

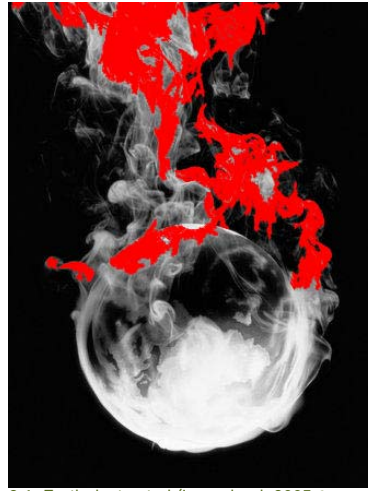
chapter 2
philosophy & theory

2.1. HUMANS AND ENVIRONMENT

The relationship that humans have towards their environments has consistently changed throughout our existence on this planet. It has evolved from one of harmony and sustainable existence to an approach that sees humans enforcing power and demands on it as seen by the enormous increase of energy and resource consumption, urban sprawl, industrialization of agriculture, dominance of individual transport, mass consumption and an increase in refuse and pollution. (Mayer 1998) At last we're starting to see the wood for the trees, even though so few are left, as the reactions to our arrogant and nonchalant behaviour are becoming more drastic and are starting to influence human comfort levels and causing an imbalance in the ecological order, for example an increase in pollution resulting in climate change, and resource consumption resulting in the loss of biodiversity and extinction of species due to habitat destruction.

We have reached a stage where our perception of the landscape we live in is greatly varied; we are confused about how to step into the future with regards to our approach to the environment. The landscapes that make up our realm of understanding can broadly be described as, the natural landscape, mainly untouched by human development, the rural landscape which sustains us and the urban landscape which has become the primary human habitat.

Humans have conceived a certain degree of understanding, although warped and egocentric, with regards to the natural and rural landscape. There is the realization that natural landscapes should be conserved and managed so that natural processes can function efficiently, so that humans have a playground to venture into over weekends, and so that future generations will be able to experience a portion of what exists today. The rural landscape is mostly seen as a food generator which should be managed and maintained for our continued existence. It is seldom realized that these landscapes have deep and complicated underlying processes which cause them to function efficiently; and often these processes are hindered by our loitering and selfish presence.



2.1. Earth destroyed (Imagebank 2005 & edited Howard 2005)



2.2. Cartoon by Mauldin (Eckbo 1964)

"Man can hardly recognize the devils of

2.2. HUMAN HABITAT

The human habitat, primarily being the town or city, is a vibrant and dynamic hub in which humans operate at a greater degree of selfishness than in any other environment. The existence of the urban landscape phenomena within this environment has rarely been seen as an important entity; in fact it has hardly been acknowledged as an entity at all.

The modern city developed a relationship to nature in the 19th Century which was based on power over nature, distance from nature and compensatory mechanisms which catered for people's longing for nature (Ipsen 1998). Currently though, a paradigm shift towards a better environmental understanding is underway. To understand the role of the urban landscape processes, structure and functioning, one must have a certain understanding of the human habitat as an entity.



2.3. The urban habitat - Night time New York (Dodd & Donald 2004)

To analyse the processes of human habitat, structure and functions, one must view it as any other habitat. One of the primary characteristics of any habitat or network is the interconnectedness between its various processes, structures and functions, as well as the connectedness that exists between it and the surrounding processes, structure and functions. This fundamental characteristic is illustrated by Jakob von Uexküll's statement: "Like the spider with its web, so every subject weaves relationships between it and particular properties of objects; the many strands are then woven together and finally form the basis of the subject's very existence." ("Streifzüge durch die Umwelten von Tieren und Menschen" 1956, Cited in Norberg-Schulz 1971:9) The understanding of these intertwined relationships will guide us to an understanding of how a habitat comes into existence, how it exists, and how it continues to exist productively. Using Jakob von Uexküll's simile, the human habitat, including all extents of human settlements from the grouping of nomadic tents to large metropolitan urban environments, should be analysed and examined by viewing the different components as strands of a complete web.

The human settlement web is composed primarily of the socio-cultural, economic and ecological strands. The following sub-sections address the the primary strands of the human settlement web in response to the urban landscape.

2.2.1. SOCIO-CULTURAL STRAND

Urban inhabitants have lost contact with the landscape (Norberg-Schulz 1971:27) due to a common characteristic of the urban way of life whereby the city place and life is neither dictated by natural physical features or conditions, nor by the rhythm of nature. (Mayer 1998) Landscape levels are generally determined by ideologies and beliefs (Norberg-Schulz 1971:72) and to a large extent this is where the problem arises. The human belief of having power and control over all elements within physical reach has led to distorted approaches to the urban landscape, for example the baroque park's design which expressed the wish to humanize the landscape. (Norberg-Schulz 1971:72) Often many social and cultural problems within societies can be aided by creating healthy open spaces where communities can gather to interact and create a sense of unity therefore emphasizing Olmsted's idea of parks within the urban environment acting as "neighbouring" gathering places which are characterized by great civilizing forces with a democratic nature. (Grese 1992)

his own creation."

Albert Schweitzer (Wines 2000)

2.2.2. ECONOMIC STRAND

Essentially the functions of the city are that of production, consumption and sustaining. Production and consumption are well understood and have become the main goal of the urban economically-driven, while the sustaining factor has mostly been neglected. (Wang & Hu 1998) Most decisions that exist within the city environment are dominated by the need to increase economic prosperity, and therefore urban open spaces which do not present or produce any direct economic value are seen as useless and wasteful within this capitalist society. It is therefore necessary that the positive qualitative values as well as the indirect economic values of urban open spaces be brought to the forefront of arguments of this kind. This approach is validated by the following statement made in the UNEP, IUCN and WWF joint report, *Caring for the Earth*, in 1992: "Biodiversity must be conserved as a matter of principle, as a matter of survival, and as a matter of economic benefit." (Dramstad et al 1996)

2.2.3. ECOLOGICAL STRAND

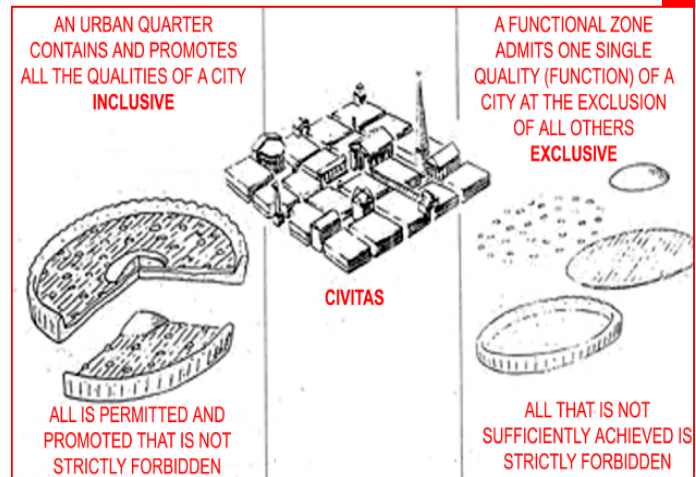
From ancient times humans have always had a need to give 'better definition to geography', for example the Great Wall of China, and have attempted to make the forms of the surrounding landscape more precise, or transform them to fit our general environmental image, for example the Egyptian Pyramids, which form an artificial row of mountains defining the boundary of 'civilized' space along the Nile, even though further south real mountains fulfill the same purpose. (Norberg-Schulz 1971:69-70) Therefore the landscape always had the function of forming the continuous background of our environmental image (Norberg-Schulz 1971:28). Today, we should see the landscape not only as the background but as one of the functional and purposeful entities of the entire environmental image, from which we can learn of successful guiding principles with regards to habitat development and management.

Piaget describes the process of a human's typical reaction to situations as a combination of 'assimilation' and 'accommodation'. Assimilation can be described as the action of the organism on the surrounding environment and accommodation can be described as the action of the surrounding objects on the organism. During assimilation the organism, rather than submitting passively to the environment, modifies it by imposing on it a certain structure of its own. (Norberg-Schulz 1971:10&11) An example of this is the manner in which humans demonstrate their power over the environment they find themselves in, rather than being guided by what the landscape subtly suggests. Piaget sees 'adaptation' as the equilibrium between assimilation and accommodation. To create successful sustainable and healthy urban environments it is essential that we achieve this state of equilibrium and therefore like the traditional Chinese, strive to create harmonious relationships whereby humans and nature become one. (Wang & Hu 1998)

2.3. CREATING A 'EUTOPIA' - GOOD PLACE

It is impossible to have utopian dreams for each urban environment. Understanding of the forces that cause change and making the most of the opportunities wherever and in whatever form they may arise is a better dream. We should strive to create a "Eutopia", meaning good place, rather than a "Utopia", a perfect place or no place. (Hough 1990) What is a good city? Leon Krier, one of the most influential traditional urbanists of our time has graphically compared the traditional urban environment to a pizza. He describes the traditional urban neighbourhood as a slice of pizza, containing within it all of the essential qualities and elements of the whole. In the same way he describes the modern suburb, formed from modern zoning, as ingredients of the pizza, all being separated from each other, therefore the modern city has all the ingredients but does not have the form. (Bess 2003)

New Urbanism is the movement to revive the physical forms of traditional cities due to problems that are related to the physical form of suburbia, such as suburban sprawl, the corresponding ecological and aesthetic degradation of the natural environment, and a growing sense that civility itself is in decline. (Bess 2003) New Urbanism is the attempt to employ, which also necessarily has entailed relearning, in our current circumstances the best practices of city-making from the past, toward the end of making better cities for the future. (Bess 2003) Inspiration should also be derived from existing conditions and by making use of all available opportunities. We should create an urban landscape which integrates ecology, people and economy, namely, multi-functional landscapes, productive landscapes and working landscapes. (Hough 1995) These landscapes will have great value from all perspectives.



2.4. The City-Pizza metaphor (Bess 2003)

2.4. URBAN OPEN SPACES

Urban open spaces can be defined as open-air spaces in the urban realm which offer functions and values to human and ecological habitats. These spaces include churchyards, parks, semi-private gardens, schools, waste and derelict sites, the urban fringe, wetlands, building courtyards, plazas and squares, industrial sites and institutions, and even a streetscape. Open spaces are valuable within the urban realm. The values of these spaces vary between those that are explicitly obvious, those that are unconsciously experienced and to those that are subdominant, yet vital forces within the given environment. Values associated with urban open spaces are primarily those that are intangible or indirect, rather than tangible and direct. Knowledge of all of these intangible values is essential to the understanding of the urban open space's function and character within the urban environment.

2.5. URBAN OPEN SPACE VALUES

Here follows an inventory and discussion of the values that urban open spaces (particularly green urban open spaces) have with regards to the city's socio-cultural, economic and ecological environments.

2.5.1 VALUES FOR THE SOCIO-CULTURAL ENVIRONMENT

Open spaces within the urban fabric seem to have lost their purpose and are under-utilized; therefore, landscape planners, designers and managers need to have sound information on the benefits and functions of urban landscapes for society, as well as the types of spaces that people prefer. (Kendle & Forbes 1997) It is interesting that these values were held as so important by a society whose collective problems of poor housing and other more direct causes of ill health were far greater than ours are today. (Kendle & Forbes 1997) I believe that these social issues are still prevalent today, especially in developing countries like South Africa. Therefore, we should revert back to the 19th century beliefs of the importance of open spaces, especially green open spaces, in the urban setting.

The contemporary attitudes towards parks and open spaces, particularly green spaces, are confused and ambivalent. The majority of these areas are perceived as places of crime and moral degeneracy rather than owning positive experiences. The wider values of landscape and the scope for contribution to a sustainable society have been largely forgotten but it is undeniable that urban green has great potential value for humans at many levels. (Kendle & Forbes 1997) Socio-cultural benefits of urban open space are divided into two categories, namely the values experienced by the community and the values experienced by individuals.

Frederick Law Olmsted stated that: *"There is increasing evidence suggesting that mental health and emotional stability of populations may be profoundly influenced by frustrating aspects of an urban, biologically artificial environment. It seems likely that we are genetically programmed to a natural habitat of clean air and a varied green landscape, like any other mammal. The specific physiological reactions to natural beauty and diversity,*

to the shapes and colours of nature, especially to green, to the motions and sounds of other animals, we do not comprehend and are reluctant to include in studies of environmental quality. Yet it is evident that in our daily lives nature must be thought of not as a luxury to be made available if possible, but as part of our inherent indispensable biological need." (Todd 1982)

2.5.1.1. EMOTIONAL RELIEF

The community experiences a sense of pride and achievement when involved, especially directly, with an urban open space. (Kendle & Forbes 1997) Rohde and Kendle state that urban parks and open spaces can cause a reduction in stress and therefore a directly related increase in happiness. An escape from the city, an opportunity to identify with nature, a sense of freedom, a peaceful retreat to repair emotions and a higher level of fulfilment is experienced. (Kendle & Forbes 1997) Urban open spaces offer respite from the frantic pace of city life (The Pennsylvania Horticultural Society 2005) and Wong states that a reunion with nature causes a re-awakening of an individual's sense of possibility and empowerment, restoration and a relief from daily struggle. (cited in Kendle & Forbes 1997)



2.5. Early 20th century park experience: 'We are enjoying the rest and quiet at Felton', Northumberland (1909) Postcard from the collection of Fiona Jamieson (Woudstra & Fieldhouse 2000)



2.6. Urban relief in the Prairie Wildflower Garden, a portion of the Village of Yorkville Park, Toronto (Tate 2001)

2.5.1.2. COMMUNITY DEVELOPMENT & SOCIAL INTERACTION

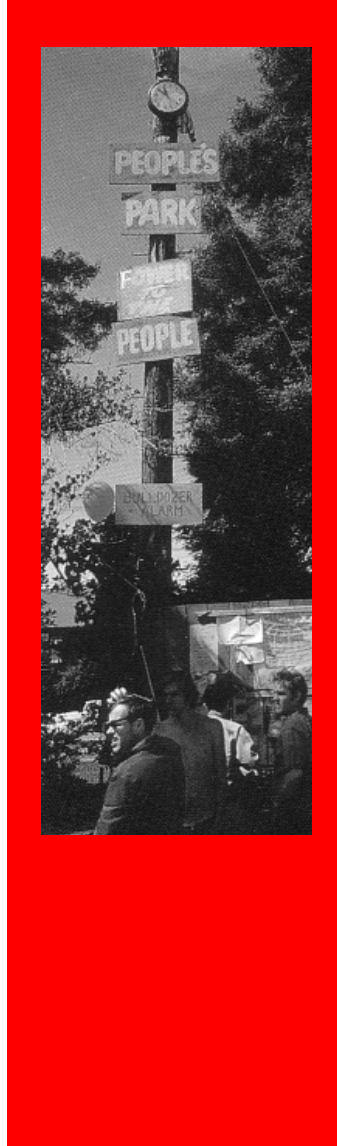
During the design of Central Park, New York, Olmsted had a vision of nature as a healthful antidote to the city and saw parks as having a great civilizing force with a democratic nature and providing 'neighbouring' gathering spaces. (Grese 1992) Adams and Dove state that parks and other open spaces help build and strengthen ties among community residents by:

1. Bringing people together
2. Including those who are otherwise divided by race or class
3. Helping them work together on common projects (cited in Johnson 1995)

These ties labelled as "social capital" represent subtle but important assets for a community as they:

1. Provide avenues through which information, values, and social expectations flow
2. Empower people to tackle communitywide problems
3. Empower people to embark on collective actions and advocate effectively for their community (cited in Johnson 1995)

Research by Coley, Kuo and Sullivan on low-income housing developments has found that park-like public spaces encourage residents to: leave the isolation of their apartments and socialize with one another therefore forming lasting ties. (cited in Johnson 1995)



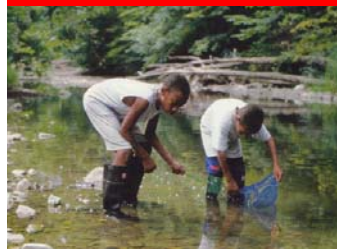
2.7. A community taking ownership of and pride in a local open space (Reid 1993)

2.5.1.3. CULTURAL

Wong argues that an increased sense of identity, ownership and a sense of integration rather than isolation are experienced by the various cultural groups of a community when accessible urban open spaces exist. (cited in Kendle & Forbes 1997) Furthermore, urban open spaces are perfect sites for outdoor festivals and concerts. (The Pennsylvania Horticultural Society 2005)

2.5.1.4. EDUCATIONAL & EXPERIENTIAL

Urban green spaces provide opportunities for the community to participate in environmental care (Kendle & Forbes 1997) and skills development, and bringing people into contact with nature can motivate them to do something positive to enhance their environment. (Wiltshire website) Urban open spaces are areas where one can see nature at work, learn about the variety of flora and fauna species, local history and develop new skills. (Kendle & Forbes 1997) Humans have a certain appreciation for the surprises that come from letting nature have more control and find open spaces familiar and easy to understand (Kendle & Forbes 1997), while Adams and Dove also emphasize that aesthetic and visual diversity found specifically in urban green spaces offer positive experiential qualities to individuals. (cited in Johnson 1994) These outdoor spaces also encourage explorative and adventurous behaviour which in turn results in an increase in self-esteem. (Kendle & Forbes 1997)



2.8. Education through experience at Gwynns Falls Greenway in Baltimore (Harnik 2000)



2.9. Learning in a community garden - The Parterres, a portion of Parc de Bercy, Paris (Tate 2001)

2.5.1.5. YOUTH DEVELOPMENT

Parks can provide opportunities for children of all ages to build the skills and strengths they need to lead full and rewarding lives. The latest thinking about youth development makes a powerful case that children and adolescents are best served by a constellation of community-based activities that helps them build essential skills, knowledge, and aptitudes. (Walker 2004) The assets children and youth need for healthy development fall into four major domains: physical, intellectual, emotional, and social. And parks can offer programmes that are not only fun, but also help kids acquire assets in one or more of these domains. (Walker 2004)

2.5.1.6. SOCIAL IMPROVEMENT

Sampson, Raudenbush and Earls state that a reduction in crime and disorder, even in very poor communities, is a result of successful urban open spaces. (cited in Johnson 1995) Added benefits that have a strong 'public good' element, for example, improvements in water quality, causing better social environments, result from open-space preservation. (Bolitzer & Netusil 2000) Kuo refers to a series of studies that determined that having trees in public housing neighbourhoods lowers levels of fear, contributes to less violent and aggressive behaviour, and encourages better neighbour relationships and better coping skills. (Wolf 2004)

2.5.1.7. SPIRITUALITY & QUALITY OF LIFE

Urban open spaces offer an area which often has the potential for an individual to experience spiritual growth through meditation. These spaces also have the potential to cater for religious meetings, functions and festivals. It is found that quality of life is no less important than health and although modern medicine has made extraordinary advances in prolonging life, society is not so clear about how to make these extra years worth living. (Kendle & Forbes 1997) It is believed that urban open spaces can offer opportunities to increase an individual's 'quality of life'.

2.5.1.8. PHYSICAL HEALTH

Contact with the living world helps to maintain well-being and can prevent illness (Kendle & Forbes 1997) and improve health by appealing to the senses and by providing a place to enjoy fresh air and exercise. (Walker 2004) A range of passive and active recreational activities (bird-watching, fishing, hiking, cycling, walking, chess-playing, jogging) are available in urban open spaces. A study in Cleveland confirms the promise of parks in promoting health for Americans aged 50 and older as older park users (bikers, joggers, walkers) were found to be significantly healthier than non-park users and they stated to be feeling "renewed" after using the park, with greater frequency of use linked to better health. (Walker 2004)

2.5.1.9. MENTAL RELIEF & DEVELOPMENT

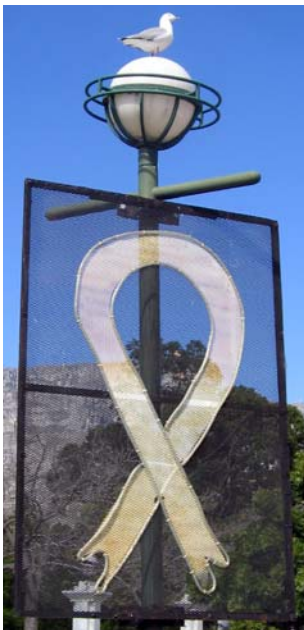
The 18th century philosopher, Johann Georg von Zimmerman stated that, "In nature deep solace is found for the pains and melancholy of life," and he advised his readers to practice escapism into green spaces. (Grese 1992) Urban parks of the 18th and 19th centuries were also seen as successful antidotes to counteracting public health problems, as New York physicians prescribed time in Central Park as routine treatment for their patients, especially those with nervous disorders. (Grese 1992) Contemporary studies by Rohde and Kendle state that urban open spaces have definite cognitive values as a reduction in mental fatigue is experienced when visiting such areas, as well as encouraging, especially in children, higher levels of mental development and stimulation. (Kendle & Forbes 1997) School-related studies show that children with ADHD (Attention Deficit Hyperactive Disorder) show fewer symptoms of the disorder and show more self-discipline in academics if they have access to natural settings. (Wolf 2004)



2.10. & 2.11. Surrounding residents (primarily retired persons) of the George Botanical Gardens volunteer in the running and management of the site, with their quality of life being improved by having this green open space close to their living environment (Howard 2005)



2.12. Meditation (Imagebank 2005 & edited Howard 2005)



2.13. Aids campaign via site furniture in an urban open space system - Company Gardens, Cape Town (Howard 2005)

An example of an innovative health-focused program is the 'Hearts N' Parks' campaign which is supported by the National Heart, Lung, and Blood Institute and the National Recreation and Park Association of America. (Walker 2004)

2.5.2. VALUES FOR THE ECONOMIC ENVIRONMENT

The statement, 'Money makes the World go round' is an excellent example of the human community's unhealthy veneration of financial resources. The making of money has become so important that the systems and characteristics of other ecological and socio-cultural environments that do actually have a large part in 'Making the World go round' are neglected. Hawken believes that commerce is central to the breakdown and functional transformation of land, water, air and sea from life-supporting systems into waste repositories. (cited in Motloch 2001) A transformation of commerce is required which sees the integration of economy and ecology, and which teaches us that wealth is short-lived unless based on the cyclical processes of nature. (Motloch 2001) To this I add that economical and ecological processes should also be integrated to socio-cultural processes, therefore creating a balanced, functional and sustainable urban environment. The economic order of a good city is characterized by marketplace diversity and entrepreneurial freedom. Its purpose is twofold: to create and distribute the material goods and services necessary to the material well-being of the populace, and, beyond this, to create the surplus wealth necessary for the various kinds of non-subsistence cultural endeavours—music, art, scholarship, sport—that are the very hallmarks of urban culture. Just as important, however, is the recognition that a good city is also a moral order. (Bess 2003) The marks of this order are the existence of various religious, civic, and political institutions that are sufficiently strong and influential to restrain the excessive individualism that a free economy encourages. Such institutions will seek to educate individuals in a variety of moral and intellectual virtues and to promote among individuals a sincere regard for the common good. If these institutions are in good working order, they will be promoting and sustaining a shared sense that the city is not only a marketplace but also a moral community, and that the market exists for the community and not the community for the market. (Bess 2003) Economic processes are essential, and can never be abolished or neglected, but as Hough believes, there is a need to invest in the protection of nature, society and culture, and this need has never been so urgent. (Hough 1990)

The general perception of Urban Open Spaces is that they are a waste of financial resources as they do not truly generate a tangible income and require a lot of capital input to plan, design, construct and manage them. Therefore, as population increases in towns and cities there is an ever-increasing demand for development areas and thus a loss of formal and informal open spaces in the urban fabric. We should learn from 'Catholic economy' which is an economy founded on the virtue that Saint Thomas Aquinas and Aristotle called liberality. This virtue teaches and governs the correct use of the goods of this world that have been given to us for our maintenance. As Saint Augustine says: "It belongs to virtue to use well the things that we can use ill." (Sorondo 2003) At the same time, parks managers face the challenge of "concentrated costs and diffuse benefits." The costs of building, maintaining, or upgrading parks are readily calculated and conspicuous. But the benefits parks provide are spread over many areas, making them hard to quantify and easy to overlook. (Walker 2004)

2.5.2.1. TOURISM

Urban open spaces have economic value by offering places where tourists have experiences of both the cultural and natural environment of the specific place, as well as being landmarks that attract tourists to particular areas, thus causing an indirect economic benefit to businesses surrounding the space visited.

2.5.2.2. SERVICES & PRODUCTS

Economic gain is achieved through services (parking, classes or programmed activities and recreation) and products (on-site gift shop purchases, equipment bought to participate in workshops, additional purchases may include plant and landscape equipment acquired as a result of learning about trees, wildlife or horticulture while at a park, food purchased for a picnic eaten on-site and other incidentals) associated with the open space. (Wolf 2004)

2.5.2.3. JOB OPPORTUNITIES

Youth, especially in developed countries, have long found holiday employment in parks and open spaces. For many young people, these jobs introduce the world of work, close to home and in a relatively protected setting. Urban open spaces can also offer longer-term jobs for community residents, as well as valuable training opportunities that equip both young people and adults to enter the workforce with marketable skills and experience. (Walker 2004)

2.5.2.4. NEIGHBOURHOOD QUALITY

It has been confirmed by studies that there is a statistically significant link between property values and proximity to green space. One study found that the value of properties near Pennypack Park in Philadelphia increased from a distance of 760m to a distance of 12m by 1150%. (Walker 2004) Results from an analysis done in Portland, Oregon, indicate that distance from a home to an open space and the type of open space can have a statistically significant effect on a home's sale price. (Bolitzer & Netusil 2000) Properties very close to open spaces or parks may decrease in value due to noise and congestion, while properties located a few blocks away from the park receive benefits from proximity, but may not encounter any negative externalities. (Bolitzer & Netusil 2000)

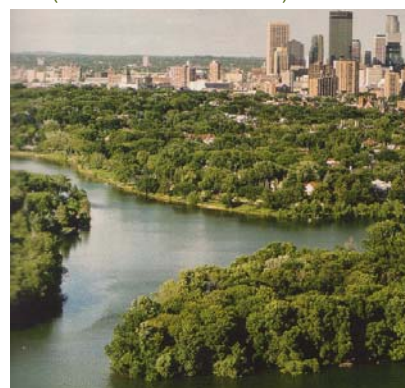


2.14. Open spaces like Central Park in New York are often one of the primary attractions of an urban environment, therefore boosting economy through tourism (Harnik 2000)



2.15. Mobile food stall entrepreneur in St. James's Park, London (Woudstra & Fieldhouse 2000)

Local communities benefit in various ways from the trade in biological resources. For example, the Makuleke community in the Kruger National Park had their land returned to them and are now developing infrastructure for tourists, as well as benefitting from consumptive wildlife resource-use. (Burger 2004)



2.16. In the 19th Century the city of Minneapolis dredged swamps and ponds to form Lake Harriet (shown above) and the rest of the famous Chain of Lakes. Today this waterway continues to generate property value and tax revenue (Harnik 2000)



2.17. In Portland traditional sidewalk planting is being replaced by a series of interconnected swales which act as stormwater treatment cells which intercept and filter street runoff (Owens Viani 2005)



2.18. & 2.19. Create economic environments around and in pleasant open spaces, like this example in Wilderness (Viljoen 2005)

The national Center for Disease Control in the United States of America is conducting baseline studies on human physical activity levels, and how to motivate people to do basic physical activities, such as walking, on a routine basis. CDC is collaborating with urban planners to explore how urban form (such as street layout, the presence of sidewalks and parks proximity) can encourage walking and biking. (Wolf 2004)

2.5.2.5. ENVIRONMENTAL BENEFITS

American Forests has conducted 27 Urban Ecosystem Analyses in U.S. metropolitan areas in an effort to capture the value of services that trees provide in cities. Estimated findings were that tree cover in the urban growth boundary area had reduced stormwater storage costs by \$910 million, and generated annual air quality savings of \$19.5 million. The Center for Urban Forest Research has also conducted micro-scale studies, focusing on street tree costs and benefits. McPherson states that these calculated benefits include energy savings, reduced atmospheric carbon dioxide, improved air quality, and reduced storm water runoff. Environmental benefits modelling is often based on the economic principle of deferred costs, that is , if trees are not present, homeowners or municipal government would have to invest in additional engineered infrastructure or equipment to remedy environmental problems. For instance, tree canopies intercept rainwater, thereby reducing the amount of water falling to the ground and running off into stormwater collection systems, thus potentially saving a community the materials and construction costs of a stormwater system built for greater runoff capacity. (Wolf 2004)

2.5.2.6. RETAIL AFFECT

Investigations on the role of trees on shoppers' behaviour in retail business districts find that people claim that they are willing to pay about 10 percent more for products in a shopping area with trees, as compared to a comparable district without trees. (Wolf 2004) Laverne and Winson-Geideman refer to a study that found that rental rates of commercial office properties situated on sites with quality landscapes, including trees, were about 7 percent higher. (Wolf 2004)

2.5.2.7. HUMAN PHYSICAL HEALTH

The positive economic consequences of routine, mild exercise are enormous when aggregated across entire cities or the nation as medical expenses are lower for people who do routine physical activities and exercise. As found by Wang and Dietz, a 2002 CDC (Center for Disease Control) study estimates that obesity-associated annual hospital costs for youths aged 6-17 were about \$35 million between 1979 and 1981, and nearly tripled to \$127 million during 1997 to 1999. Weight related medical expense trends for adults are equally alarming as studies referred to by Pratt, Macera and Wang, suggest that when inactive adults increase their participation in regular, moderate physical activity, annual mean medical costs are reduced by \$865 per person (in 2000 dollars). (Wolf 2004) Studies also confirm that hospital patients recover more quickly and require fewer pain-killing medications when having a view of nature. (Wolf 2004)

2.5.2.8. HUMAN MENTAL HEALTH & EFFICIENCY

Mental health is a second arena of health benefits with economic consequences as recent studies have established that the presence of trees and 'nearby nature' in human communities generate numerous psychological benefits. It is also suggested that office workers with a view of nature are more productive, report fewer illnesses and have higher job satisfaction. (Wolf 2004) These studies therefore suggest extensive economic consequences for urban inhabitants who have views of trees and nature in the course of their normal, everyday activities and experiences. (Wolf 2004)

2.5.3. VALUES FOR THE ECOLOGICAL ENVIRONMENT

A good city exists within and is an ecological order. It is an artifact by means of which the human animal dwells in and on the landscape. If this artifact is created sensitively and well, both the human animal and the ecological order of which it is part will thrive. If it is not created well, both parties will suffer in the short- and long-term. (Bess 2003) Nature conservationists are realising that battles to save biodiversity cannot be won if they are only fought in habitats such as the rain forest. They have found that battles should be fought locally, with the urban population as a key group to be motivated. It is established that if urban communities do not care for the nature on their doorstep it is almost impossible to make them care for distant and abstract problems. (Kendle and Forbes 1997) Presenting arguments to preserve or restore urban open space solely as habitat for wildlife is seldom successful as the public and decision-makers are more likely to support urban wildlife habitat programs if other uses of urban green spaces are also accommodated. (Johnson 1995) The challenge for planners and designers is to minimise adverse impacts, capitalise on those attributes of other uses that enhance habitat value, and still protect sensitive habitats. (Johnson 1995) McHarg states that it is reasonable to suggest that nature performs work for man without his investment and that such work does represent a value. (McHarg 1969) The following ecological value discussion is specifically related to urban green open spaces.

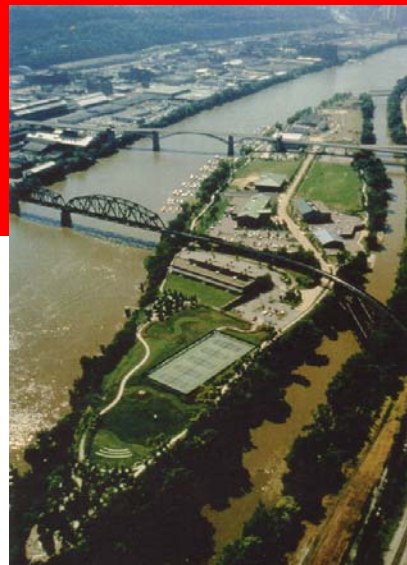
2.5.3.1. HABITATS, RESOURCES & ALIEN ERADICATION

A habitat is an area where an organism lives. An organism finds food, shelter, and everything else it needs to live within its habitat. Various values to habitats exist due to urban greening, namely bio-diversity increase, which reflects increased ecosystem balance, better habitat diversity, as well as habitat or niche completion. (Kendle & Forbes 1997) According to McHarg one of the natural processes that perform work for man and, therefore, add value to the ecological order, is forest and wildlife inventory increase (McHarg 1969), or as we may call it bio-diversity increase. One of the aims of the Metropolitan Open Space System (MOSS) of Johannesburg City is to protect habitat for the diversity of plant and animal species so as to ensure the protection of healthy, viable and sustainable ecosystems as well as the conservation and the preservation of biological diversity. (Russouw 2003)

Urban greening has an added advantage as it aids in resource protection, species recovery, species introduction and species reintroduction into the urban ecological community. (Kendle & Forbes 1997) The leaves of indigenous trees and other vegetation types are eaten by many insects, and dead leaves are transformed into humus. Trees also provide nesting and breeding sites for birds. (Enviro Facts 1999) Well-managed and effective urban greening which ensures establishment of endemic vegetation has a definite benefit as it aids in species replacement and therefore the eradication of alien species. (Kendle & Forbes 1997)

2.5.3.2. LAND: SOIL QUALITY, QUANTITY & CONTROL

According to McHarg natural processes of value to a metropolitan environment include drought and erosion control, as well as topsoil accumulation. (McHarg 1969) Johnson supports this by arguing that urban greening definitely aids in erosion control and, according to research completed by Adams and Dove, soil as a resource is improved due to sediment trapping and nutrient retention. (cited in Johnson 1995) Soil benefits from trees and other vegetation types, as their far-reaching roots hold the soil in place, preventing erosion. (Enviro Facts 1999) Some trees, like acacias, have bacteria in their roots, which convert nitrogen from the air into nitrates which the tree can use to grow, whilst the soil is enriched. (Enviro Facts 1999) Further benefits of urban greening with regards to soil quality and quantity improvement include the broader implications of land reclamation. (Davie 2002) Innovative planning and design of urban open spaces may include the re-use and recycling of solid waste. (Davie 2002)



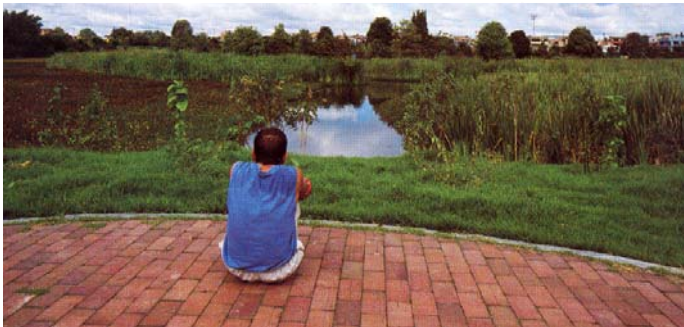
2.20. Bio-diversity and ecological resources are increased as Herr's Island in the Allegheny River, Pittsburgh, evolved from a brownfield site of rail yards and a slaughterhouse to a park system with the associated amenities (Harnik 2000)



2.21. A project being undertaken by the Rebuilding Biodiversity Group in Great Britain is the removal of conifers from ancient woodland sites so that the broad-leaved woodland ecosystem is allowed to recover (Baines 2005)



2.22. & 2.23. No city is 'all built-up'. Create parks and open spaces on underused or misused sites like this one in Chicago (Harnik 2000)



2.24., 2.25. & 2.26. Santa Maria del Lago has become a popular and ecologically healthy wetland in Bogotá, Columbia due to it's rehabilitation as part of a wetlands restoration plan for the Bogotá River Greenbelt (Martignoni 2005)

2.5.3.3. WATER: MANAGEMENT, QUALITY & CONTROL

Natural processes of value to metropolitan areas include water purification, water storage and flood control. (McHarg 1969) Greening along a watercourse, properly designed, can serve the basic functions that foster a healthy environment. It helps provide an antidote to some forms of non-point source pollution (storm-water from urban and agricultural runoff) by acting as a filter, conduit and sink. Greening as filter and sink: As water sheet flows across the land, it picks up many elements. A well-vegetated riparian edge allows some of the water to pass through, but slows it down and diffuses the flow allowing different elements, including pollutants, to drop out. Green areas can also store surface water in a porous floodplain or riparian wetland for a long enough period of time to reduce flooding in peak runoff events. (Weekes 1998) An urban green area can absorb rainwater, like a great sponge, and help it replenish groundwater. Therefore, rainwater should be infiltrated near to where it falls, or else it should be detained near to where it falls, and discharged slowly. Urban greening therefore aids in watershed stabilization, stormwater detention and flood storage, therefore controlling flooding. (Johnson 1995) Another one of the aims of Metropolitan Open Space System (MOSS) of Johannesburg City is to protect water quality, including the quality of surface and underground drinking water and the quality of lakes and streams and water-based recreation. (Russouw 2003)

2.5.3.4. AIR: CLIMATE AMELIORATION & POLLUTION

The cities create the filthy air, while natural processes of the countryside, and to a lesser degree urban green spaces, include atmospheric pollution dispersal and climatic amelioration. (McHarg 1969) Furthermore urban greening definitely aids in climate and air quality improvement, reduction of global warming and carbon dioxide. (Davie 2002) Plants are the only species to manufacture its own food through photosynthesis, by taking in carbon dioxide and releasing oxygen. Trees thus help to maintain low levels of CO₂, thereby reducing the greenhouse effect. Trees are also called the "lungs" of a city, for absorbing pollutants and releasing oxygen. (Enviro Facts 1999) According to Dr Debra Roberts, Deputy Head of Environmental Management, Development Planning and Management Unit of the eThekweni Municipality, Climate disruption is the biggest environmental threat to people and the global ecosystem and, at the moment, the issue is not receiving the attention it deserves. The eThekweni Municipality has responded to the issue of climate change at different levels, one being consideration given to the open space system due to the importance of greening to micro-climate amelioration. (Meyer 2005, vol.10, no.3, p.12-14) Johannesburg City within its Metropolitan Open Space System is placing emphasis on preserving open space for the protection and enhancement of air quality. (Russouw 2003)



2.5.3.5. EDUCATION & SCIENCE

Urban green areas provide opportunities for education and scientific research. (Kendle & Forbes 1997) Cole states that contact with nature should be the experience of many, not few, and that a clear understanding of, and concern for, nature is best instilled through direct and frequent experience. (Cited in Kendle & Forbes) Environmental literacy lies at the heart of understanding the places with which we are familiar and it is important for people to know the environment around them and for the users to have an awareness of the place that is part of everyday life. Environmental ignorance plays a big role in people's lack of understanding and compassion for natural processes and functions. There has to be a change in attitudes and the way we experience nature to have a true and valuable understanding. (Makhzoumi & Pungetti 1999) Educational landscapes that are fun as well as instructive should be created. (Makhzoumi & Pungetti 1999) According to the Johannesburg City, another aim of MOSS (Metropolitan Open Space System) is to provide places for education and research on ecological, environmental and appropriate cultural resources. (Russouw 2003)



2.27. & 2.28. The channelised Los Angeles River has been so mistreated that one proposal called for using it as a freeway during the dry season. But given half a chance, the river's ecology can flourish, and educate, and there is a growing movement to develop parks and trails along it (Harnik 2000)