IN PRAISE OF SHARING AS A STRATEGY FOR SUSTAINABLE HOUSING

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ABSTRACT

A central theoretical principle of sustainability is the interdependence *of economic, socio-cultural, environmental, and equity issues. The core idea is that sustainability is achieved only by balancing these elements. In practice, however, this balance is rarely evidenced in the design and production of housing, despite the mass of research into sustainable housing. This paper discusses some of the political, economic and socio-cultural issues at work in sustainable housing typologies. It illustrates how the notion of sustainability has come to be represented by ecologically-focused models, while other approaches to sustainable housing design, such as shared housing models, are barely mentioned in the literature. The paper argues that modernist imperatives, such as demands for speed and status undermine sustainable housing design and obscure its meaning. The authors suggest that in the planning and design of sustainable housing attention should be given to the sharing of resources and space as an added method of conservation, and conclude that current imbalances in research agendas and socio-cultural practices create a blind spot in the sustainable housing debate.*

KEY WORDS

conjoined housing, shared housing, sustainable housing, Pacific island housing

INTRODUCTION

The cultural and historic roots of sustainable housing can be traced back to the industrial revolution (Maher and McIntosh, 2007a). More recently, through the economic high times of the 1980s, sustainability remained primarily associated with guarding the environment from destructive human use. Only after the 1987 Brundtland report did the concept become more broadly and concretely defined.[4]

With the global recession of the 1990s, sustainable construction became an urgent international issue and at the 1992 Rio Summit, the 1987 definition was expanded beyond environmentalism to include socio-cultural and economic sustainability. In this paper the authors' starting point is the Rio Summit's core idea that sustainability is achieved only when there is a balance between economic, socio-cultural, ecological and equity issues. Although sustainable housing practices are not guaranteed merely by the presence of such a balance, it is argued that balance is a necessary condition in the design of a sustainable future.

This line of argument starts with a brief analysis of housing typologies that are widely regarded as sustainable. From this overview it can be concluded that the notion of sustainability has come to be represented by ecological sustainability models, as is seen with green housing, while other forms of sustainable housing designs have receded into the

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[4]"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commissions on Environment and Development 1987:23).

background (Maher and McIntosh, 2007b). In exploring why some approaches have been and continue to be mentioned in the literature on sustainability, while others are not, we suggest that modernist imperatives, including increasing demands for speed, status, privacy and space underpin contemporary housing demand and production, undermining and obscuring the multiplicity of meaning inherent in 'sustainable housing' (Milton, 1996). In line with authors such as Richard Ingersoll (2006), it is argued that such cultural imperatives are the hidden underbelly of research and practice in housing. After discussing some promising cases, the paper concludes with the suggestion that, in the planning and design of sustainable housing, more attention should be given to the sharing of resources and space as an added method of conservation, while in research terms we need to work at defining and applying the balance between ecology, equity and economic issues, without which true sustainability will continue to elude us.

THE POLITICAL, ECONOMIC, AND SOCIAL BACKDROP

> *What is happening is that developers are deliberately oversizing their dwellings in order to get higher percentage reduction credits by increasing the amount of external wall area which loses heat and hence can be insulated more.*
>
> (Stevenson, 2009)

Sustainability has always been motivated by cultural anxieties: health and safety concerns; economic inequalities; nature alienation, and the geo-political fears of hungry nation-states (Ingersoll, 2006; Carroll, 1998). In the period following the 1990s the list of concerns grew to include economic uncertainty, speculative changes in communication technologies, and global terrorism. From a browse of the internet we can deduce that many people (at least in the western world) have given more than passing thought to the issue of unsustainable housing. One indication of the extent of concern is the more than 30 million internet hits for "sustainability" and almost 11 million hits for "sustainable housing." A sample reveals that individuals can recognise many unsustainable aspects of their personal being in the world, their local communities and whole nations, but it also reveals the force of self-interest as a key motivation for political, economic and socio-cultural action in the world. 'Answers' to a sustainable future abound, but they often revolve around commercial opportunity and cover one or a few isolated factors. If this is true, it could explain why 'balance' in sustainability, as defined at the Rio Summit, is so elusive.

At the same time, speed has become one of the paramount values of our time (Chesneaux, 2000; Virilo, 1986). The onset of our information age has created an obsession with instant gratification and with it demands for a 'quick fix'. In her search for sustainable housing, architect Susan Saranka (1998) notes, "There are two major culprits responsible for our feeling overwhelmed. One is the accumulation of things we think we need; the other is the speed at which we race through our days." Increasingly, researchers are expressing concern that the rush to save the world from unsustainable use of dwindling energy reserves, global warming, etc., is (ironically) deemed to be forcing policy makers and other stakeholders into making poor decisions (Pearson, 2008). Instead of conservation measures and smart planning, the focus is predominantly on what products or techniques can be added or used to improve a single family house design, for example: photovoltaic panels; recyclable steel; light weight sustainable timber; natural ventilation systems; waste recycling systems; water cycle models and suitable insulation.

DOMINANCE OF ECOLOGICALLY-FOCUSSED MODELS

Our western cultural roots are grounded in a scientific rationalist view of the world. It has survived to the present in the mechanistic perception of sustainability in the West. This finds expression in the focus upon energy, fossil fuels, indicators and definitions (Edwards & du Plessis, 2001:10). Guy and Farmer (2001) identify that technological approaches to sustainability are overwhelmingly quantitative. Che Walls (2006), then chairman of World Green Building, said it plainly in his statement, "If you can't measure it, you can't invest in it." Like a civil emergency list, eco-houses come with a checklist. Locally, this tendency was expressed in a recent New Zealand Herald article (South, 2007: 40), "Eco-houses can be broken into set areas:

energy efficiency; water efficiency; use of sustainable materials; and indoor air quality." Through programmes such as Green Star and LEED, buildings can obtain sustainability scores which are heralded as having commercial value.

Such imbalance is in part because green housing, with its concentration on technological objects and systems, focuses on mechanistic objects that can be measured and quantified, and be prescribed values dictated by the market. Far from being a *hidden* agenda of green housing, profit-making and sustainability are openly linked with the media, industry, and governments keenly promoting the marketability of sustainable practices. "In the future, business will need to be sustainable to make money, and there will be money to be made from being sustainable" (NZ Prime Minister Helen Clark, 2007). But in order to apply an accounting methodology to sustainability, it is the 'verifiable' product of science and industry that matters, not the sometimes messy socio-cultural elements of home life and living.

Space use, and the un-sustainability of the single family house design in the wider sense, is overlooked in most eco-housing. "The problem is not so much that current energy conservation initiatives are flawed, but that they do not consider the most significant determinant of building energy use—space" (Addington, 2003: 18). Single-family house designs promote sprawl and consumerism and dissuade behavioural patterns that encourage sustainability such as the sharing of resources and infrastructure. Similarly, the latest new forms of affordable housing such as micro-homes have become one of the hottest fashions in architecturally designed housing, yet while some of these new models have adopted some green technologies, they rarely address the larger issues of infrastructure and seemingly would rather do without than share.

In this debate there is an aspect of righteousness, the morality tied up with our drive for sustainability. The connection between sustainability and morality is not a particularly new one; in fact if you replace 'sustainability' with 'nature' or 'the environment' the connotations and moral directives remain more or less the same. However, the risk in a culture fuelled on fear can be a rise of 'carbon fundamentalism' and the transference of social trends and behaviours into simplistic equations of carbon footprints. Some writers warn of growing moral authoritarianism in the climate change debate (Allenby, 2008). Fundamentalism suggests an abandonment of reason, a narrowing of dialogue, and blindness to other views, but it can also result in a kind of moral disengagement by those not in full support (Bandura, 2006), which is equally harmful to the goal of sustainable housing.

Sustainability and its relationship with domestic architecture is, then, not an entirely new concern - it shares similarities with earlier social and political movements from the urban health concerns of the nineteenth century onwards, although contemporary concerns differ from the past in their increasingly finely-tuned attention to resource scarcity, depletion and environmental contamination (Maher and McIntosh, 2008a). But despite various reincarnations, sustainable solutions continue to be viewed as scientific solutions to problems brought on by culture against nature.

OVERVIEW OF MODELS OF SUSTAINABLE HOUSING

Current models of sustainable housing can be categorised into three general groups depending on which aspect of sustainability is the main motivation for establishing the housing. *Public housing* is largely driven by the constraints of limited publicly-sanctioned finance; socially motivated sustainable housing models have been grouped under *collective housing*; *ecological housing* has as a primary driver the desire to restore or improve the environment. The literature on sustainable housing predominantly captures examples of public (affordable) housing, cohousing, and green housing. In keeping with the historical development of sustainable housing already mentioned, the early literature was split between housing for economic sustainability or socio-ecological sustainability as is the case with the philosophically driven cohousing model. In classifying housing types, 'intention' has been commonly used to distinguish between shared housing and cohousing types. But more recently, the notion of sustainable housing has come to be represented first by ecological sustainability models, as is seen with green housing, while other forms of sustainable housing designs are less discussed. A search on library research databases reflects the predominance

of this particular definition of sustainability, with most articles focused on green housing.

As commonly defined in the literature, public housing is policy-driven, subsidised, low-cost housing for people who cannot afford to own their own homes. It is 'sustainable' in the sense that it has been historically (and politically) enduring and it provides the greatest number of dwellings at the least cost, which equates to the least use of resources. As Ahrentzen and Franck (1989:7) make clear, the motivation for this type is "largely economic rather than social or practical." As a consequence, ecological and social needs gain little or no traction, often resulting in unsustainable ecological and social practices and behaviours such as overcrowding, stress, sleeplessness, lack of privacy, violence, sickness and accident (Warwick Law School, 2006).

Contemporary collective housing types, and their counter-culture predecessors, are attractive to people who share a belief in the benefits of community. The quintessential example of contemporary collective housing in the West is cohousing. Cohousing, first developed in Scandinavia in the 1970s, was adopted in the United States, Australia and Canada in the 1990s. Cohousing organisations "form with an explicit intention of creating a socially cohesive and mutually supportive community" (Meltzer 2005:2). Although the definitions of what actually constitutes cohousing vary somewhat in the literature, differences are minor. McCamant and Durrett (1988), who coined the term cohousing, define it as a resident-owned, developed and managed cooperative community, in which individual households are clustered around a village-like courtyard or street; and share a range of facilities. Yet, despite the designated communal areas, in general such projects do not fundamentally depart from the single family house design. Economic and ecological sustainability, then, are at least partly achieved through net reductions in consumption and pollution. The main difference from eco-housing, though, is that social sustainability is also considered crucial in collective housing—a nod to its communitarian roots—and is thought to be best achieved through an enhancement in community life.

While collective and public housing have limited popular appeal because of their stigmatised pasts, 'green' housing has grown to become the preferred sustainable housing model in the literature. Green housing, or eco-housing, is the object par excellence of the environmental approach to sustainability. It is a design approach rooted in the counter-culture movement of the 1960s and 1970s that since the 1990s has been, and continues to be, wrapped in the rationalist language and logic of modernity (Milton, 1996).

THE NOTION OF SHARING IN SUSTAINABLE HOUSING DESIGN

Sustainable housing means more than ecologically sound practice. It includes notions of creating a socially sustaining community of individuals who share resources and space; it includes the creation of a house that costs little to make and maintain, thereby reducing expenditure on resources; and it includes flexible housing, which allows for change in use, with fewer new buildings being necessary. Yet despite the various ways of defining sustainability, for the most part, in the literature, sustainability has come to stand for 'ecologically responsible', single-family homes, which use recyclable materials and are energy efficient: scant attention is given to the option of sharing resources or space as an added method of conservation.

The problem presented by such narrow and slanted definitions within the literature is that different ways of living more sustainably such as conjoined housing and other examples of shared space, are not being adequately recognized and studied. This has implications for how we come to understand and analyze the way people live, which in turn affects our understandings of their capacity to adopt sustainable living practices for the future. The practices of 'sustainable' housing research, design and occupancy need to be widened to include models that do more than stand for just one element of sustainability, but may in varying degrees incorporate all, with ecological sustainability being but one.

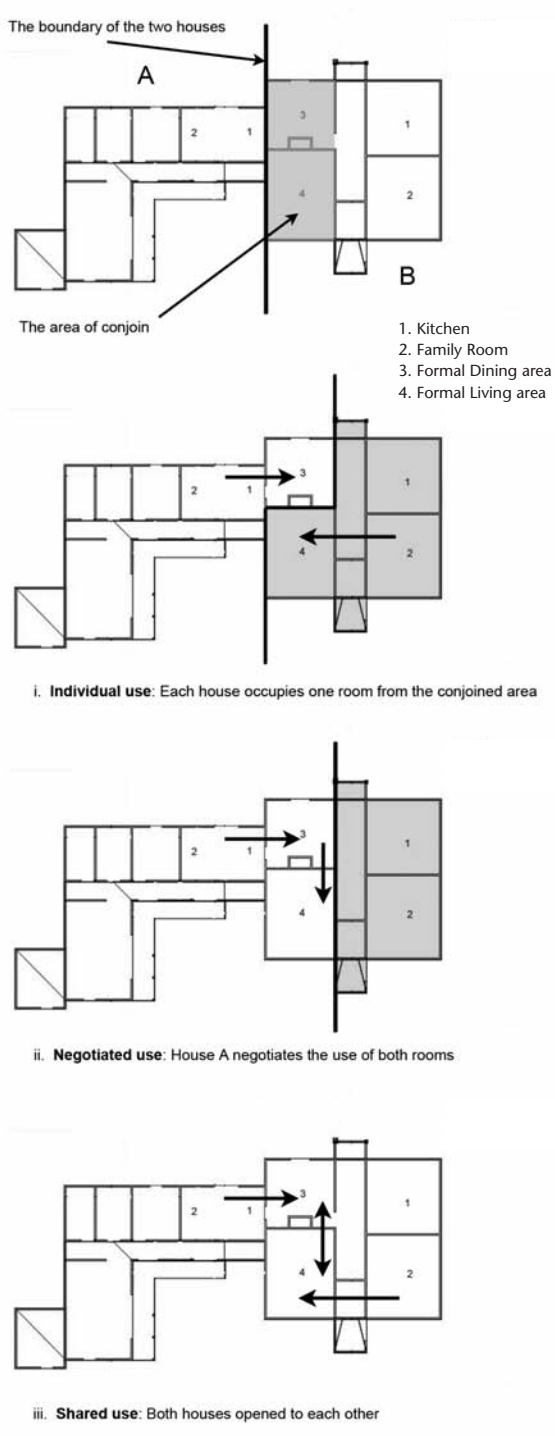
The authors first noticed a gap in the literature on emerging or alternative types of sustainable housing while working on a brief prepared by two sisters. The sisters were both professional married couples with children and had jointly purchased a large 1920's villa and a smaller adjoining cottage in an inner-city neighbourhood. Environmentally minded and socially close-knit, they sought a housing

modification that would afford them both the privacy of individual dwelling for their separate families, but also equivalency in terms of house utility through the use of shared space. The modification was to provide private self-contained space, as well as shared spaces with flexibility for a variety of uses and the capability of opening up the entire building for special family occasions or for freedom of movement by their children. The modifications were to include improvements to the energy performance of the buildings and the use of green, non-toxic building materials, but the final plans also both reduced the amount of necessary construction and total floor area. Figure 1 shows the how the building was 'conjoined' to meet the client brief, minimizing new construction and building green while still while affording them all the desirable features of equivalent inner city homes.

Preliminary research uncovered the terms conjoined and compound in relation to housing, but finding documented contemporary examples proved difficult. With perseverance we uncovered some recent published examples of shared housing. Greive and Hon (2005), for example, note a resurgence of compound housing in parts of Perth, Western Australia. They describe how, up to the 1980s, examples of compound housing existed, but in small numbers because of outdated planning rules centred on the issue of density and slums. Despite this legislative disincentive, Grieve and Hon cite three current examples, all variations of compound or conjoined housing, where services and infrastructure are shared to varying degrees. In New Zealand, we uncovered nineteen examples of conjoined houses, one of which has been published.[5]

An early 'classic' example of a conjoined house is Rudolph Schindler's (1887–1953) Kings Road house in West Hollywood, California. In this prototypical conjoined housing model built in 1922, Schindler and his wife co-resided with another family, the Chaces until 1924, after which a different couple (the Neutras) moved in. The Schindler house is a one-storey, open floor plan dwelling with two adjoining wings, one for each of the two couples, with a

FIGURE 1. Floor Plan—Conjoined House proposal, Wellington, New Zealand.

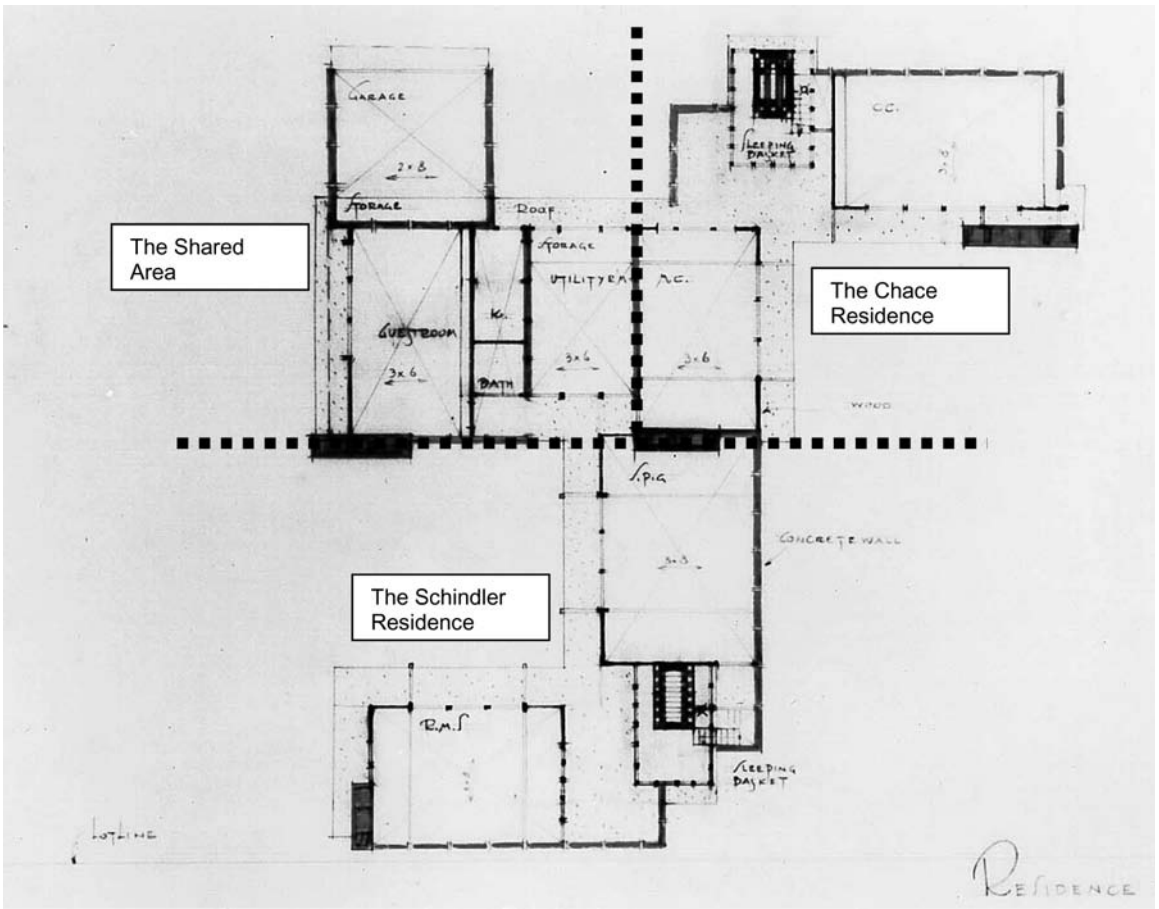


[5]The house was built for two generations, see 'All in the Family' In *NZ House and Garden,* 2000, Vol 15, No. 12, pp. 5–13.

shared guest room linking the wings, and a shared kitchen, garage and garden. Each of the wings consisted of two studios linked by a shared entranceway and bathroom, providing each individual with their own living/working space, a daybed for sleeping, a fireplace and a small area for making coffee/tea and simple meals. The shared bedroom for each couple was in an open-sided 'sleeping basket' on the roof of the house. When the house was built, the neighbourhood density and adjacent building height were sufficiently low to ensure privacy and the Los Angeles, California climate sufficiently mild to permit outdoor sleeping. While predating the Rio Summit by 70 years, Schindler designed his home for the California climate, in an economical manner using natural materials wherever possible, building as little as possible and sharing non-essential, but desirable spaces with the flexibility to live in the space as four individuals, as two couples or as one communal space when entertaining or socialising.

Designed for non-discrete, non-traditional households, a conjoined dwelling serves a range of owner-occupants (kin and/or non-kin) who share a dwelling unit designed for both common and private space use. As well as being purpose-built, a conjoined house may also be formed from two or more single family detached houses that are joined together to create shared space(s), or by modifying a dwelling to accommodate more than one household unit. The occupants of conjoined housing come to reside in them for a myriad of reasons; unlike collective housing, there is no single, stated philosophy

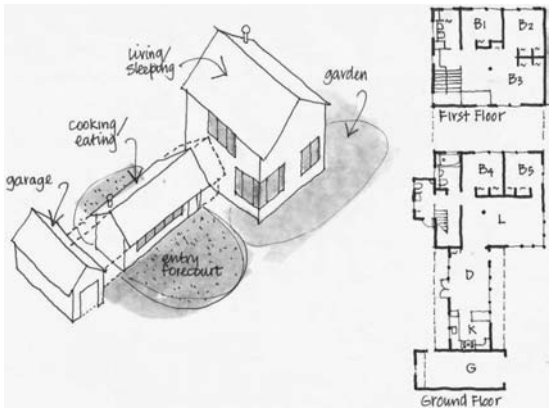
FIGURE 2. Floor Plan—Schindler House, West Hollywood, California.



in residents' housing choice. Because of its design and therefore openness to both social and scientific approaches to sustainability, the conjoined dwelling can address all three principles of sustainability. It is similar to yet distinct from the dominant sustainable housing models discussed in the literature; the principal point of departure being that it challenges the standardised homogenous design of the single family house while the others, especially green housing, generally do not. Thus the conjoined house makes its users active participants in solving the issues of sustainability, addressing whole sustainability through economic, equity and ecological imperatives.

Another recent and local example, the 'Tokelauan House' near Wellington, New Zealand simultaneously addresses issues of ecology, economics and equity. This detached dwelling is a demonstration public housing project, designed and developed as a collaborative effort by researchers at the School of Architecture Victoria University of Wellington, the Wellington School of Medicine Otago University, and Housing New Zealand Corporation (HNZC). Crucially, the house was designed in participation with members of the Wellington Tokelau Association. The brief called for a house for up to 10 people in permanent residence, in three generations. In response to serious health issues in New Zealand housing (Gray, 2008), it had to be warm and dry, durable and healthy, with a layout and features that would meet the physical and cultural requirements of Pacific peoples now living in New Zealand, and fit seamlessly in its suburban context. These 'basic' requirements are not especially difficult to meet if delivered with a generous budget and a predictable household composition. However, the uncomfortable truth is that poverty, overcrowding, changes to household composition, and unpredicted behaviours, are social realities that can mean the difference between sustainable and unsustainable housing. So, the Tokelauan House also had to meet the following additional requirements: it had to work with a minimum of electrically powered equipment; be within the tight HNZC budgetary limits for capital, maintenance and operating costs; and continue to meet basic health and functional requirements even when unplanned or unexpected circumstances arise, such as additions to the household or when the occupants forget to open the windows for ventilation. Householders' own assessments (Pene, 2009) together with early (as yet unpublished) results from environmental monitoring and improvement in householders' health, suggest that the design does meets the tough brief for a sustainable house, lending credence to the possibility of managing the balancing act between equity, economy and ecology.

FIGURE 3. Diagram, plan and photograph of the Tokelauan house, Wellington, NZ.



The ecological features of the Tokelauan house included an increase in building insulation, use of passive solar technologies with heat storage and a heat pump for backup and a passive ventilation system, comprising a vertical chimney-like duct with a wind-driven exhaust fan to draw warm moist air from bathrooms by utilizing Venturi and stack effects. Control of interior dampness for the highly populated building (in addition to ventilation) was

helped through the separation of wet areas from habitable rooms. Socio-cultural demands for privacy regulation and supervision were achieved though design of the building layout and the relationships between circulation public and private areas which allowed the household the flexibility to alter the use of spaces to suit changes in household composition and activity. Crowding concerns were addressed through the design of sleeping areas as well as the provision of a 'garage' space designed for temporary inhabitation. Economically, the demonstration house was constructed within the capital and maintenance cost limits of its State-owner, Housing New Zealand Corporation, while in terms of the tenants' operating expenses it costs about the same as it's less sustainable and much smaller predecessors.

This house and a conventional New Zealand house were critically compared in pre and post-occupancy evaluations by occupants and other representatives of the Tokelauan community. The new house was given a positive assessment. It shows that extended-family living can be enhanced by appropriate built environments. Layout, material choices, space, warmth and dryness are key to the positive outcomes. The case indicates that properly designed social housing can achieve multiple objectives: it can increase the disposable income of families, and by allowing extended families who want to live together to do so, it can maintain minority languages across generations, and contribute to an improvement in the health and social wellbeing of family members (Pene, 2009).

CONCLUSION

> *If you want to change how someone thinks, give up; you cannot change how another thinks. Give them a tool, the use of which will lead them to think differently.*
>
> —Buckminster Fuller

Sustainability in housing means more than taking a positivist approach, it also means attending to socio-cultural, health and economic dimensions alongside environmental concerns. "Today, an appreciation of the significance of the non-technical issues is growing and it is realised that so-called 'soft' issues are at least as crucial for a sustainable development in construction. Economic and social sustainability must be accorded explicit treatment," (Agenda 21, 1992). Sustainability in the wider socio-cultural sense, as is suggested above in the passage from Agenda 21, includes notions of creating a community of individuals who share resources and space. A lack of balance in the standard approaches to sustainable housing obscures the multiplicity of meaning inherent in sustainable housing.

The thorny challenges inherent in creating balance have much to do with our modernist imperatives combined with a mechanistic perception of sustainability. More than ever the world requires houses that cost little to make and maintain, thereby reducing expenditure on resources as well as conserving diminishing resources. Crucially, it also means a wider range of flexible housing models to allow for change in use over the life of the buildings and different types of occupancy. In each of the cases we investigated, a balanced expression of sustainability resulted from a mediation between client and designer. 'If we accept this notion of the work of architecture building as anthology rather than pure expression of concept, we open possibilities of looking closely at the way the parts of the anthology come together and interact with each other' (Williamson (2003).

In research agendas and in design and construction practices, greater attention needs to be paid to the socio-cultural elements of sustainability and the advantages inherent in conservation through sharing. Knowledge and understanding are the most powerful tools we have to tackle the problems of unsustainable housing, but the toolkit has to be complete. If we imagine the field of sustainable housing to be a triangular net of flexible fabric, the three corners of the net are commanded by a sustainability triumvirate representing Ecology, Economy and (socio-cultural) Equity. Provided these three pull together, each always mindful of the other two, they have command of a safety net that might rescue us from a future of unsustainable housing.

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