

The Role of Community Gardens in Sustaining Healthy Communities

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Abstract: Community workers, public health officials and urban planners are increasingly concerned about declining levels of physical and psychological health of city dwellers. The reasons behind this alarming trend are complex. Much of the blame is being levelled at factors such as car dependency, long commuter distances, polluted and unsafe environments – all of which make it difficult to undertake the physical exercise needed to combat many serious diseases. Poor nutrition – particularly over consumption of high density foods – is another significant factor in the equation, especially in disadvantaged communities where fresh produce is often hard to find and expensive. Built environment and health professionals are gradually realising that they need to work together to better understand these issues if workable solutions are to be found. This is the background for our paper which discusses the role of community gardens in building healthy and sustainable communities. Focussing on a large high-rise public housing estate in Sydney's inner west, the community garden scheme studied was part of an urban renewal program designed to ameliorate ongoing social problems on the estate. Our research found that this project resulted in a broad range of positive physical and psychological well-being outcomes for the public housing tenants. These included providing opportunities for individuals to relax, undertake physical activity, socialise and mix with neighbours, sharing across culturally different backgrounds and religions. The gardens also afforded opportunities to learn about horticulture and sustainable environmental practices, such as composting and recycling, as well as being an important source of low-cost fresh produce for a healthy diet. This research confirms that community gardens can play a significant role in enhancing the physical, emotional and spiritual well-being necessary to build healthy and socially sustainable communities. The importance of community gardens to Australian city dwellers is likely to grow as the trend for consolidated and densely populated urban areas increases.

Introduction

Governments are increasingly concerned about rising rates of serious physical and psychological conditions—such as cancer, heart disease, diabetes, asthma, depression and emotional stress—in city populations across the globe. Many of these illnesses are exacerbated by obesity which is, in turn, linked to low levels of physical activity and poor eating habits – particularly the over consumption of fats and sugar and insufficient intake of fresh vegetables and fruit (Begg et al, 2007, pp. 81-83; p. 87). Medical interventions are limited in tackling these issues as they are related to a variety of complex factors (Dixon and Broom, 2007). It has been suggested that such multifaceted problems necessitate "...action in many areas. Preventing obesity... means making changes in the transport, urban planning, agriculture, education and health sectors, for starters" (Sweet, 2007, p. 16). Urban lifestyles with their characteristic car dependency, long commuter distances from home to work and time pressures can make daily healthy habits difficult (Thompson, 2007; Mead et al, 2006; Frumkin et al, 2004). And even where individuals might have the time to undertake exercise, heavily trafficked, polluted and often unsafe and unpleasant environments dissuade many from doing so. Eating fresh food, particularly fruit and vegetables, can also be tricky. It can be difficult to find, is often expensive and then requires cooking skills and preparation time. This is particularly problematic for those from lower socio-economic groups.

Urban consolidation is increasingly seen as the best way to overcome the toxic ill-health effects of traditional suburban environments. And while there are significant benefits including ready access to public transport and reduced commuting times, for Australians the loss of the traditional backyard has come at a cost to health. Not only is this a safe place for active children's play, it is where many families grow fresh fruit and vegetables, as well as ornamental flowers and shrubs. Gardening involves regular and enjoyable physical activity and when the work is done, the area is an ideal place for recreation with friends and relatives. Backyards are also where domestic pets, which bring many recognized health benefits to humans (Jackson, 2007), are kept and nurtured.

The move to consolidated cities is well underway in Australia, particularly in Sydney, Melbourne and Brisbane, with this trend increasing (Randolph, 2006). In Sydney, for example, medium density housing is set to be 70 per cent of all new dwelling construction over the next 30 years (Bunker et al, 2005). This has implications for the provision of open space as traditional residential lifestyles undergo a dramatic shift away from the historical focus on, and importance of, the backyard for children's play and gardening activities.

Accordingly, we contend that the community garden has never been more important in the Australian city. For those who till the soil within them there is fresh produce to eat as well as a raft of social and physical well-being outcomes. Passers-by benefit, as does the environment at large. In this paper we explore these benefits – initially from the international literature and then using our research on a specific community garden project in a large high-rise public housing estate in Sydney’s inner west. Initiated as part of an urban renewal program designed to ameliorate ongoing social problems on the estate, these community gardens provided an opportunity for residents from diverse cultural backgrounds to come together for the first time. The research explored the impact that the community garden had on the lives of tenants of the estate. Here we focus on the physical and psychological health and well-being benefits. The broader results of the study, including suggestions for better management of community gardens in public housing estates, are presented in Bartolomei et al, 2003.

Origins of Community Gardens

Community gardens have a long history dating back as far 100BC in the UK and the small Celtic fields of Lands End, Cornwall, which are still in use today. During the reign of Elizabeth I (1558-1603), the manorial ‘common’ lands were enclosed and ‘commoners’ were compensated with ‘allotments’ of land attached to tenant cottages. But it was not until 1908 that the Allotment Act of Parliament established a legal requirement for local authorities to meet community demand for gardens (Humphreys, 1996). In the USA a program of allotment gardens began in the late 1890s in response to the needs of families devastated by the effects of economic depression. Not long after, John Dewey promoted gardens in schools as part of his educational reforms. It is estimated that by 1910 there were 80,000 such gardens across the USA where academic work was connected with practical experience (Fang, 1995). During World War I, in both the UK and USA, severe food shortages again triggered the need for community gardens. In America this involved some 20 million gardeners and produced 44 per cent of fresh vegetables during the war years (Warner, 1987).

In Australia the development of community gardens was initiated in Victoria in the mid to late 1970s. This initially occurred in the suburb of Nunawadding, and later with the development of the inner city Collingwood Children’s Farm and the suburban Brunswick City Farm (Grayson, 2000). Subsequently, community gardens were developed by state governments on a number of public housing estates. Sydney’s first community garden was located in the grounds of the former Rozelle Psychiatric Hospital in the mid 1980s by a local community centre and was used as part of a patients’ recuperation program. In the mid to late 1990s community gardens appeared in many public housing estates as a ‘community renewal’ initiative. The 1990s saw the development of community garden networks such as the Australian City Farms and Community Gardens Network (based in Queensland) and the Community Gardens Network (based in Sydney) in response to increased demand for gardens linked to promotion of waste management through composting and urban permaculture initiatives.

Interest in community gardens has continued to grow steadily in Australia. The “Australian City Farms and Community Gardens Network” web resource continues to link active and prospective gardeners across the nation with a wealth of practical ideas, news and information about community gardens in every state. An informal, community-based organisation it aims to facilitate “the formation and management of community gardens and similar social enterprise by making available information ...and advice”, together with the promotion of “the benefits of community gardening and urban agriculture” (ACFCGN, 2007). Most recently the organisation’s annual conference (the fourth), entitled “Cities Feeding People - Grow it Where You Live” attracted around 700 delegates from all states (Grayson, 2007), attesting to the increasing interest and involvement in community gardens.

Community Gardens: Health and Well-Being Benefits

Community gardens around the world have been credited with an array of beneficial outcomes for participants. These include local political activism; environmental education where participants learn about sustainable urban agriculture, biodiversity and improved waste management; and opportunities for training, employment and local economic development in the form of markets and food co-operatives (Keeney, 2000). Nevertheless, the most significant and widely reported benefits are associated with individual and community health and well-being. Gardens require physical exertion, provide relief from stress and engender creativity, participation with nature and a sense of stewardship for the land (Francis and Hester, 1990). Individuals reap direct benefits from the physical activity involved in gardening and having access to fresh, cheap produce on a daily basis. A community garden project in Denver reported health improvements for the more than 25,000 inner-city residents who participate each year. “These urban oases foster neighborhood ties and promote physical, social, and mental well-being. By providing access to fresh organic produce, opportunities for physical activity, contact with nature, and neighborhood meeting places, these gardens promote physical and mental health in communities with diverse residents” (Prevention Institute, 2004, p. 21). Specific

health benefits from increased physical activity and consumption of fresh vegetables and fruits have been documented for community gardeners in California (Twiss et al, 2000, in Prevention Institute, 2004, p. 21). Vegetable consumption was shown to be significantly higher for those participating in a garden in Philadelphia when compared with non-gardeners (Blair et al, 1991 in Prevention Institute, 2004, p. 23). Even the promise of better health is a motivation for involvement in community gardening activities (Armstrong, 2000 in Prevention Institute, 2004, p. 21).

Psychologically there is satisfaction that comes from the joy of a successful harvest (Kaplan, 1973). Gardeners report decreased stress as well as “the feeling of a spiritual connection with ‘Mother Earth’ ” (Prevention Institute, 2004, p. 23). Sharing of food from the garden, as well as favourite recipes, contributes to relationship building which in turn, can lead to community cohesion and enhanced levels of acceptance and belonging. The latter is related to social capital, an important aspect of well-being not so widely reported as the more tangible physical health benefits of community gardens. Social capital “relates to the resources available within communities in networks of mutual support, reciprocity, and trust” (Edwards, 2004, p. 5). These networks facilitate cooperation among individuals and groups, which is essential for the functioning of society (Productivity Commission 2003, p. viii). The need to enhance social capital is particularly important in low-income and ethnically diverse neighbourhoods. Community gardens have brought about significant benefits to participants from disadvantaged neighbourhoods. A plentiful harvest of cheap fresh fruit and vegetables meant that poor residents were able to provide for their own needs and those of others in a New York garden (Trust for Public Land, 2001, p. 14). A substantial number of community gardens have been developed in response to the needs of new immigrant families in disadvantaged areas. Often prompted by a desire to grow traditional foods in culturally familiar and appropriate ways, such initiatives have resulted in enhanced social capital for the community. In East London, for example, Bangladeshi women developed plots in the grounds of their housing estate (Forbes, 2001). Other immigrant groups have established community gardens as a way of reconnecting with their cultural heritage, as well as a practical means of supplementing their food supply (Warner, 1987). Community gardens have been beneficial for sharing experiences of upheaval, such as fleeing one’s country as a refugee (Cooper Marcus et al, 2001). In the public housing context of a dense urban neighbourhood, gardens can engender a sense of ownership and connection to what would otherwise be undifferentiated public space (Alexander, 1977; Cooper Marcus et al, 1990).

Gardens are increasingly recognised and valued for their therapeutic and restorative qualities (Gerlach-Spriggs et al, 1998; Kaplan, 1995; Francis, 1987). Patients in health care facilities benefit from participating in gardening activities, even with relatively little physical exertion (Gerlach-Spriggs et al, 1998). The research work of Roger Ulrich has substantiated the physical benefits hospital patients realise from just being able to view garden areas. These outcomes are measurable in reduced blood pressure, diminished requirements for pain relief, fewer complaints to nursing staff and decreased time of recuperation (Ulrich, 1984). Community gardens have also become a means of expressing healing in communities affected by the AIDS epidemic (Cooper Marcus et al, 2001).

We now turn to the specifics of our research on the community gardens in Sydney’s Waterloo Housing Estate. We first set the context for the establishment of the gardens before discussing the project’s health and broader social well-being outcomes.

Public Housing Estate Renewal in Australia

Since the early 1990s all Australian state governments have initiated renewal programs on large public housing estates in an attempt to ameliorate increasing problems of disadvantage and social dysfunction. It is generally recognised that these arise from shifts in public policy that impact on the supply of social housing, the consequent need for allocations to be targeted to those most in need, and an ageing and inadequately maintained housing stock. Estate renewal programs, while initially focussed on asset improvement strategies, soon recognised the importance of combining these with social interventions – particularly the need to consult local communities and help build their capacity through community development initiatives. These have involved a wide range of strategies including tenant employment and training initiatives. Community gardens have become a feature of a number of estates undergoing renewal. However, little research has been undertaken to study their actual role in the housing estate renewal and community building process. This was the motivation for our study examining the community garden project on the Waterloo Estate.

The Waterloo Estate

Waterloo lies some 2.5 kilometres south of the Sydney CBD. It is the largest of the inner-city public housing concentrations comprising around 2,500 dwellings (82.5 per cent of all dwelling stock) and over 5,000 tenants. The demographics of the area indicate an overrepresentation of older people (34

per cent), single person households (18 per cent) and sole parents (28 per cent) (Bartolomei et al, 2003, p. 14). It is ethnically diverse with high concentrations of people from Russian/Ukraine, Vietnamese, China and other Asian backgrounds. It is also home to a significant Aboriginal and Torres Strait Islander (ATSI) community. Its level of high disadvantaged has been confirmed in several studies (Vinson, 1996; 1999), most recently in 1999 when it was ranked as the 22nd most disadvantaged postcode in the state of NSW (Vinson, 1999).

The Waterloo estate is divided into two distinct areas. First, the so called 'slum clearance' district comprising both low-rise and high-rise apartments which was constructed mostly between the late 1950s and the early 1970s. Second, the 'rehabilitation and infill' housing area developed during the 1980s as a result of strong local resident action against further high-rise development. This action was supported by Builders Labourers Federation 'green bans'. There are six high rise apartment blocks – four 16 storey blocks designed as mostly two bedroom family accommodation, and two 30 storey towers of bed-sitter accommodation for elderly people some of which have been recently converted to one bedroom apartments. Three community gardens are located in the open space amongst the high-rise apartment blocks (Bartolomei et al, 2003, pp. 12-13).

The Waterloo Community Development Project

A Community Development Project (CDP) was first established on the Waterloo Housing Estate through a collaboration of the University of New South Wales (UNSW) and the Department of Housing (DoH). Called the Waterloo Neighbourhood Improvement Program (NIP) it has been jointly funded by the University and the DoH. The Program has a Coordinator and provides opportunities for staff and students to participate with the local community and other stakeholders in the process of estate renewal. This includes those undertaking degrees in social work and built environment disciplines working on a range of projects to improve the quality of life and physical environment of the estate, including the three community gardens that are the focus of this paper. The CDP has been extended to other public housing estates, initially to nearby Redfern (also containing a number of high-rise buildings) and more recently to the South Coogee Estate in the eastern seaside suburbs. The project has also facilitated the involvement of University staff and students in a number of research projects including one on the role of community gardens in neighbourhood renewal reported on here.

The Waterloo Community Gardens

The first Waterloo Community Garden was constructed by the DoH in 1997 in a children's playground that had become disused because of poor supervision and the danger of injury from discarded and used syringes. The idea originated from community consultations undertaken by UNSW social work and built environment students during 1996 as part of an urban design project for the estate. This first community garden comprised 28 pie-shaped plots within the existing circular enclosure of the playground. Support for the project was also provided by the South Sydney City Council (SSCC) via a community grant and the involvement of Council's Community Gardens Officers. The Royal Botanic Gardens (RBG) also supported the project by providing plants and expert horticultural advice, later incorporated into the joint RBG/DoH Community Greening Initiative. The UNSW assisted tenants to develop a constitution and members were required to pay a small fee. What became known as the Cook Garden, after the name of the nearest high-rise apartment block, was soon fully subscribed by enthusiastic tenant gardeners. Demand for the development of additional gardens followed (Bartolomei et al, 2003, pp. 16-17).

The Solander and Marton Gardens (also named after nearby apartment blocks) were constructed in 1998 with the cost of capital works shared between the DoH and the SSCC. The UNSW once again assisted with convening of meetings and ongoing management support. These gardens were initially smaller than the Cook Garden with only 15 plots each, but were later expanded to approximately double this size using a design prepared by the UNSW Landscape Architecture Program (Bartolomei et al, 2003, p. 17). These gardens are more rectangular in shape with individual garden plots typically around 2 x 3 metres.

Unlike some other community gardens that have shared plots, the Waterloo gardens have been developed on an individual allotment basis where individuals determine what to plant. Each of the three community gardens has its own water supply, a lockable tool box and composting bin, and is surrounded by a painted steel fence with masonry pillars with a keyed entry gate.

The Research: Examining Community Gardens in Public Housing Estates

There were several objectives of the community gardens research project upon which we draw in this paper. The specific aims were to:

- Review the literature on community gardens and their role in community development;

- Document the physical and social development of the gardens;
- Understand the social characteristics of gardeners, their motivation for involvement, level of commitment and perceived benefits and rewards of involvement;
- Understand the role of the gardens as a vehicle for community development and their importance in the process of neighbourhood improvement;
- Understand the strengths and weaknesses in the design and management of the gardens so as to inform the development of future gardens; and
- Develop further strategies community development through garden projects in disadvantaged neighbourhoods.

The research team included an urban planner, landscape architect, social worker and architect experienced in community renewal. A qualitative methodology was used. This involved a literature review, data collection on the gardens, in-depth interviews with key stakeholders (tenant, CDP Coordinator, two DoH staff, SSCC Waste Services Officer), and five focus groups involving a total of 28 gardeners representing 50 per cent of all gardeners. Two of the focus groups were garden specific, one was mixed, and two involved gardeners from particular cultural groups (Russian/Ukraine and Vietnamese) with translators. Questions put to the focus groups were grouped into five themes:

- Activity and therapeutic benefit;
- Ownership and belonging;
- Social function;
- Managing the garden;
- Cultural diversity; and
- Safety.

The individual interviews and focus groups were audio tape recorded and transcribed. A line-by-line, thematic analysis of the resultant texts was undertaken by the research team allowing development and confirmation of recurring themes by comparing similarities and differences across all responses.

We now turn to discuss the research findings focussing on health and well-being. The full spectrum of research outcomes are presented in our report, "A Bountiful Harvest: Community Gardens and Neighbourhood Renewal in Waterloo" (Bartolomei et al, 2003).

The Gardeners

At the time of the research there were 55 public tenants who were active members of the three community gardens under study. There were 29 in the largest and 12 in the smallest, plus a number of other gardeners, mostly children, who shared or worked in a plot. Membership was restricted to public housing tenants but not limited to those in the adjacent buildings. Nevertheless, most gardeners lived in the nearby high-rise buildings with the remainder residing in three-storey walk-up flats on the Waterloo Estate.

The age of members ranged from 36 to over 75 years with the majority (60 per cent) aged between 56 and 75. The gender balance was strongly in favour of women who accounted for 70 per cent of garden members. Ethnicity, as in the surrounding public housing estates, was very mixed and included people from Argentinean, Armenian, Australian, Burmese, Chilean, Egyptian, Fijian, Indonesian, Iraqi, Irish, Malaysian, Russian, Spanish, Turkish and Ukrainian backgrounds. The largest representation was Russian/Ukraine (45 per cent) followed by Anglo Australian (11 per cent) and Vietnamese (11 per cent). Length of residency on the estate for the gardeners ranged from three to ten years with 30 per cent claiming residency of over ten years (Bartolomei et al, 2003, p. 31).

The frequency of visits to the garden varied from daily to once per month, with most visiting for between two and four days per week. The duration of visits was from less than one to three hours, with a majority generally spending around two hours in the garden. Those attending more frequently were, however, likely to be there for shorter durations – in some cases less than one hour (Bartolomei et al, 2003, p. 32).

In illustrating the research findings below we quote extensively from the gardeners, in most cases, identifying their garden, gender and ethnicity to better contextualise the results. We take care to generalise these identifiers when the respondent is from a small group in order to respect confidentiality assurances. We do not state age as the quotes are predominantly from the older members of the community gardens. Most of the quotes used in this paper are from the Cook or Marton gardeners.

Contributions to Health and Well-Being

As discussed earlier, the health and well-being benefits of gardening are well documented for individuals and communities. Our study found a wealth of such benefits confirming the cited research.

For many Waterloo gardeners the physical exercise of gardening was regarded as critical in the maintenance of good physical health. For others it was a way of regaining general good health. In other cases the health benefit was very specific.

I have got a high blood pressure problem. I go into the garden in the morning and I work over there and then I come back home. I feel much better. I do much more things. I feel more energetic and my blood pressure goes down. (Cook Garden, male, Russian)

Peace and relaxation were also cited as specific psychological benefits.

When I go there it calms me down and I can reflect on many things being there. (Cook Garden, female, Russian)

...I feel great just going out to the garden... it's relaxing. (Cook Garden, female, Anglo Australian)

In a community with high levels of unemployment and welfare-dependency, the daily routine of attending to a garden plot was also important.

I used to work and then I found that we were made redundant – I had nothing to do so I thought I'd see if I could get a garden block so I had something to do... (Marton Garden, female, Anglo Australian)

To others who had experienced isolation or emotional upheaval the garden became a central and very important focus of their lives contributing to their psychological well-being.

...I'm a different person altogether. I was very emotional, not steady, [but] since I've got the garden, I feel good about myself [and] all the different things happening to me. It's just made me stronger. Before I was a wreck. Now I am very strong. That's my garden. That's my little plot. (Cook Garden, female, Anglo Australian)

Well I just became housebound... I sort of heard about people jumping off balconies... I wanted something extra... I'd always had a garden, always had a beautiful garden [before coming to the estate]. I've always been house-proud and garden-proud, you know, and that's part of your life... (Cook Garden, gender not identified, Anglo Australian)

Gardening also provided a spiritual dimension, enabling a connection with a divine reality through contact with nature and meditation.

It's also a spiritual thing... It feels great... after I've been about an hour in the garden sometimes I come back feeling fresher and more energetic... (Non-identified gardener)

I just go to [the] garden and I [am] calm... I'm just thinking. I think about God and people... (Cook Garden, female, non Anglo)

As highlighted in the literature, community gardens have the practical benefits of providing a source of fresh food that can ensure a healthy diet and help to reduce food costs. Further, such provision can avoid wastage if only a small quantity of a vegetable or herb is required. We discovered that the cultivation of medicinal herbs was common amongst the Waterloo gardeners.

[in my garden plot] mostly it's medicinal herbs and... all of them are useful... We don't go to the doctor, that's why. For healing, yes... [the] garden it helps [with] healing. We can heal each other like we heal the old and the ill. (Cook Garden, female, non Anglo)

The boy [in the next garden plot]... is Italian and he only grows herbs... he always tells me what they're for, some for arthritis... He's just a naturalist and these are the only plants he grows. (Cook Garden, gender and ethnicity not identified)

Not all however, gained their satisfaction from growing vegetables and herbs. For some great pleasure was derived from the gardening activity itself – the contact with nature, the satisfaction of

seeing plants grow, the enjoyment of learning new skills and simply taking-in the beauty of their surroundings.

I became involved in the garden about two years ago, maybe a bit more... mainly because I've always loved gardening and plants. It's my life now... it's [a] very big pleasure for us to be in [the] fresh air, to be, to work, [to] think about flower[s]... We don't think about harvest because we haven't harvest, it's good, very big pleasure...joy from our garden and flowers. (Cook Garden, male, Russian)

There's something...relaxing about achieving even a plant of superior growth because you have a hand in the planting of it, the nurturing of it, and the harvesting of it so it's a fulfilling occupation even though it might be menial by some people's standards. (Marton Garden, male, Anglo Australian)

Contribution to Community and Social Life

In addition to the physical and psychological health benefits outlined above, the community gardens in this study were seen by participants as a social, caring place contributing to a greater sense of belonging and a catalyst for friendship formation. These are important aspects of social capital which are not so widely reported nor recognised in the literature on community gardens.

Many tenants of the Waterloo Estate had rarely, if ever, conversed with their neighbours. They spoke of a culture of social isolation where barriers between residents were commonplace, reinforced by few interactions in the physically desolate public spaces around the housing towers. This changed when the gardens were developed, bringing an activity into the public area. Through participation in the gardens, people started talking to one another. Conversation was often initiated with the sharing of garden produce and information. As the plants grew, so did friendship, often forged across cultural barriers challenging stereotypes and an historical suspicion of strangers.

...after we start to [garden, we start to] talk together, anywhere in the garden or anywhere after [we] say hello ... and know each other. Inviting to house, OK. 'Come on have a tea' because they know you and they want continue conversation. ... From a small step that garden's good for the community. (Cook Garden, male, non Anglo)

The generosity of gardeners in sharing produce with each other and non-gardeners (including the researchers) was remarkable. This extended to swapping gardening hints, recipes and taking responsibility for looking after one another's plots. One participant expressed this sharing as a philosophy of life.

...If you share the plant, you got plenty... but if you selfish... the plant is dying... but if you have generous heart... you got more benefit for yourself... you produce more (Cook Garden, female, non Anglo)

To another, sharing with people outside the garden group was source of happiness.

...I grow lots of lettuce, I pick lots and I see people sitting down in the park, old people, and I say do you want a lettuce? I give it and they're very happy. I'm very happy to give. More happiness for me than them. (Cook Garden, male, non Anglo)

The positive contribution of the gardens to a sense of community in an area characterised by a lack of trust between individuals was also evident from the responses of gardeners.

[By being involved in the garden] I understand about...why the community is very important to working together in any sort of work....You water that plot and then somehow that's splashing to the others and I feel strongly [that they] are really wanting to drink. Why I just look at them and I feel like that kind of wholeness in me. (Cook Garden, female, non Anglo)

An increased sense of belonging to the housing estate was apparent.

I think it gives you a feeling of belonging more... this is mine... you have something to own. And you're not just another little person in another little box. ... There's certain amounts of things that you can do certainly, but your outside activities are either visiting other people that you know or doing something with visitors... but a garden gives you an opportunity to meet people... to relax... to be creative. (Marton Garden, female, Anglo Australian)

The contribution to community extended beyond the immediate participants to the wider estate community. The visibility of the gardens attracted attention and opened up opportunities for conversation and breaking down barriers between strangers and generations.

...I have lots of young people who come [to the garden] and visit. A lot bring their family and I just say, 'Well, children really aren't allowed, but if you [are] prepared to look after them bring them in, by all means [come in]'... (Cook Garden, male, Anglo Australian)

Sometimes this led to an interest in participating as a gardener.

The people get some idea they are interested in gardening, [they] want to do their [own] garden so more people want to join the community garden and... they want to start to do the gardening...There are now more people do[ing] the garden. (Cook Garden, female, non Anglo)

Perceptions of the role of the gardens in contributing to safety from crime and harassment on the estate varied between community workers and gardeners. The former reported a positive contribution.

...one of the biggest things that stimulating activity in common areas does is that it increases the natural surveillance of the area ...just the fact that there was a garden that people enjoyed being in, were regularly watering in the morning, watering in the evening - all of a sudden there's activity... I think it has made a very real contribution to both safety in real terms and people's sense of safety and sense of comfort in their own community. (Waterloo Redfern CDP Coordinator)

...[The gardens] encourage people to share common interests, people have met their neighbours, they've developed links with each other, they feel safe with each other...." (DoH's Community Renewal Coordinator based on the Waterloo Estate)

The gardeners' views were, however, much more mixed. Some perceived the gardens as having made an important contribution to improving safety and security, while others had very different opinions.

Yes, it has made a lot of difference. Not only just a little bit – a lot of difference. (Cook Garden, gender not identified, Anglo Australian)

No it hasn't made any difference. Just nice, anyway, to have a garden. (Cook Garden, female, non Anglo)

Accordingly, the contribution of these gardens to improving safety and security on the estate remains uncertain, although there is no doubt that they have encouraged people to be more engaged with their neighbours in the public sphere. The issue of safety cannot, however be overlooked in ensuring a healthy environment. Safety is a critical factor – if people do not feel safe, they will be reluctant to venture beyond the front door into the public realm where they can engage in healthy pursuits such as physical activity and social interaction.

Contribution to Cross-Cultural Relations

Given the cultural diversity of the estate one of the important findings of this research has been the positive role played by the gardens in fostering interaction and understanding across cultural groups. This is recognised both by the key community workers and the gardeners alike.

...one of the project's greatest successes [has been] the cultural mix of the participants... most of the projects that we've been involved in prior to the gardens have been very dominated by the white Anglo Saxon... involving people from non English speaking communities had been difficult. (WRCDP Coordinator)

...it teaches me to appreciate other cultures. (Cook Garden, female, Anglo Australian)

I met one woman from India, another woman from China and although both of us, we speak broken English, but we could understand each other. (Cook Garden, female, Russian)

Gardens have been found to fulfil an important role in the process of settling in a new country and a feeling of 'being at home' for migrants generally (Thompson 1994). For many of the Waterloo tenants who have come to Australia as refugees or immigrants, involvement in the garden has provided an

important connection with their culture of origin. Indeed many have their own strong extended family or 'community' gardening traditions (for example, the 'dacha' garden in Russia and the garden plots of Asian villages).

We decided to do it mainly for pleasure, because back in Russia we also had dacha with a garden...and we loved to work over there so this [garden] is kind of a continuation of what we did over there. (Cook Garden, gender not identified, Russian)

Yes, I have a huge, big garden in my country... At the beginning when I arrived in Australia I can't find the chilli or the Asian food... Later...[I] find from Fiji market or somewhere or Chinatown, now I grow in the garden, it's better. (Cook Garden, female, non Anglo)

Food is another important connection with cultural origins. The gardens clearly provided a source of specialist produce for cooking ethnic dishes, both conveniently and economically.

I even have garlic [from my garden]... This is important [for] very good Italian soup. We use a lot of rosemary and I chop and make beautiful soup – and you can't find soup like that... (Cook Garden, male, non Anglo)

I grow sugar cane, chilli, tomato, Japanese mustard, sweet potato and other Chinese vegetables and parsley and basil...yeah and lemongrass. We [the Burmese] use them, that's why. (Cook Garden, female, non Anglo)

...cucumber is kind of the main vegetable that we grow. And we (Russians) particularly like small cucumbers. What we do with it, we just eat it, we use it for salad. We also prepare pickle cucumber... (Cook Garden, gender not identified, Russian)

In a multi-cultural garden, the provision of such specialised ingredients provided opportunities for learning about cultivation techniques and plant types used by other cultures.

We meet with different people originally from different countries... we are exchanging the information - what we grow and how we grow things, things like that. (Cook Garden, gender not identified, Russian)

When I saw her plot... then I learn so much, you know, because she plant some beautiful herbs from China because that's where she coming from. (Gardener, location, gender and ethnicity not identified)

This extended to sharing of produce, recipes and cooking techniques.

The people from Tonga and Fiji they have this potato, the sweet potato. They teach me how to eat the leaves... You never tasted better, put a little bit butter on it, put it in the oven and cheese on top and a bit of garlic. (Cook Garden, female, non Anglo)

... the different cultures do share information if you're listening. I know in our particular case we've learned a lot about fruit and vegetables from other cultures that we didn't know anything about ... you find out how to use their produce in making other dishes and you only do this because they lower their guard in the garden and will talk to you... (Marton Garden, gender not identified, Anglo Australian)

Such garden based sharing of knowledge has contributed to strengthening community on the estate by opening lines of communication between different cultural groups and breaking down racial and ethnic stereotypes.

It's community, it really is, and I meet the Russian ladies even though they can't always communicate to a certain extent, [in the] garden they can. ... as soon as I get there... they come straight down and we have a real old chat. (Cook Garden, gender and ethnicity not identified)

However, while the cultural exchange of garden life was regarded by most gardeners as positive, there were some instances of misunderstanding and conflict arising from language barriers and cultural difference.

[Some] people, they just come to the garden and then they don't feel [that they] want to mix or to talk with us...maybe because of the language. (Cook Garden, gender not identified, Anglo Australian)

Such issues were seen by the DoH Community Renewal Coordinator as minor and within the normal range of cultural misunderstanding expected in such a diverse cultural environment.

...you might have one or two individuals who get jealous, or they don't like certain ethnic groups, and they see that a certain ethnic group does something but that's very minor, if at all. So a small minority might not like the fact that land's been set aside and it's being used by marginally diverse cultural groups but again that's everyday life and that's only a small minority. (DoH's Community Renewal Coordinator based on the Waterloo Estate)

The overwhelming views of garden participants confirmed that the cross-cultural interaction within the gardens has helped to break down cultural barriers, open up friendships across the cultural divide and enriched individual lives through learning about the unique garden practices, produce and cuisine of other cultures. The annual community garden lunches, with a multi-cultural flavour, have become a significant event in the community involving an even wider range of participants from various cultures. More recently a group of gardeners have been key players in developing multi-cultural cooking classes on the estate and catering for other local events.

Conclusions

As an urban renewal strategy in disadvantaged neighbourhoods, community gardens are perceived by public housing authorities as a cost effective strategy for community renewal, empowerment and capacity building. But as this research demonstrates, they offer much more. Community gardens provide active participants with significant physical and psychological health benefits. These outcomes encompass exercise in the fresh air which maintains and builds good health and can reduce depressive conditions. The availability of fresh produce means that a more nutritious diet is available – both cheaply and conveniently. These outcomes from our research are consistent with those widely reported and recognised in the literature. This reinforces the need to widely resource community gardens as Australian cities become increasingly consolidated with more people living in medium density and high rise accommodation without access to private open space. The research presented here also shows that community gardens have a significant role to play in building social capital, particularly in culturally diverse communities. They afford opportunities to bring individuals together around a commonly shared interest in, and love of, gardening. And while our research focuses on a marginalised group in a low income public housing estate, it is likely that social capital can be built in different Australian multicultural communities especially as the demand for quality public outdoor recreation space grows. It is essential that urban planners and policy makers respond to the changing trends in residential living and open up the public sphere for community gardening. The health and well-being benefits are undeniable.

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