

AFFORDABLE LOW-COST HOUSING AND COMMUNITY ASSESSING ECONOMIC AND HEALTH IMPACT

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Abstract

With the rapid increase in the world population, it became a necessity to exert more efforts to cover the, relatively, increasing demands. One of the most important needs is housing. As a fundamental human right, and a shelter from the external environmental threats, housing is taking a great concern from governments, investors, organizations, and individuals. The aim of this paper is to find the best way to establish low-cost houses regarding community assessing economic and health impact. In order to do so, I started gathering, summarizing, and comparing several papers that interpret the same issue from different points of views, presenting the different elements they dealt with. Moreover, proposing some solutions to make it more achievable in Saudi Arabia and to fill the gaps existed, linking between them, the solutions, and the newly appeared, followed, and spotlight events like suitability. Eventually, concluding with the discussion that will help to reach sustainable, affordable, economic, healthy low-cost housing, followed by an example that applies the final discussion results and conclusion.

Keywords: *low-cost, housing, economic, healthy, sustainable, urban, population*

Introduction

Affordable housing is not as simple term as it seems to be. To deal with affordable housing we need to answer some questions like, what is affordable housing? Who uses affordable housing? How to have affordable housing for low-income groups? What are the key challenges of low-income housing? Is the social network in affluent urban affordable housing units better for low-income citizens and families? What factors are shaping low-cost housing aspirations and expectations for young generations? Impact of challenging lifestyle and economic factors in the low-cost housing residential area? Many papers studied affordable housing. Each one of them came with a definition, classification methods and specific households. These papers and these efforts show how vast and various is the affordable housing term. Hence, a vital issue needs to be studied in a specialized manner. This specialized manner starts with gathering the similarities related to the issue of whether they are definitions, results, methodologies, criteria, or even criticism excluding the different data and personal comments and opinions.

The next step would be the discussion in which we are going to interpret the gathered results on how to achieve affordable housing applying better criteria categorized within the urban planning and the housing design to get specific steps to our goal, followed by the example that achieved most of the reached criteria.

Materials and Methods

Research questions. What is affordable housing? Who uses affordable housing? How to have affordable housing for low-income groups? What are the key challenges of low-income housing? Is the social network in affluent urban affordable housing units better for low-income citizens and families? What factors are shaping low-cost housing aspirations and expectations for young generations? Impact of challenging lifestyle and economic factors in the low-cost housing residential area?

Research problem statement. The problem here lies in the misunderstanding between being able to build affordable housing by applying the economic, health, and sustainability components considering the additional elements added to achieve the additional features.

Research hypothesis. Our hypothesis appears in assuming that there is no objection to having healthy, economic, sustainable, affordable housing. Hence, the ability to apply it on a larger scale achieving a sustainable, healthy, economic and affordable community perfectly integrated within the larger Saudi Arabian community.

Research counter hypothesis. The counter-hypothesis states that, it is not possible to achieve affordable housing that gather the sustainable design criteria.

Research method. My research method follows the “Qualitative Research” method based on secondary recourses. It is noted through the continuous effort to explain the affordable housing designing criteria applying the sustainable components. All that was mentioned arranged and classified logically without putting limitations on the research’s ideas by adding a closed end. Moreover, it follows the “Case Study” method that exists in having an explanatory and descriptive case study integrated permitting a better understanding of the issue.

Literature review

Affordability and affordable Housing

Before starting with the literature review, we need to know the definition of both Affordability and Affordable Housing. They both have different definitions starting with Habitat definition, as it is the simplest; it defined affordability as “getting people into housing and keeping them there.” (Habitat for Humanity, 2015). On the other hand, it defined affordable housing as the housing that cost overburden requiring 40 percent or more of the full disposable household income.

Yosef (2002) interpreted affordable housing definition through the United Nations strategy, as a house that has privacy, sufficient space, safety, reasonable daylight and ventilation, good location to the household work and infrastructure with reasonable coast (Yosef, 2002).

Sidawi (2008) interpreted the Western concept basing on the annual income of the individual, the individual marital and health status, which is measured by the term “30/40 split”, whereby more than 30% of household income is spent on housing costs for the bottom 40% of household (Muazu, 2010). Moreover, it has been adopted in the Arabic region including the Saudi Arabia Kingdom. Hence, it will be suitable for my research as I am working on Saudi Arabia. However, a number of researchers see, it is not clear and it was not adapted to suit the local lifestyle and traditions (Sidawi, 2008).

Many other papers have put these definitions into considerations but Muazu (2010) was much comprehensive one gathering deferent meaning from deferent countries for example; in France, it is known as “low-rent housing”, in Finland “subsidized-finance housing” and in Spain “social-interest housing” (Sidawi, 2008).

Hence, we can say affordable housing is a house that exceeds its household’s ability to bear its rent coast. Which in turn tells us that it is not necessary to have poor households, as it is a relive relation the put the households’ wage and rent payment into consideration. That leads us to the next question, How to have affordable housing for low-income groups?

Requirements, Objectives, and Challenges

Requirements. Yosef (2002) gathered the needed requirements through the urban and designing process into five main points, which are:

- reaching the minimum space of the services rooms (kitchen and bathroom);
- simple, local and adaptable building materials;
- making the best use of the use of the spaces to satisfy and serve the households’ way of living;
- achieving privacy, natural ventilation, daylight, and the ability to expand into the future with the natural growth of the family members. which Milligan, Phibbs, Fagan and Gurran called Scalability (Milligan et al., 2004);
- the location should be far from the pollution resources like factories (Yosef, 2002). Bredenoord (2016) added more features like:
- ventilating, insulating and backward sun-orientation of houses in tropical climates using passive solar energy;
- lowering environmental temperatures by designing tree-lined streets;
- insulating walls and roofing;
- cooking with gas instead of wood;
- using water-saving measures in showers and toilets (Bredenoord, 2016).

Objectives. There are many objectives for the affordable housing. Yosef (2002) mentioned certain points like:

- being available for all income categories with affordable rents;
- satisfying the rapidly increased demand for housing;

- increase the efficiency of using the local materials;
- sustaining the Architectural fabric of the country by applying the architectural elements in the area;
- increasing the social activities and social network by creating more interactive citizens (Yosef, 2002).

Al-Shihri (2008) categorized the objectives through the inclusive processes on which the design is made in three main objectives.

- Objectives that are related to human: in which he mentioned the need of having housing satisfying the one's demands in certain points like: being close to the place of work in order to save time, money and country resources; widen the categories of affordable housing in order to deal with larger classifications of people like the recently graduate students and elder peoples; making the best use of the existed infrastructure.
- Objectives that are related to place: in order to make the best use of the place and the environment around, that is applied starting with the urban process and ending with the designing process.
- Objectives that are related to time: modify and develop housing to be done through a specific timing with the architectural features that distinguishes the period (Al-Shihri, 2008).

Muazu (2010) has third classification mentioned in two main points: economic and social objectives, which shows the importance of both terms. Eventually, Sidawi (2008) who classified housing objectives achieving four main dimensions, which are physical, psychological, social and spiritual, dimensions.

Challenges. Surly affordable housing has its own challenges. Moreover, some of these challenges can make a great loss to the community. ip O'Neill (2008) sees that one of these challenges is the over the cost of the rent, which can affect families by preventing some of their children to go to schools, hence, a great loss of both families and communities.

The best way to study these challenges is by noting the actual challenges that faced actual projects. Starting with Muazu (2010) in Nigeria, he mentioned the challenges in the following order:

- challenges that deal with land. They were about the availability, fund and the accessibility of land;
- challenges that deal with finance. In which he mentioned the lack, inadequate and the availability of the finance;
- challenges that deal with building materials. In which he interpreted the reasons for the high cost of the building materials;
- eventually, challenges that deal with the infrastructure.

On mentioning the challenges that face affordable housing in Palestine. Raed Mohammad Saleh Yosef showed that the greatest challenge is the respectively increasing demand on this type of housing. Supporting his words by numbers, Raed deducted that they need a suitable, locally reusable materialized, affordable housing (Yosef, 2002).

Moving on to Saudi Arabia, and by updating Al-Shihri (2008) information, we will find out that the problem is the same as Palestine's, the increasing demand for housing. With a total population of 32552336 according to general authority statistics of Saudi Arabia, official website [<https://www.stats.gov.sa/en>] compared with 23980834 in 2007 with population growth rate of 2.52%, it is obvious that the demand on housing is increasing every day. [<https://www.stats.gov.sa/ar/indicators>]
Reviewing the key challenges and the indicators that help to shape affordable housing, we are going to analyze and produce criteria that will help to have better designs and better solutions for affordable housing in a matter of urban and designing methods.

Discussion

Affordable housing as a matter of urban planning

It is obvious the unstoppable increase in the world population will not give us enough time to think of solutions to the problem it is making, so we need to think and act fast. UN estimations show that the developing countries' populations will be increased by 2.4 billion in the within 39 years, which means it will be approximately doubled (Bredenoord, 2016).

However, planning, designing suitable and various types of housing is not a solution itself. World health organization (WHO, 2011) declared that residential buildings emit close to 18% of direct CO₂ emissions in 2008. Of course, 18% is a relatively high ratio, which leaves us wondering what is the best urban designing criteria for affordable housing?

After declaring that 60% of the population live in the cities especially in low-income cities World Health Organization (WHO, 2011) proposed befitting from the "smart growth" creating climate-friendly housing applying the idea of having clusters with green areas in between, so this will be our urban planning base point.

On thinking of affordable housing, we need to think of every possible way to reduce the cost. Many contributing specialists through OIKODOMOS (2011) suggested some manners that help to deal with affordable housing urban planning like pattern.

Pattern is used to be known as the repetition but it is not necessarily to be. On the other hand, it means "an adaptation to changing needs". Hence, applying repetition is low-cost technique, as it lowers the numbers of designs and sorts of materials needed and so more, on one hand, and adaptability manner on the other hand, by allowing flexible editions and changes. (Figure1)

Gathering Yosef (2002) and Muazu (2010) urban planning points that can be used; we can get perfect urban planning criteria, which is:

- the site should minimizes biodiversity losses, maximizes low-energy transportation options, and promotes the use of renewable energy and protects the biodiversity of nature;
- accessibility to all social group, facilities by foot or public transport;
- providing safe traffic, calmed streets, and neighborhood;



Figure 1. Shows deferent methods of applying patterns in urban planning in Barcelona (OIKODOMOS, 2011).

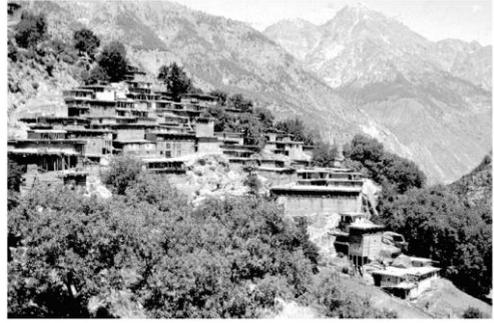


Figure 2. Shows Nested below the top of mountain slope this compact Nuristani village took advantage of logical site topography. (Kazimee, 2008)



Figure 3. A view of the well-preserved dense Kurdish village of Palangan, a UNESCO World Heritage listed site (Rostam, 2017)

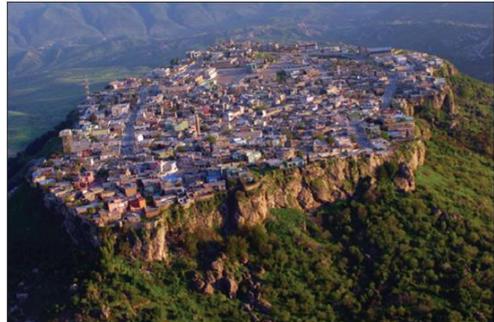


Figure 4. Shows the picturesque village of Amédî, Kurdistan while respecting the nature around. (Rostam, 2017)



Figure 5. Shows Typical stepping characteristic of Nuristani houses with the beautiful integration with the surrounding nature (Kazimee, 2008).



Figure 6. Shows the town of Tewêlle situated hidden deep in an enclosed triangular valley at +1477 above sea level with a great level of integration with nature (Rostam, 2017)

- providing open spaces; parks, playgrounds, etc.;
- creating local economy through new markets and shops;

- allowing diversity in household income, age, gender, household, education;
- housing diversity occurs when different types of housing are located in an area (Figure1);
- density (the number of dwelling per unit area) to achieve a more sustainable level of development and meet the local housing targets, which therefore lowers the cost of land per unit (Figure 2 and 3);
- respecting nature around during urban planning process. (Figure 4-6);
- providing cheap transportations.

These were some points that are needed to have baselines on affordable housing urban planning criteria. The next will be affordable housing designing criteria.

Affordable housing as a matter of house design

The following points interpret the need design methodology for affordable housing to make the best use of the place, space, and usage. Besides, not allowing the designers to role by their design. So as not to make households feel like being forced to live in the place without taking their interests and lifestyle into considerations. To do so we need to:

- insulate buildings to minimize heat gain, loss, and energy efficient as it reduces illness from cold, dampness and it saves from exposing to extreme temperatures and risk beside being way larger energy saving strategy. On the other hand, better insulation and heat reduction, as a result, are two of the most important elements help to achieve mental health and comfort;
- consider the building's orientation and natural ventilation. As WHO (2011) declared, "Provision of good natural ventilation is necessary to ensure health gains from more energy-efficient and weather-tight housing." As well as avoid exposures to toxic indoor air pollutants ensuring that bad ventilation can cause catastrophic illnesses and diseases;
- apply shading devices, operable windows, shutters, skylights for daylighting and low-energy electrical devices, moreover, using renewable sources to power these appliances;
- build cool roofs or green roofs (vegetated);
- natural resources; local and recycled building materials like locally produced masonry, bamboo, wood, which are so durable and can be earthquake resistance, compressed earth blocks, loam, adobe blocks, which are a mixture of clay-based soil straw and water, and interlocking stabilized soil block system (Bredenoord, 2016). Moreover, it helps to avoid health risks that are made by using insufficient materials (Figure 7-10);
- use recycled content (figure 11).

Saudi Arabia has, of course, extra features that need to be applied. It, for example, requires much more attention to privacy and sound level, sound and visual isolation, the separation between boys and girls bedrooms, the separation between the male and female.



Figure 7. Shows the local Materials used in the house (Kazimee, 2008).

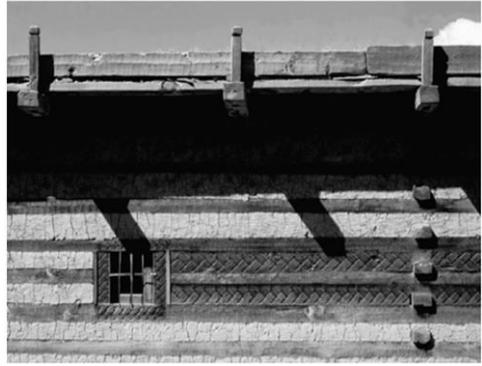


Figure 8. Shows the local Materials used in the façade (Kazimee, 2008).



Figure 9. Shows the usage of the local Materials in the houses of the village of Palangan in the neighborhood of Tewélle (Rostam, 2017)



Figure 10. Shows New townhouses use local materials, form in the town of Tewélle (Rostam, 2017).



Figure 11
Shows Alley road on the site in the town of Tewélle (Rostam, 2017).

Eventually, this, of course, is not the whole criteria, there are far more concepts considerations and points of view. As well as some spatialized methods that are related to the smallest housing detail like doors, windows, lights, furniture, positions, levels, appliances, color, textures, ext. but that is so much to be noted.

Hence we considered the most general but vital methods to reach a better level of designing.

The applied example

The best way to prove our discussion results is to apply them an example and to see its validity range, so I draw designed an urban neighborhood and building that achieve most of the results as we are going to see.

Figures 12 and 13 shows two simple drawings show two different methods of urban neighborhood planning with, what is called, Islamic Mafroukeh as a base concept.

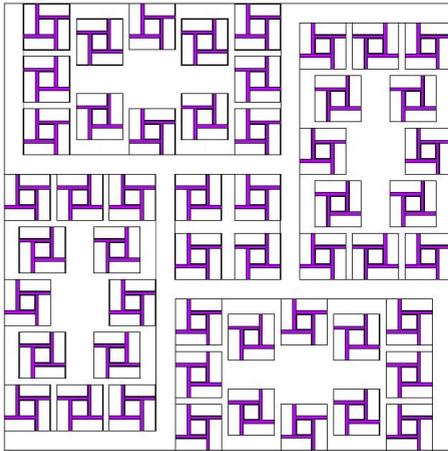


Figure 12. *Method (1) on the level of urban neighborhood planning (McMorrough, 2018).*

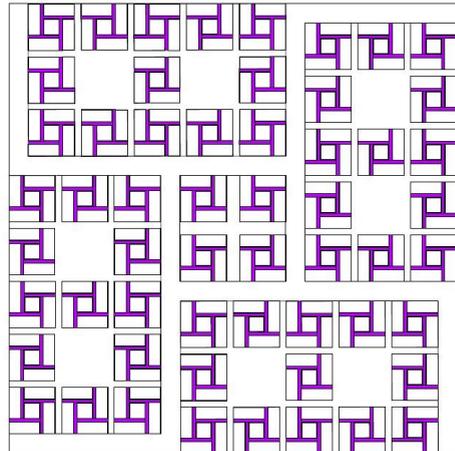


Figure 13. *Method (2) on the level of urban neighborhood planning (McMorrough, 2018).*

They show criteria of having a compact affordable housing with the prosperity of having wide streets separated from pedestrians' maximizing the need of transportation options, green spaces, markets and shops and separate entrances for each block helping to have quieter streets.

Figures 14 and 15 show the applied criteria as a matter of design. These criteria can be seen in the thickness of the outer walls as an insulation item in order to minimize heat gain, loss, and energy efficient.

On the other hand, every room are well oriented and ventilated as the Islamic Mafroukeh give vast verity in the orientation and helps in the air ventilation movement, besides, providing outer shading elements which reduce energy consumptions and heat gain.

Hence, our example shows how far can the discussion results be easily applied and regarded during the urban planning and house designing alike, which leaves us with no choice but giving it more attention and care as it can and will a major step in our country's prosperity.

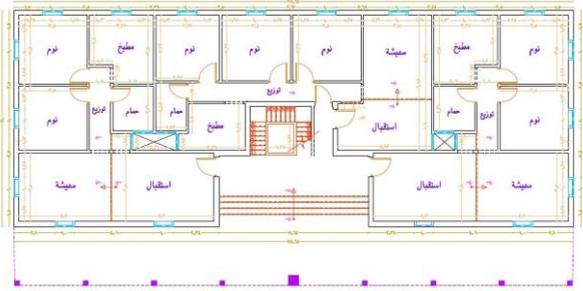


Figure 14
Shows the ground floor of the single building with the four buildings block ((McMorrough, 2018).

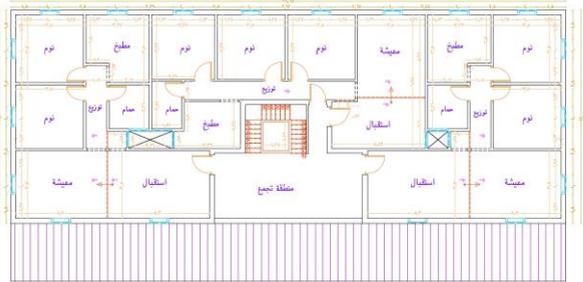


Figure 15
Shows the first floor of the single building with the four buildings block. (McMorrough, 2018).

Conclusion

As we have shown the terms of “Affordability and Affordable housing” are vast and various, trying to figure the closest or the widely used definition to deduct the suitable households effect, hence, targeting our research to deal with the best solutions that directly deal with those households.

By having the definition needed and the households interacted, we proposed the requirements, objectives, and the challenges that are needed, aiming, and facing, respectively, the affordable housing on both urban planning and house design, we were able to get the points that are needed to put criteria for both branches in order to reach affordable low-cost housing.

Eventually, the demand for the affordable housing, according to the statics, is not going to end, at least soon. Hence, more efforts need to be done, more researches need to made, and more co-operation between organizations need to put into considerations. Otherwise, housing problems are going to be bigger and bigger by the day and this indispensable federal human right is going to be lost.

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