Flexible Design in Low-income Housing

Luo Xi

1 Introduction

The study trip into low-income housing in Metro Manila have give me the idea of writing this paper. When our group was doing interview we went inside many households. Every households have their own characteristics, some are quite well furnished while some are more simple; some have well designed walls inside the house that allows air to flow while some only put up cheap wooden board to divide space; some find ways to create more space by building inside while some occupy the space outside. It is amazing how some of these households were developed from the same space layout but turns out to be diverse results and give you quite different feelings. In these households I see many personalized space characters, a construction worker building the additional part of the loft for more space, families dividing space and decide the room dimensions according to their need, and households making use of the small front door space for growing vegetables are all good examples. I believe flexible design is the key to creating diversity and that it enables personal characters in a vast housing community. This can gradually change the people's attitudes toward community life to be more optimistic and participating.

This paper focuses on flexible design as a solution to low-income housing, with a brief background of flexible housing on a historical view and an introduction to the common design strategies, then bringing the topic into the context of low-income housing design, where I discuss how to achieve flexibility based on the observation and interview studies of housing projects in Metro Manila. The aim of the paper is to guide flexible design on a housing level, which will in return create a better community life.

2 Literature Review

This chapter has three focuses, first on introducing the definition of flexible design to give a clear idea of the topic, then on the motivations to adopt flexible design in a historical view, which will serve as a strong support to flexible design as a solution to low income housing on the next chapter, and finally on how flexible design have been achieved by architects, together with criteria for the methods.

Flexible design in housing

Before we move on to any further discussions, we first have to answer the questions: what is flexibility, and what is flexible housing.

Nabeel Hamdi defines flexibility as the freedom to choose among options or devise programs that fit the individual needs and aspirations. For architects, flexibility describes the capacity designed into buildings, building programs, or technologies to ensure an initial good fit and to enable them to respond to subsequent change.When flexibility is designed into housing, it becomes "housing that can adjust to changing needs and patterns, both social and technological. This definition includes changes on personal, technological, demographic, economic, and even environmental aspects", which reflect in flexible design that it is not only about playing with physical changes but also satisfying social needs. Beatrix Colomina has a better description for flexible housing, "the house had to efface itself in favor of the creative choices made by their occupants. Its only role was that of the 'shock absorber', that protects a unique and ever-changing lifestyle."(Colomina, cited in Murphy, 1997) Physical changes like the mix of units, the change of internal layouts, and the upgrading of properties are all reactions to satisfy social needs.

Another thing we should always keep in mind is that flexibility is not one-man's work, that it is achieved by both architects and the residents, it has to withstand the flow of time. Before being occupied it is the architects who imagine the different future uses and find design approach, but it is the residents who actually make use of flexibility after occupying the house. In some cases architects work or discuss with their client and fulfill their ideas based on a flexible framework, but in the majority cases, especially when it comes to massive production, communication is impossible. Therefore we should always be aware that flexibility is something we take part in to create chances before occupation instead of taking control over everything that is going to happen. Karsten Harries has a good description for architects, that

we live in the "terror of time", for that reason we are always trying to do our best in determinate aspects of an architecture, flexibility, on the other hand, is teaching us how to be indeterminate.

A brief history of flexible housing in the twentieth century

There are many solutions in design to create better housing, flexible design is just one of them, and not always the best idea. But why do people choose to use flexible design? If we take a look into the history of flexible housing we will probably find the answer.

It is rather difficult to tell the history of flexible housing in a narrative way, as it is actually "developed in two ways, the first is as a result of the evolving conditions of the vernacular, the second is as a result of external pressures that have prompted housing designers and providers to develop alternative design solutions, including flexible housing". Although the former apparently appeared earlier in history, most of it was not officially recorded. However as a spontaneous action which represents the people's intellect in solving spatial problems in an effective way, they more or less affected and inspired the architects.

It is suggested in the book, *Flexible Housing*, that there are three episodes where flexible housing come to the fore when seeking for housing solutions. First being the need for mass urban housing after the first world war, motivated by social and economic forces. Many great architects like Rietveld and Taut played an active part at that time, delivering ideas such as indetermined space and foldable furniture for the minimized housing space.The second being the rise of industrialized methods of construction after the second world war, starting with the advocated project that could be produced on assembly line by Le Corbusier, to the standardisation of building components, which were seen by Gropius as "an opportunity to provide the greatest possible variability in the floor plan"(1910 cited in Ludwig, the year of Ludwig's book), to the belief that flexibility would be inherent in industrially prefabricated and systematical buildings and their components. The last being the interest in flexible housing as means of providing user choice in the 1960s, aims on providing user empowerment throughout the lifetime of a building was put forward by Nabeel Hamdi in *Housing without Houses*, and similar spirit was found in Ottokar Uhl who claim "the objective of participation by future dwellers in the planning of their homes is to make houses more democratic".(Uhl, 1984)

After looking at the development in flexible housing it is easy to come up with the conclusion that flexible design is used when massive housing, usage of limited space,

participation, and people's will to decide their own lifestyle are demanded, and it has to be supported technologically.

Form and strategies

The goal of flexible design, as I have mentioned in the introduction, is to create diversity in the neighborhood, to provide "variable interpretive opportunities to package programs"(Schneider & Till, 2007). In order to achieve that, a variety of forms and strategies were developed.

It can be learned from the informal settlements that improvisation, extension and addition are the three most common ways to enable change, improve the fit and to personalize. Architects formalize these processes to create design strategies, these strategies can be listed from "soft to hard", as is categorized in *Flexible Housing*, where soft refers to tactics which allow a certain indeterminacy, with little or no intervention of architects in the foreground, while the hard approach include using elements that more specifically determine the way the design may be used, and the architect "frame the user as an operator of architectural equipment".

The soft strategy towards flexibility starts from creating space, for example raw space which provides options under the restriction of permanent elements like structure, excess space which provide more space but with lower specification, and slack space which refers to areas that are anticipatory of potential occupation, for example flat roofs and courtyards whose contents are yet to be decided. Making additions and extensions are more restricted within a structural framework, as well as the idea of joining together different housing units and splitting them up to create new units of different dimensions, which is a very economic approach to deal with the changing family compositions. Apart from that are the more "hard" strategies that create rooms but without determining the functions, or introducing components like sliding walls and folding furniture that are easier to handle by the residents.

The above strategies are more like a brief conclusion of what we have tried to do, but when it comes to a certain context, in this case low income housing, some strategies can fit in and be further discussed while others are not. In the next chapter I will focus on flexible design in low income housing and express some of my opinions based on answering the question: to what extent shall we architect participate in designing flexibility?

3 Flexible Design: A Solution to Low-Income Housing

Nowadays urbanization is becoming a global challenge, the number of urban population is growing at a considerable speed every year, one out of three billion of the world city population is under the poverty line. Due to the lack of affordable housing for the poor population, slums and informal settlements appear at every possible place, occupying fragmented pieces of city space or unused land which may be exposed to natural disasters such as flooding, taking up space inside obsolete structures which may be collapsing at any time, and even in heavy polluted areas on the outskirts of town. These areas provide a perfect condition for the spread of crimes and disease. The proposal of building massive low-income housing to accommodate the people living in such areas is therefore put forward to create a better life not only for them but also for the urban environment on a larger scale.

However, designing for low-income housing is facing unavoidable challenges, the first being the huge demand in a limited time, as we can see many buildings have been built in a haste for current need but with little future consideration. The second being the lack of funding, which reflects to the architectural level as minimizing the space from public areas to the housing units. Third being the design process during which the architects make all the decisions without the participation of the people, focusing more on technological level rather than caring about their physical and mental needs, as a result the project may come out as a "shock" instead of a "shock absorber".

If we take a look back at the history of flexible housing, it is not hard to find that the challenges low-income housing is facing today greatly match the historical conclusion where flexible design comes out as a good solution.

Listening to the voice of people

The proposal of using flexible design in low-income housing may sounds like a complete design issue, but before we start putting anything on paper, it is crucial to know the real need of our future residents, what are they expecting of their new home? What kind of housing gives them a better feeling of home? Are they going to do extensions if possible? Is it affordable to complete the furnishing or divide an indetermined space by themselves? We may get various answers, but since the design of housing is always based on what we know as the similarity of people, we can always get an first idea of what we are going to do to be on the right track.

Listening to the complaint of those who have already been living in a low-income housing project is of the same importance, knowing what people are unhappy about can always push the design forward. The answers may not even be of spatial concern but can be solved with flexible design. According to the conclusion from many of the surveys we did in Metro Manila, there are some common problems. One is the need of more space, but they can only expand within their units. When they have enough space they need to divide and furnish it, but some of them can not afford it, leaving the floor bare concrete and using paper boards as walls. Also they are only allowed to own one unit and couldn't buy more and finally,they dislike the way their neighbor sells the house to people who are actually not low income and are complete strangers to them.

Now that we have an idea of their likes and dislikes, we have to find out accordingly what types of flexibility is best preferred. It is not always about introducing a new strategy or technology, but getting the right one fit. More space is always desirable for a household with average 5 members in the Philippines, therefore the flexibility for extension should be considered a good solution, both inside the units, like providing a height for the possibility of making a loft, and outside the units, as long as it is within a certain framework. Leaving people space to do their own extension is a way of bringing in user participation. The joining or splitting up of units inside a frame structure should also be applied. If a household moves away the units could simply be sold to its neighbors to get a bigger house instead of having a stranger next door. Although furnishing is always considered responsibility of the user, introducing cheap space-saving pieces like folding beds and sliding doors are not always a bad choice. So here I am not proposing a community with same flexible design strategy for every buildings and households, but a multiple choice where they can chose the most suitable answer. Since flexibility is the freedom to choose among options, why not start by creating a flexible community?

Creating more out of less

One of the main challenges in low-income housing is to provide a large number of housing with limited money and space. In order to create "more" we often have to do as "less" as we can, less design effects and housing types are always preferable for massive production in a money-saving way. As a result we create communities like Mucho Lote in Guayaquil, Ecuador(Johansson, 2015). It did solve the problem for current need, but at the same time it is

a boring area where every place looks the same without any sense of community. The idea of creating more is not all about quantity, but about diversity.

It is common that when we talk about building low-income housing or social housing, the first thing that comes into mind are the huge boring blocks made up of massive repeating units , framing peoples activities in a same layout of space and assuming they have the same lifestyle. This is one of the reasons that people dislike their homes and thus care less about them, which leads to problems like lack of maintenance and community responsibility. However, if we could provide a possibility where every resident can at least make a decision, things could be greatly different, both physically and mentally.

One good example of satisfying the density and creating diversity at the same time is a project performed by Alejandro Aravena from Elemental Architecture in northern Chile, who had to build for 100 families with limited funding and land. Instead of providing each households with a minimum indoor space that allows no extension, after learning about the ideal housing types and areas of the future residents, he simply build half of the ideal area, leaving the other half as a flexible space which is unoccupied and can be filled in with functions determined by the residents themselves, but within a certain framework. After the residents moved in they quickly took up the blank space and with various kinds of materials and colors, create a neighborhood typology where half side of a house is more of an official look while the other half is completely personalized. It is a successful design that uses the people's power to build, and the experience of building a house in a slum can actually be rephrased into the ability of constructing an ideal home. (Aravena, 2014)

Figure 1: Design of Alejandro Aravena
Left: first 50% completed by architects
Right: rest 50% completed by the resident themselves
http://alejandroaravena.com/obras/vivienda-housing/elemental/

7

We can learn from Aravena's success on the design level. As I have mentioned in the second chapter, flexibility is not something that is achieved by the architects but by both the architect and the people. Instead of seeing house as a room with four walls, a ceiling and a floor, we can see it as a frame, and design is just a process where we decide how much we are going to determine within the capacity of the frame. When we have limited resource we should first guarantee the basic needs, for example sanitation, and then build with what we have. But we should do this with a more relaxed approach, not trying to occupy every corner, we can always leave some gaps for the people to fill in with their own contents, creating a building which possess an official identity through its repetitive parts but also a dynamic character through the personalized infilling, a "loose" strategy against the normal "tight" ones where in a building everything is bound by structure and squeezed together.
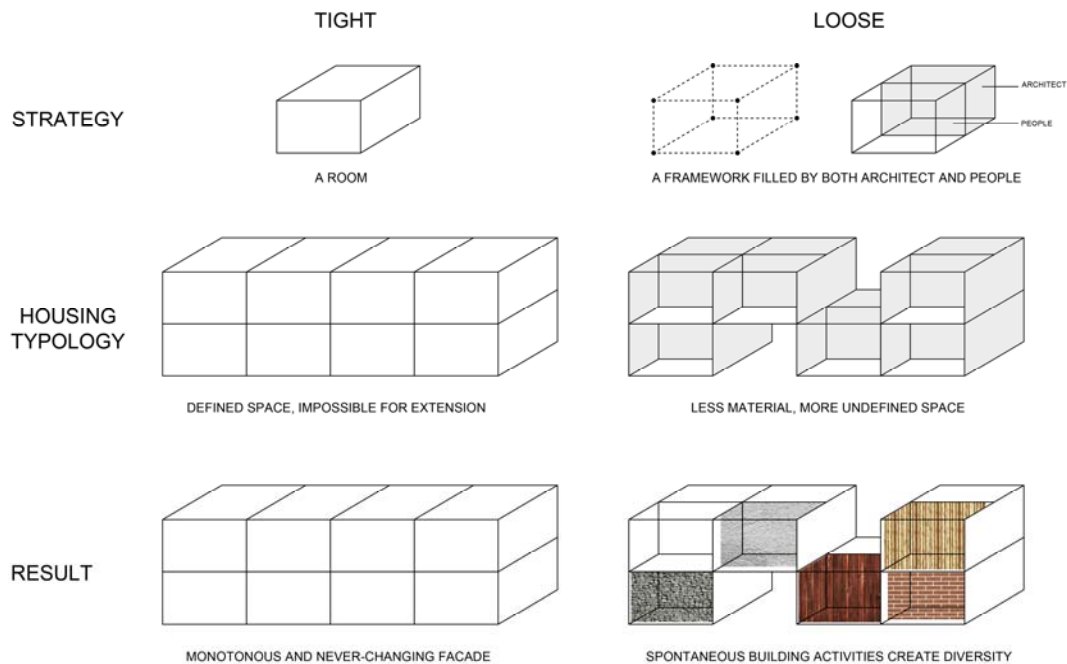
Figure 2: "loose" and "tight" strategy

Seeking Loose Inside Tight

If we look at the low-income housing around us today, we will find the tight strategy in building design is still dominant, but we can always apply loose strategy inside a building whose rooms are highly restrained. To do that we have to bring the flexible solutions into the unit level. I have found out through the study visit in various housing programs in Metro Manila that providing a space without division have far more interesting results than strictly

defined rooms. The low-income class is involved in more kinds of livelihood tasks than the rest of the population, which reflects on the architectural level that space for unknown use may be required. It is really inspiring to see how the people determine their own space with assorted materials to fit in different properties, and since it is not controlled within a certain module, it is not hard to imagine that none of the households are the same. The use of loose and indetermined space is both efficient and money-saving. Indetermined does not mean un-designed, the dimensions and capacity should all be considered to be able to hold as much possibilities as possible. If diversity is undesirable to be seen on the "face", at least it should happen inside.

Figure 3: example of how a loose unit can be developed differently
Observation at Barangay Commonwealth 2015.02.18

However, things are not always going perfectly. It happens that people make really bad choices when dividing their space, the most common cases being blocking windows or cutting off the natural ventilation. It is within our responsibility to give guidance to our users, this can be done through providing options on paper, or by leaving hints, providing a set of clues that are suggestive rather than determining, a good example is to have the window facing a really nice view or community space.
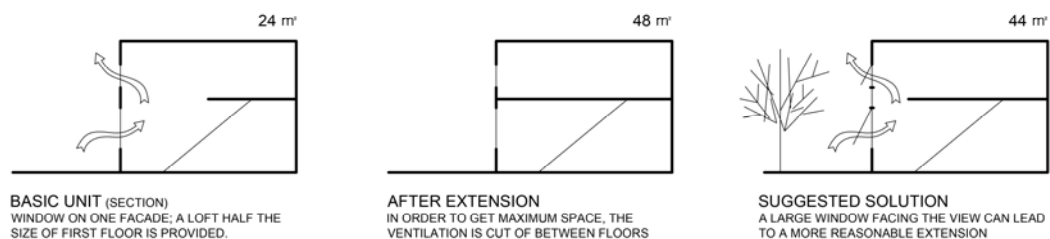

Figure 4: example of how to guide a better flexible design by leaving clues
Observation at Saint Hannibal 2015.2.23

9

5 Concluding Remarks on the Role of Architects

As a conclusion of this paper I would like to discuss the role of architects involved in designing flexibility for low income housing. First we should be listeners that absorb information. To what extent do we participate or control in the design is decided by our knowledge of the conditions, funding and the actual need of people. Then we have to be flexible architects who are open to changes and chances, always seeking possible loose solutions when trapped in the tight reality of limited resource. Always be aware that to design is not to control, and that we should be happy when results come out disparate, for we are giving opportunities for alternatives. The last and the most important thing is to always keep in mind that the capacity of people is the largest resource, designing flexibility is to empower people, to create more out of less.

Bibliography

Aravena, Alejandro, 2014, TED talk,

https://www.ted.com/talks/alejandro_aravena_my_architectural_philosophy_bring_the_comm
unity_into_the_process

Correa, Charles, 2000. Housing and Urbanization. Thames & Hudson.

Ludwig, Matthias, 1998, Mobile Architektur: Geschichte und Entwicklung transportabler und modularer Bauten, Stuttgart: Deutsche Verlags-Anstait GmbH

Error! No bookmark name given. Uhl, Ottokar, 1984, "Democracy in Architecture", in The Scope of Social Architecture, ed.by Hatch, C.R., New York: Van Nostrand Reinhold Company