The Importance of
Urban Greenspace
A Report

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C O N T E N T S

INTRODUCTION

Before looking at how urban green spaces contribute to the four main elements of this report: Nature and Ecosystems; People and Communities; Health; and Regeneration; and Economy, it is important to understand the word "green" in this context. We also need to understand its value to the continuing quality of essential natural processes and the resulting ecosystems that provide the means for life as we know it – the green in question is a key element in how life thrives on earth.

Biodiversity

What we see as green in plants is the chlorophyll that drives the photosynthetic processes. Put very simply, photosynthesis uses plants to collect water, carbon and sunlight with which through complex mechanisms creates carbohydrates that provide the primary energy for almost all forms of life on the planet – chemosynthesis not withstanding. There is, of course, key elementary systems continually at work that provide the means for plants to exist in order to photosynthesise.

If we think of a brand new volcanic island and imagine it as it has just cooled down, there will be no life on it. However, bacteria and other microscopic lifeforms, known as pioneer species, are brought to it on the wind. These, by their very nature, break down the rocks extracting and releasing essential minerals and nutrients which, along with their own bodies when they die, begin to create the basis of soils which build up over time. Seeds brought on the wind or undigested in birds' guts and released in guano will take root in this medium until a small but sustained ecosystem emerges. The new island begins to turn green as more plants are able to grow. Throughout a number of Seres and Succession stages new plants attract insects usually from nearby land, then larger plants – such as trees – and small animals may appear, again usually brought on the wind or on flotsam, and after what is normally a long period of time the ecosystem on the island will reach what is called the climax stage with mature woodland containing many smaller interacting ecosystems which contribute to the larger system. Succession can happen even in urban settings when the medium for animal and plant growth is removed such as during some of the more severe bombings of the 2nd World War [ID:174] By understanding Succession we can see how Nature through a complex, some say self-regulatory, system can sustain itself.

The Built Environment

In many ways the built environment runs counter to these natural systems. Buildings and streets, inter-city roads and other commuter structures, along with industrialised agricultural systems, have many of Nature's creative devices buried beneath them, but always Nature seems to find its way round us. Brownfield sites quickly become overgrown as hardy plants repopulate vacant spaces. In rundown, or poorly maintained, city areas we can see trees and ferns grow on old buildings as seeds take root in silted gutters and cracks in walls – Nature never stops trying to do what it does best.

There are many lessons we could learn from Nature, and as we come to understand more about natural processes we may find that we have ignored many of these; not least our inability to come to terms with the limits to natural resources [ID:92,192,193,194]. Even though resources are finite, the numbers are huge and it has been difficult for us to know were to draw the line – to know where the thresholds are. We might expect to see some warning signs, but there may be no "big bang" when we reach such thresholds [ID:333], and therefore in our hubris we may overshoot it by a long way. Must we trust to hope that we will not also damage our ability to cope with the consequences of our actions? As it is, there are many warning signs that have been discernible for quite some time. Many natural systems are showing signs of severe stress which continually appear to be ignored in favour of greater consumerism and economic growth. Knowing and understanding Nature's limits may be the greatest and most important lesson the contemporary human being will ever learn.

In this finite little world, Nature is a complexity of interweaving systems and processes that include the elemental, the animate and inanimate – of which we, human beings, are a part. As far as we know, our planet is unique in the universe. There is no other for us to go to should this one fail. It is important, then, that we preserve and conserve the systems and processes that supply us with the resources to feed and clothe ourselves; the materials to build our homes and give us the energy to heat them. Nature also provides the stock materials and energies for our industries and commerce; it also provides many of the medicines to heal us when we become sick.

At the latter end of 2008 when this is being written, our world has finally become an urban world. According to the United Nations Environment Programme report, *World Urbanization Prospects*:

> "… for the first time in history the urban population will equal the rural population of the world and, from then on, the world population will be urban in its majority." [ID 301].

The basis of this report is how we choose to live our urban lives, how to make our cities and towns more sustainable, and how these conurbations impact on the natural world. We are coming to understand how creating and maintaining green spaces in urban areas not only helps protect Nature, but makes other valuable contributions to local communities, not least safe and healthy places for young and old to walk, sit and play in. Greenspace also contributes to the aesthetics of a local area and lends to much more pleasant surroundings for people and communities. It can also contribute to the economic value of the area by increasing the value of homes within it, and there is anecdotal evidence that it can attract new commerce to an area.

Greenspaces are pretty much the 'green lungs' of our towns and cities [ID:2], and by providing places for informal recreation they contribute to our health. Activities such as walking, cycling, relaxing, socialising and children's play are important to our physical health. By providing green "breathing" spaces where we can take time out from the stresses of modern life, we also contribute to our mental health and wellbeing. In many ways Greenspaces bring the countryside into our towns and cities, making it easily accessible. They help to make our local neighbourhoods attractive places where people want to live and work. Greenspaces can help develop community cohesion, stimulate the economy and attract enterprise; they encourage and help conserve biodiversity and provide opportunities for learning, both formal and creative, for all. Greenspaces are defined by how people use them. They are living spaces, breathing spaces, working spaces, healthy spaces, wild spaces, meeting spaces, play spaces, learning spaces. Most importantly, urban Greenspaces are *people* places [ID:2].

The earliest cities were not huge by today's standards, they were usually relatively small and designed to create and protect socio-political wealth and power. In their earliest forms they were usually surrounded by walls and or natural barriers. Many ancient cities where built on or close to the most fertile lands usually strategically placed beside a major waterway or coastal area. Most archaeologists believe that early cities appeared where an agricultural economy already existed. The oldest known city is Eridu (4750BC) in the south of Sumeria (Iraq) near the Euphrates. However, Jericho exists from c8,000BC in Jordan's West Bank, and Çatal Hüyük in modern Turkey c7,500BC, but there is some contention amongst archaeologists as to whether these can be classed as cities. However, there are some who believe that these two are cities and existed to provide trade in commodities and that agriculture was secondary to trade. Whoever is correct it appears the idea of the city as we know it is, at the least, 7,000 years old [ID:347].

There are historical data showing Town Planning had been practiced before the current era by the Greeks and Romans [ID:346]. Even earlier, Nebuchadnezzar had designed and built the hanging gardens in his famous city, Babylon, for the pleasure of his Asian queen to remind her of her homeland [ID:195]. From these early beginnings, until around the time of the renaissance, parks and recreational spaces in cities were usually the sole preserve of the privileged classes. As far as such places were concerned, ordinary people were given no consideration at all [ID:56]. So, it is clear that pleasant green places in cities have been seen as valuable in this context since the first cites were conceived.

While most major cities in the world today are very different from their early counterparts, not least in size, style and complexity, at their core they appear to still follow the same basic ideas – with the best green spaces situated in mainly affluent areas. The industrial revolution of the 18th century was a watershed in the design of cities. Cities and towns are built to operate on an economy of scale with plenty of people to work and make maximum use of natural resources, usually imported from outside the city limits. With just enough share of the wealth for many to purchase the goods produced, mankind created urban societies with an economy, safe from the vagaries of the natural world – not many people are eaten by lions, or trampled by

stampeding herds in city centres. Ultimately, Nature to city dwellers, over many generations, came to be seen only as something to exploit and to serve these new manmade systems of economy and society. In the past, cities were places to flee to, "where jobs were created and serfs could escape the tyrannies of rural life" [ID:195]. In Britain today, however, there seems to be a reversal of those trends with people, mainly professionals and highly skilled artisans, moving to more rural areas or in a general direction south. [ID:234].

Urban Green Spaces

Until the mid-nineteenth century British cities were quite malodorous places, especially after the advent of the industrial revolution in the mid-eighteenth century. As more people moved to the cities looking for work, or to become free of serfdom, pressure was put on urban infrastructures such as sewage systems, which were usually open ditch affairs. Diseases such as cholera and typhoid were rife in British cities as the connection between raw sewage and disease was not made until the mid 19th century, but it still took some time after this until something was actually done about it.

The "Great Stink" in London (1858-59), during which Parliament had to be suspended on numerous occasions on hot summer days due to the stench from the River Thames, resulted in a new underground sewerage system being built. Completed in 1865 the sewer system made a huge contribution towards the health of the city, seeing the very last cholera outbreak in the city soon after. Up until then smelly cities meant those who had the means had other homes outside the city and would frequently visit them to get away from foul stenches. So, green spaces were not alien to the well-to-do city dweller, though the cost of experiencing it was borne by the individual – it also meant being separated from their sources of income. There was a push during the latter half of the nineteenth century in Britain to have gardens and parks become more accessible within cities. Having cleaned up the smelly towns the Victorians wished to spend more of their time in them, and at the same time being closer to their businesses; their sources of wealth. They also wanted the pleasant greenery of the countryside on their doorstep, along with its accompanying wildlife, that many of them had become used to.

Many of the parks and private gardens they had designed into city planning and architecture remain with us today. These city parks and gardens throughout Britain, many donated by Victorian philanthropists, have played a major role in the past in making city life more pleasant than it might have been for many people. Though they are still important today, many of these Greenspaces have been allowed to deteriorate over the last few decades – and while there are many more people with even greater wealth than the Victorians, the same level of philanthropy concerning city parks and gardens does not appear to exist. We are also coming to realise that there are not enough of them; we need more and not just for recreational purposes. Greenspaces are necessary to help protect the natural habitats that support the biological diversity that contributes to all the natural processes mentioned earlier.

Greenspaces should give our children safe places to play and grow and learn; they contribute to better health and quality of life; they make our living spaces much more pleasant and add to both aesthetic and economic value of the surrounding areas. In a time of global warming and the resulting climate change, when temperatures are on the rise we need the shading from trees in our towns and cities to cool us down. More time outdoors means less time inside possibly contributing to less use of energy in buildings. Without well designed Greenspaces to entice people out of hot buildings more energy will be used in air conditioning machines which could contribute to a vicious cycle of carbon release and more global warming.

This Review – a summary

This report reviews literature which highlights the need and importance of urban Greenspace. The main period for this literature is 1988-2008, but it may include some essential pieces of literature from outwith the period, however, these will be at a minimum. As this review is for the reader to assess the importance of the cited authors' research to their particular field, parts of the descriptions of the reviewed literature in this document are by the authors or publishers themselves with some parts rewritten or paraphrased by me to blend them into a cohesive report.

The papers, articles and books cited are mainly those of primary importance to urban Greenspace, but there are others, not directly aimed at green space, that may highlight the importance of it through other subject areas. This includes literature deemed of secondary

importance to the research as well as tertiary or grey literature, that which is not strictly academic or professional in its opinion, but nonetheless makes valid and important points concerning Greenspace. The main themes served by urban Greenspaces and, therefore, considered in this review are: Nature and Ecosystems; Health and Wellbeing; People and Communities; Regeneration and Economy, and how these contribute to all aspects of sustainability though biodiversity, human health issues, both physical and mental, social inclusion, value (both aesthetic and economic), local and national economies, and to planning for regeneration. It is intended that any gaps in urban Greenspace research in the UK are highlighted to enable further research and action.

The literature is cited here by their ID number from the accompanying literature database, and it is there that the literature's Source, Theme and Type can be found. These are also included in the printed reference list at the end of this document. The database is designed, wherever possible, to lead those with valid access to the actual documents cited. The database is filtered by: Source and Theme, as well as Theme sorted by Source. There is also a "Keyword Search" tab which can help cross reference specific subjects from the Title, and Abstracts or Introductions to the document. There are some documents which have been gathered, but not cited and which have been purposely left in the database as these may be of interest to researchers.

Joe Murray, Glasgow January 2009

CHAPTER 1: NATURE AND ECOSYSTEMS

> *"Most research projects just look at impacts on biodiversity and land degradation without integrating socio-economic factors. Changes in social systems are all reflected in the environment. It is critical to link the two."*
>
> **Jennifer Olson, Human Geographer**

1.1 Biodiversity

1.1.1 The Importance of Biodiversity in Nature

Biodiversity is a relatively new way of describing the myriad of different life-forms on the planet. It includes all forms of life from single cell animals like protozoa and bacteria, invertebrates, insects, mammals, reptiles, fish, and then all the plants and fungi too from the microscopic to the giant redwoods – all of these are the diverse and inter-active life that is Planet Earth.

Our built environments, our cities and towns, for the most part, bury Nature beneath them. They will always adversely affect biodiversity and many of the natural cycles, but we can mitigate some of this by designing and creating open and green spaces in our built environment. By doing so, Nature's diversity of lifeforms and processes can exist in urban areas. However, some of the basic science of biodiversity should be highlighted here at the outset to show the importance of creating green and open natural spaces in our cities and towns.

Biological diversity was first described in the USA by Thomas Lovejoy in the *Global 2000 Report to the President* (1980) [ID:106]. Almost immediately, it can be imagined, it would have been truncated to Bio-Diversity, but many believe Dr. Walter G. Rosen used the shortened term of biodiversity when planning the National Forum on Biological Diversity [ID:45]. Edward O. Wilson (1988) [ID:108] used the shortened form in the title of the publication of the proceedings.

The word biodiversity quickly became part of the modern English lexicon and is known to be important on a number of different levels; David Suzuki groups these in three categories:

- **Ecological Values:** All living creatures are supported by the interactions among organisms and ecosystems. Loss of biodiversity makes ecosystems less stable, more vulnerable to extreme events, and weakens its natural cycles.
- **Economic Values:** A biologically diverse natural environment provides humans with the necessities of life and forms the basis for the economy. Everything we buy and sell originates from the natural world.
- **Cultural Values:** Most people feel connected to Nature, often for reasons that can be hard to explain. Some feel a strong spiritual bond that may be rooted in our common biological ancestry. Others are inspired by its beauty. Human cultures around the world profoundly reflect our visceral attachment to the natural world. Thus cultural diversity is inextricably linked to Earth's biodiversity [ID:334]

Nature tends to operate in cycles and each cycle often operates to a period of time, not always within our own tolerable timescales. These natural cycles are important as they moderate the mean temperature of the Earth; grow the plants we eat for food, clean the water for us to drink and clean the air and make it breathable. These are the most obvious:

- **Energy cycle:** the basis of photosynthesis the process by which green plants convert sunlight, water, nutrients, and carbon dioxide into carbohydrates, and also releases oxygen into the atmosphere.
- **Water cycle:** the circulation of fresh water from all of Earth's ecosystems is brought about initially by sunlight causing evaporation of the oceans; precipitation, transpiration through absorption and release by plants. There are long term cycles which release fresh water slowly from frozen ice-fields and glaciers. Also, forests, moderate water flows by catching, holding and recycling rainwater. Water moving slowly through wetlands and estuaries is purified; this will also control flooding.
- **Carbon and oxygen cycles:** most of the carbon dioxide (CO_2) in the atmosphere is generated by animal respiration, plant decay and the burning of fossil fuels – volcanic activity also emit CO_2. Carbon dioxide is absorbed into the oceans through photosynthesis by tiny sea-dwelling organisms called

phytoplankton. The photosynthetic process in trees and plants releases oxygen back into the atmosphere, providing us with a breathable air.

- **Nitrogen cycle:** Nitrogen is crucial to life on Earth. Approximately 79% of Earth's atmosphere is Nitrogen which is an important element in amino and nucleic acids and is also a component of chlorophyll which is central to the photosynthetic process. Nitrogen is not directly accessible to most organisms in its natural atmospheric form. To be of use to the organisms it must be converted, primarily by certain types of bacteria which absorb nitrogen from the air and "fix" it into compounds like nitrate and ammonia. In this form plants can take it up and, through photosynthesis, helps them grow. Nitrogen is recycled into the atmosphere in its original form when animals feeding on these plants release it in their waste products, which then decomposes [ID:334].

There are many important natural cycles with those above being among the most important to us. It is from these cycles that Nature creates many of the vital services that allow us to live in relative comfort on the planet. Living in cities these processes can become invisible to us and therefore easily ignored. However, they remain as crucial to us as urbanites as if we were rooted in the land.

In 1992 the Rio Conference [ID:185] created The Convention of Biological Diversity (CBD) which was later adopted by the UK in 1994 [ID:97]. The convention makes provision for:

> "…the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources…".

Preserving and conserving biodiversity depends much on habitats. According to Brooks *et al* (2002) habitat loss especially in biodiversity hotspots is becoming a serious problem [ID:124], and these hotspots tend to be found across the globe. In the UK, CBD is concerned with the diversity of habitat, species and genetics and takes a hierarchical approach to the management of diversity [ID:97]. After the Convention was adopted it became part of UK policy "Biodiversity: the UK Action Plan" [ID:98].

The National Biodiversity Action Plan identified major national habitats and species and created plans for action on these. The next stage was to prepare Biodiversity Action Plans at the local level (LBAPs) and the process for creating these was similar to the National BAP. The aim behind the LBAP was the conservation of selected habitats and species at a local level. The designation process gave additional protection to some habitats and species. However, greater consideration is required to the designations of some communities so that more flexibly is given to protect Nature as a changing and dynamic process [ID:338]. Cities and towns impact on these natural processes, but by designing Greenspaces into our built environments we can alleviate some of the impacts.

The Convention agreed at the Rio Conference was an attempt to reduce the rate of species extinctions at the international level. Extinction rates are believed to be an important indicator of the pressures on habitats and species. Subsequent literature [ID:109,110,112,118] indicate that where species diversity is lessened because of extinctions, habitats can become susceptible to catastrophe. Reductions in biodiversity also reduce essential products and services to humans: food, drink, medicines, as well as clean air, and water.

At the National level of biodiversity conservation, many of the habitats in the national Biodiversity Strategy are also listed in the Habitats and Species Directive [ID:99] (Special Areas of Conservation – SACs). The designated bird species are also included through the Birds Directive [ID:100] (Special Protection Areas – SPAs) and the Ramsar Convention – the convention on wetlands [ID:101]. All these sites now included in the designation process are now designated Sites of Special Scientific Interest (SSSIs). This process resulted in many more designations in a short period of time in order to meet the deadlines set by Europe as part of the implementation of the Directive.

SEPA's *State of Scotland's Environment* report in 2006, an update of the 1996 version, highlighted a number of important issues. In the report it was realised at an early stage that there were three overarching issues concerning Scotland and its environment:

- Biodiversity,
- Human Health, and
- Climate Change

The final three chapters of the report deal with these important topics [ID:139]. In a global sense these issues are even more great and the UNEP report Global Outlook 4 gives many scenarios in the wider sense on such matters [ID:293] including climate change and biodiversity. Concerning the latter, in Scotland, Scottish Natural Heritage (SNH) found increasing resistance to designation which was bringing the SSSI suite of protective areas under criticism and delay. The issues of right of appeal and rights of landowners were the main problem areas. The difficulties led to the drafting of the *Nature Conservation (Scotland) Act* (2004) [ID:102].

Scotland is home to some 90,000 species [ID:103]. At one end of the scale we have at least:

- 40,000 species of virus, bacteria and protozoa,
- 24,800 species of invertebrates, and
- 20,000 different plants and fungi.

At a more comprehensible level, we also have:

- 242 species of birds,
- 63 different mammals and
- 10 species of reptiles and amphibians [ID:103].

The Scottish government's agenda for action on biodiversity conservation consists of five major strategic objectives to conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future – to meet this broad aim there may be a need for balanced action across a range of areas. The required actions of the five major objectives are:

- **Species & Habitats:** To halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats
- **People:** To increase awareness, understanding and enjoyment of biodiversity, and engage many more people in conservation and enhancement
- **Landscapes & Ecosystems:** To restore and enhance biodiversity in all our urban,

rural and marine environments through better planning, design and practice

- **Integration & Co-ordination:** To develop an effective management framework that ensures biodiversity is taken into account in all decision makings
- **Knowledge:** To ensure that the best new and existing knowledge on biodiversity is available to all policy makers and practitioners [ID:103].

To conserve and protect biodiversity and wildlife in Scotland, requires a legislative tool and therefore the *Nature Conservation (Scotland) Act* was brought into force [ID:102]. The Bill for this Act of the Scottish Parliament was passed by the Parliament on 5th May 2004. This Act consists of five major parts:

1. Biodiversity (outlines biodiversity strategy)
2. Conservation and Enhancement of Natural Features (SSSIs, procedures, reviews and offenses)
3. Protection of Wildlife (Marine Wildlife Watching Code)
4. Scottish Fossil Code
5. General (Orders, Regulations, Guidance) [ID:102].

Where once the responsibility for biodiversity belonged to Nature conservation organisations, today conserving biodiversity is now a duty for all organisations and communities and this is a dramatic shift in accountability. This shift in responsibility provided opportunities for a wider range of individuals and groups to address the seven urban objectives outlined in the Urban Biodiversity Implementation Plan 2005-2008 [ID:339]. These are:

1. To integrate biodiversity into urban regeneration, development and all planning systems
2. To ensure that business practice enhances biodiversity and that economic activity is supported as a consequence
3. To enhance biodiversity as a consequence of site planning, building design and construction practice
4. To integrate the conservation and enhancement of biodiversity into the management of all urban spaces

5. To promote first-hand experience and learning about biodiversity in local urban communities
6. To ensure that decision-makers take account of the contribution that biodiversity makes to the quality of life, environmental and social justice, and healthy living agendas
7. To improve opportunities for people to enjoy and care for biodiversity through increased awareness, volunteering, local action and lifestyle [ID:339].

All of this legislation highlights the growing seriousness in which governments take the issues of biodiversity, and the not least for the reliance our societies and economy have on the very services they provide to us. As Wurthmann (2007) writes: Biodiversity is often a measure of the health of biological systems (and) indicate the degree to which the aggregate of historical species are viable versus extinct [ID:340]. It is with that in mind we need to reverse, wherever possible, the problems of loss and fragmentation of habitats, pollution, overexploitation, and the invasive exotic species. There are a number of papers and reports in this review that support his view such as (Johnston 1995; Kirby 1995; Rodiek 1995; Harding 2001; Chand 2003 etc.) [ID:74,80,81,91,93,95,121,130,131,132,316,335]. Well designed Urban Greenspaces can play an important part in helping to preserve biodiversity by creating new habitats and can become part of wildlife corridors through our built environments thereby reducing at least some of the problems of habitat fragmentation. It should be remembered that species can and do adapt to changes in their normal habitats (Berry, 1990). Melanism (changing colour over time), for instance, in the Peppered Moth in urban environments is a classic example. Put very simply, their light colour against the sooty industrial backdrop increased predation on this species, and overtime these changed to a darker colour and the moth became camouflaged in its new environment. However, when the Clean Air Act came in and cities were being cleaned up predation increased again as these darker species began to stand out against the lighter backgrounds prompting further melanism. [ID:138].

1.1.2 Ecosystem Services

Few would dispute that humanity depends on Nature's resources and services to live and to survive [ID:54,136]. Nature and biodiversity continually provide us with essential natural services and this is another area in which Greenspace can assist the

natural processes which provide these. What we know Nature to be is due to the actions and interactions of the biological diversity that exists on the planet. As the human trend is to become more urban and therefore more remote from Nature it is easy to forget that cities, and the people who live in them, rely on the ecosystems that lie beyond its municipal boundaries and the essential services they provide; in fact many of these are the very basis of Earth's life support systems [ID:75].

Apart from the obvious resources, water food, clothing and shelter, what are relatively unappreciated are the many other crucial services provided to us by Nature such as:

- purification of air and water,
- detoxification and decomposition of wastes,
- regulation of climate,
- regeneration of soil fertility, and
- production and maintenance of biodiversity, from which key ingredients of our agricultural, pharmaceutical, and industrial enterprises are derived [ID:54].

These services which are provided by the environmental systems and the "natural capital", or raw materials, that they produce are critical to the functioning of the life-support systems of our planet. By direct or indirect means they make a huge contribution to our welfare, and in doings so represent part of the total economic value of the Earth [ID:75].

The study of the economics of the Earth, after many discussions about the name, has become known as Ecological Economics. Robert Costanza in his article: *What is Ecological Economics?* explains that ecological economics, unlike environmental and resource economics, addresses the relationships between ecosystems and economic systems in the broadest sense. These relate to many current problems such as sustainability, global warming, species extinction and wealth distribution [ID:191].

So, biodiversity and ecosystem services are not only important to the Nature and Ecosystems theme in this review, they also contribute directly to the Health and Wellbeing, and Regeneration and Economy themes. This is not surprising as without these ecological services as we perceive them, humanity like all other life on Earth

would not be as it is. In fact, humanity may not exist at all. However, we are fortunate that these natural systems are in place. However, as has been mentioned, we need to have a greater and wider understanding of their importance to help us manage these resources and the services they provide, more carefully. Making cities greener may help us achieve such an objective.

As human populations increase, so too there is an increase in the need for more housing, more water, food and clothing and more of all the other artefacts and services human communities need, or more precisely, want. This obviously puts stress on natural services as the renewal or replenishment of many of these are time restricted. Using more of our natural services outside of these time constraints digs deep into the natural capital rather than us using the interest from that capital [ID:333]. This goes directly to the limits of resources, both ecological and economical [ID:92,193,194,333]. It could, according to Mathis Wackernagel, be seen as poor fiscal management. “We must learn to live within our means and preserve and conserve the natural resources and services – live off Nature’s interest, not its natural capital” [ID:333].

The global population may be increasing, but the balance between rural and urban living is also changing. A United Nations Environment Program report states that human populations have now become more urban that rural [ID:301]. It is also believed that by 2030 urban populations will include over 60% of humanity [ID:136]. This change in urban/rural balance brings with it a new raft of problems. As our cities and towns grow, and urban sprawl encroaches further into natural green areas the ecological service we rely on will become diminished unless we can minimise the destruction of them. There are direct and indirect impacts on human health as Lawrence *et al* (2004) infer, and it also needs to be noted that suburban areas and other commuter areas some distances from cities also undergo considerable development which can impact severely on ecological functions and reduce biodiversity [ID:21,23,28,81,87]. As natural habitats are destroyed through greater urbanisation, many animals can find themselves in competition with humans, and some can move from being, or contributing to, a natural resource to becoming a pest [ID:81].

Increasing urban green space can help in redressing some of our impacts on the natural world. We need to keep in mind how this can greatly benefit humans socially, health-wise and economically while at the same time having benefits for wildlife. There is also growing evidence that urban green spaces can contribute to offsetting some of the excesses of climate change [ID:281], which will be discussed later in this section of the review.

In the short term, populations will not slow or decrease so we must plan our cities and towns in a more "organic" way. It is important that we understand that the built environment can incorporate the natural environment through careful planning and design of urban spaces. Much of the research cited in this review underlines many of the advantages of green spaces within the built environment – how it can help to redress some, though not all, of the problems the impacts large conurbations are causing the natural world. We need to incorporate more natural green space into our built environment; to give greater consideration to natural wetlands and floodplains; to include more woodlands and natural open spaces.

Many people may envisage trees when thinking of natural green spaces; they are part of the iconography of Nature. Trees are specifically diverse and each tree can be a small ecosystem in itself and can act as different habitats for many different species of animals, insects, birds, fungi and plants. In an urban setting, trees can help to reduce air pollution and water pollution. Through shading they can also help keep cities cooler, and they are a more effective and less expensive way to manage storm-water runoff than building systems of concrete sewers and drainage ditches [ID:230].

Fresh water is an essential resource and Scotland has more of it per capita than any other country in the world. How we manage this resource is important. Understanding catchments and how surface waters impact on groundwater resources is also important and natural green spaces both urban and rural play their part, so too in some cases does the health of Scotland's biodiversity. So, water quality management and river catchments and river basin management, as well as protecting groundwater sources, are imperative. There are a number of papers and reports released in Scotland that cover such things: see Langan (1989), Ferrier and Harriman (1990), Johnston and Whitehead (1995), Soulsby *et al* (1998), The Scottish Government (2007), EU

(2007), SEPA (2007) among others [ID:141,159-166]. By creating more urban green space we will increase the ecological services directly into our built environment which not only, minimise and mitigate harm to the natural environment, but also add to the health and wellbeing of the people who live in urban areas.

1.1.3 Urban Wildlife

Increasing wildlife, both flora and fauna, in the urban setting is important and should be encouraged, but it requires the natural spaces to allow for this to happen and these spaces need to be considered on the same level as all the other parts of the urban infrastructure [ID:62,70,273,279,281]. To do that policymakers and urban planners need the information that highlights the value and benefits of green space at all levels of society. Knowing that we need the natural environment to live in relative comfort, we need to continue to highlight how the impoverishment of this environment will ultimately lead to the detriment of our built environments.

Humans encroaching on the natural environment is an age old problem. It creates confrontations with the incumbent wildlife – with generally one winner, humans. While it can be exciting to see normally rural animals in our towns and cities, increases in these less usual species of wildlife becoming urbanised has in the past been a surrogate indicator of the impoverishment of the rural environment – the destruction of ecosystems which forced wildlife to seek new habitats. In Britain these may be foxes and in some cases badgers [ID:196], but in other countries this problem may result in wolves, bears or other predatory animals coming into contact with human communities [ID:16,126]. This is not always good for humans, but can sometimes be even worse for the animals [ID:126].

While some species of animals can relatively easily become urban, there are many that cannot [ID:122,123] and fragmentation of their rural habitats are cause for real concern [ID:81,99,121]. Cities and towns are surrounded by rural areas and therefore they directly add to the fragmentation of habitats and ecosystems. In general the same ecological laws and rules govern both rural and urban ecosystems, however, urban systems appear to be more island-like, similar to early succession stages that are vulnerable and easily invaded by alien species [ID:127]. The question has arisen in the past of whether or not a separate theory of urban ecology should be developed.

Niemala (1999) contends that this is unnecessary as urban ecology can be successfully studied using existing ecological methods [ID:127]. Any planning to increase the numbers and types of urban Greenspace will also need to address the problems of island communities and system fragmentation if the plans are to serve the natural environment successfully. However, in his book, Last Child in the Woods, Louv's discussion with Californian ecologist, Elaine Brooks, highlights that island communities can thrive in urban areas if they are cared for [ID:12].

1.1.4 Lawns and Gardens

There is a growing trend among urbanites, particularly those who own cars, to pave or cement over their gardens – to turn them into small private parking lots. The main reason is that many households now have more than one car (in some households, one for every member of the family). In such cases the convenience of hard-topping gardens is without question. However, it does go to the heart of how we choose to live in our cities and what has become acceptable.

In a relatively short period of time it has become obvious that this practice is having a great effect on many aspects of our interaction with the natural world. For instance, another service that Nature provides to our built environment is that of flood prevention. Building on floodplains notwithstanding, hard-topping gardens means that water that would naturally be "soaked up" by gardens becomes run-off and now gravitates in lower levels of the surrounding built environment [ID:261]. Most British cities have dual sewage systems therefore much urban flooding is usually accompanied by black-water from overloaded sewers. Another major problem of hard-topping gardens is that whole ecosystems are removed such as hedgerows. Garden hedgerows provide great protective habitats for insects, and wild birds such as sparrows. Wild birds could be seen as a quality Greenspace indicators so too the very habitats they use [ID:16, 276].

In urban setting the hedgerow is a favoured habitat of the common house sparrow and their increasing removal is having devastating effects on them. The 20-year decline in house sparrows is attributed directly to the removal of hedgerows and bushes which means they have fewer places to nest and their chief sources of food are removed – insects in summer and seeding plants in winter [ID:259]. The removal of wild and cultured flowers in British gardens is also attributed to the decline of bee populations in

Britain [ID:257], though intensive farming and infestation of hives are also to blame for this. Bees are a great plant pollinator and therefore are important to ecological and agricultural services. Pollinating insects and wild birds are showing themselves to be good indicators of the quality of the urban landscape. If we are providing fewer green spaces to support them and they decline accordingly, then it becomes obvious that we need to replace and increase urban green spaces in order to increase the quality of the natural environmental within urban areas [ID:286]. Helping to increase the richness in bird species in urban environments is considered to be necessary and worthwhile, and there are a number of papers cited here that correspond to that thinking [ID:5,6,7,8,28,89,93,95,113,114,115,116, 305,325]. There are no rules or regulations to prevent hard-topping private gardens, but the negative impacts to natural services and the economic costs of resultant and more frequent urban flooding are borne by all for the convenience of the few.

Lawns and gardens can easily be adapted to increase biodiversity. By leaving more remote parts of the lawn to overgrow allows seeding plants and wild flowers to grow providing food and shelter for small animals and birds. Removing other plants such as Leylandii and replacing them with privet also provides shelter and food for birds [ID:252]. The *BUGS Project* (2007) by Sheffield University was a three year research into the significance of urban gardens as its for 'natural' biodiversity. It also looked at some simple creative conservation measures that could help enhance urban biodiversity which is similar in outlook to some other studies [ID:28,93,130,274,325]. All underline the importance of, wherever possible, encouraging new biodiversity to our urban environments [ID: 79,292,314].

1.1.5 Climate Change and Biodiversity

Species Distribution Models (SDM) are now being promoted as indicators for assessing climate change impacts and other conservation management issues. Guisan and Thuiller (2005) suggest new avenues for incorporating species migration, population dynamics, biotic interactions and community ecology into SDMs at multiple spatial scales. While admitting that some limitations preclude the use of SDMs in many theoretical and practical applications, the authors provide an overview of recent advances in this field as dealing with all the problems requires better integration of SDMs with ecological theory [ID:110]

The role of biodiversity as a counter to the excesses of climate change is becoming better understood. Our built environments contribute to negative impacts on the natural environment by changing the chemical makeup of the atmosphere and by covering over the ground. These create cumulative effects which contribute to increases in temperature in urban areas which is distinctly higher than the surrounding natural landscape. So, as mean temperatures rise, cities and towns take on a "urban heat island effect" (UHI) [ID:172,180,249,279]. Gill *et al* explore UHI and how less vegetative areas mean less evaporative cooling and suggest increasing the urban green infrastructure can help offset some of the effects of climate change [ID:279].

Now it is known that our built environments are becoming warmer, green spaces then are also becoming more important. Within these green spaces, different species of trees can have different roles to play in the urban environment in mitigating some of our negative impacts. Along with high albedo surfaces in urban settings which will reflect sunlight, trees also create shading for buildings and therefore act as a cooling agent.

Air temperatures in streets lined with trees can be around 6-10 degrees than streets without the shading of trees [ID:180,195,337]. A mature tree intercepts about 1,000 gallons of water a year, and this can help control flooding They can also offset the severity of downpours, protecting against soil erosion. So, removing these from gardens will add to flooding and other associated problems. Urban trees can also act as air filters therefore help mitigate some aspects of air pollution and help increase air quality [ID:195,337].

The Barker Report sets out a number of major challenges for planning policy and processes in England, amongst them the need to consider the mitigation of, and adaptation to, climate change and the development of biodiversity policy [ID:273]. In Scotland, the need to conserve biodiversity in relation to climate change is also clear. In the government report, Changing Our Ways: Scotland's Climate Change Programme (2007), states:

> A commitment has already been made by the Executive to develop soil management strategies/policies which will promote conservation and enhancement of biodiversity interests by 2007 [ID:341]

The Local Government Association also highlight the effects climate change will

have on wildlife in its report: Be Aware, Be Prepared, Take Action [ID:281]. In order to facilitate the conserving and increasing biodiversity in the urban setting it is necessary to adapt our public spaces to maximise the efforts. This is not an easy task as government policy is to encourage higher urban densities as it is believed to make cities more efficient. However this impacts directly on green spaces by applying pressure to these, especially small-scale local spaces [ID:318]. There is then a great reliance on good urban design to ensure that the urban spaces that already exist are preserved as well as designing in new green spaces to help manage water, temperature increases and biodiversity. CABE's briefing paper, *Adapting public Space to Climate Change* (2008), suggests that "planning authorities need to set a development framework that prioritises the provision of strategic good-quality open space for social and environmental reasons, rather than releasing it to development for economic return" [ID:318].

While there is a necessity for more green space to help increase biodiversity the effects of climate change on wildlife should not be underestimated. Climate change could potentially affect wildlife and insect populations by affecting the distribution of disease vectors – biting pests, especially bloodsuckers. According to DEFRA's, *Animal Health and Welfare Strategy for Great Britain* (2004), the inter-relationship between wildlife and other animals is an important risk factor for changes in disease distribution. Also, many marine and aquatic species are temperature intolerant and as climate change warms UK coastal and pelagic waters some species of fish are moving north to cooler waters [ID:343]. This makes a vital resource for the UK economy harder to utilise as trawlermen have to go farther and use more fuel to in pursuit of them.

Climate change is caused in part by pollution that changes the structure of the atmosphere, and as research has shown green space and biodiversity can help mitigate some of the effects of pollution therefore it is imperative that we make a great effort in the short term to create these spaces to gain long term benefits for ourselves and other forms of life.

1.2 Environmental Quality

1.2.1 Air Pollution

The *Air Quality Standards (Scotland) 2007* outlines the air quality standards for Scotland. It gives limits for all pollutants emitted to air – for example, oxides of nitrogen (NO_x), sulphur (SO_x) and particulate matter (PM_{10}) as well as the maximum occurrences of these

limits [ID:158]. There are some plants and fungi that make very good indicators for air quality many of which are bryophytes (mosses) and lichens. These can be very susceptible to air pollution and their presence can be an indicator of good air quality [ID:134,135].

Once again trees in their diversity of service to us can reduce atmospheric pollution taking up pollutants through their leaves, especially in urban woodlands and tree lined streets [ID:181]. Each leaf is in effect a small air filter and as one mature beech tree can have around 800,000 leaves the need to plant them in city landscapes is paramount [ID:195]. Trees also release oxygen and remove carbon dioxide from the atmosphere, helping reduce the effects of global warming [ID:337].

One mature tree transpires up to 450 litres of moisture a day – equivalent to five room-sized air-conditioners left on for 19 hours [ID:195,249]. A large beech tree produces around 120kgs of oxygen per year [ID:336]. Planted near buildings to provide shade and reduce wind speeds – a single tree, for example, has a sun protection factor of between six and 10 – trees can reduce a building's energy costs by 25 per cent [ID:195]. Their role as pollution-busters – absorbing dust and pollutants – is also increasingly appreciated. The canopy their leaves provide makes up a surface area up to 10–12 times greater than the ground they shadow. Even a conifer like a Douglas Fir can filter out around 20 kgs of sulphur dioxide a year without harm to itself [ID:195].

Trees in urban areas are important, then, for many of the reasons previously highlighted. However, as McDonnell *et al* highlight in their study of red oak woodlands in New York State (1997): forest and woodland along the urban/rural gradient are being impacted in negative ways and need to be included in a more strategic manner when new developments along these gradients are being planned [ID:174].

Changing local neighbourhoods to help mitigate some of the worst effects of climate change is not easy, but there are ways of achieving change. Graves and Phillipson (2002) and McCabe *et al* (2007) among others highlight some of the necessary changes to buildings and other aspects of the built environment, and how to go about realizing them [ID:277,278,279.280,281].

2: PEOPLE AND COMMUNITIES

> *We are in danger of making our cities places where business goes on, but where life, in its real sense, is lost.*
>
> **Hubert H. Humphrey Vice President USA 1965-1969**

2.1 Social value

2.1.1 Housing

Housing is, of course, a most important factor in human society. There are many different types and uses for buildings in our cities and towns. However, the buildings or houses in which we make our homes protect us from the natural elements by keeping us warm and dry – or at least that is the idea – therefore, fundamentally, these are of prime social value.

Houses are not all the same. They differ in size, design and style, materials and, depending on the quality of build, they may use utilities to differing degrees. For example poorly designed and insulated houses use far more energy than they should, therefore usually cost the inhabitants larger percentages of their disposable income to heat them while contributing to global warming through greater CO_2 emissions. Where houses are situated can also make a huge difference to those who live in them, for instance, how well served they are by infrastructure, or civic amenities. William Rees, one of the co-creators of the global footprint theory, insists in his paper, *The Built Environment and the Ecosphere: a global perspective*, that green and healthy buildings should become the norm in our societies [ID:120]. It is becoming more evident through research that Greenspace is also an important factor in the design and structure of our urban communities. How well served local areas are by designed or natural Greenspace may well be an important indicator of whether a community is healthy and happy or one that appears, or actually is, depressed. It is important to note, though, that what constitutes quality green space can mean different things to different people.

Local Communities are made up of those who live in the houses and may be, though not exclusively, a mix of ethnicity, differing interests, socio-economic status, age and religious beliefs. The stakeholders in the community may be politicians, key opinion leaders, people in senior positions, and ministers of religion [ID:302]. If our

communities are to be sustainable in the long term there are specific requirements that need to be met in order to help them achieve this. These requirements may include:

- A safe and healthy local environment with well-designed public and green space;
- effective engagement and participation by local people, groups and businesses, especially in the planning, design and long term stewardship of their community, and an active voluntary and community sector;
- A flourishing local economy to provide jobs and wealth;
- Good public transport and other transport infrastructure both within the community and linking it to urban, rural and regional centres;
- Buildings - both individually and collectively - that can meet different needs over time, and that minimise the use of resources;
- A well-integrated mix of decent homes of different types and tenures to support a range of household sizes, ages and incomes;
- Good quality local public services, including education and training opportunities, health care and community facilities, especially for leisure;
- A diverse, vibrant and creative local culture, encouraging pride in the community and cohesion within it;
- A "sense of place" [ID:349]

Deprived communities may suffer from isolation and discrimination, and any barriers that prevent a community from attaining these basic requirements must be addressed. These barriers may include:

- intrapersonal – confidence, body image, self-esteem, attitude;
- interpersonal – other participants, lack of role models, attitudes;
- structural – cost, access, transport, organisational culture. [ID:302]

Planning new communities has not always been as successful as it could have been. In Glasgow as in other parts of Scotland, cheap and quickly built housing is still a problem in some areas, especially in the post-war peripheral housing schemes such as Easterhouse, Drumchapel and Castlemilk. Having been built on farmlands on the periphery of Glasgow, locals had access to some natural Greenspaces, however, there

were many other social problems in these housing schemes that hindered community cohesion. Poor public transport services along with a lack of shops and other civic amenities left many with feelings of isolation and discrimination as more affluent areas could be seen to be better served with these. In recent years the Scottish Government has implemented new "Community Planning" policy and enshrined it into statute within the *Local Government in Scotland Act* (2003) [ID:117]. Community Planning acts as an overarching framework under which all statutory agencies should be working. Local authorities have the lead for community planning across their whole area, in partnership with other local agencies. It has an important role to play in improving public services through effective public partnership which must involve meaningful consultation with local communities.

The report, *Health: Community Planning* (2007) [ID:199] has set out the statutory framework for Community Planning with 32 Community Planning Partnerships (CPPs) across Scotland. There is no typical model but most are organised with a strategic board and groups taking forward key themes, for example: health and social care, and housing. Greenspace plays a part in all of these and if it is to sit high on the agenda then it is partnerships such as these that need to champion it.

The Community Planning Framework allows partners to look together at the needs profile within the whole community, and in particular localities. It can look at all the existing resources in order to redesign and improve services to give quicker access and better outcomes that will meet the needs of the local population. There are of course different issues in the large cities as compared to the more remote rural areas, but a whole systems approach through the community planning structure and processes enables these diverse needs to reflect local circumstances. Highlighted in the report is *Joint Future*, which is sometimes described as community planning in action. Joint Future as described by the Scottish Government, "is the lead policy on joint working between local authorities and the NHS in community care. Its main aim is to provide faster access to better and more joined up services through improved joint working. It expects local partnerships to take holistic decisions on the management, financing and delivery of community care services for all care groups" [ID:199] . Joint Future could be said to be community planning in miniature, with a

smaller number of players working together in partnership. Joint Future is usually part of the 'health and wellbeing' or 'health and social care' themes in individual partnerships. Joint Future also impacts directly to a significant extent on a CPPs resources [ID:199].

Joint Future and Community Planning do not mention urban Greenspace, parks or gardens directly, but they do provide the means for these to be part of local community agendas. They both have some things in common, but also have some differences between them though they are mutually supportive. They have formal partnership frameworks with parent bodies still individually accountable. Both have become the normal way of working together, rather than something additional. And their priorities can be a mixture of local and national issues. And the differences? Community planning is based in statute whereas Joint Future has been driven forward as a key policy initiative. Joint Future has formal reporting arrangements to the Scottish Executive, community planning doesn't. There is systematic evaluation of Joint Future which is now developing in community planning. Highland Wellbeing Alliance is the Community Planning Partnership for Highland. It has grown from a group formed in 1996 of five public organisations in order to express their commitment to improve the wellbeing of the people of the Highlands and to develop collaborative ways of working [ID:200]. When the 2003 Legislation on Community Planning was implemented, Highland Wellbeing Alliance took on that responsibility for Highland.

Community Planning, according to the Alliance, is "…the process through which the connections between national priorities decided by the Scottish Executive and those at Highland, local and neighbourhood levels are improved. It is about making sure that people and communities in the Highlands are genuinely engaged in making decisions on public services which affect them" [ID:200]. The alliance also outlines how community involvement is supported: "…it requires a commitment from organisations in the Highlands to work together, not apart, in providing better public services. It provides the over-arching partnership framework within which other initiatives and partnerships can be co-ordinated and, where necessary, acting to rationalise and simplify public sector working arrangements. In the Highlands,

community planning involves representatives of the voluntary and business sectors as well as public sector agencies" [ID:200].

Community Planning has been discussed at some length here because in Scotland it is pivotal in ensuring local communities become healthy, vibrant and good places to live and work. Over the last decade or so the idea of sustainable eco-villages and towns, with affordable houses built to emit zero carbon; using sustainable materials and designed to create social inclusion and cohesion through local decision making and problem-solving have come to the fore.

In April 2008, the government, through the Communities and Local Government published a consultation paper, Eco-towns: Living a greener future [ID:289]. This consultation document shortlists 15 locations where Government believes there is potential for an eco-town, which will go forward for further assessment. The actual process is set out and this includes the undertaking of a Sustainability Appraisal – and timetable leading to a final list of up to 10 potential eco-town locations, together with a final eco-towns Policy Statement. The document also outlines how Government will support the bid preparation and assessment tasks, and the delivery of eco-towns, and seeks the public's views on the vision for eco-towns and on the shortlisted locations [ID:289].

The Department for Communities and Local Government (formerly the Office of the Deputy Prime Minister), published the Eco-towns Scoping Report in 2007 [ID:290]. This was followed in 2008 by the Department for Communities and Local Government (DCLG) Eco-towns Sustainability Appraisal: Scoping Report for the Planning Policy Statement. This Prospectus set out the Government's vision for eco-towns that would "achieve high standards of sustainable living while also maximising the potential for affordable housing" [ID:290]. It also outlined the support that would be available from Government to take eco-towns forward, and invited proposals from organisations interested in developing eco-towns. Accompanying this document was the Eco-towns Sustainability Appraisal: Scoping Report for the Planning Policy Statement – Appendices [ID:291]. The design of eco-towns allows a great opportunity for architects and designers to create urban Greenspaces that fulfil the requirements for all four of the themes contained in this review. Their designs of Greenspaces

should be transferable to other urban areas; it is an opportunity that should not be lost.

2.1.2 Infrastructure in the Built Environment

If the UK Government's ambition to increase the supply of housing is to be achieved then investment in infrastructure needs to increase. There is widespread agreement that a Planning Gain Supplement (PGS), levied at an appropriate rate, offers one mechanism for increasing resources for investment [ID:206]. It is however important that PGS is not implemented as a single solution but rather as part of an overall package of measures. It should not be seen as, or treated as, a replacement for existing sources of funding beyond those aspects of planning obligations which it will subsume. Any additional revenue which it generates must remain additional. This is the view of the Treasury. The *Planning Gain Supplement* report produced in 2005 outlines, that even by increasing the contribution that developers make towards infrastructure, PGS would also facilitate them by creating more certainty, equity and a less demanding planning regime.

Analysis of the Government's PGS proposals has identified a number of potential benefits. For local authorities these include an opportunity to plan and, critically, to fund infrastructure provision in their area in a more strategic manner, following the lines of local development plans and regional spatial strategies, while at the same time reducing incentives to permit development purely on the grounds of planning gain. Local authorities could also benefit from both additional cash injections and savings resulting from a less demanding planning obligations regime. There is real value in certainty for developers and delivering that certainty provides part of the justification for increasing the contribution that developers make towards infrastructure. Central Government too may benefit, in terms of additional resources for investment in the infrastructure required to deliver its commitments on housing supply. However, the public may benefit from more strategic provision of critical resources such as schools, housing, transport services public amenities [ID:206] and these should include amenities such as parks and other Greenspaces

Building on the principles set out in the eco-towns Prospectus, DCLG's 2008 paper, Eco-towns: Living a greener future [ID:289], also explains the planning process for eco-towns, indicates how the eco-town proposals from bidders will need to be further

refined and developed, and points to the specific challenges which will need to be addressed in each location, if it is to be confirmed as a potential eco-town location. There were 57 bids covering a wide range of proposals and this paper summarises the 15 that went forward for further assessment and how up to 10 locations were selected as suitable. The paper also sets out how Government will support local authorities and other delivery bodies as the proposals are taken forward [ID:289]. This consultation paper sets out how Government is taking forward the eco-towns programme including the shortlist of locations going forward for more detailed assessment.

The paper sought views from interested parties on:

- how particular features such as Greenspace or innovative approaches to housing can best be developed in an eco-town;
- the way in which the eco-towns concept is being developed and the different potential benefits that an eco-town could offer;
- preliminary views on the 15 locations going forward for further assessment [ID:289].

While it is commendable to look to new build and design, to improve communities there are still existing problems in our older communities that need to be addressed. Bruce Appleyard's article, *Livable Streets: Protected Neighborhoods?* [ID:40], examines how mapping exercises with schoolchildren can reveal the influence of travel conditions on perceptions of the neighbourhood environment. These can help identify, prioritise, and generate support for improvements that will make the journeys to school safe and attractive for walkers and bicyclists. To this end, the 2005 paper by Appleyard demonstrates "… how exposure to heavy traffic negatively affects children's perceptions of their environment, and how installing pedestrian and bicycle improvements can quickly improve those perceptions". This shift in perceptions may not only encourage more physical activity, but can also strengthen the connection between children and their communities. In sum, safe school-area streets for walking and bicycling improve a neighbourhood's liveability from a child's vantage point [ID:40].

Appleyard contends that: "children are highly dependent on cars (and their drivers) for mobility, and, at the same time, they are at the greatest risk from the threats posed

by speeding traffic ... and … if a road is busy with speeding traffic and has no sidewalks and/or bike lanes, parents will likely tell their kids to avoid it altogether.".

It is apparent from this that the author believes that cars rule our streets and this impacts directly on local neighbourhoods, and effectively isolates children from the surrounding community as well as limiting the range of activities they can participate while they are growing up.

Appleyard insists that: "… this limit on independent mobility decreases children's opportunity to be physically fit and healthy" [ID:40]. The author also believes it may also impact on aspects of children's mental health by way of diminished ability to independently experience and learn about the world around them.

How well infrastructure, new build and retrospective policy work also depends on the architecture in communities. The Scottish Government's, *A Literature Review of the Social, Economic and Environmental Impact of Architecture and Design* (2006) [ID:268], looks at the possible impacts of architecture and design on the sustainability of local communities. The Scottish Executive commissioned this study in the light of the *Policy on Architecture for Scotland* to provide better public access to the results of research on the social, economic and environmental impact of architecture and design and to better inform clients and designers, with a view to improving quality of life – parks, gardens and other urban Greenspaces must be viewed as part of our infrastructure and therefore, architects and designers have a responsibility to include them in their plans. The review focuses on the end-user, those individuals for whose use buildings and places are ultimately designed. The review draws on evidence from the previous ten years, from the UK, mainland Europe, Canada and New Zealand [ID:268].

There is a growing demand for greater protection of public parks and natural open space in cities and towns. At the same time the benefits and costs of these spaces bring to the community, and to local government are being highlighted [ID:83,85]. The importance of Greenspace is recognised by some but it is noted that more research is required in these. To bring the "countryside" into urban areas means understanding more about the countryside and Rackham's, History of the

Countryside, is a good guide to gain a good understanding of this [ID:128]. Many rural and urban studies of flora and fauna cited previously will help give a good understanding of how these can compete in urban Greenspace areas. Understanding how species may become endangered is important also and there are far too many papers and books to fit into this broad literary review, but what is contained here is essentially a good start to finding more contemporary literature. For example on a wider note, Cronk and Fuller's, *Plant Invaders: The threat to Natural Ecosystems* (1995), Trinder-Smith's, *Profiling a Besieged Flora* (1996), and Brooks *et al* (2002) all highlight how endemic species by their nature may come to be stressed and endangered [ID:124,150,152].

To try and achieve this a report by Urban Green Spaces Taskforce Working Group 2 entitled *Good Practice for Improving Urban Green Spaces* [ID:298] was produced for the Department for Transport, Local Government and the Regions. Working Group 2 carried out the exploration of good practice for achieving and maintaining successful urban green space in its widest context [ID:298]. Definitions of what we consider as urban green space, and of the main focus of this working group, are given in the report.

A main conclusion of the authors is that, in its broadest sense, well managed urban green space is extremely important to its users, highly valued by local communities and is highly successful in providing access to a wide range of different leisure opportunities for people from all age groups and backgrounds.

They found clear evidence of good practice in almost every field of park services and management. However, good practice is: "applied in different authorities and at different levels and is not often transferred". Committed officers and managers find it difficult to spare the time to attend important seminars or to find the resources to initiate and develop good practice further. However, it seems that all is well as the report also highlights many examples of less successful and under-resourced urban green space. According to the authors: budgets are often too low to maintain green spaces at appropriate levels. In some areas, local politicians feel able to reduce funding for parks and green spaces with impunity, making financial planning for parks services uncertain. It seems too that charitable trusts are successful fundraisers

for green spaces but are often not sufficiently supported by the local authority whose communities they serve [ID:298].

According to its mission statement, the POLIS Project on Ecological Governance, a centre for transdisciplinary research at the university of Victoria in British Columbia in Canada, is intended to cultivate ecological governance through innovative research, policy analysis and strategic advocacy, law reform, education and community action.

In one of its many publications, *Economic Benefits of Natural Green Space Protection* (2001), Deborah Curran takes a wider view of natural green space and believes that some view natural open space is underutilised, while others value it as a component of the quality of life in a neighbourhood. She also highlights: natural open space benefits for storm-water management, habitat protection, recreation, groundwater capture, water and air quality improvements. [ID:69]. This highlights that urban Greenspace should be championed at all levels, and that there should be consistency in dealing with green space across all the social-political boundaries.

In their Report, Improving Urban Parks, Play Areas and Green Spaces, Dunnett, *et al* (2002) highlight the importance of parks and other urban green spaces in enhancing the urban environment and the quality of city life [ID:287]. This has also been recognised in both the Urban Taskforce report [ID:231,287,298,299] and the Urban White Paper [ID:212]. The 2002 report sets out the findings of research carried out to inform the work of the Urban Green Spaces Taskforce, which was set up to advise the government on proposals for improving the quality of urban parks, play areas and green spaces. It also reflects the need for more research identified in the Urban White Paper.

Another report where the importance of parks is discussed is the 2002 report, *Urban Green Spaces Taskforce Working Group 3: People & Spaces* [ID:299]. This Report is divided into six sections:

1 A consideration of the wider public values which might inform the provision of urban green space in a democratic, multi-cultural society, which continues to undergo social and demographic change.
2 The present situation: a schematic representation of the current state of supply

and demand for different kinds of urban green space in public, voluntary and private sectors.

3 A consideration of the essentially local context within which parks are provided, used, and succeed or fail to meet policy objectives, together with some principles of involvement and representation.

4 The operating principles which WG3 believe would enable existing and future provision to flourish.

5 Some evidence for the important role which parks could play in helping other government departments achieve some of their policy objectives in a series of cross-cutting initiatives.

6 Some key recommendations.

While this Working Group endorse the Taskforce's concern with unmet needs, especially among disadvantaged or marginalised groups within the wider population the group was keen to highlight the continuing popularity of traditional parks and green spaces, especially where these remain well-maintained and managed. They believe that the needs of urban populations are changing but have found no evidence that the basic need for access to good quality, well maintained parks and green spaces is changing at a fundamental level. Where they found a fall in use they believe it to be a result of declining condition and security, rather than a diminution of need. It is unclear what indicators were used to support this belief. For this reason they caution against mistaking what may be a temporary dissatisfaction with mainstream parks provision (for understandable reasons), for dissatisfaction with parks themselves There is no reason why parks "…which still aspires to express the values of a common civic culture and citizenship – should not co-exist with a wider range of specialist parks and green spaces …"

2.1.3 Green Space as Amenity

It is claimed that around 1.5 billion visits are made to public parks annually [ID:300,304]. Yet these parks are only a part of the "tapestry of green spaces woven into our urban fabric" [ID:300]. There are many other natural green spaces such as: recreation grounds, riverside walks, play areas, cemeteries and allotments. These are part of this urban green mix, however, many of our parks and green spaces today are not as welcoming as the could be. As research shows a significant reduction in the

resources dedicated to maintaining such places, and a decline in their quality [ID:304].

Nature, Role and Value of Green Space in Towns and Cities: An Overview, a paper published in 2003 by the Landscape Department at Sheffield University, summarises research into the role and value that urban green spaces such as parks, play areas and gardens. The research looked into people's attitudes to such areas and how they are maintained. The positive contribution of urban green space makes to some of the key agendas in urban areas including social inclusion, health, sustainability, and urban renewal are also reviewed here. [ID:197].

Despite the importance of public parks to the quality of life and vitality of our communities, the last 20 years has seen dramatic cuts in revenue expenditure for these – now estimated to be in the region, cumulatively, of £1.3 billion [ID:304]. A *Public Park Assessment* report of 2001 states that historic parks, have in general fared worse than recreational open spaces during this period with significant loss of features due to this disproportionate reduction in revenue expenditure [ID:304]. Despite the recognition of national status conferred by inclusion on the registers of parks and historic gardens, registered parks have also suffered significantly with only Grade I designations offering any perceivable protection. The report further stresses: "park stocks are beginning to become polarised with good parks getting better and poorer parks getting worse and in the most deprived authorities these trends are further exaggerated.". Historic country parks, it seems, fare marginally better than other historic parks.

The views of the *Public Park Assessment* report are supported by the 2004 good practice guide, Green Space Strategies [ID:304]. Some of the results from the survey, in this CABE highlight the serious decline of urban parks in the United Kingdom. As a public resource, urban parks, is a massive one – with 27,000 of them covering 143,000 hectares. According to the report around £630M is being spent on their upkeep annually [ID:304].

According to *Green Space Strategies: a good practice guide* (2004) urban parks are a huge physical presence in our towns and cities and support a multi-million pound business in their provision while creating many local jobs. The challenge for

politicians, planners and managers is not simply to reverse the trend of the last thirty or so years, but to revitalise parks and green spaces to put them at the centre of an urban revival, as well as at the centre of the life of communities. This cannot be done without a cohesive plan [ID:300].

Now enshrined into law, the Scottish Government's "Closing the Opportunity Gap" policy is intended to increase opportunity in less well off and deprived communities. As an overarching framework, it is designed to ensure all agencies work better together to achieve the core aims of the policy.

Over the years the opportunity gap in Scotland has been widening. Poverty and deprivation have become concentrated in specific urban and rural areas and these tend to be more prevalent in Scotland than in the rest of the United Kingdom. The causes of these are many and the issues complex; dealing with them is complicated. However, there have been significant successes in some communities in the last 30 years but much more needs to be done if the opportunity gap between Scotland's disadvantaged areas and the rest of the country.

In 2002 the Scottish Government's Community Regeneration Group produced the report, *Better Communities in Scotland: Closing the Gap* [ID:198]. This document sets out the two main parts of the strategy: ensuring that core public services are effective as possible in deprived areas by designing them to meet the needs of people and deliver them in ways that improve the quality of their lives. Making sure that together with its partners in local government, parts of the public sector, the private sector and voluntary and community groups, it turns round disadvantaged communities and create a better life for those who live in them. It highlights the necessity for individuals and communities to have the social capital – the skills, confidence, support networks and resources – to help them take advantage of and increase the opportunities open to them. The report goes on to set out the Scottish Government's action plan for delivering the strategy as well as how it intends measure progress over time.

In order for local people to participate, to be a partner in the decision process, understanding and ownership of their local environment is important if they are to

contribute to a sustainable future for the local community. An excellent example of this is the John Struthers Park Group in East Kilbride [ID:63], which started as a pressure group to protect their local Greenspace from development and grew into a land management, design and biodiversity focussed group, involving the whole community in decision making and activities.

Open spaces within the built environment provide opportunities for a wide range of social interactions and pursuits. They are, therefore, important for quality of life in that they support personal well-being as well as that of the community as a whole. PAN 65 is a document that supports SPP 11 which is concerned with Planning and Open Spaces and physical activity [ID:201]. It is important to know at the outset how much park space there is and whether there is enough of it. There are many ways to measure existing park space in metropolitan environments. The simplest is a per capita measurement – just add up the total park acreage in a community and divide it by the number of people living in the area. However, such park measures can be misleading because they report only acreage, not the accessibility [ID:229]. The Trust for Public Land in the USA finds that when a region's parks are clustered together, some neighbourhoods will enjoy easy access to open space, but other areas will be nearly shut out. They cite the example of Los Angeles which offers 9.1 acres of parkland per 1,000 residents, a per capita total close to the national average. However, when taken into consideration on their own, the Santa Monica Mountains National Recreation Area and a few other large parks distort the statistics which creates an illusion of adequate park space citywide and masking the reality that only select neighbourhoods enjoy easy park access [ID:229].

Open spaces allow individuals to interact with the natural environment while providing habitats for wildlife. They can also be important in defining the character and identity of local communities. New areas of open space of enduring quality and value have, however, been the exception rather than the rule and existing spaces are under pressure not just from physical development but also from poor management and maintenance. PAN 65 [ID:105] gives advice on the role of the planning system in protecting and enhancing existing open spaces and providing high quality new spaces. It also sets out how local authorities can prepare open space strategies and gives

examples of good practice in providing, managing and maintaining open spaces. The advice relates to open space in settlements: villages, towns and major urban areas. PAN 60 [ID:125], Planning for Natural Heritage is a close relation of PAN 65 and in the context of parks as amenity so too is PANs 76 – New Residential Streets [ID:329], PAN 77 – Designing Safer Places [ID:330], and PAN 78 – Inclusive Design [ID:331]. Inclusive design and safer places are not just about houses, offices and other structures they are about internal and external environments where all people regardless of age, gender or ability can go about their daily activities in safety. So urban planning plays a major part in all of this.

In their book, *People Places: design guidelines for urban spaces* [ID:31], Marcus and Francis (1998) describe seven types of urban open space:

1. urban plazas,
2. neighbourhood parks,
3. mini-parks and vest-pocket parks,
4. campus outdoor spaces,
5. outdoor spaces in housing for the elderly,
6. child-care outdoor spaces, and
7. hospital outdoor spaces.

The seven types are discussed to show how each contributes to making "people places" However, there needs to be a comparison made between how different groups use leisure space and Skeggs (1999) undertook an investigation into an empirical understanding of the relationship between "leisure space, sexuality, identity and legitimation" [ID:32]. It is important that different types of people spaces serve all types of people.

Delivering new infrastructure through planning is not without its difficulties. In Bavaria, it seems, there are greater legal prescription around the form and content of the land use plans which helps to provide more detailed and consistent plans. By contrast, many of the requirements on developments in Scotland are set out in policy and advice rather than law. Both the Bavarian and Scottish systems have their benefits and can result in a set of plans which differ greatly across authorities, but are they

more flexible in terms of what they can allow. These are outlined in the Scottish Government's 2007 report: Delivering Physical Infrastructure through Planning: Scotland and Bavaria [ID:62].

The Land Reform (Scotland) Act 2003 [ID:303], also known as the access legislation, has previously been mentioned a number of times in this review. Part One of the Act establishes new statutory rights of public access to the outdoors, however, these rights come with some responsibilities. The act also gives local authorities duties and powers to support the new rights. An outdoor access strategy is not a requirement under the Act, but it will help local authorities to carry out several of their new duties. Under the Act, each local authority has to set up a Local Access Forum to advise on how the new rights should be carried out [ID:303].

The development of a comprehensive outdoor access strategy can be a foundation for the work of the Local Access Forum, and the Forum can then use the strategy to guide its work. The Forum has a central role in monitoring and reviewing the strategy. The Act also says that core paths plans must be developed to create managed access facilities for many different users [ID:303]. Although the outdoor access strategy does not go into detail on specific paths, it will help towards preparing an effective core paths plan. It does this by creating the context for core path planning at a local level.

2.1.4 Civic Pride

Throughout history the connection to specific areas of land, the sense of "place" has been important to the cultural identity, in the first instance, for the individual, but also to the community they belong to [ID:344]. Alasdair McIntosh in his book, *Soil and Soul*, relates some of the events leading to the inhabitants of the Isle of Eigg becoming the first in Scotland to remove a laird from his land and returning it to a self-empowered community [ID: 345]. How the growth of urban areas, and related changes to land, impact on that personal or community connection to place could well be an important Greenspace indicator. Does this connection increase, or decrease the sense of civic pride – what might be the other factors that coincide with this? Cassandra *et al* (2007) believe that People's connection to land is indeed an important contributor to identity in traditional southern society [ID:284]. In small southern communities: "to know where someone lives is to know who someone is because

place assigns biography", according to the authors of this paper, comparatively little research focuses on the impacts to culture of urban growth. They have considered how sense of place (as an indicator of culture) may be impacted, over time, by physical and structural changes in a locale. This point of departure examines the temporal dimension of sense of place, or how place perceptions may vary as familiar places and practices are altered by landscape moderations.

2.2 Community

2.2.1 Safety and Accessibility

"Walkability", a feeling of safe and easy access to and through a local area is extremely important for local people. Safe and pleasant pathways through, and linking, open spaces are essential to the process of providing Greenspace. The perception of whether a community has a sense of walkability could be another important indicator of the health of communities. There are a number of publications which highlight this aspect of Greenspace. The following group of publications help to set out a code of practice for the investigation of Core Paths Plans, and emphasise their importance, in many ways, to individuals and local communities.

Scottish Natural Heritage's 2004 publication, Core Paths Plans: a guide to good practice [ID:204], contends that outdoor access is relevant for everyone whether for their work or recreation or simply for getting around the area where they live. Strategies are used as the framework to plan and develop such activities as: non-motorised outdoor travel, by people of all ages and abilities, using networks of paths, open spaces and linkages in and around cities, villages and rural areas. The strategies recognise the importance of outdoor access issues to many people; it also recognises that many partners need to work together to take them forward. According to the document most local authorities have now developed outdoor access strategies and these are evolving year on year.

Another document aimed at core path plans, Responses to the Consultation on the Draft Code of Practice for Local Inquiries etc. published in 2006 [ID:202] is a summary report on the consultation carried out by the Scottish Executive over the draft Code of Practice for Local Inquiries into Core Paths Plans under the *Land Reform (Scotland) Act 2003*. The consultation period ran from 12 December 2005 to 6 March 2006 where the

Executive consulted a wide range of organisations and a total of 28 responses were received. This summary report provides a table of the responses to the consultation.

In 2007 and with help from the Highlands and Islands Enterprise, the Paths for all Partnership has set up the Community Support Project, Developing Local Paths Support, to help communities in the council area develop well designed, managed and promoted path networks for walkers, horse-riders and cyclists of all ages and abilities.

A leaflet [ID:203] published alongside the project highlights the things that need to be considered when planning treks or trips. This Community Support Project offers support and advice at all stages. Also in 2007 Paths to Health began as a discreet 'project' of the Paths for All Partnership [ID:205]. However, this project has become a core part of the Partnership's business and accounts for the largest operating element. This has led to, among other things, a review of the Partnership's company objects to better reflect Paths to Health work.

A unique selling point of Paths to Health has been to offer outlets for practical action to support walking. The demand for the services on offer from Paths to Health have broadened out from the community sector and now include partnership working with health professionals, workplaces and other national agencies.

The Edinburgh College of Art Literature Review, *Teenagers and Public Space* (2003) [ID:61], reviews literature on young people and public space. From the mid-seventies studies have focused on young people's perceptions and experiences of their local environment and their participatory role in planning and decision-making of environmental projects. However, since the mid-nineties, researchers have shifted their interest towards more radical studies questioning governmental policies and strategies which lead to the exclusion of young people from public space through the criminalisation of certain activities (i.e. skateboarding, graffiti) and policing of their movement (i.e. juvenile curfews). If we consider that these days perceptions of safety in public spaces are distorted by media and political bias towards young people, this important literature review presents the most important of these studies with young people, and critically discusses their findings [ID:61].

2.2.2 Environmental Justice and Social Inclusion

In February 2002, First Minister Jack McConnell made a speech calling for environmental justice for all. Since that time there has been significant policy development in relation to health, social justice, communities, planning, access and biodiversity. In 2003, 'A Partnership for a Better Scotland' (the "Partnership Agreement") was published, setting out priorities for the next four years of the Scottish Parliament.

Greenspace Scotland's *Making the Links* report [ID:1], follows the structure of *A Partnership for a Better Scotland* and draws on a review of research into Greenspace and quality of life. It combines this with case study examples, to show how Greenspace contributes to each of the key strands. This demonstrates that Greenspace is not simply an environmental issue, but is an essential component of our everyday lives.

The London School of Economics' (LSE) Centre for Analysis of Social Exclusion (CASE) has investigated the links between environmental issues and people's behaviour in low-income areas in the UK [ID:267]. A focus group study involved 75 residents in six representative low-income areas which are part of a longitudinal ESRC funded CASE study into area change in the UK. A questionnaire was also completed by 72 of the 75 participants. Evidence from key local managers in the 6 areas added detailed local observations. The authors set their work in the context of earlier studies of environmental attitudes and behaviour and environmental problems in low-income areas. Among their findings concerning local environmental issues were:

- Participants discussed a wide range of problems in their local areas, illustrating the significant difficulties faced by residents living in low-income areas.
- Participants' responses gave a wide definition of local 'environmental' problems, which fell under three broad categories:
    - physical problems such as lack of green space, dirty streets and poor quality housing
    - social problems such as crime, unemployment, antisocial behaviour, and tensions between established and new communities in areas

- problems specifically relating to services or facilities, such as poor transport, too few police, lack of recycling facilities, and service providers not involving the community [ID:267].

Some participants talked about wanting to leave the areas because of poor local environmental conditions. The study shows an awareness of environmental problems and actions among residents in low-income areas that belies many firmly held assumptions. People in low income areas are aware of wider as well as local environmental problems and possible solutions. They also quite readily relate to global problems to their everyday lives, but due to low incomes may feel they have more pressing priorities: "…I'd probably say global warming is really important to me, or the rainforests, I'd go along with that. But while you're living in an area like this, they go on the back burner". Redcar, Female [ID:267].

2.2.3 Community Integration & Cohesion

Rishbeth, and Finney's paper, *Novelty and Nostalgia in Urban Greenspace: Refugee Perspectives* (2005) [ID:269], investigates migrants' perceptions and experiences of urban Greenspaces. The researchers used innovative participatory and visual (photography) methods and the 12 week programme included visits to 10 Greenspaces in Sheffield. The participants were all asylum seekers and refugees from Asia and Africa. The authors discuss how and why the participants engaged or disengaged with local Greenspace in the short and medium term. Migrants' perceptions and experiences of urban Greenspaces were also investigated, specifically the importance of memory and nostalgia in participants' experiences. This included the significance of plants; the novelty of visiting British 'parks'; and the role of Greenspace in enhancing the quality of life of immigrants [ID:269].

The paper concludes that a positive impression of the local environment and meaningful participation in it can be a useful component of integration into a new society. Added to this, recognition of landscape elements or characteristics can provide a conceptual link between former and new homes. However, for this refugee group many physical and psychological barriers must be overcome if the full benefits of urban public open space are to be realised [ID:269].

In his report for the America organisation, Trust for Public Land, *Why America needs more city parks and open space in urban areas* (2003), Paul Sherer writes that "city parks and open space improve our physical and psychological health, strengthen our communities, and make our cities and neighbourhoods more attractive places to live and work". He also notes that, "few Americans are able to enjoy these benefits" [ID:230].

Eighty percent of Americans live in metropolitan areas, and many of these areas have an acute lack of park space. He contends that only 30 percent of Los Angeles residents live within walking distance of a nearby park, and that Atlanta has no public green space larger than one-third of a square mile which is quite astonishing. He insists that low-income neighbourhoods populated by minorities and recent immigrants are especially short of park space. In Los Angeles, for example, white neighbourhoods enjoy 31.8 acres of park space for every 1,000 people, compared with 1.7 acres in African-American neighbourhoods and 0.6 acres in Latino neighbourhoods. This inequitable distribution of park space harms the residents of these communities and creates substantial costs for the nation as a whole. From an equity standpoint, there is a strong need to redress this imbalance [ID:230].

City parks also produce important social and community development benefits. They make inner-city neighbourhoods more liveable; they offer recreational opportunities for at-risk youth, low-income children, and low-income families; and they provide places in low-income neighbourhoods where people can feel a sense of community. Access to public parks and recreational facilities has been strongly linked to reductions in crime and in particular to reduced juvenile delinquency [ID:230].

2.3 Education

2.3.1 Creativity and Learning Spaces

The House of Commons, Department for Education and Skills (DfES) Committee in their report: Education outside the classroom, state that: outdoor learning supports academic achievement, for example through fieldwork projects, as well as the development of 'soft' skills and social skills, particularly in hard to reach children. It can take place on school trips, on visits in the local community or in the school grounds. Yet outdoor education is in decline [ID:207].

They go on to argue that provision of outdoor learning by schools is extremely patchy. Although some schools offer an active and well-planned programme of outdoor education, which contributes significantly to teaching and learning, many are deterred by the false perception that a high degree of risk attaches to outdoor education as well as by cumbersome bureaucracy and issues of funding, time and resources. Neither the DfES or local authorities appear to be doing enough to publicise the benefits of education outside the classroom or to provide strategic leadership or direction in this area.

A short document with extracts from recent HM Inspectorate of Education (HMIE) reports concerning outdoor learning provision made by schools shows that among many of the benefits of outdoor learning at primary level Pupils were able to develop new types of team working and problem-solving skills during residential outdoor education experiences. The report also shows that a group of S5 pupils successfully planned an outdoor education event which was designed to prepare them for the challenge of S6 [ID:208].

In the report, *A Curriculum for Excellence 3-18* (2004), the Scottish Executive's vision for children and young people is set out were: "[Scotland is a country] … in which every child matters, where every child, regardless of his or her family background, has the best possible start in life" [ID:209]. Underpinning this is the *Education (Scotland) Act 2005* which states that: "… education should be directed to the development of the personality, talents and mental and physical abilities of the child or young person to their fullest potential and that due regard, so far as is reasonably practicable, should be paid to the views of the child or young person in decisions that significantly affect them, taking account of the child or young person's age and maturity." [ID:209]. The Act also makes provision for the five National Priorities for Education:

- Achievement and Attainment;
- Framework for Learning;
- Inclusion and Equality;
- Values and Citizenship; and
- Learning for Life.

The programme report, *Taking learning outdoors; partnership for excellence* (2007), is supported by an Advisory Group with representatives from a range of interests: local authority, voluntary and commercial providers, teachers, head-teachers' associations, education directorate, higher education institutions, HMIE, the Scottish Advisory Panel for Outdoor Education (SAPOE), Scottish Natural Heritage (SNH) and the Institute for Outdoor Learning (IOL) [ID:210]. This 2007 programme report has been informed not only by a research programme on outdoor education in Scotland, but also by a wide range of partners through a national conference and research seminar.

It is important that the findings, conclusions and good practice identified by this research are considered not just in terms of how they might help to prove the value of outdoor learning, but also in terms of how they can improve quality, access and capacity [ID:210]. This research and further detailed information is available on www.LTScotland.org.uk/takinglearningoutdoors/index.asp.

The combined work of the Outdoor Connections programme led to the vision that to achieve sustainable outdoor learning in Scotland: We must work in partnership to overcome the barriers and provide all children and young people across all school subject areas and beyond, and at all stages 3–18, with opportunities to learn outdoors regularly. For much more information follow the link below:
http://www.ltscotland.org.uk/takinglearningoutdoors/

2.3.2 The Importance of Greenspace in Creative Learning

In the face of radical technological changes and curriculum innovations, much of the new public school architectural design is tied firmly to past and outdated practices. Currently reform advocates push for program change to occur, while voicing minimal concern for the often obsolete and shabby physical environments of the schools where the program improvement is to evolve [ID:35].

It is, then, important to understand how to create environments which put young people in touch with their surroundings while simultaneously providing them with a stimulating, educational, and safe place to play. Stein's book on this subject, *Landscapes for Learning: Creating Outdoor Environments for Children and Youth*

[ID:38], is based case studies which demonstrate projects that work. The book describes design concepts and offers designers ideas to incorporate into their own safe learning projects.

Another group that needs good quality, safe and walkable green spaces are older people, especially those in megacity areas [ID:48]. Takano *et al* in their paper, *Senior Citizens' Longevity in Megacity Areas: the importance of walkable green spaces* (2002), believe that living in areas with walkable green spaces positively influenced the longevity of urban senior citizens independent of their age, sex, marital status, baseline functional status, and socioeconomic status. They state that: "… greenery filled public areas that are nearby and easy to walk in should be further emphasised in urban planning for the development and re-development of densely populated areas in a megacity". It is necessary for professionals such as those in: health, construction, civil engineering, planning, as well as any others working in the context of a healthy urban policy, to work in collaboration, to ensure the health and wellbeing of senior citizens living in large conurbations [ID:48].

The research consensus appears to be that the availability of green space in the vicinity leads to use of green space amenities, but according to Maat and deVries (2002) it is only very attractive parks which draw people from a wider catchment area [ID:68]. The authors put it that the greater the distance to a park or natural area, the less people walk to it and the more they go by bicycle and, particularly, by car. Therefore proximity, more than availability, to green space amenities encourages people to visit them and to choose a sustainable means of travel.

Good design of school sites and the spaces they occupy is important if learning is to be maximised. In Kate Kenny's book, Grounds for Learning: A Celebration of School Site Developments in Scotland [ID:55], ideas and descriptions of some of the best ways Scottish schools can use and develop their grounds are put forward. There are chapters that examine the process of change from getting started to planning and making the necessary changes [ID:55].

Howe and Wheeler's paper, *Urban food growing: The experience of two UK cities* is concerned with urban food growth, and highlights the resurgence of urban food

growth in developed nations, the case for urban food is made and unpacked through an empirical examination of initiatives in two adjacent cities in the north of England [ID:57]. This is reflected in creative education here in Scotland where another project, the Balornock Urban Garden Scheme (BUGS) – not to be confused with the Sheffield BUGS project – takes school children to work on local allotments giving them hands on experience of learning how to grow food. This is essentially an action research with children on their experiences in this kind of learning. The authors publish their research findings in the report, *Demonstrating the Links: action research on Greenspaces* [ID:275]. The Glasgow BUGS programme shows that outdoor classes can work very well in giving school children a chance to learn about the natural environment. Using gardening as a creative teaching tool is not a new idea, DeMarco, L *et al* (1998) write: "elementary school teachers can also use the process of growing plants and gardening as a vehicle to present an interdisciplinary curriculum to their students. Teachers find the use of school gardening assists students in learning and understanding new ideas within the context of the real world and through participation in the learning process" [ID:58]. The authors Grant and Littlejohn (2001) argue also that "greening the grounds of schools is an excellent way to promote hands-on, interdisciplinary learning about the environment through projects that benefit schools and increase green space and biodiversity in communities" [ID:59]. Their book, *Greening School Grounds: Creating Habitats for Learning*, features step-by-step instructions for numerous schoolyard projects from tree nurseries to school composting to native plant gardens, along with ideas for enhancing learning by addressing diverse student needs. The guide includes detailed articles on rooftop gardens, multicultural gardens, far north gardens, desert gardens, butterfly gardens, ponds, and more than a dozen schoolyard habitat options. For project planners there are practical tips on minimising vandalism, maximising participation, and raising funds, while for teachers there are dozens of outdoor classroom activities [ID:59].

In the UK concerns have been raised about the decline in opportunities for outdoor learning and low levels of understanding about food, farming and sustainability issues amongst young people in this country. Dillon *et al* (2006) in their report: *Engaging and Learning in the Outdoors – The final report of the Outdoor Classroom in a Rural Context Action Research Project* [ID:211], concentrate on some recent studies done

such as the *Education and Skills Select Committee Enquiry* (2005) into education outside the classroom as well as OFSTED's (2004) report on outdoor education; the Government's Growing Schools Programme sought to enable "schools to make better use of the outdoor classroom as a context for teaching and learning" (DfES, 2005). This Executive Summary summarises key findings and recommendations from these and other research [ID:211]. Highlighted are some of the benefits of outdoor learning and experience which include learning about: Nature; Society; Nature-society interactions and oneself. Outdoor education can involve working with others, developing new skills, undertaking practical conservation and influencing society. The intended outcomes of such experiences can encompass: knowledge and understanding, attitudes and feelings, values and beliefs, activities or behaviours, personal development and social development.

The research team on this report observed "young people engaged in activities that, initially, appeared to have a primary focus on particular cognitive developments. However, many of the teaching staff subsequently acknowledged that other domains (particularly learning about oneself and learning about working with others) not only emerged but, in some cases, became for them one of the primary benefits of working in the outdoor classroom" [ID:211]. This echoes some of the findings of the Balornock report. The report makes some good recommendations worth mentioning here:

1. The DfES, local authorities and other agencies should aim to further raise school staff awareness and understanding about the range of outdoor learning sites and what the outdoor education opportunities they offer.
2. The DfES, local authorities and other agencies should seek to further develop school teachers' confidence and capacities to work with students in outdoor contexts (both by themselves and with outdoor educators).
3. School governors, head-teachers and teachers need to enhance the extent to which outdoor education is embedded into the routine expectations and experiences of the school, so that it becomes an established and normal part of 'what we do here'. Such an initiative would require the status of the full range of personal outcomes of outdoor experience to be raised substantially.

4. All involved in outdoor education should further develop their awareness and understanding of the national [school] curriculum and how outdoor education can contribute at different key stages to realising its goals.
5. Teachers and other outdoor educators should consistently aid students to understand how what they experience in the outdoor classroom connects to, extends, and reinforces their in-school work.
6. Schools, local authorities and outdoor providers need to optimise the extent to which work out-of-school is integrated with work in school before they try to increase the amount of time spent in the outdoor classroom.
7. All concerned need to be much clearer about how (as well as what) outdoor education can contribute to pupil learning. This should involve a greater conceptual understanding of ways that students can learn in the outdoor classroom.
8. All decisions about the organisation of teaching in the outdoor classroom should take ideas about how students learn into account when considering what they will focus on and the experiences they will have.
9. Government departments and research funders must take seriously the need for a stronger and more accessible evidence base on outdoor learning. The recommendations of the recent Learning Working Group concerning innovative programmes of development and research deserve the attention of practitioners, policy-makers and researchers within the outdoor learning field [ID:211].

In recent years both the UK and Scottish governments have been taking more interest in out of the classroom study. The Report: *Public space lessons: Designing and planning for play* (2008) [ID:285], edited by David Taylor, shows how a new era of design thinking is encouraging more creativity in the design of play environments. With a boost of £235m of government investment, local authorities can make the most of this opportunity by drawing on best practice and providing imaginative, more natural play spaces that meet the needs of the wider community. Eco Schools have been playing a huge part in out of class learning. *Eco School Grounds*, a Report by Eco Schools (2008) [ID:288] highlight the Eco Schools objectives in this area which are:

- to enrich teaching and learning opportunities across the curriculum for the whole school community
- to encourage a sense of place
- to encourage habitat creation, which enhances the biodiversity of school grounds
- to encourage schools to make community links
- to encourage schools to value their grounds as a place for pupils to play, learn and make important personal connections with the natural world.

Learning outcomes

Through work in school grounds, pupils should be enabled to:

- explore and express feelings for the natural world
- appreciate the importance of biodiversity in their locality and beyond
- take part in decision-making
- take responsible action within their local community
- think critically
- work cooperatively with others
- care for self, care for others and care for the environment.

Some of these objectives and desired outcomes were outlined in the USA in 1999 in the journal paper, *Defining an agenda for the geography of children: review and prospect* [ID:226]. The authors Matthews and Limb, argued that there was only a limited development of a solidly grounded social and cultural geography prepared to conceptualise children as a neglected social grouping undergoing various forms of socio-spatial marginalization. Their emphasis was on work which examined the experiences of children and how they 'see the world' around them. They argued that "research on the lives of children should not just be reported for its own sake, but should lead to outcomes which encourage empowerment, participation and self-determination consistent with levels of competence" [ID:226].

Her Majesty's Inspectorate of Education's (HMIE) 2006 report on *Improving Scottish Education* [ID:219] comments on the quality of provision across all sectors and offers

many things, however, out of class learning as hardly mentioned. In the section on Special Schools it says:

> "Pupils successfully participate in enterprise activities, outdoor education and in a range of educational experiences based in their local communities"

And in section 3:

> "Study support, homework clubs, out-of-hours learning, summer schools, primary-secondary liaison, residential outdoor activities and eco activities have all been promoted" [ID:219].

This apparent lack of appreciation of out-of-class teaching by HMIE may be systematic. Howard Gardner, co-director of Project Zero at Harvard University, is credited with the development of the multiple intelligence theory. In an interview with Ronnie Durie editor of *Mindshift Connection* says in response to elaborate on his theory of multiple intelligence in particular the eighth intelligence – the naturalist:

"The core of the naturalist intelligence is the human ability to recognise plants, animals, and other parts of the natural environment, like clouds or rocks. All of us can do this; some kids (experts on dinosaurs) and many adults (hunters, botanists, anatomists) excel at this pursuit."

And in response to what he hopes MI can bring to education:

> … [it] cannot be an educational end in itself. MI is, rather, a powerful tool that can help us to achieve educational ends more effectively. From my vantage point, Ml is most useful for two educational ends:
>
> 1. It allows us to plan educational programs that will enable children to realise desired end states (for example, the musician, the scientist, the civic-minded person);
>
> 2. It helps us to reach more children who are trying to understand important theories and concepts in the disciplines [ID:222].

So long as materials are taught and assessed in only one way, we will only reach a certain kind of child. But everything can be taught in several ways. The more that we can match youngsters to congenial approaches of teaching, learning, and assessing, the more likely it is that those youngsters will achieve educational success [ID:222].

Of course, as Gardner shows, creative learning does not begin or end in schools. Children learn in all aspects of their lives and how the respond and use open spaces may affect their non-academic learning. Sanford Gaster in his 1991 paper, *Urban children's access to their neighbourhoods. Changes over three generations* [ID:225] investigated one New York City neighbourhood to determine the changes in the use of local public space by local children between 1915 and 1976. Twenty-nine adults were interviewed on their experiences there as children. In addition, such archival sources as U.S. census reports were consulted for demographic changes.

The interviews were content analyzed to detect changes over time in various aspects of children's activities. Substantial changes were detected in (a) the age at which children were first allowed outdoors without supervision, (b) the number and quality of settings visited, (c) the number and nature of environmental obstacles, (d) the number and nature of parent-imposed restrictions, and (e) the number of professionally supervised activities undertaken. It was found that both the degree to which the neighbourhood environment was supportive of children's play and children's access to their neighbourhood have declined substantially since the 1940s.

While the situation concerning out-of-classroom learning is improving in some areas it does not appear to be across the board except for the age old sporting pursuits [ID:235], which are important, but it could be more than this. While many schools have been designed in the past with sports grounds in mind new schools should be designed with other outdoor creative learning facilities. Greening school grounds should be as important in this respect as sports activities.

Making school grounds green need not be a difficult task. Moore and Hong's *Natural Learning, Creating Environments for Rediscovering Nature's Way of Teaching* (1997), demonstrates what can happen in a school when design moves beyond its normal physical and educational limitations. The authors, together with students and faculty, transformed

an ordinary asphalt playground into a lush, naturalised environment filled with ponds, meadows, and gardens. Teachers now find endless ways to expand their curriculum into the area affectionately known as "the Yard." Natural Learning is both a case study and a guidebook that offers practical advice and innovative suggestions for landscape architects and environmental educators. [ID:224].

Learning, of course, is not only important to children, but to adults of all ages. The report by the Scottish Executive, *Learning for Our Future: Scotland's First Action plan for the UN Decade of Education for Sustainable Development* (2006) [ID:216] follows on from the 2005 report, *Choosing our future: (parts 1-3) Scotland's Sustainable development strategy* [ID:213,214,215], which set out the main aims of the Scottish Government's approach to learning for sustainable development. The 2006 Action Plan explains the actions which the Scottish Executive and their partners are taking to achieve the necessary outcomes. It is intended to create the situation in Scotland where:

- Learning for sustainable development is a core function of the formal education system
- There are lifelong opportunities to learn
- The sustainable development message is clearly understood

This Action Plan explains the first wave of actions that will be taken over a five year period that will support the global programme of integrating the principles, values, and practices of sustainable development into all aspects of education and learning.

3 HEALTH AND WELLBEING

> *Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.*
>
> **Constitution of the World Health Organisation, 1948**

3.1 Physical and Mental Health

The *National programme for improving mental health and well-being: Action Plan 2003- 2006* [ID:218] sets out the key aims to be achieved and the main priority areas for action nationally and locally during 2003-2006.

The four key aims for National Programme action during the period were:

- Raising awareness and promoting mental health and well-being
- Eliminating stigma and discrimination
- Preventing suicide
- Promoting and supporting recovery.

The National Programme aims to work with and through others to achieve these key aims in the following priority areas:

- Improving infant mental health (the early years)
- Improving the mental health of children and young people
- Improving mental health and well-being in employment and working life
- Improving mental health and well-being in later life
- Improving community mental health and well-being
- Improving the ability of public services to act in support of the promotion of mental health and the prevention of mental illness [ID:218].

One of the main tasks of the National Programme is to engage with, and support, a wide group of agencies and interests including: Scottish Executive Departments, NHS Health Scotland, CoSLA, NHSScotland, Scottish Prison Service, Communities Scotland, Job Centre Plus, Scottish Arts Council in taking forward the aims and priorities of the programme.

3.2 Diet and Physical Activity

Two of the primary determinants of physical and mental health, leading to increases

in life expectancy, are now acknowledged to be diet and physical activity [ID:233]. Ironically, just as food shortages have been largely conquered in industrialised countries, so poor diets have become a major public health cost. On average, people now consume more food calories than they burn, and consume types of food constituents that are making them ill. The costs of diet related illness (coronary heart disease, strokes, obesity, maturity onset diabetes mellitus, gall-stones, osteoporosis and several cancers) now exceed those of tobacco use [ID:233]. Weinsier *et al*'s *The Etiology of Obesity: Relative contribution of metabolic factors, diet and physical activity* (1998) [ID:220], indicates that there are three major factors modulate body weight: metabolic factors, diet, and physical activity, each influenced by genetic traits. Despite recent advances in these areas, the prevalence of obesity in Westernised societies has increased. The authors believe that: "in all likelihood, activity levels will have to increase in response to an environment engineered to be more physically demanding!" [ID:220].

According to Pretty *et al* (2003), physical activity is now known to be a co-factorial determinant of health. In Europe, there has been a dramatic fall in physical activity over the past 50 years with on average 2 MJ (500 kcal) less energy output per day in adults aged 20-60 years [ID:233]. This is equivalent to the running of a marathon each week. Although similar trends have occurred across Europe and North America, the UK compares badly with many countries. Jobs have become less physical, people are more likely to take the lift than walk the stairs, and adults and children are more likely to travel to work or school by car than to walk or cycle. Only 32% of adults take 30 minutes of moderate exercise five times a week, and only 47% participate in sport more than 12 times a year [ID:233].

The primary role played by diet and physical activity in emotional and physical well-being is complemented by secondary roles played by connections to Nature and social communities. People seem to prefer natural environments to other settings, and the benefits go beyond just enjoyment. A growing number of researchers from many disciplines are now showing that contacts with the natural world can benefit mental and physical health [ID:1,2,3,4,9,10,18,29,34,48,88,197,205,218,230,233,246,248, 270,296,306]. There are, it seems, many ways in which to make contact with Nature in this context:

- the effectiveness of wildernesses in contributing to spiritually beneficial recreation and leisure experiences;
- the healing value of hospital gardens or of nature views from hospital or gaol windows;
- the benefits of community gardens and nature areas in urban settlements.
- The benefits of Core pathways; safe walking through communities
- Contributing to the quality of green spaces through gardening, allotments etc.

In their paper, *Green Exercise: Complementary roles of nature, exercise and diet in physical and emotional well-being, and implications for public health policy*, Pretty *et al* (2003) conclude that exercise programmes can reduce clinically-defined depression, and that this can happen as quickly as 4-6 weeks [ID:233]. They also believe that there is a synergistic benefit in adopting physical activities whilst at the same time being directly exposed to Nature. They call this `green exercise'.

According to Sherer, in his report, *Why America needs more city parks and open space in urban areas* (2003), there is evidence to show that when people have access to parks, they exercise more. Regular physical activity has been shown to increase health and reduce the risk of a wide range of diseases, including heart disease, hypertension, colon cancer, and diabetes. Physical activity also relieves symptoms of depression and anxiety, improves mood, and enhances psychological well-being. Beyond the benefits of exercise, a growing body of research shows that contact with the natural world improves physical and psychological health [ID:34,129,230,232,295,]. Adding to this research, Mardie Townsend's Paper, *Feel Blue? Touch Green! Participation in forest/woodland management as a treatment for depression*, (2006) highlights the growing importance of Nature and Greenspace in the face of the technological and social changes occurring over recent decades, through three qualitative studies in towns in Australia [ID:88]

3.2.1 Green Exercise

Despite the importance of exercise, only 25 percent of American adults engage in the recommended levels of physical activity, and 29 percent engage in no leisure-time physical activity. The sedentary lifestyle and unhealthy diet of Americans have

produced an epidemic of obesity. The Centres for Disease Control and Prevention has called for the creation of more parks and playgrounds to help fight this epidemic [ID:230].

Green exercise, they say, is likely to have important public and environmental health consequences. A fitter and emotionally more content population costs the economy less. Increasing the support for and access to a wide range of green exercise activities for all sectors of society will produce substantial public health benefits. Safe places to walk and cycle are important. Wendel-Vos *et al* (2006) have investigated factors of the physical environment that may influence time spent on walking and bicycling. Parks and sports facilities were found to be important places for these activities [ID:153]. Cleveland *et al* (2008) look at the role local neighbourhood environments play in influencing purpose-specific walking behaviours. Their investigation was a cross-section and prospective examination of local physical and social environments and whether these were associated with mothers' walking either for leisure and or for transport [ID:170]. Their results showed that public transport accessibility and having trust others within their neighbourhood showed increases in walking for leisure. Where there was greater connectivity such as pedestrian crossings and slower local traffic speeds, there was also increases in transport-related walking. People's satisfaction with local facilities appear to increase both types of walking. A better social environment was important for maintaining high levels of both leisure- and transport-related walking [ID:170].

There is a huge body of research into how cities mainly through their buildings and infrastructural processes contribute to environmental pollution which ultimately affect human health. They are too many to mention more than a just a few here (ID:177,178, 179,181,281]. Poor air quality, too much noise, unsafe and unpleasant surroundings, inequity and lack of opportunity in our cities are highlighted often. There are others worth a particular mentioning that highlight direct effects on the health of city populations. Perdue *et al*, (2003) *The built environment and its relationship to the Public's Health: the legal framework* [ID:19], Lawrence et al (2004) *Urban Sprawl and Public Health: designing, planning and building for healthy communities* [ID:21], Scottish Executive's (2007) *Health: Community Planning* [ID:199], all highlight how

urban living can impact human health, and offer solutions. Community Planning was set out in *The Local Government in Scotland Act 2003* and has an important role to play in improving public services through effective public partnership working involving local communities. Community Planning Partnerships (CPPs) of which there are 32 across Scotland are organised with a strategic board and groups taking forward key themes; examples of which are "health and social care" and "housing"[ID:199].

Social inclusion is another important aspect of urban Greenspace. Social inclusion goes right across the board through, social class, race or ethnicity, to age, disability and infirmity. If social inclusion for all is to become the norm, meaningful consultation on, and access to, urban green space is essential to everyone [ID:22,30,164,212,258]. The fact that most people feel better both physically and mentally when visiting parks or gardens where the air quality may appear to be better shows that green spaces are essential to every local community and all of their inhabitants. Healthy and relatively happy communities are more physically active and appear to contribute to the overall health and wellbeing of wider society, while unhealthy and unhappy communities lead to less positive activity and can be a drain on economic resources of the wider society[ID:233].

The Scottish Government believes that physical inactivity is clearly a very common and certain risk to health and wellbeing in Scotland [ID:217]. Lack of exercise can result in death and disease but it also limits to what extent some people can take part fully in activities at school, work, in their communities or even in their own family life. The Physical Activity Task Force, set up in 2001 after the government white paper: Towards a Healthier Scotland, provided the evidence about the scale and consequences of inactivity among the Scottish population. Action is required but it is not something that can be delivered overnight, and a long term approach is best aimed at preventing inactivity. The challenge for the Scottish Government is to provide a combined effort across a wide range of policies – transport, education, social justice, health, housing and economic regeneration [ID:217]. Creating healthy communities is allied to the processes of sustainable development, preliminary research by Srinivasan *et al* (2003) demonstrate the health benefits of sustainable communities [ID:49].

However, the authors felt that the impact of mediating and moderating factors within the built environment on health needs to be explored further. This is mainly due to the built environment consisting of our homes, schools, workplaces, parks and recreation areas, business areas and roads. It also extends overhead in the form of electric transmission lines, underground in the form of waste disposal sites and subway trains, and across the country in the form of roads. The built environment, in effect, encompasses all buildings, spaces and products that are created or modified by people, and impacts indoor and outdoor physical environments [ID:49]. Given the complexity of the built environment, understanding its influence on human health requires a community-based, multilevel, interdisciplinary research approach. It means that a multi-disciplinary approach needs to be taken to researching how to make our communities healthier. This, of course, is what is happening albeit by different institutions and organisations.

3.3 How We View Our Local Environment

How we view our local landscapes can also affect our physical and mental wellbeing. According to Velarde et al (2007) the visible landscape is believed to affect human beings in many ways, including aesthetic appreciation and health and well-being [ID:129], they found that:

> "Generally, the natural landscapes gave a stronger positive health effect compared to urban landscapes. Urban landscapes were found to have a less positive and in some cases negative effect on health".

This study gives an overview of the relationships between health and landscapes arranged in an accessible format, and identified that quantifiable landscape attributes affecting health are an important factor in enabling future landscape design to be of benefit to human health [ID:129]. The authors identified three main beneficial effects of good landscape design on health:

1. Short-term recovery from stress or mental fatigue,
2. Faster physical recovery from illness and
3. Long-term overall improvement on people's health and well-being.

Rachel Kaplan (2001) in the paper, *The Nature of the View from Home: psychological*

benefits, contends that for those indoors, windows and the views from them are important factors for wellbeing. She highlights several studies in hospitals and prisons where views help the speed of recovery and reduce the need for health care services. However, they also make the point that while a pleasing view from a window can be important in some circumstances, the setting is experienced from afar rather than being in it [ID:245].

3.4 Green Space and children's development

How young people view the natural environment is also an important factor in psychological welfare, according to Taylor *et al* (2002) in their study, *Views of Nature and Self-discipline: evidence from inner city children* [86]. This study examined the relationship between local Nature and three forms of self-discipline in 169 inner city girls and boys randomly assigned to 12 architecturally identical high-rise buildings with varying levels of nearby Nature. The study found that on average the more natural view from home for a girl, the better her performance at each of the three forms of self-discipline. The findings showed that for boys, who typically spend less time playing in and around their homes, the view from their home had no relationship to performance on any measure. These findings suggest that, for girls, green space immediately outside the home can help them lead more effective, self-disciplined lives. For boys, it was thought that maybe distant green spaces held equal importance to them [86].

Children growing up in the inner city are at risk from a range of negative developmental outcomes. Taylor *et al* (1998) asked if barren, inner-city neighbourhood spaces compromise the everyday activities and experiences necessary for healthy development? Their study took in sixty-four urban public housing outdoor spaces (27 low vegetation, 37 high vegetation), and these were observed on four separate occasions [ID:27]. Of the 262 children observed, most (73%) were involved in some type of play, and most groups of children (87%) were supervised to some degree [ID:27]. In relatively barren spaces, however, the picture was considerably less optimistic: Levels of play and access to adults were approximately half as much as those found in spaces with more trees and grass, and the incidence of creative play was significantly lower in barren spaces than in relatively green spaces. It suggests, of course, that access to good quality green space is important for children's development.

Hertzman *et al* (2002) in their report, *Early Development in Vancouver: Report of the Community Asset Mapping Project* [ID:37], take the view that society's influence on child development would not necessitate it becoming a public issue if its influence were random across the population, or uniformly beneficial. In Canadian society as in most of the wealthy countries of the world, they argue, "society's influence on child development is neither random nor uniformly beneficial. In Canada, inequalities in child development emerge in a systematic fashion over the first five years of life, according to well-recognised factors: family income, parental education, parenting style, neighbourhood safety and cohesion, neighbourhood socioeconomic differences, and access to quality child care and developmental opportunities" [ID:37].

Children who grow up in safe and cohesive neighbourhoods, on average, appear to do better than those from dangerous and fragmented neighbourhoods. Similarly, vulnerable children who grow up in mixed income neighbourhoods tend to fare better than those that grow up in uniformly low income neighbourhoods. Finally, access to quality childcare and developmental environments, programs, and services; both those that include parents and those that do not, can and do make an important difference for Canadian children [ID:37]. The Scottish Government's Implementation Plan, *Good places, Better Health* (2008) proposes to consider "a discrete number of health priorities and their environmental determinants" in response to the challenges in creating safe and positive environments particularly for children [ID:351]. The document supports a number of the Scottish Governments main outcomes on health and wellbeing including well-designed sustainable places, and valuing, enjoying, protecting and enhancing our built and natural environment [ID:351]. The UK government is signatory to the Children's Environment and Health Action Plan for Europe (CEHaPE), and the Health Protection Agency's report on CEHaPE (2007) summarises the activities aimed at addressing health issues affected by children's environments in the UK. One of the main regional priorities is obesity and physical activity and, therefore, both the UK and Scottish governments are committed to tackling this problem. Well designed and sustainable urban green space can help them deliver on that commitment [ID:350]. The framework being jointly developed by the Scottish Government and COSLA indicates that in the long term reducing health inequalities will be a key outcome. The ministerial task force on health inequalities

report, *Equally Well* (2008) highlights the consensus that tackling health inequalities requires a cross-government approach and cannot be achieved through health policies and health care systems alone, and that the emerging understanding of the deep-seated causes of health inequalities needs to be turned it into practical action. This involves: "working across all of national and local government's key responsibilities – for enterprise and skills, children, justice and the physical environment, as well as health and wellbeing" [ID:111].

Louise Chawla's report to UNESCO, *Growing up in an Urbanising World*, (2002) highlights that in industrialised countries, a half to three-quarters of all children live in urban areas; in the developing world, the majority of children and youth will be urban in the next few decades. Yet across a wide range of indicators, cities are failing to meet the needs of young people and their families [ID:228]. This failure prompts some searching questions such as:

- What does the process of urbanisation mean in the lives of young people?
- From young people's own perspectives, what makes a city a good place to grow up?
- What factors help children and youth feel connected to their urban communities? Or alienated and disconnected?
- How can community development processes encourage children and youth to invest energy and hope in their urban futures? [ID:228]

Growing Up in an Urbanising World summarises the results of an eight-nation UNESCO project that explores these questions and others across a spectrum of low-income neighbourhoods in the industrialised and developing worlds. The report builds on the pioneering ideas of the *Growing Up in Cities* project of the 1970s (a four-country effort directed by the influential urban planner Kevin Lynch), and gives new emphasis to the active participation of children and youth in the planning, design, and implementation of urban improvements. The report shows how principles of the Convention on the Rights of the Child, Agenda 21 of the Earth Summit, and the Habitat Agenda can be implemented at the local level in order to engage young people's insights, energy, and creativity in shaping their cities and towns. It also

documents typical obstacles to participatory processes, and recommends policies and practices that will make cities more responsive to the needs of children, adolescents, and their families [ID:228].

3.5 Human Health: Biodiversity and Productiveness of Urban Green Spaces

Biodiversity has been mentioned a number of times in this report, but the importance of biodiversity in relation to human health needs to be reiterated. The diversity of bacteria creates productive soils and clean our waterways. Without the diversity of plant life such and our forests, bogs as well as the plankton in the sea, the enhanced greenhouse effect which is causing global warming could be more serious than it is now [ID:103]. The practical applications of biodiversity are many and varied. It should be remembered that the first antibiotics were created from mould. Also, there are thousands of other plants, fungi, bacteria, plankton and fish which have, or could have, applications in medicine, and for healthy eating, pest management and much more beyond these [ID:103].

There is growing evidence that humans are beginning to alter, for the first time in history, the chemistry and physics and physiology of the Earth. Eric Chivian (1997) highlights this problem in, *Global Environmental Degradation and Biodiversity Loss: Implications for Human Health* [ID:306]. He maintains that:

> "A basic understanding of biological systems and their dependence on the environment should alert people to the potential dangers these alterations pose for human beings".

It is Chivian's belief that most people, including most policymakers, do not comprehend the human implications of global environmental change. Underlying this lack of comprehension is, says Chivian:

> "the widespread belief that human beings are separate from the environments in which they live; that they can change the atmosphere and oceans – and damage marine, aquatic, and terrestrial ecosystems in the process – without these changes affecting them" [ID:306].

If Nature and our immersion in it helps us to become healthier and improve our overall wellbeing, then it makes sense, environmentally, socially, and economically to

ensure our cities are made greener. The Urban Wildlife Network report, Greener Cities: Closing the gap between policy and practice (2005) contends that:

> Urban green space can be the catalyst for a wide range of regeneration activity, from community health projects to social enterprises … [ID:196].

David Nicholson-Lord goes further in his book, *Green Cities And Why We Need Them* [ID:195]. He argues that the new orthodoxy is profoundly mistaken. For all the inspiring talk of sustainability and urban renaissance, our obsession with compact cities risks another great planning disaster – a new era of town cramping which, by ignoring human relationships with Nature, will do nothing to secure the long-term stability of the city [ID:195]. There may be other hidden factors that could impact on human health by making urban areas more compact and that is the possible transmitting of diseases from animals to humans. This may be from domestic pets, wild animals or from pests and vermin [ID: 137]

Compacting urban areas means land is at a premium and will tend to remove local proxy Greenspaces which have naturally overgrown brownfield sites. Many of these spaces will have been "adopted" by locals and can be sorely missed when they are taken away. However, as Litt *et al*, (2002) point out in *Examining Urban Brownfields Through the Public Health "Macroscope"*, there can be health and safety risks with such sites depending on the historic industrial use of the sites [ID:20]. The authors describe an approach to characterise vacant and underused industrial and commercial properties in Southeast Baltimore, USA, and the health and well being of communities living near these properties. Their methods included, creating and evaluating indicators using local 1990 census data to provide a broader context from which the "brownfields" issue could be considered and evaluated. The also collected health data on the leading causes of mortality for the population 45 years of age and older in Baltimore City for 1990–1996 [ID:20].

If safe sites can be identified, making the most of them productively could be part of healthy eating exercises by using some of these as gardens for growing food which also helps with physical exercise and outdoor creative learning [ID:29,57,153, 211,275,300].

4 REGENERATION AND ECONOMY

> *"… a city's coherence is somehow imposed on a perpetual flux of people and structures. Like the standing wave in front of a rock in a fast-moving stream, a city is a pattern in time".*
>
> **John Holland (1995)** [ID:352]

4.1 Green Spaces in Planning for Regeneration

There is increasing public awareness and appreciation of the value of good quality parks play areas and green spaces in regenerating towns and cities. As this review shows, it is becoming increasingly clear that these types of spaces help increase urban biodiversity, improve the health and wellbeing of local people and also provides opportunities for learning both formal and creative, for children and adults alike. However, despite the popularity and benefits of these kinds of public spaces there has been a serious decline in the quality to many of them over a number of decades. The literature in this section of the review agrees that action is required to improve them and deliver the opportunities and benefits these can provide to communities.

The report from the Urban Green Spaces Taskforce, *Green Spaces, Better Places* (2002) comes with a simple message: "now is the time for an urban renaissance with parks and diverse green spaces" [ID:295]. The Taskforce report sets out a programme for national and local government to work in partnership with local communities and other stakeholders to revitalise parks and urban green space. There is a summary of the issues and recommendations for reversing the trend in decline of these spaces. Some of the key ones are:

- Government and local authorities to prioritise the provision of high quality urban green space
- Put urban green spaces at the heart of regeneration.
- Introduce a funding management scheme for urban parks and green spaces
- Establish a national agency for green spaces
- Resources for training with a best value indicator
- Apprenticeships to increase skills and replace aging workforce
- Ensure local communities at the heart of programmes
- LAs to develop/update green space strategy

- Government to promote strategic importance of green space/ensuring provision and protection are key objectives in PPGs
- Establish national quality standards for green space
- Planners and the planning mechanism to take greater account of the need for green space (no incentive to do so except the desire of individual planning managers)
- Design reviews to revive parks by looking at their basic design relating to needs of local people [ID:295].

Unfortunately, a recommendation of the report, that "an agency with sole and direct responsibility for Parks and Green spaces should be brought into force", has not been taken up; the responsibility for these are spread out among many different agencies across the UK. According to Kuo *et al* (1998) [ID:52], neighbourhood social ties (NSTs) may substantially depend on the informal social contact which occurs in neighbourhood common spaces, and that in inner-city neighbourhoods where common spaces are often barren no-man's lands, the presence of trees and grass supports common space use and informal social contact among neighbours. The authors found that for 145 urban public housing residents randomly assigned to 18 architecturally identical buildings, levels of vegetation in common spaces predict both use of common spaces and NSTs; further, use of common spaces mediated the relationship between vegetation and NSTs. In addition, vegetation and NSTs were significantly related to residents' senses of safety and adjustment [ID:52].

Kuo *et al* (1998) believe that these findings suggest that the use and characteristics of common spaces may play a vital role in the natural growth of community, and that improving common spaces may be an especially productive focus for community organizing efforts in inner-city neighbourhoods.

In a report for Department for Communities and Local Government (DCLG) by Bell *et al* (2006) *Green and Public Space Research: Mapping and Priorities* [ID:294] aimed to map existing and future research into public and green space, to identify gaps in order to help set priorities for future research, and to develop a freely accessible and searchable database of all research. The project was carried out by

OPENspace, the Research Centre for Inclusive Access to Outdoor Environments based at Edinburgh College of Art.

The mapping was structured around two axes. The first of which was of research themes based on The Value of Public Space but developed further and broken down into sub-themes. The second axis was a typology of green and public space based around Planning Policy Guidance 17: Planning for open space, sport and recreation (PPG17) with elaboration from Green Spaces; Better Places. The authors collected research dating back over a ten year period together with data on current, ongoing and planned research in the UK. They analysed the material and the following main trends emerged:

- Most research has been undertaken on physical aspects, such as planning and on biodiversity.
- Economic values have also been a focus, but on a smaller scale.
- Social research is quite well covered but very patchy.
- Management is better covered than maintenance.
- By far the weakest area represented in the research is health and well-being, both in terms of social groups and types of green space [ID:294].

Greenspace Scotland report, *Greenspace Quality: a guide to assessment, planning and strategic development* (2008) [ID:297] has been prepared to assist those involved in Greenspace planning to share and better understand best practice in developing a co-ordinated approach to Greenspace provision based on a Greenspace Strategy. The Greenspace Strategy reflects the final stage in a series of work elements that draws together the key findings and commitments from the:

- Strategic Framework that establishes with all stakeholders a partnership understanding of how Greenspace will be addressed, promoted and developed
- Greenspace Audit that establishes the quality, quantity and accessibility of Greenspace and the specific needs and opportunities to develop Greenspace within communities
- Monitoring & Evaluation Framework that establishes the mechanisms to monitor continuous improvement and the status of Greenspace across a Local Authority area

This guide focuses on how quality of Greenspace is assessed in the Greenspace Audit and how quality issues and standards can be best addressed in Greenspace planning [ID:297].

According to Sherer (2003) the availability of park and recreation facilities is an important quality-of-life factor for corporations choosing where to locate facilities and for well-educated individuals choosing a place to live. City parks such as San Antonio's Riverwalk Park in the USA often become important tourism draws, contributing heavily to local businesses [ID:230]. Community gardens also increase residents' sense of community ownership and stewardship, provide a focus for neighbourhood activities, expose inner-city youth to Nature, connect people from diverse cultures, reduce crime by cleaning up vacant lots, and build community leaders [ID:230]. Using vacant urban spaces may well be "best use" of such areas in the long run for Nature and urban communities [ID:311;316].

4.2 Planning Policy Guidance for open and green spaces

Planning Policy Guidance 17 (PPG17) [ID:266] sets out the policies needed to be taken into account by regional planning bodies in the preparation of Regional Planning Guidance (or any successor) and by local planning authorities in the preparation of development plans (or their successors); they may also be material to decisions on individual planning applications. This replaced the PPG Note 17 published in 1991.

National Planning Policy Guideline (NPPG) *14* [ID:104] gives guidance on how the Government's policies for the conservation and enhancement of Scotland's natural heritage should be reflected in land use planning. In this context, Scotland's natural heritage includes its plants and animals, its landforms and geology, and its natural beauty and amenity. Natural heritage embraces the combination and interrelationship of landform, habitat, wildlife and landscape and their capacity to provide enjoyment and inspiration. It therefore encompasses both physical attributes and aesthetic values and, given the long interaction between human communities and the land in Scotland, has important cultural and economic dimensions. NPPG 14 sets out national planning policy considerations in relation to:

- Scotland's natural heritage;
- summarises the main statutory obligations in relation to the conservation of natural heritage;
- explains, as part of a wider framework for conservation and development, how natural heritage objectives should be reflected in development plans;
- describes the role of the planning system in safeguarding sites of national and international importance;
- provides guidance on the approach to be adopted in relation to local and non-statutory designations; and
- draws attention to the importance of safeguarding and enhancing natural heritage beyond the confines of designated areas [ID:104].

Planning Advice Note (PAN) 60 [ID:125] gives advice on Scotland's Natural Heritage. It sees this as a unique and importance resource. Not just concerned with biodiversity, though this is important in its own right, this PAN outlines the importance in planning consideration of mountains, lochs, coastlines and the more gentle beauty of farmland and designed landscapes. PAN 60 provides advice on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourages developers and planning authorities to be positive and creative in addressing natural heritage issues [ID:125].

Scottish Planning Policy (SSP) 11: Open Spaces [ID:26] reflects elements of the existing National Planning Policy Guideline 11: Sport, Physical Recreation and Open Space in promoting and protecting open space. It proposes enhanced provisions requiring local authorities to undertake an open space audit and prepare a strategy for their area. SPP 11 also proposed national minimum standards for the quantity of open space in new development. Supporting SSP 11 is *PAN 65: Planning and Open Space* [ID:105] which reflects the importance of open spaces on quality of life. It highlights how they provide the setting for a wide range of social interactions and pursuits that support personal and community well-being, and allow individuals to interact with the natural environment and provide habitats for wildlife. PAN 65 gives advice on the role of the planning system in protecting and enhancing existing open spaces and

providing high quality new spaces. The PAN also sets out how local authorities can prepare open space strategies and gives examples of good practice in providing, managing and maintaining open spaces. The advice relates to open space in settlements: villages, towns and major urban areas. The planning system performs two key functions in relation to open space: protecting areas that are valuable and valued; and ensuring provision of appropriate quality in, or within easy reach of, new development [ID:105].

Open places are not just parks the streets we live in, they are important open spaces. *PAN 76: New Residential Streets* [ID:329] deals with the growing concern that the design of many housing layouts has become dominated by the technical and engineering requirements of road design. Bruce Appleyard's 2005 paper, *Liveable Streets: Protected Neighborhoods* [ID:40], investigates some of the same issues in American cities. Streets dominated by the car can effectively isolate children from the surrounding community and limit the range of activities they can participate in along the way to growing up. "This limit on independent mobility decreases children's opportunity to be physically fit and healthy. But it may also have an impact on aspects of their mental health by way of diminished ability to independently experience and learn about the world around them" [ID:40]. It becomes necessary to change the approach to designing streets in new developments, if the ambition to produce better quality, more attractive and safe residential environments is to be met. PAN 76 provides advice on the design of better quality residential streets. It focuses on some key factors which can create successful street design. It also clarifies the roles and responsibilities of those involved.

PAN 77: Designing Safer Places [ID:330] deals with similar local issues and the requirement to make local communities safe, attractive and well-managed, while at the same time discouraging anti-social behaviour and criminal behaviour. CABE Space also published a policy note in 2004, *Preventing anti-social behaviour in public spaces* [ID:324], in which they say: "investing in the creation and care of high quality public spaces is more effective in tackling anti-social behaviour than the blanket use of tough security measures". *PAN 78: Inclusive design* [ID:331] is about inclusive environments which can be used by everyone – regardless of age, gender, ethnicity or

disability. At the start of 2009, when severe economic difficulties begin to take hold, Hazel Blears, UK Communities Secretary, highlights fears that recession could fuel tensions within local communities:

> "The evidence is that where resources are scarce, then unless you make positive attempts to bring people together, to get information out, for people to understand entitlement and who gets what, then these myths [about immigrants] can grow and become received wisdom. [ID:348]"

Providing more recreational green spaces such as parks and community garden projects may well be one way to bring local people together to eradicate the social exclusion of vulnerable minority groups. Community spaces, where all people can be together, can create greater intra- and inter-community understanding, and may help scotch such myths.

Green spaces need not only be parks and open spaces or re-natured brownfield sites, there are many good and useable designs for green roofs on flat roof buildings [ID:59,89,309]. Many cities around the world are, in some cases, finding these to be good green space proxies to on the ground green space.

Too often we hear that communities cannot afford to conserve open spaces. However, Lerner S, Poole W (1996) in: *The economic benefits of parks and open spaces: how land conservation helps communities grow smart and protect the bottom line*, highlights accumulating evidence indicates that open space conservation is not an expense but an investment that can produce important economic benefits. Some of this evidence comes from academic studies and economic analysis. Other evidence is from the firsthand experience of community leaders and government officials who have found that open space protection does not “cost” but “pays.” [ID:260]

4.3 Brownfield, Derelict Sites

There has been a growing recognition among community groups and environmental organisations that brownfield sites hold enormous potential for "greening" city environments, through the implementation of parks, playgrounds, trails, greenways, and other open spaces [ID:51,62,236,237,238,239,241,242,244]. However, as

mentioned previously, there is a new convention that believes that making cities more "compact" is the way to make them sustainable. There is some merit in this new orthodoxy in that services can be administered and provided more economically and may use less resources or at least with less waste. However, this generally means that brownfield and other vacant spaces within cities, even if these have become natural green space over time, are removed and built over. People and their relationship with Nature, it seems, are what is missing from this idea. Also, depending on the location of the vacant site the price of the land could well be at a premium as: "the relationship between the price of land and location figures prominently in urban economics" [ID:24]. This and similar themes concerning urban vacant land are discussed in the book *Recycling the City: The Use and Reuse of Urban Land*, edited by Rosalind Greenstein and Yesim Sungu-Eryilmaz [ID:240]. Articles in the book ask essential questions such as:

- Is vacant land an opportunity or an obstacle?
- Are brownfield sites a legacy of prior industrial wealth, or of illegal and dangerous contamination?
- Is a land inventory vital to community needs for future growth, or the symbol of political short-sightedness or worse? and …
- Is the reclamation of this land the first step in an urban turnaround, or one more giveaway of local assets to investors with weak ties to the community? [ID:240].

The above bullet points notwithstanding, establishing how much vacant space there is in Scotland, the Scottish Vacant and Derelict Land Survey (SVDLS), an annual survey, is undertaken to establish the extent and state of vacant and derelict land and the amount of land that has been reclaimed since the previous survey. While not all local authorities participate fully, the vast majority of central belt and urban areas provide data every year (recently response rates have improved with 31 of Scotland's 32 local authorities providing a survey response in 2005 and 2006). The main purpose of the survey is to provide a national data source to inform the programming of the

rehabilitation, planning and reuse of urban vacant and derelict sites [ID:65].

4.4 Green Space, Homes, and House Prices

There is growing evidence which points to some types of green space increasing the value of nearby commercial properties. Joke Luttik, an academic in the Netherlands, set the hypothesis that an attractive environment is likely to influence house prices – that houses in attractive settings will have an added value over similar, less favourably located houses [ID:46]. It can be said that this effect is intuitively felt, but he asks: "does it always occur?" It needed also to be asked: which environmental factors make a location an attractive place to live in?

The Dutch research found that house prices could increase due to environmental factors, with the largest increases 29% greater for houses with a garden facing water, which is connected to a sizeable lake. The research was also able to demonstrate that a pleasant view can lead to a considerable increase in house price, particularly if the house overlooks water between 8 and10% or open space between 6 and12% greater. In addition, the analysis revealed that house price can vary by landscape type. Attractive landscape types were shown to attract a premium of 5 to 12% over less attractive environmental settings [ID:46]. This research shows that green spaces and natural features and landscapes increase value of houses.

In a similar fashion, Lahan, BL *et al* (2000), in *Valuing Urban Wetlands: A Property Price Approach, Land Economics*, along with structural characteristics, neighbourhood attributes, use residential housing and wetland data to also relate the sales price of property to amenities of wetlands and other environmental characteristics [ID:47].

In Finland, Tyrvainen and Miettinen's based their empirical study (2000) on data from the sales of terraced houses in the district of Salo. According to their estimation a one kilometer increase in the distance towards the nearest forested area leads to an average 5.9 percent decrease in the market price of the dwelling. Dwellings with a view onto forests are on average 4.9 percent more expensive than dwellings with otherwise similar characteristics [ID:66]. In a later paper, *Economic valuation of urban forest benefits in Finland* (2001) Tyrvainen studied the valuation of urban

forests in two different urban environments Joensuu and Salo, Finland [ID:251]. Her results underline the importance of defining urban forest policies for municipalities in Finland. More than two-thirds of the respondents were willing to pay (WTP) for the use of recreation areas. Good location and active management, according to Tyrvainen, raised the average WTP. Moreover, approximately half of the respondents were willing to pay for preventing construction in urban forests. Her results also show that the monetary value of amenity benefits in recreation areas is much higher than the present maintenance costs. This reflects Lerner and Poole's findings, that parks and open spaces do not "*cost* but actually *pay*." [ID:260].

In contrast to the UN Report, *World Urbanization Prospects: 2007 revision* [ID:301] even with the influx of immigrants and those seeking asylum, there is growing evidence that cities in Britain are experiencing a nett reduction in populations [ID:195,234]. Champion (1999) in *Migration and British cities in the 1990s*, provides much analytical data to back up this theory. According to this paper those moving are mainly high earning professionals and skilled workers [ID:234]. The Clydeside area around Glasgow for instance had a nett decrease in population between 1991-1997 of almost 29,000. "Most of the other large cities lose out to both the urban-rural shift and the North-South drift, while attracting only relatively small numbers of immigrants" [ID:234].

This "nett urban exodus" consisting of the more affluent citizens, along with other research that highlights those who can afford it are willing to pay more to be near natural landscapes, even if this means moving from urban areas, could be a worrying trend for those who run the municipalities in Britain. It could mean that many high earners who make a large contribution to the finances of urban areas through rates or local taxes are being lost to them. This should not mean that local councils should ensure that only affluent areas are served with quality urban green space, there is much evidence to show that lack of green space in poorer areas can contribute to depressed and unhealthy communities, and can be a drain on financial resources.

5 CONCLUSIONS

If our societies are to become sustainable, as they must, local communities need to become truly suitable places to live by reducing their impacts on the natural world. This means all aspects of sustainability must be considered when planning for regeneration of urban areas – Nature and People must be considered equally with Economy. However, with the need to turn our cities green, questions have to be asked of the model now adopted by local and national governments in the UK. It has become political policy in Britain to make cities more "compact" in order to make them more efficient and therefore more sustainable, but are the indicators chosen to measure this model correct? [ID:195]. This policy is putting pressure on Brownfield sites that could and in many cases should be turned over to green space. It is possible that we are creating a contradiction in policy. On the one hand urban green spaces are becoming an important indicator for the health and well being of cities and the people who inhabit them, while on the other redeveloping brownfield sites for housing or commerce is seen as an indicator of sustainable development.

New build communities such as the proposed new eco-towns require green space as an essential component of their design. Eco-towns were mentioned earlier in chapter two of this review, but it is worthwhile reminding ourselves of them again here. The main reason for doing so is that a main government document, *Eco-towns Sustainability Appraisal: Scoping Report for the Planning Policy Statement* [ID:290], only mentions green space once, and this in relation only to leisure (recreation and sport). There is no mention of green space related to any other important sustainability issue such as: equality, discrimination, inclusion, social capital or education and learning. When regenerating cities or creating new towns, green spaces must be taken into account the same as all other aspects of socio-economic infrastructure. This apparent lack of understanding of green space relative to these aspects of community is of concern.

More than two-thirds of the respondents were willing to pay (WTP) for the use of recreation areas, while good location and active management raised the average WTP. Research has shown that approximately half of the respondents were willing to pay for preventing construction in urban forests.

Areas for further research

- What actually constitutes "quality" Green Space – are there differing perceptions of it? What indicators are used to qualify quality Green Space?
- Paving over Gardens: to what extent does this contribute to urban flooding – how much water does 10^2 metres absorb and for how long?
- Loss of Habitats in urban areas – would mean a habitats survey along with Green Space audit.
- How much Green Space do we actually have in Scotland (audit)
- How much nett Green Space are we losing annually?
- How important is factoring in the costs of ongoing maintenance to the sustainability of designed Green Space?
- Does quality urban Green Space and actually attract business and commerce? Where is the evidence?
- How do Local Planning Authorities prioritise green spaces against re-development for short term economic return?

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