

# Warning – ‘Garden Grabbing’ Costs Lives

## Cafe Scientifique

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### Introduction

Is ‘garden-grabbing’ indicative of our attitude to green space. We enjoy and appreciate the green landscape in our towns and cities, but ultimately it is expendable when other economic or social pressures come to the fore. Do we have the balance right in this context? What sort of ‘environmental services’ does green space provide for our urban environment, especially in light of a changing climate, and do we always consider these fully when planning future developments? At a more fundamental level, we as a species evolved in a natural landscape, but in an era of industrialised food production do we still require elements of the green landscape for our own physical and psychological well-being? Indeed, does the green landscape have a role in helping tackle some of the problems associated with our largely sedentary and high-tech urban lifestyles, for example heart disease and depression? For those that live in the rural environment green space may be the norm, but 20% of city children have never visited the countryside, and the average urban dweller only spends 3 hour per year visiting it. To help air some of these issues, this presentation provides an overview of green space in an urban context, and how its ‘value’ to society is being assessed more effectively through recent scientific research.

### Key Findings

Green Space is an essential component of the urban environment and vital in maintaining a range of environmental services in addition to a fit and healthy society.

Specifically, benefits can be determined across *environmental*, *psychological*, *physiological* and *social* terms.

For example

- Moderating urban temperatures and offsetting urban heat island effects, hence improving the thermal comfort of citizens during heat waves.
- Reducing the energy load of buildings through thermal insulation and micro-climate cooling (Figure 1).
- Reducing the risk of flooding, by regulating the surface run-off of precipitation
- Reducing exposure and providing relief to human physiological stress. Stress and anxiety being two main precursors to subsequent mental health problems, such as depression. (Figure 2).
- Increased pain relief and more rapid recovery from illness are associated with access to green space.
- Encouraging people to be more physically active. Activities that promote moderate degrees of physical exertion, walking, gardening, cycling etc. are more accessible, popular and longer-lasting when closely linked with natural and semi-natural environments.
- Self-esteem, communication skills, attention span and even educational / work performance have been shown to increase with exposure to green space.
- Increased social cohesion – gardening and other green activities have been linked with aiding social integration and inclusion.
- Reduced incidence of crime – esp. those related to stress e.g. domestic violence.

### **Implications of the review**

‘Garden grabbing’ - the emotive term used to describe the loss of gardens to new housing development (e.g. 32 km<sup>2</sup> of garden space lost in London alone over the last 5 years) is to some extent, the ‘tip of the iceberg’. Existing urban green infrastructure is under threat from development and change in lifestyle patterns (e.g. smaller gardens with a greater component of hard standings), but challenges associated with climate change and societal needs suggest we should be increasing the component of green space not decreasing it.

Politicians, architects and urban planners need to realise that a lack / loss of provision for quality green space in the urban environment has serious implications for human health and well-being. Components of this include physical, physiological and psychological elements e.g.:-

Physical

Urban vegetation contributes to city cooling. For example, recent modelling work suggests that a 10% increase in urban green space could reduce mean temperature by 4°C and help offset 'urban heat island' effects. Recent heat waves have been linked with premature deaths (e.g. 35,000 in central Europe during 2003) mostly in the elderly and frail particularly, often living in and around the warmer city centres.

### Physiological

A range of green activities (gardening, walking, conservation work) are associated with reduced blood pressure, better pulse rates, and steady physical exercise that helps consume calories without excessive strain on the body. The advantage of these sorts of activities is that participation is often relatively straightforward, and accessible to people of different ages and backgrounds. Indeed, there may be additional benefits associated with the activities taking place in a green environment (participant retention rates are better in green gyms than conventional gyms).

### Psychological

There are numerous reports that indicate exposure to natural and semi-natural landscapes is positively related to mental health, particularly stress-related illnesses. Horticultural, eco and pet therapy are frequently used to aid people suffering mental health problems. In a study sponsored by the mental health charity MIND, patients were shown to respond more positively to a 30 min walk in a natural landscape than an equivalent one in the urban retail environment. Similarly, exposure to natural environments (or even images of natural features) can reduce blood pressure and stress levels in those not suffering clinical mental health problems. A recent report from Australia suggested that gardening helped delay the onset of dementia in the elderly.

### Multiple benefits

A number of studies show that green landscapes and activities are beneficial due to the fact they combine a number of different factors that relate to the human psyche. For example, the benefits associated with allotment gardening have been attributed to enhanced physical activities, reduced levels of stress and mental fatigue, and better social and cultural integration for the participants. Especially for older people, allotments may provide a supportive environment that combats social isolation and contributes to

the development of their social networks. This may explain results from a study among elderly men in the Netherlands that showed participants spent a greater amount of time per week doing gardening than other 'green' activities such as walking or cycling.

The review indicates that gardens, parks, play areas, allotments, nature reserves are not luxury 'add-ons' to our urban conurbations, but absolutely fundamental in providing a sustainable, liveable environment.

The research outlined aims to evaluate the value of green space (not just in immediate economic terms) and to determine innovative ways to increase its coverage in the urban landscape.

### **Next Steps**

The work at the University of Reading is largely focussing on the environmental relations of urban green space, and focussing on how different types of vegetation can be used to help insulate buildings (e.g. by altering solar gain, shading, cooling via evapo-transpiration or providing physical parameters that improve wall insulation). This has implication for the energy use of buildings, both through trying to reduce the requirement for artificial air conditioning in summer, but also improve heat retention in winter, for example by using plants more effectively as wind barriers around the building. Green roofs and walls are likely to provide a number of environmental benefits to city landscapes, but again the work at Reading is looking at choice of plant species in this respect: for example finding plants that can continue to provide environmental cooling when water availability is sub-optimal (e.g. as is likely to occur on a roof!)

### **Others working in the area of urban green space**

As the presentation is a review it utilises many other pieces of specific research. Journalists may find the following particularly useful and relevant though:

Akbari, H. (2002). Shade trees reduce building energy use and CO<sub>2</sub> emissions from power plants. *Environmental Pollution*, 116, S119-S126.

Cameron, R.W.F. and Taylor, J. PlantforLife Briefing Reports 1-18 (2002-09). Horticultural Trades Association and the European Union.

<http://www.bordbia.ie/aboutgardening/GardeningArticles/ScientificArticles/The%20Benefits%20of%20Green%20Space.pdf>

Diette, G.B., Lechtzin, N., Haponik, E., Devrotes, A. and Rubin, H.R. (2003). Distraction therapy with nature sights and sounds reduces pain during flexible bronchoscopy - A complementary approach to routine analgesia. *Chest*, 123: 941-948.

Faber-Taylor, A., Kuo, F.E. and Sullivan W.C. (2001). Coping with ADD: the surprising connection to green play settings. *Environment and Behaviour*, 33:54-77.

Federighi, S. (2008). Today's challenges and opportunities – Kids in the woods. U.S. Department of Agriculture, Forest Service, Office of Communication.  
<http://www.fs.fed.us/emphasis/products/kids-facts.pdf>

Frumkin, H. (2001). Beyond Toxicity: Human Health and the Natural Environment. *American Journal of Preventive Medicine* 20: 234-240.

Gill, S. E., Handley, J.F., Ennos, A.R. and Pauleit, S. (2007). Adapting cities for climate change: The role of the green infrastructure. *Journal of Built Environment*. 33:115-133.

Herzog, T.R., Chen, H.C. and Primeau, J.S. (2002). Perception of the restorative potential of natural and other settings. *Journal of Environmental Psychology*, 22: 295-306.

Kalnay, E., and Cai, M. (2003). Impact of Urbanization and Land-Use Change on Climate. *Nature*, 423:528-531.

Kaplan, R and Kaplan, S. (1989). *The Experience of Nature: A Psychological Perspective*, Cambridge, Cambridge University Press.

Kuo, F.E. and Sullivan, W.C. (2001). Environment and crime in the inner city: does vegetation reduce crime? *Environment and Behaviour*, 33: 343-367.

Maller, C., Townsend, M., Pryor, A., Brown, P. and St Leger, L. (2005). Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations. *Health Promotion International*, 21: 45-54.

McPherson, E.G., Simpson, J.R. and Livingston, M (1989). Effects of three landscape treatments on residential energy and water use in Tucson, Arizona. *Energy and Buildings*, 13, 127-138.

Morris, J. Briggs, M. and Zidenberg-Cherr, S. (2000). School-based gardens can teach kids healthier eating habits *California Agriculture*, 54: 40-46.

Morris N. (2003). Health, Well-being and Open space, Literature Review.  
<http://www.openspace.eca.ac.uk/healthwellbeing.htm>

Pretty, J., Griffin, M., Sellens, M. and Pretty, C. (2005). Green exercise: Complementary roles of nature, exercise and diet in physical and emotional well-being and implications for public health policy. <http://www.essex.ac.uk/ces/researchprogrammes/cesoccasionalpapers/greenexercise>.

Seymour, L (2003). Nature and psychological well-being. English Nature Research Reports No 533. English Nature, Peterborough, UK.  
<http://www.ukpha.org.uk/cgi-bin/admin/uploads/documents/English%20Nature%20-%20psychological%20well-being%20report.pdf>

Simons, L.A., Simons, J., McCallum, J. and Friendlander, Y. (2006). Lifestyle factors and risk of dementia: Dubbo Study of the elderly. *Medical Journal of Australia*, 184: 68-70.

Stec, W.J., van Paassen, A.H.C. and Maziarz, A. (2005). Modelling the double skin facade with plants. *Energy and Buildings* 37:419-427.

Taylor, A. F., Kuo, F.E., and Sullivan, W.C. (2002). Views of nature and self-discipline: Evidence from inner city children. *Journal of Environmental Psychology* 22: 49-63.

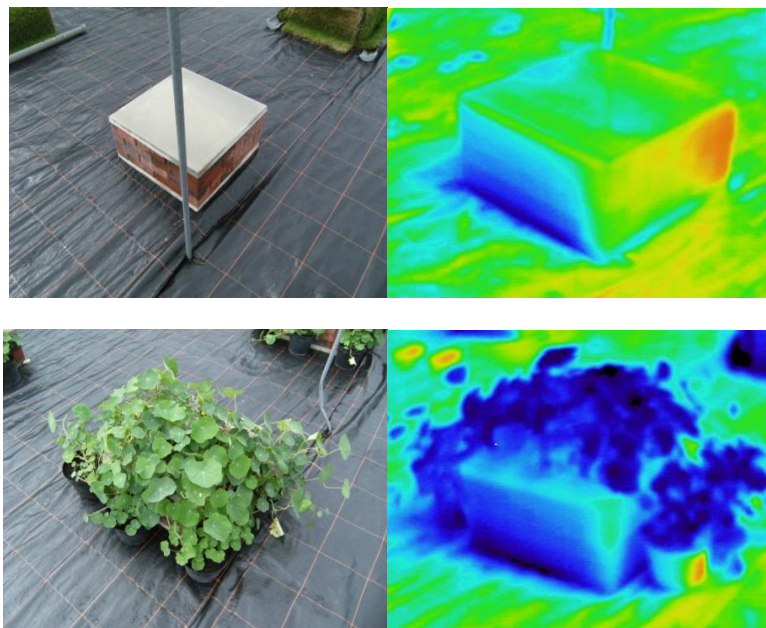
Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., and Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11: 201-230.

Ulrich, R. (1984). View through a window may influence recovery from surgery. *Science* 224: 420-421.

Van den Berg, A.E., Koole, S.L. and Van der Wulp, N.Y. (2003). Environmental preference and restoration: (How) are they related? *Journal of Environmental Psychology*, 23: 135-146.

Wells, N.M. (2000). At home with nature: effects of "greenness" on children's cognitive functioning. *Environment and Behavior*, 32:775-795.

Figure 1. Brick Mini-houses at the University of Reading – Vegetation keep the ‘houses’ cool (blue areas) via shading and evapo-transpiration.



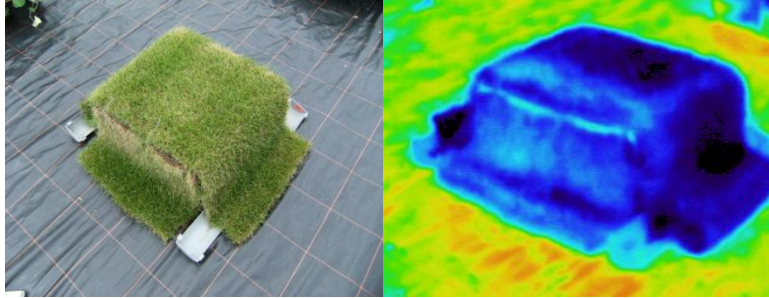


Figure 2. Views of nature and green landscapes (even artificial ones) can help reduce stress and influence psychological well-being.

