like shared spaces and goods could affect on the size of dwellings and help to reduce material footprint of solo-living, improving both affordability and social and environmental sustainability of living alone. Virtual spaces and smart services ought to be taken into consideration too when outlining novel concepts for sustainable solo-living. Tervo proposes creating a satisfying home environment by collecting a combination of spaces and services around the private apartment, granting further resonance with changes in life situations\textsuperscript{51}. Improving the social and spatial quality of solo-living environment requires interdisciplinary study of both the actual and virtual home in order to build a comprehensive view of urban solo-living.

**CONCLUSIONS**

When drawing conclusions on the residential preferences of solo-living, it is crucial not to mix locational preference with dwelling type preference. The preference for urban central location does not automatically include housing block as preferred dwelling, nor does a preference for detached house necessarily mean that a solo-dweller would be interested in living alone in low-density suburban location. However, urban location is usually the realized preference with solo-living. Choosing a home is a complex decision making process of finding the right combination of housing attributes such as location, size and quality of the home. In further study I aim at searching for the qualities the detached housing type represents for solo-dwellers, in order to use research by design methods to develop housing concepts that meet the preferred qualities without compromising the preference for urban intensity nor the environmentally sustainable travel patterns.

**Solo-home concepts**

While the organization of dwellings is still much dependent on the functionalist tradition of a family home, under one-fourth of Finnish households are nuclear families. The urgent demand for dwellings suitable for small households is clear for the housing developers, and most of the new apartments in urban central locations are targeted accordingly. Challenge is the lack of true innovation; the layouts of apartments are simply scaled down to minimum, instead of taking the design solutions especially suitable for small households as the starting point\textsuperscript{52}. The excess demand of small dwellings has not urged the developers for product development. Perhaps, the mindset of seeing living alone as a temporary stage of living affects on the eagerness to elaborate novel architectural layouts and concepts. Relatively little is known on the solo-living preferences and needs, especially concerning more detailed qualities of the home. Re-thinking contents of solo-living may also involve requirements for urban design and planning.
In the last decades the greatest leaps in the quality of Finnish housing have happened in detached houses, much due to the customer-centered design processes. Perhaps participatory strategies with dwellers in study and design of living alone could be helpful in tracing out the complex, sometimes contradictory, preferences and housing decisions of one-person households, in order to develop novel concepts for solo-living.
NOTES

1 See: Kirsi Saarikangas. *Asunnon muodonmuutoksia. Puhtauden estetikkä ja sukupuoli modernissa arkkitehtuurissa.* (Helsinki: SKS, 2002.)
20 Strandell, *Asukasarometri,* 34.
21 Strandell, *Asukasarometri,* 75.
22 Strandell, *Asukasarometri,* 75.
23 Strandell, *Asukasarometri,* 75.
24 Strandell, *Asukasarometri,* 76.
25 Strandell, *Asukasarometri,* 76.
26 Klienenberg, *Going Solo,* 60.
29 Strandell, *Asukasarometri,* 76.
30 Strandell, *Asukasarometri,* 76.
31 Strandell, *Asukasarometri,* 76.
34 Juntto, Suomalaisen asumistoiveen ja mahdollisuudet. 
36 Ibid 
37 Wulf et al., Why Don’t Small Households Live in Small Dwellings?, 58. 
38 Juntto, Suomalaisen asumistoiveen ja mahdollisuudet, 125. 
42 Strandell, Asukasbarometri, 34. 
43 Darren M. Scott and Mark W. Horner. The role of urban form in shaping access to opportunities: an exploratory spatial data analysis (Journal of Transport and Land Use, 1(2), 2008.), 113. 
44 Deka. The Living, Moving and Travel Behaviour of the Growing American Solo. 11. 
46 Deka. The Living, Moving and Travel Behaviour of the Growing American Solo, 11. 
48 Kotakorpi et al., KotiMIPS, 62-64. 
49 Hirvilammi et al., Kohtuuden rajat?, 84-90. 
52 Anneli Juntto. Suhdanteet ja trendit muovaavat asumisen tulevaisuutta, 292. 

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TERRACED HOUSE TYPOLOGY AS POLIS – SIEDLUNG HALEN AS A LONG-TERM DEVELOPMENT

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INTRODUCTION
Over the past five decades, steady change in society's life style and demographical transformation have had an impact on the requirements for habitats. The reaction in housing discourses to face these social and ecological needs is dominated by approaches favouring new typologies.

Meanwhile, housing policy in Europe follows the strategy of new constructions to provide demanded housing. But as Jörg Stollman points out, new residential areas are created as replicas of established morphology of the Gründerzeit, estimating to gain urban quality by reproducing formal patterns. The results are artificial quarters without identity and diversity, adhering to a lack of planning strategies providing adaptable structures for continuous social and urban conversion.

Both approaches undermine a crucial aspect of housing stock, originated in the Booming Years. Due to lack of time distance there is still a contempt of this architecture and of raw concrete as representing element of the period’s Zeitgeist. Fifty years later, the life span of these buildings is coming to an end, demanding for resilient concepts of this stock; therefore, the awareness of architects and historians towards the built legacy of the period has increased. For the first time raw concrete appears as renovation measure in residential building stock, requiring new and specific approaches in order to tackle the dissolution of raw concrete. However, for housing, demolition or standardized renewal general chosen solutions are still favoured. Thus, important “mind maps” of generations and also positive evaluated housing resource disappear.

This loss relates particularly to the terraced house typology (Terrassenhäuser) of the late 1950s to 1970s. Inhabitants appreciate the high living quality, provided through a specific architectural – sociological approach which facilitates potential as long-term developments. As raw concrete has been disregarded this innovative typology has been affected and therefore strategies for its update are required; on the one hand featuring its intersections and diversity of interior and exterior spaces and on the other hand referring to the human scale generated through concrete elements while following the language of the whole settlement. The design idea and approach of a “human” housing typology emerged as consequence of the critics of concepts in the early post-war era, which were destroying the urban and rural context with Megastructures or the spread of mono-functional planning.
SPIRIT OF HALEN: PAST - PRESENT - FUTURE

A masterpiece of this typology is the Siedlung Halen (housing development Halen) near Bern/Switzerland. More than five decades after its finish, the spirit of Halen is still alive, however, since the past decade, the deterioration of the structure is demanding interventions transforming it into a long-time development. Therefore, it will be analysed as reference for a holistic resilient approach and to raise awareness towards the quality and meaning of raw concrete in the architectural language. The Siedlung Halen was designed by the Swiss architects of atelier 5 in 1955. In Switzerland this period was marked – similar to other countries of Western Europe and North America – by an economic boom, generating an increasing change in western society and life style. New technology was promoted as being a guarantee for progress, prosperity and social welfare. New housing concepts and urban settings represented the transformed environment. However, in the early modernism period, Switzerland was highly influenced by the modernism movement and Werkbund; in the post-war period, new constructions in the residential sector were characterised by an absence of international architectural discourse.

Due to the design in the late 1950s, the Siedlung Halen pioneered the discourse of structuralism and approaches of terraced housing in the Booming Years, proposing an economical and valuable alternative to single family houses, also including the commitment to create an urban community living. Its typology enables the generation of units facilitating privacy inside and outside and communication via community spaces to interact with other inhabitants if required. Car free public spaces and facilities with green areas foster a lively atmosphere of gathering and encourage diversity in the everyday life of the Siedlung (housing development). Their design of living space is not triggered by a particular image; on the contrary, the task is approached in a conceptual way, focusing on the needs of users. However, as the inhabitant must be perceived in connection to the community suitable community via urban democracy has to be designed, forming a balanced composition of privacy and community.

The social-political commitment to “apparently non-architectural” aspects of atelier 5 implied the creation of housing based on community coexistence without hierarchy between inhabitants and participation in a democratic way. Discourses about the work of atelier 5 contextualize the project as initial project for housing developments in raw concrete which is marked by their experience and their preference of reinforced concrete. However, raw concrete is not applied to all façades; it becomes the identifying element of the Siedlung and therefore exemplifies the significance of required awareness and influence of the material on the creation of identity. In Halen, the perception of a whole autarkic structure is shaped by the unifying elements of raw concrete which generates the link of public and private spaces The statement of one of the children who lived in Halen confirms this connectional perception: “[… if you cross the bridge, than you perceive this structure in the middle of the forest, […]. That is Halen for me.” By creating the main facades and elements in reinforced concrete and also forming the structural system of cross walls in this material, the units can be recognized but are at the same time embedded in a primary structure, forming the frame for the partitions; facilitated by structural property of raw concrete it at same time generates a similarity in the facades (here south facade). The absence of hierarchy strengthens the community and equality between inhabitants.

Particularly in terms of the late 1950s this far-sighted architectural planning of housing as a polis facilitates common, useful and adoptable spaces in a unique structure. At the same time, the architects have chosen raw concrete for the main facades not only as unifying but also as innovative material. In the 1950s to 1960s raw concrete made a difference particularly in terms of this new life style; a fact which atelier 5 intentionally used to distinguish their work. They’ve aimed to point to a distinction
between this housing development based on a new approach of living style and spirit and the established or wide-spread housing types of the “rural romanticism-revival”\textsuperscript{31}. Therefore, raw concrete was subsequently used as atelier 5’s oeuvre\textsuperscript{32}.

In comparison to the traditional built environment of that time, raw concrete is perceived as different material, becoming the outstanding feature of the Siedlung. Thus, the development and its inhabitants are associated with this concrete, implying the connotation of being different which leads to the recognition of a group. In retrospective, Halen children – the first generation of children who grew up in Halen – remember being called “crazy” or “avant garde” when they found out that they were inhabitants of Halen or their parents wanted to live there\textsuperscript{33}. The distinction between concrete and common construction outlines a differentiating character, consolidating community spirit\textsuperscript{34}. This underlines a sense of belonging to the community and defines the Halen spirit. The statements of the children of Halen contradict the stigmatization of raw concrete; on the contrary, due to its materialization a proper identity was formed, reinforced by the experience and collective remembrance\textsuperscript{35} of space. For atelier 5 however, this dense living implicates the need for an elaboration of housing project regulations; this settlement constitution was passed in Siedlung Halen on an exemplary basis for following housing projects. The constitution determined limits and responsibilities of the individual in a community, pointing out that modifications inside the resident’s
units are always allowed as long as they do not have a negative effect on the privacy or liberty of others; tolerance and respect are the main aspects of democratic spirit. Therefore, the initial idea and intention to provide modifications and therefore flexibility of living space is confirmed. Establishing a primary structure which connects the whole units is the foundation to guarantee the spatial frame and so the identity of the community. Thus, transformability is one inherent and essential feature of this typology; therefore the conceptualization ‘resilient type of housing’ is ensured.

The unfinished character of raw concrete is crucial and evokes a certain liberty for architectural interaction and the possibility of space adaption, being a material for “objects of utility” and “interpretation”\(^{36}\). This design parameter of “identification-in –space through built-environment [which] correspond[s] to ‘ownness’ […]”\(^{37}\), creates the basis for identity formation within the community. This idea resembles the approach of \textit{structuralism}\(^{38}\). Milena – one of the Halen children – stated in the interview, that for her the most relevant element for the experience of space was the “simplicity, functionality” of the Siedlung. An important housing reference for atelier 5 was the life style and use of habitats in Mediterranean cities such as Naples\(^{39}\), where people use their houses without focussing on the aesthetics of maintenance; on the contrary, they are able to establish their life between given spaces. Perhaps due to Halen’s innovative character she also compares it to “pueblos” and “\textit{Indianerdörfer} (Indian villages)\(^{40}\). This statement echoes a special milieu\(^{41}\) in Halen, resembling the intended atmosphere of a Mediterranean village\(^{42}\), where streets serve as venues for citizens and even playgrounds for children. People gather in plazas as well. For atelier 5, the primary success criterion of a Siedlung is the behaviour of its children. If they use common areas in their naïve and uncomplicated manner, the Siedlung passes the test as a long-term urban setting\(^{43}\). The durability of the architectural living concept and valued Siedlung is transmitted by the sign of time – the patina, representing the Siedlung’s common history and validity as a whole, creating the community’s identity over generations; patina is an important quality\(^{44}\) and has been considered in the conceptual idea of atelier 5 by choosing concrete\(^{45}\). Its valued ageing reflects living history and communicates personality and appropriation of the houses by the inhabitants.

\textbf{Figure 3. South façade in 2010, in Zumbühl 2010}
More than fifty years later, life style, ecology and building standards have changed. Like the first generation of the inhabitants’ children the Siedlung Halen has aged. However, the settlement is still one of the most valued living spaces in Switzerland.

But, ageing of construction complicates this potential. Identity loss might be evoked which affects the community. Problems caused by the ageing of the Siedlung have increased in severity. From 1990s onwards owners of Halen have been facing a continuous acceleration of construction problems⁴⁶, provoking a problematic situation for the valued living space.

In the beginning, small interventions were not seen as a problem, but later Siedlung Halen was increasingly perceived as significant architectural patrimony. The icon was considered to be in a worrying condition and there were concerns about its eventual decay. In 2003, the Siedlung was therefore listed in the Inventar schützenswerter Bauten des Kantons Bern als Objekt kantonaler Bedeutung (cantonal inventory of buildings in the canton of Bern worthy of protection, declared as an object of cantonal significance). Due to this application the energy requirements for the Siedlung were less strict. However, this protection did not resolve the problem of missing concepts to deal with on-going technological problems⁴⁷.

The problematic situation increased, more damages were detected in the flat roof sealing and in the raw concrete elements. In order to simplify the decision process of renewal works, the cooperative of Halen assigned a committee responsible for the coordination of measures. Thus, in 2013 atelier 5 in cooperation with the authorities of Bern enforced guidelines⁴⁸ in order to simplify the detection of important architectural elements. Moreover, the concept was explained to citizens and priorities on intervention schedules were set, also to prevent standard solutions. Furthermore, possible individual modifications were recommended. Yet, suggesting a specific technological methodology for restoration works such as raw concrete was not on their agenda. Such issues were supposed to be contracted before deciding on the reparation or where not to apply outside insulation⁴⁹. Due to missing research and knowledge in the field of the construction industry or due to economic reasons and alternatives, most provided works did not seem to match expected solutions⁵⁰. Due to a lack of agreement in the cooperative or convincing alternatives decision were made delayed and have since been complicating the process for decisions and repairs⁵¹.

In the past, Siedlung Halen exemplified housing development which embodies the character of unique contemporary urban settlement involving high privacy but also encouraging an intense spirit of community as “collective space”⁵². Due to its architecture and the commitment of its inhabitants and
architects the character has survived society changes; assumptions regard an update of the Siedlung’s qualities. As the investigation shows, Halen possesses the demanded resilient structure, the potential to continue providing lively habitat with community spirit and ability for transformations without losing its character.

Figure 5. Plaza of Halen, in the 1960s, Bezzola 1972; Figure 6. Children helping “cleaning” the forest, Plaza of Halen in the 1960s, in Wiesmann-Baquero 2005

Halen is exemplary for a settlement with positive social impact on its inhabitants over generations. The transformability on the one hand and the significance of the materiality as identity-forming instrument on the other hand must be pointed out by architects. Changes in standardized methods for concrete reparations, ground floor options and the meeting of energy requirements should be part of a holistic approach, considering the typological characteristics. Therefore, methodologies and strategies are needed to support inhabitants in transforming their habitats into long term developments.

Figure 7. Plaza 2010, in Zumbühl 2010

CONCLUSION
In housing, outside insulation with standard artificial plaster and flat roof finishing with external roof drainage of metal are examples of these common reparations. This concept leads to the loss of
volumetric layers which are necessary for the creation to perceive units and to generate diversity through the joints of formwork and concrete elements in one structure. The difference in concrete surface differs in terms of a homogenous plaster finish due to changing light reflections on the stone mixture of the coarse-pored material. Moreover, the natural character of concrete which implies the creation of patina, neglecting ageing of buildings of this period is ignored. The effects are also deleted while applying concrete glaze, due to its characteristic of closing the pores. Therefore, an artificial shiny surface is generated. These strategies demonstrate the maintenance driven approach and also lack of knowledge or budget for specific renovation works. In particular, missing concepts were brought about by the fact that concrete-cosmetics are frequently replacing restoration work\textsuperscript{54}. Interesting approaches do already exist, as seen in the restoration works on the raw concrete facades of the university building in Aachen (Germany) Rechenzentrum RWTH Aachen, which have been executed by the German restaurateur Rochus Michnia\textsuperscript{55}. However, such approaches are generally not considered regarding housing stock, ignoring the significance and the role of reinforced concrete as identity creating element. The potentials of concrete would disappear; atelier 5 views the character of concrete as “natural” material which “demonstrates the marks of formation and [does not hide] the signs of ageing, a material which has achieved its final state in its rawness, which can be continuously applied on inner and outer elements. Therefore, the approach of “moderner Raumplan” (modern floorplans) is ensured; thus, Raumfolge (sequence of space) is not a matter of addition of closed boxes but one of continuous interrelation. Concrete is the material […] which it [sic: nature] assumes; through its simplicity it is capable of acting as organizing material of a whole with high complexity […].\textsuperscript{56} Concrete is not artificial, it ages such as other natural materials and therefore creation of patina is desired and a quality.

New approaches to technologically update the construction stock and professional advice are necessary to develop long term living space. Also economic solutions have to be elaborated to facilitate reliable quality for daily living spaces, while providing the characteristics and therefore the qualities of the Siedlung. As consequence, considerations about renovation works should not convert residential stock into delicate artwork of high maintenance. The concepts have to meet the approaches of Terrassenhäuser offering available housing of high quality in a community, and at the same time providing possibilities of modifications within the primary structure.

The aim of restoring raw concrete is to repair technological damages by maintaining the surface of the material, working out the modulation of the elements in the whole composition, and, at the same time, offering a contemporaneous expression; the overall picture of the Siedlung remains and the construction is not affected; however, a patina can be created. Thereby, the perception of aged raw concrete changes from “dirty” into surfaces of quality and persistence\textsuperscript{57}, improving the settlement and emphasizes its quality as durable and sustainable habitat for generation that triggers the “mind maps” of inhabitants. Raw concrete plays an important role in creating this perception, achieving a new definition of its meaning in the architectural language and meaning for its criteria in society. Growing awareness for the meaning of raw concrete as identity creating element in Terrassenhäuser of the Booming Years could provide the first step towards the evolution of resources into long-term housing developments and therefore to establish a resilient approach in housing policy by considering a re-evaluation of the Terrassenhäuser of the Booming Years.
Figure 8. Children playing in Halen, 1960s, in Wiesmann-Baquero 2005
NOTES

(Quotes from German references were translated for this paper by the author)

2 Peter Ebner, "Die Stadt, die Wohnung und der Raum," in *Housing is back* (New York: Springer, 2002), 10ff.

Living spaces have to be adaptable for the needs of changing social-political and ecological parameters in housing.

5 This term defines the architectural historical period of the 1960 to 1970s in Western Europe, in Switzerland the period is also including the 1980s. For detailed explication see also Uta Hassler, *Offene Fragen,* in *Bauten der Boomjahre – Paradoxien der Erhaltung*, ed. Uta Hassler, and Catherine Dumont d’Ayot (Zürich: Infolio, 2009), 8, and Martin Behnisch, “Raum-zeitliche Struktur muster im Schweizer Baubestand,” Ibd., 246.

She points out that architects, historians who censured the architectural and urban approach in the late 1970s as "initiator for the destroyer (Zerstörer) of urbanity" and “deleting the urban center (Urbane Mitte)”, are still in the positions of evaluating building stock as patrimony nowadays. Due to their rejecting position in the 1970s, attitudes towards the built legacy of the Boom Years have to undergo a shift in judgment. The lack of definition in patrimony definitions of the post war period is also supporting the problem of objective judgement.

7 Reyner Banham, *Brutalismus in der Architektur: Ethik oder Ästhetik?* (Stuttgart [u.a.]: Krämer, 1966), 27.
8 Since 2003, the building stock of the 1960s – 1970s is main subject of interdisciplinary symposiums and exhibitions mainly in Germany, Switzerland, Austria and Britain, see for example the call for interdisciplinary concepts in Haspel, Jörg, "1960 plus - ein ausgeschlagenes Erbe? - Resümee.". See also: Karen Beckmann, *Urbanität durch Dichte? Geschichte und Gegenwart der Grosswohnkomplexe der 1970er Jahre*, (Bielefeld: transcript, 2015), 37-40.


12 See also Ibd., 15. The author describes the loss of a great part of East German's built legacy which is creating a lack in the identification of the contemporary witnesses of the time before the Wende (reunification of Germany). This can be applied to international cases of habitat-loss of the Boom Years, due to the similar specific approaches in their design.

See for example the discourse about the need of planning strategy and approaches in: Smithson, Alison, ed., Team Ten Primer (London: Studio Vista, 1968), 47.

In the late 1960s first reaction came against the "destroying" concepts of the Post war period. The climax of these critics was achieved in 1975 in the Year of Patrimony; see for critics: Jane Jacobs, 1961 and Alexander Mitscherlich, 1965 or the exposition "Heimat Deine Häuser", 1968.

Heinz J. Zumühül, Siedlung Halen: Meilenstein moderner Siedlungsarchitektur (Bern: Haupt, 2010), 53.

Atelier 5 was founded in 1955: Erwin Fritz, Rolf Hesterberg, Alfredo Pini and Hans Hostettler worked for the renowned architect Hans Brechbühler in Berne, who was one of the most popular representatives of modern architecture in Switzerland. Their colleague, Samuel Gerber, joined them after returning from working in Brazil for Roberto Burle Max. Hans Brechbühler worked at Le Corbusier's office for seven months. From 1953-1955 Erwin Fritz, Rolf Hesterberg, Alfredo Pini and Hans Hostettler (founders of atelier 5) worked in Brechbühler's office. His thinking was a major influence for them and they called him their "intellectual mentor" (translated by the author), see interview with Hans Hostettler and also for more detailed information of the influences of this office in Heinz J. Zumühül, Siedlung Halen: Meilenstein moderner Siedlungsarchitektur (Bern: Haupt, 2010).


Nancy Wiesmann-Baquero, Die Kinder der Siedlung Halen (Bern: Simowa Verlag, 2005), 74.


Ibid., 6, 7.

See also for the intention to provide democratic spirit in housing: Smithson, Alison, Team Ten Primer, 41.


Nancy Wiesmann-Baquero, Die Kinder der Siedlung Halen (Bern: Simowa Verlag, 2005), 74.

Michael Hecker, Structuralism in architecture and urban planning (Stuttgart: TU Stuttgart, 2007), 118.

The critic of a certain revival is reflected in Max Frisch, Schweiz als Heimat? (Frankfurt a. Main: Suhrkamp, 1990), 146-148.

Friedrich Achleitner, Atelier 5. Basel [u.a.]: Birkhäuser, 2000, 17

Nancy Wiesmann-Baquero, Die Kinder der Siedlung Halen (Bern: Simowa Verlag, 2005), 74, 104, 119, 121.

See interview with Milena in ib., 74.

Ibid., 66.


Michael Hecker, Structurel | Structural (Stuttgart: TU Stuttgart, 2007), 118.


Nancy Wiesmann-Baquero, Die Kinder der Siedlung Halen (Bern: Simowa Verlag, 2005), 74.


Anatole du Fresne and Atelier 5, Siedlungen (Zürich: Ammann Verlag, 1984), 45.


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