The Sustainability of Affordable Housing

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Abstract
Affordable housing and sustainable urban development are major challenges across the world including Australia. Generally there is a conflict between the approach of sustainable development and affordable housing. Sustainable development means a compact city and often compact development is more expensive than low-density residential development. In Australia sustainable housing has generally been constructed for the high end of the market. Affordable housing means small housing units, use of low cost material, in small blocks built on cheap land at the periphery of the city. Basic aspects of sustainable residential design such as increasing density, mixed use and proximity to public transport are being increasingly adopted in Australian cities. However, the sustainability of affordable housing remains questionable.

The aim of the paper is to improve our understanding of current practices of sustainable residential development and housing affordability and discuss whether the approach of sustainable residential development aligns with affordable housing objectives.

Keywords: housing, affordable housing, sustainability, housing design.

1. Introduction

Both affordable housing and sustainable development are major challenges across the world including Australia. Housing affordability has once again emerged on the policy agenda of Australian governments (Beer et al. 2007). House prices have risen in response to booming demand and constraints on the supply of dwellings. Shortage of housing dwellings is
especially due to a shortage of land in the capital cities. Many low-income households and young people are unable to gain access to home ownership and are not able to afford private rental housing (Beer et al., 2007). Due to shortage of land supply, climate change and recourse constraints in cities of Australia, the government agenda has moved towards densification and urban containment.

There are real tensions in the planning strategies of Australia’s metropolitan cities between desire to provide affordable housing, on the one hand, and desire to achieve sustainable development on the other. It is generally seen in Australia that sustainable housing development is unaffordable for low income households and young people. Sustainable development means a compact city and often these developments are more expensive than normal residential development. However, some studies have demonstrated that Australian housing markets are significantly unaffordable by international standards with urban consolidation (Wendell, 2005).

In Australia sustainable housing has generally been constructed for the high end of the market, for example, Lochiel Park in Adelaide, South Australia. Affordable housing means a small unit, use of low cost material, small blocks and cheap land at the periphery of the city. Basic aspects of sustainable residential design such as increasing density, mixed use and proximity to public transport are being adopted increasingly in Australian cities. However, generally the high density apartments near the city or in inner suburbs or along the coastal areas cater for the housing needs of upper end of the society but are unaffordable for the majority of the population. Hence, generally there is a conflict between the approach of sustainability development and affordable housing. However, making affordable housing as sustainable development remains questionable and problematic/challenging.

The aim of the paper is to improve our understanding of current practices of sustainable residential development and housing affordability and discuss whether the approach of sustainable development aligns with affordable housing objectives. The study is based on review of relevant literature and desktop analysis of K2 Apartment. The paper is divided into three parts. The first part of the paper gives an overview of sustainability and sustainable housing and the second part talks about affordable housing. The third part of the paper
elaborates on whether a sustainable development approach aligns with affordable housing objectives.

2. **Sustainability and sustainable housing**

There are many definitions of sustainability but a well known and well accepted definition is the one proposed by the World Commission on Environment and Development in their 1987 study commonly known as Bruntland commission report (WCED, 1987, p. 8).

> Sustainable development means meeting 'the needs of the present without compromising with the ability of future generations to meet their own need'.

However, Choguill (2007) argues that even though the definition used by WCED looks very simple, it is very complex to apply to real life problems. ‘The term sustainability has become one of the most overused and all-too-frequently misused terms in the development literature’ (Choguill, 2007, p. 144). Choguill argues that we talk loosely about sustainable cities, sustainable housing and many other sustainable activities. Sustainable development has become firmly established in the community development and planning literature (Jepson, 2007). However, when it comes to practising sustainable development it remains largely outside the mainstream. Initially the concept of sustainable development was related to macroeconomic development and more recently it has been applied in human development, by implication housing (Choguill 2007).

In economics, the capital approach is usually used to measure the sustainability of a development. This approach considers ecological and sociological aspects along with economic aspects. Uwasu and Yabar (2010) argue that the capital approach in economics is used as a sustainability measurement. He says that ‘as long as we are able to maintain or increase wealth (i.e., capital stock) over time, the goods and ser-vices necessary to fulfil human needs will be secured’ (Uwasu and Yabar 2010, p. 1).

The concept of sustainability started from human settlement and from there it has gone further to address issues of housing and neighbourhood development. Sustainable housing means ‘housing which contributes to community building, to social justice and to economic
viability at a local level’ (Morgan and Talbot, 2001, p. 321). Sustainability should be the main principle to design housing and one of the important dimensions of housing quality (Morgan and Talbot 2001). Development of sustainable housing refers to not only the development of building but also layout of housing areas as housing is a verb not a noun (Turner 1976). Quality of dwelling life is not ‘therefore, simply concerned with having a roof over one’s head and a sufficient amount of living space, but also with social and psychological satisfaction. Sustainable physical design can contribute to quality of life’ (Hasic, 2001, p. 329). Hasic says that the social and behavioural elements of housing design are the key to the success of the residential development. Therefore social capital (the advantage that accord from a social network) is a key component of housing sustainability and this could be achieved by encouraging the community’s joint activities and social inclusion. Social capital is ‘not what you know, it’s who you know’ (Woolcock and Narayan 2000, p. 225). This quote sums up the general understanding of social capital. The concept of urban development social sustainability is also connected with the understanding of social equity, social inclusion and social capital (Bramely and Power 2009).

Therefore, to develop sustainable housing, housing initiatives must be socially acceptable, economically viable, environmentally friendly and technical feasible (Choguill, 1999). In theories of sustainable development usually these three aspects are treated as separate but interrelated entities (Giddings et al. 2002). The theories behind sustainable development are shaped by people and organisations’ different world views, which influences the formulation of the issues and actions proposed. The ‘theories of sustainable development stress the need to take a ““whole systems”” approach that appreciates emergent properties, complexity and intersections’ (Giddings et al 2002, p.187). The social capital approach could support the achievement of sustainable affordable housing because ‘social capital could facilitate access to a range of other capitals including economic and cultural capital, which in turn determines an individual’s position within the social structure’ (Bourdieu 1986).

3. Affordable housing

Unfortunately, like sustainability, housing affordability is also overused and misused. Hulchanski (1995, p.1) argues that in recent years ‘housing affordability’ has become a commonly used term for summarising the nature of the housing difficulty in many nations. He identifies six elements of measuring housing expenditure to an income ratio to measure
housing affordability. These six elements are developed based on North American usages. The six elements are: ‘(1) description of household expenditures, (2) analysis of trends, (3) administration of public housing by defining eligibility criteria and subsidy levels, (4) definition of housing need for public policy purposes, (5) prediction of the ability of a household to pay the rent or the mortgage, and (6) as part of the selection criteria in the decision to rent or provide a mortgage. Each of the six uses is assessed based on the extent to which it is a valid and reliable measure of what it purports to measure’ (Hulchanski, 1995, p. 1). He says use the term ‘housing affordability’ is misleading, and we should not use it because household consumption patterns and the means by which households meet their needs are very diverse. It is easy to grasp the concept of affordability but might be hard to pin down in practice, because of changing circumstances of families and individuals (Paris 2007). Again measurement of affordability varies from place to place and country to country but the most accepted measurement of affordability is the ratio between household income and housing cost (Hulchanski, 1995). A well known and well practised measurement of affordable housing is that housing cost should be less than 30% of household income of the occupants in the bottom 40% of household incomes (Disney, 2007).

The issue of housing affordability is multi-dimensional. Numerous studies have identified many factors associated with housing affordability, like interest rates, income levels, construction cost, land supply, and housing prices. The problems are many and they are all interwoven. One of the biggest problems low income households face today is finding affordable and appropriate housing. Affordable housing is that it is affordable to lower or middle income households. It includes owner-occupied housing as well as rental housing owned by government, nonprofit organisations, corporations or individuals (Disney, 2007).

Numerous research on affordable housing has been undertaken by many researchers across the world (Berry, 2006; Burke et al., 2007; Wendell, 2005; Yates and Gabriel, 2006; Yates et al., 2008; Yates et al., 2007; Lloyd-Sherlock, 2000; Whitehead, 2006). These studies are generally addressing one of the housing affordability issues such as fiscal implication, housing finance, problems of housing affordability, which has an affordability problem, policy, planning etc. However, there is not much research on an integrated approach to address issues of housing affordability. Again there is literature on housing affordability and housing sustainability but not an integrated approach of housing affordability and sustainability.
The next section will investigate the relationship between sustainable residential development and affordable housing.

4. Sustainable development and affordable housing

Housing means a roof over the head whereas sustainability and housing is more than a roof over the head (Newman, 2002, p. 1). Affordable housing also limits the cost of housing because households should not pay more than 30% of their household income. This aligns with the aim of the capital approach where social and ecological outcomes are trade-offs with economic threshold. Therefore, it is a real challenge for both facilitator and provider to provide affordable housing, which is also sustainable. As we know sustainability does not only mean economically viable, but also socially and environmentally sustainable. Therefore, there is a need to trade off between various sustainable elements to achieve sustainable housing that is affordable. Unfortunately currently the sustainability of housing is very much related to economics and to some extent environment. However, to improve the quality of life social sustainability plays a vital role.

Table 1 shows the factors/indicators, which are required to create sustainable development and affordable housing. The table also reflects that there are many factors which are common in providing both sustainable residential development and affordable housing. The indicators are identified based on academic and professional literature reviews and the authors’ own experience.
Table 1: Indicators to achieve sustainable development and affordable housing

<table>
<thead>
<tr>
<th>Indicators/factors</th>
<th>Housing Affordability</th>
<th>Sustainable residential development</th>
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<tbody>
<tr>
<td></td>
<td>Economic</td>
<td>Social</td>
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<tr>
<td>Housing expenditure</td>
<td>√</td>
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<td>Standards and quality of housing</td>
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<td>Locational factor</td>
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<tr>
<td>Supply of land</td>
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<td>Compact development</td>
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<tr>
<td>High density</td>
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<td>√</td>
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<tr>
<td>Land use/zoning</td>
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<td></td>
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<tr>
<td>Size of dwelling</td>
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<tr>
<td>Housing cost</td>
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<td>√</td>
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<tr>
<td>Non housing costs</td>
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<tr>
<td>Materials</td>
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<tr>
<td>Transport</td>
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<tr>
<td>Layout design</td>
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<tr>
<td>Mixed land use</td>
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<tr>
<td>Accessibility</td>
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<td>√</td>
</tr>
<tr>
<td>Efficient use of land and space</td>
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<td>√</td>
</tr>
<tr>
<td>Proper mix and balanced land use</td>
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<td>√</td>
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<tr>
<td>Convenience, efficiency and safety for pedestrian and public transport users</td>
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<td>√</td>
</tr>
<tr>
<td>Permeability</td>
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<td>√</td>
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<tr>
<td>Circulation pattern</td>
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<tr>
<td>Consideration of solar orientation and ventilation</td>
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<td>√</td>
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<tr>
<td>Reduced footprint</td>
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<td>√</td>
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<tr>
<td>Solar access to open space and roof</td>
<td>√</td>
<td></td>
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<tr>
<td>Energy efficient house plan</td>
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To achieve sustainable housing, there is a need to provide community facilities, compact design, pedestrian friendly design, eco-efficient houses etc. Indeed there are many elements that are common in both sustainable and affordable housing. Therefore, it is possible to make affordable housing sustainable by giving due consideration to various design parameters, involving community in the design process and by providing government subsidies to achieve eco-efficient housing.

Eco-efficiency in design and construction of housing is widely accepted across the world by wealthy households (Newman, 2002). However, the question arises whether it would be possible to make this as a compulsory requirement of building codes for all houses irrespective of income. Extra cost might be a trade off by reducing the house size or by reducing from two garages to one garage and going for considerable reduction in ongoing cost of energy, water and travel.

Therefore the question arises of how to achieve sustainable affordable housing. A very good example of sustainable and affordable housing in Australia is K2 Apartment, which is social housing in Victoria. This example demonstrates that design plays a very important role in providing sustainable and affordable housing. Design can reduce the house cost, infrastructure cost, reduce ecological footprint and could increase social sustainability and quality of life. This design concept aligns very well with the concept of the capital approach in economics as well as a social capital approach. Design of housing development covers both design of house and design of neighbourhood. The K2 Apartments are an excellent example of an affordable and sustainable housing project which has attempted ground-breaking reductions in energy and material usage. The designers have incorporated some sustainable design features such as recycling grey water and passive thermal heating. To achieve the sustainability of affordable housing they have involved the community in the process of achieving sustainability. This project demonstrates the importance of the design features and the involvement of the community to provide sustainable affordable housing. K2 Apartment is a 96 unit, medium density complex in the South east of the Melbourne City.
In the planning context it is assumed that housing design, the form of the development should be eco-efficient means less resource consuming and less waste producing and yet provides better quality of life and quality of place. Design needs to take care of solar orientation and wind direction. To make socially sustainable places, design has to provide an environment where walking and participating in community activities are encouraged. Again K2 Apartment is a good example where designers have adopted sustainable design features. The 4800 square metre site consists of four connected building which are oriented on the east west axis. Two of the blocks are 8 storeys and one 4 storeys and another 5 storeys height. The building are staggered and spaced to allow maximum solar access to each of the blocks facing north facade and to allow communal courtyard areas between the buildings. Layout is based on a green spine concept and adjacent to green spine are shared common landscaped areas. These areas are intended to promote social interaction. Approximately 20% of the site
is landscaped area and sustainable landscape features are used to make the development water smart and improve social interaction.

To achieve affordable housing, there is a need to reduce the cost of the house by providing housing near public transport, infrastructure and community facilities with due regard to climate and solar orientation. This will make the house cool in summer and warm in winter and will reduce use of energy for thermal comfort. Proper use of solar orientation will increase the use of solar energy instead of electricity and gas. Design should provide quality public open space and a public realm that should attract people of all age groups to participate in community activities. All this will reduce the maintenance cost of housing and allow good social interaction within the community.

K2 Apartment design is a very good example of capital approach and social capital to achieve affordable sustainable housing.

**6. Conclusion**

Many of the objectives of affordable housing closely align with the objectives of sustainability such as location close to public transport and social and community facilities, compact design, consideration of climate and solar orientation. Having said that, there are also some objectives that are quite opposite to each other such as that the eco-efficient house is expensive, and it is difficult to achieve affordability without financial support from government. Even though housing sustainability is as important as housing affordability, it is necessary to give priority to affordability for low income households. Therefore to make housing sustainable for everyone sustainability criteria will not be the same across various socio-economic groups. Affordable housing and social sustainability could easily be achieved by providing better design and public realm but environmental and economic sustainability might be difficult to achieve due to the high cost of sustainable housing. Choguill (2007) argues that 50 years of housing policy development has not solved the problem of affordability and every year inadequate housing in the developing world is increasing. Therefore, it is hard to believe that just because we label something ‘sustainable’ it will improve affordability (Choguill, 2007).
Even though we tend to think of affordable housing as a distinct and identifiable sector, in fact, it is little more than one sector of the overall housing development. Although we can treat these two issues in isolation they are invariably interrelated and we are unlikely to achieve success in one without succeeding in other. In the same way some of the principles of sustainability are aligned with affordable housing objectives and housing as a whole sector. Therefore, it is quite unlikely that success will be achieved in sustainable affordable housing without succeeding in housing as a whole incorporating issues of sustainability. However, the scale of the sustainability for social, economics and the environment will vary based on the housing affordability of households from place to place. It is unlikely, without using design criteria such as the new urbanism concept and development of housing policy including a sustainability agenda, and government subsidies to achieve sustainability, that it will be easy to achieve sustainable affordable housing.

References


