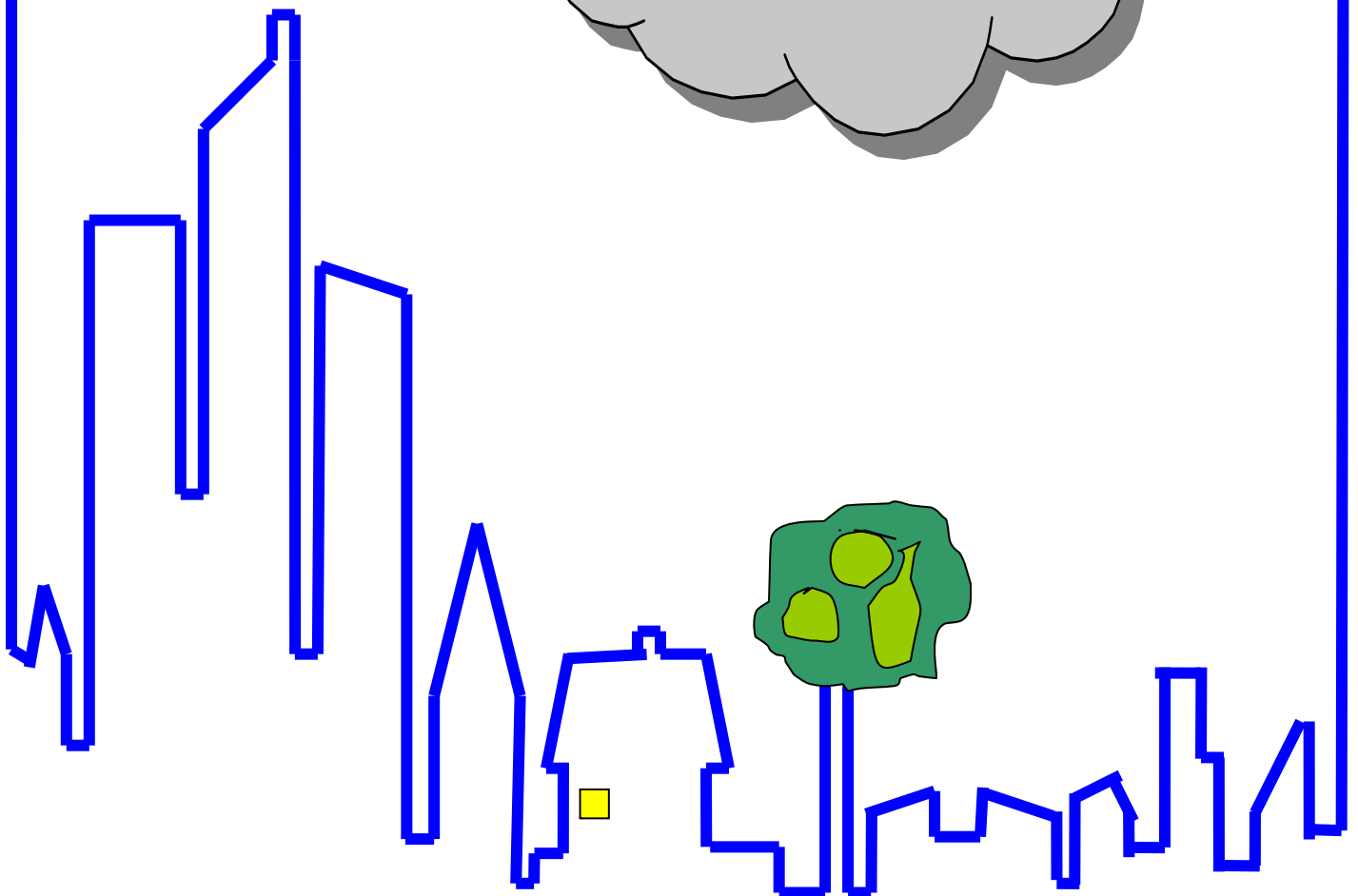# Human Ecology

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The Manchester Conference recognised that human ecology is ever more essential in our complex, crowded world; and that we could all learn a great deal from one another and gain much enjoyment from so doing.

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Keynote Address – The Answer Lies in the City

Dr Anna Tibaijuka
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Introductory comments

The conference theme captures the defining challenge of the 21st century. With half of humanity already living in cities and the demographic shift to urban expected to accelerate in the coming decades, the issues of human ecology are intricately connected with the way we manage, plan and govern our cities. The unfolding climate, food and energy crisis has underscored the urgency and gravity of the issues you are discussing at this conference. I commend the organizers, the Commonwealth Human Ecology Council, the Society for Human Ecology, the University of Manchester and the German Society for Human Ecology, for choosing the theme of this important conference.

It is also my great pleasure to come to the University of Manchester, one of leading universities, not only in the UK, but in the world. I am told that the atom was actually discovered through ground breaking research that began at this university. I am also told that many great scholars, including twenty-three Nobel Prize winners, have roots at Manchester University. For these and many more achievements, I salute you Mr. President.

Sustainable urbanisation

Ladies and Gentlemen, the ecological interaction of cities and their hinterlands is a recurring theme. Rapid urbanisation and climate change have given it a new impetus and sense of urgency. Way back in 1976, the Habitat conference, in its plan of action, stated:

"Expected population growth and migration mean that urban expansion will be the most common and universal development challenge. However, urban expansion can take the form of urban sprawl; it is then costly, wasteful, and ecologically destructive".

Later, at the Rio Summit, Chapter 7 of Agenda 21 explicitly addressed the issue and introduced the concept of sustainable human settlements for the first time. It stated that:

"Urbanisation, if properly managed, offers unique opportunities for the supply of sustainable environmental infrastructure through adequate pricing policies, educational programmes and access mechanisms that are economically and environmentally sound".

At the Habitat II Conference in 1996, the international community underscored in the Habitat Agenda the need for new approaches to planning and managing rapid urban growth and human settlements. These and other debates advanced the notion of 'sustainable urbanisation' to help unpack the complex processes of urbanisation, and the symbiotic relations between urban and rural settlements. 'Sustainable Urbanisation' is a multi-dimensional dynamic process that includes not only environmental but also social, economic and political-institutional sustainability. It encompasses urban-rural linkages and the full range of human settlements, from village to town to city to metropolis.

Sustainable urbanisation bridges the crucial linkages between cities and the natural environment. It provides a framework for dealing with the environmental impact of cities on their hinterlands, including climate change adaptation and mitigation. It also provides a platform for managing the economic relationship between town and countryside.

Sustainable urbanisation is a concept that goes beyond the traditional urban-rural dichotomy, and recognizes the need to come to terms with rapid urbanisation and urban growth by focusing on the effective management of these processes to achieve functional, resilient and responsive human settlements. Economic and social dimensions such as poverty and deprivation, governance, gender inequality and social exclusion, are central challenges to sustainable urbanisation at all levels.

Ladies and Gentlemen, we have come a long way on the debate and discourse of these issues. But the challenges are complex and daunting, and require continuous engagement and effort at all levels. A series of interrelated phenomena unfolding in our times are making the issues of human ecology and urbanisation a matter of urgency.

I now want to talk, in turn, about rapid urbanisation; the urbanisation of poverty, cities and climate change; the food and energy crisis. Through these themes I highlight that the answer lies in the city.

Rapid urbanisation

Firstly, rapid urbanisation is happening, and it is occurring largely in developing countries where a massive demographic shift has enormous implications in terms of poverty, natural resources and the environment. The latest 'State of the World Cities Report' published by UN-HABITAT in 2008, projects

an average growth of 5 million new urban residents per month in the developing world. In the coming decades, the developing countries will be responsible for 95 per cent of the world's urban population growth.

Levels of urbanisation are expected to rise, with the least urbanized regions of Asia and Africa transforming from largely rural societies to predominantly urban regions during the course of this century. By 2050, the urban population of the developing world will be 5.3 billion; Asia alone will host 63 per cent of the world's urban population, or 3.3 billion people.

Africa, with an urban population of 1.2 billion, will host nearly a quarter of the world's urban population. In sharp contrast, the urban population of the developed world is expected to remain largely unchanged, rising only slightly from just over 900 million in 2005 to 1.1 billion in 2050.

The Urbanisation of Poverty

Secondly, rapid urbanisation in developing countries is coupled with another phenomenon - namely, the urbanisation of poverty. For millions of urban dwellers in the developing world, urbanisation of poverty is chaotic and brutal. It is inhumane and debilitating. It affects between 30 and 70 per cent of all urban dwellers in developing countries who live in slums.

In developed countries, urban growth is largely attributable to urban sprawl and lifestyle choices. In developing economies, what we are witnessing is the explosion of slums. Currently, an estimated one billion people are living in slums. This figure could easily reach 2 billion by 2030. The vast majority of these people live on less than two dollars a day. They lack safe water, a major contributing factor to malnutrition, disease and loss of productivity.

In many communities, young girls spend hours a day fetching water and thus forgo their education. Most slum dwellers have no access to sanitation. In some of the slums we work in, there is no refuse collection and up to 300 people share a single toilet. HIV/AIDS, malaria and other diseases are rife and life-threatening. Entire families, especially women, and the children they support, eke an existence from informal trading and services at the margin of human existence. Crime, drugs and violence are daily realities. Worse still, when natural disasters strike, as they sadly occur more often than before, the poor are disproportionately adversely affected since they are least prepared. It is a vicious circle.

Cities and Climate Change

Thirdly, Climate change is now recognized as one of the most pressing global issues of our planet. It is no coincidence that global climate change has become a leading international development issue at the same time as the world has become urbanized. The way we plan, manage, operate and consume energy in our cities will have a critical role in our quest to reverse climate change and its impact.

Seventy-five per cent of commercial energy is consumed in urban and peri-urban areas. In addition, 80 per cent of all waste is generated from our cities and up to 60 percent of Greenhouse Gas Emissions which cause global climate change emanate from cities.

The impacts of climate change will be felt strongly in the years to come. If sea levels rise by just one meter, many major coastal cities will be under threat: Buenos Aires, Rio de Janeiro, Los Angeles, New York, Lagos, Alexandria-Cairo, Mumbai, Kolkata, Dhaka, Shanghai, Osaka-Kobe and Tokyo, just to mention some mega-cities that are under imminent threat.

The many smaller coastal cities, especially those in developing countries and those of small island nations, will suffer most due to their limited adaptation options. More and more people are drawn to the urban magnet. In many parts of the world, climate refugees from rural areas that have been hit by drought or flooding, aggravate the migration to cities. Those parts of the population who already suffer from poor health conditions, unemployment or social exclusion are rendered more vulnerable to the effects of climate change and tend to migrate to cities within or outside their countries. The UN predicts that there will be millions of environmental migrants by 2020, and climate change is one of the major drivers.

The food and energy crisis

Fourthly, the urgency to address human ecology and urbanisation is further amplified by the economic, food and energy crisis, and conflicts over resources - mainly over water and land- which the world has been witnessing in recent times in big and intense ways. The links between climate change and food crisis is more evident today than ever before. The ordinary farmer in Africa will tell you that there is change in our climatic conditions.

Those most affected by the food and energy crisis are the urban-dwellers, who depend on monetary means to access both of these commodities. Surges in the pricing of food and/or energy immediately affect the coping capacity of the urban poor and can result in income poverty in a very short period of time. The UN estimates that the surges in the price of food or energy in 2008 have relegated a further 100 million people into extreme poverty. How many of these are already living in slums? How many of these will join the ranks of urban slum dwellers?

Ladies and Gentlemen, I want to submit to you

THAT THE ANSWER LIES IN THE CITY.

We have come a long way in terms of knowledge and development. We are much more knowledgeable and capable today than before to deal with these challenges

and reverse the social and ecological threats facing our cities, and the world.

Cities are the reservoir of knowledge and innovation, where innovations are born and human capital is abundant. There are many cities around the world which are leading by example through their commitment to sustainable development.

Last month, I was privileged to participate in the third C40 Large Cities Climate Summit in Seoul, Korea. Mayors and their delegations from 40 large cities participated in this event to share their experiences in addressing Climate Change.

Many of these large cities have long recognized that they play a crucial role in addressing climate change and, in fact, many cities have taken decisive actions to address climate change which exceed the goals and targets set by their respective national governments. What struck me in particular at this meeting was the resolve with which the cities stuck to their climate action, despite the current economic crisis. They remain convinced that climate change action makes economic sense. For example, increased energy efficiency is not only good for the climate, but also makes sense for a city's budget. As former president Bill Clinton said:

"For every 1 billion US dollars invested in the retrofitting of houses to increase their energy efficiency, 6000 jobs are created. This is six times bigger in impact than in average public investments. And what is more: savings in energy will pay back for this investment in just over 7 years".

Ladies and Gentlemen, the future vision of our cities should be inspired by nature itself. This is best captured by one of the Melbourne Principles of Sustainability which states that:

"Cities can become more sustainable by modelling urban processes on ecological principles of form and function, by which natural ecosystems operate. The characteristics of ecosystems include diversity, adaptiveness, inter-connectedness, resilience, regenerative capacity and symbiosis. These characteristics can be incorporated in the development of strategies to make them more productive, regenerative, and resulting in ecological, social and economic benefits".

Indeed, notions like eco-city, compact city, and green-city embody elements of this principle. Density, velocity and efficiency in metabolism should be among the key determinants of our future cities. A recent survey indicated that in New York City, per capita greenhouse gas emissions are among the lowest in the United States. This is because less energy is needed to heat, light, cool and fuel buildings in this compact city where more than 70 per cent of the population commutes by public transit.

The city of Atlanta in the USA and Barcelona Spain, for example, both have a population of about 2.5 million. Atlanta currently occupies an area of 4200 sq km whereas Barcelona occupies only 162 sq km.

Atlanta consumes much more energy due to its urban form and higher per capita energy consumption.

UN-HABITAT, as part of the inter-agency response to the global economic crisis working on the Green Economy Initiative, has prioritized two key areas:

One, assisting national and local governments in reviewing and updating building laws and regulations, with a view to promoting low carbon emitting building materials, renewable energy sources and energy efficient designs and standards; and,

Two, revitalizing planning as the most potent tool to curtail urban sprawl, promote efficient transport systems, and influence future energy supply and demand. City authorities play a key role in implementation of national standards through building permits, energy-efficiency regulations, and new energy conservation rules, including on alternative energy, building design and construction materials.

Distinguished Delegates, I regret to say that for the one billion people living in slums, issues such as global warming and biodiversity are distant notions, far removed from their daily struggles and priorities. They are the true victims of unsustainable patterns of growth elsewhere. In their struggle for survival, they are also unwittingly contributing to environmental degradation. They contribute to deforestation, as they often are faced with no affordable energy alternatives to using wood or charcoal. They pollute rivers and streams, because they have no sanitation services. They dare not invest any meagre savings to improve their environment, as their tenure is insecure and they are constantly threatened by arbitrary forced evictions from their homes.

Sustainable development, for the majority of the world's urban poor, is not just a matter of survival. It is about the 'right to the city', the right to have decent shelter, the right to work and to earn a living, the right to go to school. It is about the right to be recognised as a citizen, the right to have a voice, and the right to be heard.

Our cities mirror, in their burgeoning slums and dilapidated neighbourhoods, the huge chasm between rich and poor, between those who benefit from globalisation and those who are marginalised. This gulf is an affront to human dignity. It leaves all our societies vulnerable, and each of us insecure.

Our efforts to ensure a more sustainable environment must therefore be fought on all fronts. The sustainable city of tomorrow is a city that is not only efficient and clean but also socially inclusive, culturally diverse and economically vibrant. No city, indeed no society, can claim to be sustainable if a significant portion of its population lives in poor and dilapidated housing, with inadequate access to water and sanitation, education and heath care.

The 2008 edition of the UN-HABITAT flagship report on the State of the World's Cities advocated for the realization of a `Harmonious city' characterized by spatial harmony, social harmony and environmental harmony. The report documents a growing gulf

between the 'haves' and the 'have-nots' happening in many cities of the developing world.

Ladies and Gentlemen, we need to urgently address pressing socio-economic and ecological challenges which are facing many cities in the developing countries, and at the same time step-up our efforts of exploring and promoting new solutions and models for the new cities of the 21st century.

I am happy to note that the urban planning profession is in the midst of a fundamental reinvention and revival. At the 2006 World Urban Forum in Vancouver, the planning profession fraternity gathered together and resolved to reinvigorate planning for advancing the cause of sustainable urban development. A conference, held under the theme 'revisiting planning' declared that planning needs to be an inclusive process; that 'new planning' should be innovative, context-specific, embracing strategic and local integrative approaches to rural, urban and regional planning. It should encompass the physical, human, social, cultural and intellectual assets of the city.

UN-HABITAT is actively engaged in reviving planning as a potent tool for promoting sustainable urban development. We are striving with our partners in the planning fraternity to advance more highly contextualized information, new communication tools, inclusive methods for modelling outcomes, and different ways of generating solutions that support the poorest city residents and the preservation and development of ecological systems. This new approach to planning, governance and management should be strongly embedded within the principles of sustainability. Whichever entry-point it takes, planning should enable us to see the city through the prism of sustainability.

Ladies and gentlemen, the world is at a crossroad: the fight to combat poverty and climate change is to be won or lost in our cities. Cities, as much as they embody the challenges also offer the solutions. The hundreds of communities and cities which we recognize for their good practices symbolize this potential. The challenge is that many cities in the developing world are not endowed with the capacity to harness and mobilize knowledge, and knowledge is critical.

It is popularly said that knowledge is power and we need to empower our cities. The vision of a sustainable city which I have just outlined presumes a learning city which is continuously exploring and innovating, sharing and networking. Universities and knowledge-centres have much to contribute to this endeavour. Universities bring their knowledge and expertise, whilst cities offer them unique opportunities to link research and education with policy and practice. Recognizing this potential, UN-HABITAT, has recently launched the World Urban Campaign to harness and channel knowledge, expertise and experience in support of sustainable urbanisation.

Concluding remarks

I am happy to note that the Commonwealth Human Ecology Council has already signalled its support for this Campaign and its intention to play an active role in its International Steering Committee.

A key initiative of this World Urban Campaign is the Habitat Partners University Initiative, an initiative meant to stimulate the exchange of lessons learned, derived from cutting-edge experience in sustainable urbanisation, and to integrate these lessons in the educational, policy making and practice arenas.

Distinguished Delegates - this conference portrays what we want to achieve through the World Urban Campaign. It brings together scholars, policy makers, practitioners and civil society leaders to learn from each other and to transform ideas into action. Knowledge sharing of this nature is crucial to enhancing our understanding of complex issues, and thus our ability to find appropriate solutions. But even more crucial is turning ideas into action, to make our cities more harmonious and sustainable. Surely, these are daunting challenges and require a long-term engagement. But we should use the present crisis as an opportunity to spur the world for new direction and bigger action. In conclusion, may I take this opportunity to invite you all to the fifth World Urban Forum to be held in Rio de Janeiro in March 2010. At the World Urban Forum the world converges to dialogue and exchange ideas on the urban challenges of our time. The theme for the fifth session of World Urban Forum will be `Cities for all - Bridging the Urban Divide', a theme which is extremely topical in the context of the issues which I have highlighted in my address today.

I thank you for your kind attention.

Prof. Naison Mutizwa-Mangiza, Chief of the Policy Analysis branch of UN-Habitat stood in for Dr. Tibaijuka at the Manchester Conference, as she had been called away on high-level UN business at the last minute.

The Spiritual Dimension of Human Ecology: Pierre Teilhard de Chardin's Vision

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Pierre Teilhard de Chardin, who died in 1955, has exercised, and exercises, considerable influence on evolution in both its spiritual and scientific context. In the 16th century, the celebrated Cardinal Baronius suggested that "the intention of the Holy Spirit is to teach us how to reach the heavenly sky, not how the sky is composed"! In his recent work, 'Et si Teilhard disait vrai?' his fellow Jesuit Gustave Martelet states that therein lies the distinction between the cultural and the purely religious view of scientific research.[1]

The empirical how of creation does not, in our present state of knowledge, rule out its evolutionary dynamism. Neither does it argue for a God reduced to an intelligent Programmer, designing a universe just out of creative curiosity. Rather that empirical how hearkens to an evolution of that primordial order of nature enjoying ecological equilibrium and moving, in the flow of history, to our unending search, through enlightened human ecology. This search is not just for the restoration of environmental balance but towards the eventual fulfilment of that dynamic force propelling humanity and nature to a point of complete convergence with a transcendent creator, Person not Programmer.

That Creator is the only One who offers convincing answers (ratio sufficiens as the scholastics would say) to the queries which haunt man as to his where from and where to, suggesting the fundamental explanation through that Faith, not negated by reason, in a Creator in whose image men and women were created.

In that creative context, Teilhard de Chardin, criticised by some of his own as a pantheist evolutionary, forged his deep belief in the environment as beauty - one that reflects for all time the pristine beauty of goodness in the Oneness of a loving Creator.

Teilhard, even as early as 1927[2], had the intuition of peering into the spirituality of matter (just as Bergson had done earlier in his 'Matière et Mémoire' and in 'Evolution Créatrice'[3]), just before the epic discoveries of quantum physics. In 'Le Coeur de la Matière', Teilhard had postulated that precisely in the deepest heart of matter, due to the principle of complementarity (enunciating that all the constituent elements of matter, e.g. electrons, are entities with a double face, at once grains of solid matter as well as immaterial waves), the Cartesian duality of matter and spirit was no longer tenable, since matter and spirit are complementary elements of one and the same reality[4].

Teilhard had sensed this incredible oneness of reality in the celebrated episode when, seven years old, he touched a ploughshare, and in an instant of sudden understanding, he felt that 'being' was something at once hard, pure and tangible. At about the same time, Pierre's mother set fire to a lock of hair which quickly disappeared. Sensing the absurdity of nothingness, Teilhard asked himself: 'Why are there things?', Why is there something rather than nothing?' Whence does this Being, this I, come ignoring the reason of its very existence?" [5]

Exploring the answers to these questions, concerning the reality of the Universe and of its finality, Teilhard discerned that even beyond the minutest form of matter, beyond the election of its two quark families, U (up) and D (down), there seemed to be nothing except a rational sensation that there is an immaterial `something', an `entity' that not being an energy nor a force is termed a `field', defined as transformation of structures in a space-time element in a given area. What Teilhard proposed was that quantum physics, having abolished the distinction between `field' and particle, and therefore between what is material, and that which is not, what we call 'reality' is 'really' discontinuities and fluctuations, contrasts and incidents which, taken together, comprise a network of information[6].

To the overriding query, whence comes this information understood as the source of knowledge, Teilhard offered that this is precisely where the 'spirit' world commences. Aware of the importance to his vision of the relativist field quantum theory, Teilhard knew that particles do not exist on their own, but only through the effects they cause, and that is exactly their 'field' of activity (be they electromagnetic, gravitational, protonic or electronic). 'Reality' then was the permanent inter-field interaction, with, strictly speaking, no 'substance' except vibrations in association with quantons which can move in space and time in continuous and permanent interaction.

Everything is in 'evolution ', in Teilhard's concept of reality, because nothing is stable, and that the ultimate 'non-substance' which is the interplay between the 'fields' possesses the global invariability of symmetry. That primordial symmetry marks the focal point of Teilhard's quest, his pilgrimage from Alpha to Omega, the Universal Christ. On that journey, contrary to some criticism levied at him in the 1940s[7], Teilhard was

accompanied by his conviction that evolution was not an end in itself, but that it led, through a network of 'non-substance' information, to the spirit, necessarily calling for a transcendent God.[8]

Teilhard's mysticism is imbued with this burning urge to 'explain' creation. His purpose in understanding 'The Phenomenon of Man' is "an attempt to see and to show what happens to Man, and what conclusions are forced upon us, when he is placed fairly and squarely within the framework of phenomenon and appearance".[9] Although he insists that most of his work should be considered as scientific rather than metaphysical or theological, it is his lyrical poem to creation and to its God that flows all through his writing[10]. Teilhard's opus is an interpretation of the universe covering, as he puts it: "the interior as well as the exterior of things; mind as well as matter, so that man reaches a more decisive moment when the scales fall from his eyes and he discovers that he is not an isolated unit lost in the cosmic solitudes, and realizes that a universal will to live converges and is humanized in him".[11]

Environmental perfection for Teilhard is the transfiguration of Creation, as we await the definitive return of Him who encapsulates all creation in that final reach of the Omega point which, for those graced with Christian faith, is not the end of history but the consummation of that embrace between Creator and Creature, a perennial celebration of a perfect environment.

Since his death in 1955, Teilhard has been quoted and misquoted, embraced as a Marxist and a Mystic, a charlatan for some, a consummate scientist for others. Some French Marxists, such as Roger Garaudy, wished to embrace him as their own, primarily because they interpreted his work on evolution as proving the inevitability of the Marxist march of the proletariat towards their 'omega' point through dictatorship.

Ultimately, perhaps, Teilhard was essentially a theological scientist imbued with the Platonic unity of the good and the beautiful, transformed by the one Christ in that aesthetic cosmos where everything is 'beautiful', because by God produced, and by the incarnate Christ permeated.

In his foreword to 'The Phenomenon of Man', Teilhard entreats us to accept that "true physics is that which will, one day, achieve the inclusion of man in his wholeness in a coherent picture of the world".[12] That wholeness and coherence, is for him, the act of beauty. Just as true physics achieves that inclusive wholeness, so also `true` aesthetics, for Teilhard, is the unity of matter and spirit in perennial and ethereal beauty, reaching its fullness at the Omega point. The search for perfect environmental balance was one where faith and reason work hand in hand in a scientific exercise where transcendence is no humiliating constraint, but a celebration of environmental beauty.

Scientific aesthete par excellence, Teilhard's vision of the universe is a lasting one because it is the joyful vision of the Risen Christ to whom, in his "Prière au Christ toujours plus Grand", he addresses his final plea:

"Lord of Consistance and of Union, whose defining mark and essence is being able to grow indefinitely, without deformation or rupture like that mysterious matter whose Heart you occupy and whose every movement you ultimately control – please dissipate all the clouds which still hide you – as both those of hostile prejudice and those of false creeds".[13]

Human ecology as a science teaches us the rationality of environmental conservation. Through an inspiration such as Teilhard de Chardin offers us, it acquires a spiritual dimension, becoming a robust instrument that beyond the purely material beckons towards a transcending environment.

Notes

1. Gustave Martelet (2006). "Et si Teilhard disait vrai?" Paris.
2. Teilhard de Chardin, Le Milieu Divin, in Vol. IV of op.cit.
3. See Bergson's 1912 letter to the Jesuit de Tonqueder "Les considérations exposées dans mon essai M. et M. font toucher du doigt je l'espère, la réalité de l'ésprit".
4. See Jean Guitton, op.cit, pp.173 – 4, as Guitton, Bergson and Teilhard were the two great personalities influencing his life (see op.cit., pp. 93 – 96).
5. Teilhard de Chardin, Le Milieu Divin, in Vol. IV of op.cit.
6. See also J. Guitton, op.cit p.112
7. In 1947, the Dominican Garrigon-Lagrange in Angelicum recommended that the works of de Luba and Danien (later both Cardinals) as well as of Teilhard be placed on the Index.
8. See Mgr.de Solages, quoted by Claude Cuen et in Teilhard de Chardin (Rocher, p. 324.) De Solages was reacting to Garrigon-Lagrange's accusations.
9. Teilhard de Chardin. The Phenomenon of Man (1959), p. 31, London. [The French original was published by the Editions du Senuil, Paris, 1947] The 1959 English translation carries an introduction by Sir Julian Huxley.
10. See, in this connection, his preface to op.cit., p. 29.
11. Op.cit. p. 36.
12. Teilhard de Chardin, Phenomenon of Man, op.cit. pp.35-36.
13. Gustav Martelet, op.cit. pp. 99-100.

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Keynote Address- Urbanisation, Poverty and Sustainability- The Nigerian Perspective

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Introduction

A series of recent seminal summits brought world attention to sustainable development: the Earth Summit in Rio in 1992, the Habitat Agenda in Istanbul in 1986, the design of the Millennium Development Goals at the Millennium Summit in 2000, and the Earth Summit in Johannesburg in 2002.

The current concern is Climate Change, culminating in this topical International Conference on Human Ecology. We owe the organizers a debt of gratitude. I should single out Debra Whitehead for the supreme efficiency with which she handled my booking and a place in Manchester. In Nigeria we know Man U. and not the city. I am pleased to be here - a city of hospitality and education - I shall come again.

I am a proud member of the Commonwealth Human Ecology Council, CHEC, ascribing credit to Dame Zena Daysh and Professor Ian Douglas for their effort in calling world attention to Human Ecology, which was what the Habitat Agenda represented; a 'Holistic Approach to Human Development and All Earth Matters'.

I took a 'life experience' approach to this address, with the kind permission of Prof. Douglas to make a power point presentation. This address is inspired by the rapid urbanisation, and the urbanisation of poverty, occurring in many developing countries. In these areas there are empty homes and homeless people, which lead to grave demographic shifts and social conflicts. In turn this creates: conflicts over water and land, slum development, and the overlooking of peoples rights as rhetoric moves away from talking about 'shelter', towards discussion on 'housing'. In this context over 90 per cent of bank credits go to the rich to acquire land and properties. Such a system cannot provide for the poor and will certainly not protect the rich from indirect effects of poverty; the results manifest in gated homes, guard dogs and private security guards.

Nigeria - development of a nation

Nigeria has a land area of approximately 932,000 km² including rainforest, savannah and non –arable areas mainly composed of desert. The population of 150 million people is composed of a diversity of cultural backgrounds. When Nigeria gained independence from Britain in 1960 the government adopted the Westminster political model, although this was changed by the Military intervention in 1966.

Since 1966 Nigeria has been going through the pangs of growth and challenges of development of a nation state, including a dark chapter of civil war 1967 – 1970. The period between 1999 - 2009 involved experimenting and growing democracy with a mix of US and French presidential systems of governance. The military 'creature' evolved from 12 States into to 800 governments: 36 state governments and 774 Local Government Areas (LGAs).

Urbanisation in Nigeria

Nigeria is arguably one of the fastest urbanizing countries in the world. It is currently developing 37 major cities simultaneously including all the state capitals, Abuja, and some commercial towns with huge populations. For example in the South-East in Abia state, Aba city has the largest number of SMEs (small to medium enterprises), while Onitsha in Anambra state has the largest market in West Africa. Other examples include the oil city of Warri in the Niger Delta (Delta state) and Ijebu-Ode, a major industrial town in the South West of Nigeria in Ogun state, and Potiskum city in the North-East.

In Nigeria the National Ecology Fund is one mechanism which addresses ecological problems associated with rapid urbanisation and industry. This operates through a charge on national budget, and has to date funded ecological work dealing with desertification in the Northern part of the country (sand domes) and coastal erosion in the south, the latter of which is exacerbated by mineral exploration, oil spill, and associated destruction of aquaculture and mangrove forests as a result of this search for black gold. This fund also tackles gas flaring and scorching of farm lands; poor remediation of mining sites; gulley erosion, river recovery; river dredging to improve storm-water management; and natural disasters, particularly the resulting displaced persons.

Within the 774 Local Government Areas physical planning is governed by the Country & Town Planning Act, which provides for Town Planning Authorities in the Municipal and Urban centres and Local Planning Authorities in local government areas. For example, within Imo State there are 27 LGAs, and plans are under way to introduce 'Community Planning Committees' in 1,930 rural and peri-urban areas to contain urban decay, slum growth, squatting, and

address peri-urban renewal for sustainable development.

The State Planning Ministry, the Nigerian government body charged with all physical/urban planning, has recently introduced a 'Certificate of Comfort' to address building permit contraventions. This certificate is a legal instrument, perfected by the Ministry of Justice to ensure no one is forcefully removed for contravening planning regulations. It comes with a timeline for compliance to be agreed by the Land Development Control & Enforcement Unit of the Ministry and the developer, offering such offenders soft landing or discomfort if they fail. This is about civility in governance.

The new face of Imo State Capital

Imo State capital, Owerri, where I had the rare privilege of representing in the House of Representatives National Assembly from 1999 - 2003, remains the cleanest city in Nigeria. The State is doing new things in urban renewal. These include the Administration's pro-people programs which are designed to create a modern model state, Clean and Green, technology driven, growing and grooming leadership through functional education and scholarship - The Finishing School Strategy & Model Schools. In addition IRROMA (Imo Rural Roads Maintenance Agency), an agency equipped with basic road maintenance equipment, ensures all-season use of the rural feeder roads in order to allow the consistent evacuation of agricultural produce/products.

I believe that Africa can overcome her handicap, once it realizes the difference between westernization and civilization.

In Nigeria land-use falls under the Land Use Act (1978) which governs land management and administration throughout the country. The States deal with the residual law of country planning. In Imo state Imo Geographic Information Service (IGIS) represents a fundamental departure from the Paper Records System to electronic Land Records System which significantly improves land planning. This process includes the recertification of all existing title documents into State Digital Deeds Registry and Cadastral mapping of towns and cities to provide for agricultural land reserve backed by appropriate legislation. Legislation is in the works to merge tenement rate with ground rent into a single tax net – property tax – to be collected by the State and shared by the two tiers of government, while capital contribution for infrastructure development shares the burden of development.

Urban poverty in Nigeria

In Nigeria cities remain the magnet for 'success', which was in itself responsible for the high rural to urban migration that created the urban poor in the cities. Particularly pertinent problems in these urban areas include the social push on various layers of the society leading to low income earners (income poverty), inadequate and poor housing, lack of potable water and a sanitation gap. In addition there are inadequate resources to make access to land easier and there is the high cost of infrastructure development including roads, drains, water and power, due largely to high import content of the finished products from the industrialized countries. Despite all of these issues, people still get trapped in the cities- and once in the city there is no going back- thus contributing to population explosion.

As a result of poor housing and infrastructure development, population explosion and income poverty, people have adopted all manner of strategies aside from subsistence farming in order to survive; youths take to trades like motorbike taxis, now banned in the state capital in Imo State, to encourage a fresh re-birth in skills acquisition by the youth. In addition there is prolific hawking of wares, including sachet packs of potable water, although these are no longer allowed in the State Capital due largely to the difficulties associated with disposing plastic wastes, other than recycling. Perhaps the most common trade among the youths is the sale of top up cards for cell phones. In Imo state it is easier to find an unemployed graduate than get artisan-carpenters, masons, plumbers etc, simply because the poor want university education for their wards also.

It is self-evident that there is correlation between poverty and crime, and there are no safe cities in Nigeria any more. This is because these cities attract people, but cannot provide for everyone. As such the 'bold' survive one way or the other, including crimes, which of course is unfortunate, while the weak resort to mean jobs and petty crimes, prostitution, pick pockets and mugging.

Ending poverty: thoughts by experts and thinkers

De-Soto hinges his thought on titling of property of the poor to access credit. Give the poor title and the world becomes an oyster. Similarly, Jeffry Sachs listed lack of capital in six major areas: 1) Human capital: Health, nutrition and skills required to break out of it; 2) Business capital: machinery, facilities, motorized transport to support agriculture and manufacturing; 3) Infrastructure capital: roads, power, water and sanitation air/sea ports; 4) Natural capital: arable land, healthy soils, biodiversity; 5) Public institutional capital: judicial systems, good governance and 6) Knowledge capital: scientific and technological know how.

However, Eric Beinhocker posed the question "where does wealth come from in the first place?" Put plainly, how does the sweat of our brows and the knowledge of our brains lead to its creation? Wealth is the product of people's efforts and the interaction of people in exchange and trade. It is not the endowments of mineral resources, land, geography, or even population. Instead, human capital is the key to fight poverty: for example Israel's land area is 21,000 km^2 only 20 per cent is arable, while research and technology made all the difference. Japan, South Korea and Singapore have also adopted this model, whereas China, India and Brazil and Africa can't compete with these smaller countries; thus science and technology hold the key to remove poverty.

Sustainability

Nigeria with her population of about 150 million people, dispersed literacy rate, low in some states, and fairly high in some others, struggles with human capital development. Although there are well over 100 universities, they all face manpower challenges. Imo State alone has five higher institutions in the State capital and a Centre for Management Development owned by the Federal Government designed to offer Executive MBA programmes. Nigeria has fairly literate labour, but is afflicted with intellectual captivity by the financial sector. This lures the best brains into their system with fat pay cheques that are hardly sustainable, with most of them doing basically routine jobs; thus robbing the academia of the opportunity of engaging them for further academic development. All of the above add to Nigeria's major challenges, aside from 'infrastructure gap' - power and transportation.

Sources of support for urban sustainability and poverty

Recently the Nigerian federal government set up a N400billion agricultural fund (US$2.68billion) in order to support commercial agriculture, through offering loans with a low interest rate (8%) to improve food security. In addition, this fund aims to address post-harvest waste, encourage food preservation, grain storage and processing. Increasing and improving processing of agricultural produce will add value and attract better export enquiry and fair prices, and fortunately commercial Banks have also set aside a sizeable percentage of their loan portfolio in this fund too.

Another source of support for urban poverty is the 17 million Nigerians in the Diaspora, with over 50 per cent experts in various fields of human endeavour. These Nigerians contribute close to $10billion in remittances per annum, before the present economic meltdown. This acts as an extended family support system, the anchor of Africa's life support facility and current social security. There are also a plethora of community self-help programs in urban areas which provide needed support. These programs are based on African ideals, that aside from war and famine, it is un-African to watch one's neighbour starve.

Foreign aid and technical cooperation agreement

There are many countries in the world which do not have mineral resources but are forerunners in world development. Examples include Japan, Singapore, and even Malaysia; these countries have benefited from location advantage. I believe that Africa can overcome her handicap, once it realizes the difference between westernization and civilization. This clarification has made Japan the only truly industrialized nation outside the western hemisphere. This process will require courage for Nigerians to learn in their mother tongue and address the skill gap. It seems that there are so many sophisticated machines and cars that should have no place in Africa. We need to also differentiate between Free Trade and Free market; they are not one and the same. Lastly, as Ms. Maya Angelou, the US author, says, we must bear in mind that while only equals make friends, any other relationship is a mere contraption .

Constructive engagement to reduce poverty

I believe that it is possible to eradicate extreme poverty, and reduce other forms of poverty. Extreme poverty is an assault to our common humanity. It is real nuisance that society must collectively remove. Africa needs constructive engagement and not philanthropy, which in most cases amount to polite resentment of the poor by the rich and powerful. Our Nobel laureate Professor Wole Soyinka counselled Africa to accept the tragic gap of understanding between cultures, but not when it takes the attitude of violent superiority. Africa is the continent of the future.

Conclusion

In conclusion, in order to tackle the problems of sustainability and poverty in urban spaces in Nigeria I believe that Nigeria needs fair prices for unprocessed products from poor countries, structured aids to align with country plans, and aid to be targeted on human capital development. Importantly we must equip institutions of higher learning for skills development, and through doing so support talented persons to develop fully and support growing and grooming of leadership through quality education and scholarship.

Eco-urbanism: Transcendent Eco-Cities or Urban Ecological Security?

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Introduction

Ecological urbanism provides an opportunity to ask important questions about the wider societal implications and potential long-term consequences for our understanding of eco-cities. As urbanists, our primary interest in this study is in looking behind the interests promoting eco-urbanism as a specific temporal and spatial response to the challenges of climate change and resource limits. What most concerns us is the questionable assumption that eco-urbanism is a transformative style of development that will allow cities to continue to grow economically while, quite literally, transcending environmental constraints, obviating the need for wider societal change. Does eco-urbanism represent merely an attempt to create ecologically secure gated communities, or can it contribute to the development of more collective notions of planetary security in the face of multiple eco-emergencies?

Normalising Replicate Eco-urbanism

In contrast to the countercultural and alternative movements that responded to the 1973 energy crisis[1], the new eco-urbanism has gone mainstream, developing its own lexicon of scales through which new projects are implemented around the globe; there are eco-villages, eco-towns, eco-blocks, eco-islands, eco-cities, and even eco-regions. Although many developments have not left the drawing board, there is enormous enthusiasm for replicating eco-city developments, represented as visionary - and exemplary - experiments[2]. The IEEE Spectrum sees eco-cities as 'a city-scale test bed' for reengineering technologies to maximize efficiency and reduce environmental waste, while Herbert Girardet, the ecologist urbanist and advisor to Arup, argues that:

> "*Dongtan is intended to set an example. It will be a pioneering eco-city that could become a blueprint for sustainable urban development, in China itself and elsewhere in the world. It holds a promise of a high-efficiency, small-footprint urban design. By 2010, Dongtan will be a compelling model for how to build sustainable cities worldwide that may well be too persuasive to ignore*"[3].

Although there is relatively little experience of actually building eco-cities and assessing whether the social visions and technological aspirations are achievable, there are already intergovernmental agreements - for instance between China and the United Kingdom - to accelerate the development of eco-city development in both contexts.

Integrated (Quasi) Autonomous Ecotectonics

The new eco-tectonics of eco-urbanism seeks to integrate environment and infrastructure by re-bundling architecture, ecology, and technology in an attempt to internalize energy, water, food, waste, and material flows within the development. Engineers, systems modellers, material flow analysts, and designers are involved in integrating local production technologies, circular metabolisms, and closed-loop systems to reduce reliance on external centralized infrastructure networks. This places a particular premium on low-water-use systems, water recycling, reuse of waste water, local energy production systems, reuse of waste, and local food production systems. These responses strongly echo the early integrated system models of the 1970s; what is different this time is the extension of these systems to consider carbon flows and the impact of climate change, along with aspirations to explore new concepts such as carbon neutrality, waste neutrality, and water neutrality. Significantly, there seems to be much less debate in this current period about wider questions of social and institutional control of these technologies, which, it is largely assumed, will be provided by the market.

Eco-Urbanism as Transcendent Urbanism

Linked to the aspiration of greater ecological and infrastructural self-reliance is the claim that eco-urbanism can develop cities in almost any urban context, overcoming both local environmental limits and the consequences of global climate change and resource constrains. So, for example, we have Masdar being developed in the desert of the United Arab Emirates; Dongtan being built adjacent to an internationally significant wildlife site in Shanghai; and the water-stressed, polluted brownfield, and flood-risk sites of the Thames Gateway being designed to accommodate an additional 160,000 houses through a combination of water, waste, and carbon neutrality, along with unprecedented levels of flood protection. Cities, according to some visions, will even be constructed in the oceans. Eco-urbanism is a new style of urbanism that provides the technological solutions and market frameworks to overcome what we would have conventionally understood as limits while anticipating a period of climate change and ensuring continued reproduction under a period of resource constraint. Given impending eco-emergencies, eco-

urbanism will attempt to provide a guarantee that it can transcend any ecological circumstance.

Corporate and Governmental Leadership of Eco-urbanism

Leadership of the eco-urbanism movement is strongly focused around particular corporate and governmental interests. This is in stark contrast to the 1970s, when at least part of the response by radical and environmental groups was a critique of such interests. For example, General Electric is the strategic partner in Masdar, which is designed to place the UAE in a global leadership role with respect to renewable and environmental technologies. The British engineering firm Arup, which is developing Dongtan, has signed agreements with the Chinese and U.K. governments to establish a series of linked Institutes for Sustainability — the first being developed in the Thames Gateway in London — to develop the expertise and institutional frameworks to roll out eco-urbanism. Environmental and green groups, such as Greenpeace and the World Wildlife Fund, are now supporters or partners with commercial and governmental actors involved in accelerating the construction of eco-urbanism.

How do we understand eco-urbanism as the artificial reconstructions of nature and ecology through design and technology? Are they specific responses to a set of specific historic–geographic pressures, a new means of political-economic reproduction, or a cultural representation of a more ethical urbanism? Our point is that they represent a specific spatial and temporal project in which ecology and economy merge around techno-scientific design. To understand why this is the case, we need to locate eco-urbanism within a wider understanding of what is happening to global urbanism.

Contemporary Global Cities in the "Anthroprocene"

We need to develop an understanding of how the present crisis is constituted before asking whether eco-urbanism is part of the solution — or still part of the problem. The key context is the massive increase in urbanisation and the proliferation of cities globally. In 1900, 10 per cent of the world's population lived in cities; 100 years later, 50 per cent of the world's 6 billion people live in cities; by 2050, it is projected that nearly
70 per cent of the world's 10 billion will do so. Consequently the social, technical, and ecological organisation of supporting such massive concentrations of people has become more challenging. For political scientist Tim Luke, this means that we must think more carefully about how we conceptualize cities:

"Global cities now are entirely new environments tied to several complex layers of technological systems whose logistical grids knit into other networks for the production, consumption, circulation and accumulation of commodities. In addition to sewer, water, and street systems cities are embedded in electricity, coal, natural gas, and petroleum and metals markets, in addition to timber livestock, fish, crops and land markets. All of this is needed simply to supply food, water, energy products and services to residents. Global cities leave very destructive environmental footprints as their inhabitants reach-out into markets around the world for material inputs to survive, but these transactions are also the root causes of global ecological decline". [4]

Luke develops the concept of cities as 'metalogistical' spaces to capture this sense of contemporary urbanism as formulated through, and constituted by, dense concretions of infrastructural logistics. The prefix 'meta' helps to view the city as an active intermediary, which sits as a site of material transformation that anticipates, modifies, and excretes the movement of resources, materials, and people. Any understanding of urban ecosystems as constituted through material flows also has to take seriously the analysis of urbanized international and inter-environmental relations of critical resource flows.

> *Human activities are so pervasive and profound in their consequences that they have the potential to alter the systems in ways that threaten the processes on which life depends*.

Although cities exist within a highly unified and integrated global space of capital flows, particular cities vary widely in their access to ecological resources. Highly energy-intensive urban environments in the United States contrast with the cities of the global south, where millions do not have access to clean water, energy, and telephones. The United States has almost 5 per cent of the world's population, but generates about 25 per cent of greenhouse gases. Americans' ability to control global ecosystems of fossil fuel means that U.S. cities are able to be far more spatially expansive (and destructive) than if they had to survive solely on the resources available in their national space.

Contemporary urbanism is then best understood as a hybrid of economic processes and artificial ecologies that for Simon Dalby are "now changing the biosphere in significant ways". [5] It is no longer tenable to see the environment as separate or external from urbanisation. Cities are changing many physical processes in the biosphere to such an extent that earth scientists are now talking about a new geological era, the 'anthroprocene', during which the "whole planet is being remade by our contemporary urban industrial

systems".[6]   Central to the emergence of this perspective is the view that the earth is a single system in which contemporary life is a critical player in the production of global ecological change. Human activities are so pervasive and profound in their consequences that they have the potential to alter the systems in ways that threaten the processes on which life depends. Global ecological change is leading to the emergence of an 'urbanatura' that is a "more unpredictable, uninviting, and hybrid of urbanism and nature".[7]   Impending urbanaturalized environments have to contend with a new atmosphere, changing oceans, different biodiversity, constrained resources, and remade land masses to which future generations will have to adapt existing cities, but with few obvious adaptive solutions.

Global Cities Constructing Urban Ecological Security

The term 'ecological security' is usually used in relation to attempts to safeguard flows of ecological resources, infrastructure, and services at the national scale. But increasing concerns over 'urban ecological security' are giving rise to strategies to reconfigure cities and their infrastructures in ways that help to secure their ecological and material reproduction—that is, their capacity to secure the resources (such as water and energy, but also including waste disposal and protection from flooding) required to assure their continued economic and social development. Yet cities have differing capabilities to develop strategic responses to the opportunities and challenges of key urban ecological security concerns such as resource constraint and climate change, and consequently these emerging strategies may selectively privilege particular urban areas over others.[8]

A series of new socioeconomic and political problems are placing issues of ecological security higher on the agenda of national governments. For example, climate change poses problems such as constraints on water resources, uncertainties over energy security, and the geographic spread of disease. Concerns over the security of ecological resources have become intertwined with national states' priorities and responsibilities for social welfare and economic competitiveness.[9]

Yet such concerns are also increasingly becoming issues at an urban scale, for three interrelated reasons. First, increasing economic globalisation and the changing relationships between national and sub-national territories and economic activity have led to new state spaces of governance and intervention.[10] Second, the development of these new state spaces has not received the same attention in relation to environmental concerns as it has with regard to economic activity. What would an 'ecological state', with ecological protection as one of its foremost regulatory functions, look like? Finally, there is the issue of how the economic and ecological reproduction of cities can be secured in a context of rapidly growing population, high demand for resources amid increasing resource constraints, and intense competition for economic activity and jobs.

A Strategic Orientation toward Urban Ecological Security

Increasingly, cities are developing more strategic approaches to meeting future resource requirements, to enhance their standing in the inevitable competition between places, but more profoundly, to provide the conditions that can assure their continuing social, economic, and material reproduction. This reflects a shift from the post-9/11 agenda of critical infrastructure protection from terrorism or the consequences of environmental damage to a focus on safeguarding a city's material resources. A new dimension of cities' competitive positioning is their ability to internalize and control both the resources with which they are endowed and subsequent supply, consumption, and production. The knowledge, expertise, social organisation, and socio-technologies required to maintain cities' economic and social roles are thus likely to be defining features of twenty-first-century urbanism. But what actual strategies will places adopt?

New Styles of Urban Infrastructure

The strategic response to resource constraint is leading to the development of new styles of infrastructure development that privilege particular places - or rather particular spatial and socio-technical configurations of infrastructure. The world's largest cities are beginning to reshape themselves and their relationships with resources and other spaces in three ways: protection, autarky, and global agglomeration of new infrastructure systems, expanded upon below.

First: protecting cities from the impacts and effects of climate change and resource constraints. Central to such strategies are investments in understanding the city-specific and long-term effects of climate change, especially in relation to flood risk and temperature rise, and the development of strategic flood-protection systems, green infrastructure, and retrofitting to deal with increased temperatures. The Greater London Authority's assertion that central government should take responsibility for the potential investment required to protect London post-2030 from climate-change-induced flooding typifies such responses.

Second: building autarky into the supply of water and energy, the mobility of people and goods, and the disposal of wastes. Traditionally cities have prospered by seeking out resources and waste sinks from ever more distant locations. Yet this approach is now being reversed, as cities seek to become more self-sufficient by reducing their reliance on international, national, and regional infrastructures and re-internalizing their own resources and re-circulating wastes. Understanding the urban metabolism of the city and the potential for its reconfiguration becomes of strategic significance. Key examples are New York's

strategy of energy independence, the recent doubling of decentralized energy targets in London, and Melbourne's development of renewably powered desalination. Cities are attempting to reduce reliance on external resources through water and energy conservation and waste minimization schemes, and by developing pricing mechanisms for car-based mobility.

Third: collectively building agglomerations of new urban mobility systems. While focusing on local enclosed resources, cities are also seeking to guarantee intra-city and inter-world-city mobility through the development of new mobility technologies such as pricing, transport informatics, and new fuel systems based on hydrogen, biofuels, or complex hybrids.

Implications and New Research and Policy Agendas

Eco-urbanism's relationships with urban ecological security constitute a research and policy agenda that must be critically tested. Five key questions emerge:

First, are we talking about new forms of autarky based on bypassing national and regional infrastructure, leading to the development of new archipelagos of connected world cities?

Second, what will this mean for the places thus bypassed—the new peripheries constructed by enclosure, and the ordinary cities of the developed and major cities of the developing worlds?

Third, who will benefit from these configurations, who will be overlooked or disadvantaged, and what material consequences will be produced?

Fourth, who will provide material linkages between world cities and the new peripheries—national states or corporate capital?

Fifth, what are the alternatives; and where do we look for other forms of innovation driven by approaches more concerned with fair shares and equality of access? These, we argue, are the critical questions of the urban agenda of the twenty-first century.

Notes

1. See the excellent review of architectural and urban responses see Giovanna Borasi and Mirko Zardini (2008) Sorry, Out of Gas – architectures response to the 1973 oil crisis, Edizioni Corraini/Canadian Centre for Architecture.

2. For example a "bright green metropolis"—Wired and a possible "blueprint for green cities worldwide"—New Scientist.

3. See page 3 of Which way China? Herbert Girardet, http://www.built-environment.uwe.ac.uk/research/pdf/girardet2.pdf [accessed 15th September 2009]

4. See pages158-159 of Luke, T.W., (2003), Codes, Collectivities, and Commodities: Rethinking Global Cities as Megalogistical Spaces, in Krause, L., and Petro, P., (eds) Global Cities: Cinema, Architecture, and Urbanism in a Digital Age, Rutgers University Press: New Jersey.

5. See page 111 of Dalby, S., (2007). Anthropocene Geopolitics: Globalisation, Empire, Environment and Critique, Geography Compass, 1 (1), 103-118.

6. See page 114 of Dalby, S., (2007). Anthropocene Geopolitics: Globalisation, Empire, Environment and Critique, Geography Compass, 1 (1), 103-118.

7. See page 128 of Luke, T. W., (2008). Climatologies as Social Critique: The Social Construction/Creation of Global Warming, Global Dimming, and Global Cooling. In S. Vanderheiden, (Ed) Political Theory and Global Climate Change, MIT press.

8. For a longer discussion of urban ecological security see Hodson, M., and Marvin, S., (2009) Urban Ecological Security' A new urban paradigm?, International Journal of Urban and Regional Research, March. Volume 33 Issue 1, Pages 193 – 215.

9. See Meadowcroft: J (2005). From welfare state to ecostate. In J. Barry and R. Eckersley (Eds): The Global Ecological Crisis and the State. MIT Press, 2005. Meadowcroft 2005.

10. See Brenner, N. (2004). New State Spaces: Urban Governance and the Rescaling of Statehood. Oxford University Press.

Sustainability and Redevelopment in the City of Manila, Phillipines

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Introduction

Local governments are best positioned to implement sustainability initiatives. They possess a decision-making apparatus, are closest to the people, and their success is determined by being able to deliver a triple bottom line of equity, economy and environment.[1] Sustainable communities are ones that maintain their natural and cultural resource base while promoting economic development and hosting a vibrant, equitable society.[2] As an operational concept, it refers to environments that: emphasize compactness and land resource conservation; provide mixed-use development and a wide-range of housing opportunities; maintain sensitive natural and man-made cultural resources; encourage the reduction of greenhouse gas emissions through green building, energy efficiency and renewable energy; reduce physical and socio-cultural risks through sustainable management; and design green infrastructure though parks, greenways, and natural drainage systems.[3]

Today, nearly 50 per cent of the world's population lives in cities. By 2030, this percentage will increase to 60 per cent, and cities of the developing world are expected to absorb 95 per cent of this growth as a result of rural to urban migration, transformation of rural settlements into urban ones, and natural population increase. Although comprising only 3% of the earth's land area, cities consume 75 per cent of global energy, create 80 per cent of global greenhouse gas emissions, and intensely concentrate work, people, materials and energy.[4] Without proper management planning, cities constitute a major environmental hazard. Yet, cities also possess great opportunities for sustainability. Their compact settlement pattern provides economies of scale that can encourage resource and energy efficiency. With people living closer together, mass transportation can be encouraged, critical infrastructure such as sewers, roads, and electricity can be minimized, resulting in more efficient material use. Also, cities encourage innovation and resource efficiency. Energy efficient building construction, renewable energy advances, and innovative waste management solutions can be successfully adopted. In New York City, for example, global greenhouse gases per capital are just one-third of the U.S. average.[5]

In order to implement sustainability in cities there needs to be a strategic implementation process. Figure 1 displays a process that projects the development of an urban sustainability management plan as the key mechanism to implement sustainability in communities. Figure 2 illustrates two potential decision-making models for sustainability. The first model emphasizes a top-down planning approach that is driven by professionals and community elites. The second model emphasizes a collaborative approach where community involvement is central to policy development. This paper explores the utilization of the second planning model for sustainability implementation which relies on successful mobilization of stakeholder sentiment in the community.

This paper concludes that a sustainability management planning process that centres on comprehensive stakeholder input and awareness education fosters a greater probability that sustainability practices can be implemented.

Figure 1
URBAN SUSTAINABILITY MANAGEMENT PLANNING PROCESS MODEL
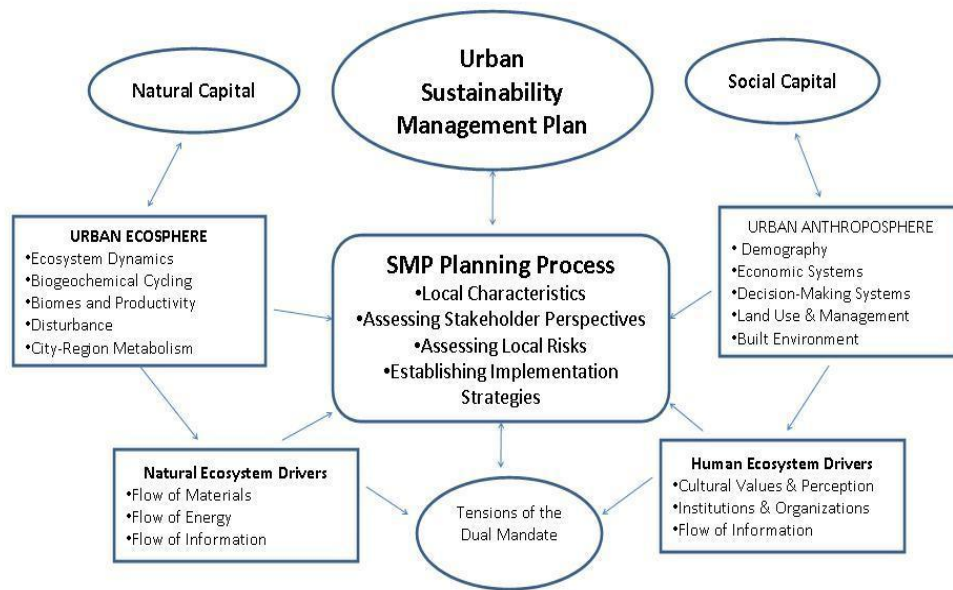
Source: Robert W. Taylor

Figure 2
Urban Sustainability Decision Models

Source: Robert W. Taylor

A study was undertaken over a six-month period from January to June 2009, to investigate the necessary preconditions for effective sustainability implementation in the city of Manila, Philippines.[6] The city of Manila is one of 17 municipalities and cities that form Metro Manila, a megacity of 12 million people residing in a land area of 38 square kilometers.[7] The study asked a number of research questions. First, do community residents from the barangays[8] in the city of Manila view the major issues, problems, and potential solutions to these problems differently than do professionals, and other elites that often drive city policies? And secondly, what are these differences and what strategies can be promoted that would minimize these differences and reduce the discrepancies between sustainability initiatives and implementation?

Methodology

In order to undertake this research, as with any formalized research program in the city of Manila, a set of procedures were followed. First, the official support for the project was sought and received through the mayor's office. This was done through submission of a letter and follow-up visits to City Hall to discuss the goals and intended outcomes of the project.[9] The next step was to establish a mechanism for the delivery of the project. This was accomplished through the involvement of research students from De La Salle University in Manila.[10] Students were trained in the basic issues of urban sustainability and applied this knowledge to technical analysis. Hence, students were engaged in an active learning project, combining theoretical information with applied applications.

The project commenced in early January 2009. The study utilized a methodology that consisted of one-on-one interviews, intensive focus group discussion and observation, the delivery of questionnaires, and computerized statistical analysis. Information was gathered through three separate seminars which took place over a period of two months. Each seminar targeted a different stakeholder group. Two seminars were aimed at professional and key decision-makers, i.e. city administrators and non-governmental organizations, businesses and national governmental entities. A third seminar was directed toward barangay officials, used in this study as a measure of community sentiment. Letters of invitation for each seminar were sent out; a detailed questionnaire was created to measure attitudes and perception of issues; and a small set of questions were developed for the focus groups that centered on an investigation of existing and potential sustainability initiatives in the city of Manila.

All of the seminars followed a similar format. They were all delivered in a modern conference facility at De La Salle University on Saturday mornings from 8 am to 1pm, which included a light lunch. Saturday mornings were selected as delays due to traffic congestion were minimized. De La Salle is located in the city of Manila so it provided a convenient and short trip to the seminar site. An official program was developed with registration, a formal introduction, a discussion of basic goals and objectives, brief student presentations, delivery of the questionnaire, and breakout focus groups. Participants were presented with official Certificates of Attendance at the conclusion.[11]

The first seminar was held on February 21 for city administrators. Thirty-one participants attended, representing 22 agencies. Participants were divided into four focus groups administered by two students each. A second seminar was held on March 7 for barangay officials. Fifty participants attended, with representatives from thirty-six separate barangays, coming from all six districts of Manila. Participants were divided into eight focus groups with one student coordinating discussion in each group. The third and last seminar was held on March 21 for external stakeholders, i.e. NGO's, cooperatives, businesses and governmental entities. Twenty-five participants from twelve organizations were represented. Participants were divided into four focus groups administered by two students each. In all, 106 participants attended the three seminars.[12]

Results

The study revealed that the three stakeholder groups surveyed had a different perception of problems, solutions to those problems and what constitutes successful sustainability practices. First, a profile of the three groups showed that their mode of travel to work was different. Overall, 98.0% of the *barangay* respondents traveled to work using public transportation, while only 50.0 per cent of the city administration respondents did, and 77.3%t of the

external stakeholders. It is surprising to note that 65.2%t of the city administration respondents traveled to work in less than 30 minutes, while only 20.4% of the *barangay* respondents were able to match this short commute time. Perhaps this is a reflection of the greater time it takes to get to work using public transportation.

In a question relating to what are the major causes of pollution in the Pasig River, the *barangay* respondents overwhelming indicated that the largest contributor was domestic waste (86.4%), while both the external stakeholders and the city administration agreed but gave more consideration to factories. Also, as seen in Table 1, *barangay* respondents advocated harsher penalties for illegal behavior, specifically in the form of fines and the revoking of business permits. But, they were strongest in not seeing detention as a viable strategy to deal with illegal activity **(Table 1).**

Another difference in the perspective of the three stakeholder groups was revealed in the question on what they perceived as the most important assets or competitive advantages of the city. While there was a general consensus on 'location to services' among all three, the city administration emphasized the location on Manila Bay, while the barangays stressed the notion of 'friendly people', and the external stakeholders emphasized 'hotels and tourism'. The breakdown is clear. One stakeholder emphasized an environmental amenity, a second stressed a 'people-oriented' value, and a third viewed the most important asset consisting of an economic asset. Clearly, all three possess a different perspective on the competitive advantages of Manila.

Table 2 shows how the three stakeholder groups view major problems differently. It should be noted that the barangay respondents were less prone to label problems as 'major', which could have distorted some of these surprising results. At any rate, problems such as water supply, drug abuse, air quality, flooding and water-borne diseases, poverty, and informal settlers were not viewed as major problems by the barangay respondents, while they were viewed as major problems by both the city administration and the external stakeholder group.

Opinion on Environmental Issues

When questions were asked relating to perception of environmental quality, 33.6 per cent of the barangay respondents strongly agreed with the notion that the "*city of Manila provides an environmentally-friendly lifestyle*". But, 70.4 per cent of the city administration respondents reported that they "*would like to live in an environmentally-conscious, green community*", much greater than the other two stakeholder groups. And finally, the barangay respondents overwhelming exhibited a greater desire to learn more about urban sustainability, reflecting a constituency that was eager to learn more about ways to improve their communities. Table 3 shows strong agreement on questions related to environmental lifestyle. **(Table 3)**

When questions were asked about issues related to environmental quality, the city administration respondents were the most concerned about flooding in Manila. In the seminar for the barangays, a question was asked about the best way to get about their communities, and a very surprising strong agreement of 60.4 per cent indicated walking. Hence, there is basic agreement among community residents to maintain an urban design which emphasizes a walk able community. And, the barangays responded strongly to restricting some usage of automobiles in their barangays. Both of these responses, on walking and on automobiles, reveal that community residents already have a mind-set that encourages sustainable practices **(Table 4)**.

Policy-makers often debate whether price affects the use of resources. If policy can be constructed, although politically challenging, to modify behavior through proper pricing, then sustainable outcomes can be attained. When the question was posed on the impact of price increase in water and electricity, all three stakeholders strongly agreed that they would use resources more wisely. The same agreement was also displayed relative to the costs of petrol **(Table 5)**.

When the three stakeholder groups were asked whether they had a program in their office or barangay to conserve water and energy, it showed that external stakeholders were least concerned about conserving water but had the highest concern for energy conservation. This could be a reflection of the high costs of electricity and lower costs and availability of water. Clearly water conservation needs to be made a greater issue **(Table 6)**.

Views on Sustainability

All three stakeholders agreed generally that the best way to promote sustainability was to have 'government lead by example in sustainability', and for 'schools and colleges to do more to educate students on sustainability'. A third strategy was that 'government should provide more incentives and funding for environmentally-sustainable initiatives'. What is surprising and perhaps perplexing was the response by the barangay respondents that advocated "*more city ordinances that provide for environmentally-sustainable initiatives*". Table 7 shows the results on the best ways to promote sustainability in the City of Manila **(Table 7)**.

Both the city administration respondents and external stakeholder respondents were asked to support a select group of sustainability initiatives for the city of Manila. There was strong consensus that the city of Manila should have a mission statement on sustainability. There was also strong agreement that there should be an official, committee, or agency, responsible for promoting sustainability, as well as a city wide campaign to reduce energy and water usage. The sustainability practice to require city administration to

live in the city received the least support. **Table 8** shows the results of these questions.

Conclusions

The three stakeholder groups have a different perception of the assets, problems, and solutions to those problems for the City of Manila. Below consists of a summary of these differences.

Barangays tended to view the assets of their community through the lens of a 'people-based' orientation, while the other stakeholder groups tended to stress environmental and economic assets.

A major difference in the perception of problems facing the city was exhibited. The city administration and external stakeholders viewed poverty, flooding, and air quality as major problems, while the barangays underplayed these problems, preferring instead to emphasize Pasig River and Manila Bay pollution. Also, the barangays tended to be more positive and had a more up-beat perception of their communities. They did not possess the intensity of views about major problems that the other two stakeholder groups exhibited.

The barangays showed a great propensity to learn more about urban sustainability and looked open to have more seminars provided that allowed for their input. The barangay seminar was very active, with a great deal of openness and exchange of ideas.

The barangays also displayed an innate vision of their communities that coincided with many of the basic principles of sustainability. For instance, they desired to emphasize walking in their communities and to restrict the use of automobiles in certain parts of their barangays.

There was a general consensus from the three stakeholder groups that schools and colleges should do more to educate students on sustainability and that government should lead by example in sustainability practices.

There was also a general consensus that the city should have a mission statement on sustainability and establish a committee, agency or person responsible for promoting and implementing sustainability initiatives.

The basic premise of this paper is that in order to have successful sustainability implementation in cities, it is necessary to have strong community input. Even with good top-down planning and professional management, sustainability initiatives will fail unless there is sufficient 'buy-in' at the community level. This might explain the discrepancy between good environmental policy and implementation. This paper concludes that a sustainability management planning process that centers on comprehensive stakeholder input and awareness education fosters a greater probability that sustainability practices can be implemented.

Tables 2 - 8

Table 1. Proportions of stakeholder groups reporting ways to stop illegal behaviour			
	City Administration	Barangay	External Stakeholders
Payment of Fines	38.1%	51.2%	4.2%
Revoke Business Permits	15.4%	57.&%	29.2%
Detention	28.6%	14.0%	20.8%

Table 2. Stakeholder Groups Different Perceptions of Major Problems			
	City Administration	Barangay	External Stakeholders
Poverty	96.6%	27.3%	79.2%
Flooding and Water-borne diseases	88.5%	7.3%	83.3%
Informal Settlers	82.8%	19.5%	62.5%
Air Quality	82.8%	13.5%	90.4%
Pasig River Pollution	75.0%	52.3%	72.0%
Drug Abuse	71.4%	11.9%	87.5%
Waste Management	71.4%	23.9%	84.0%
Manila Bay Pollution	70.0%	48.9%	72.0%
Crowded – Too Many People	67.9%	19.4%	73.9%
Housing	67.9%	22.5%	82.6%
Crime	60.7%	6.7%	75.0%
Lack of Open Space	55.2%	24.4%	59.1%
Jobs – Employment	53.6%	28.3%	65.2%
Education	46.4%	11.1%	46.4%
Water Supply	44.4%	0.0%	39.1%

Table 3. Strong Agreement on Questions Related to Environmental Lifestyle			
	City Administration	Barangay	External Stakeholders
I consider Manila to be a city that provides an environmentally-friendly lifestyle.	22.6%	33.3%	20.0%
I would like to live in an environmentally-conscious, green community.	70.4%	59.6%	58.3%
If things continue on their present course, we will surely face an environmental crisis in the near future.	61.5%	N/A	60.0%
I would be interested in taking workshops to learn more about urban sustainability.	67.7%	72.0%	56.0%
I take environmental issues into consideration in my daily life.	48.4%	48.0%	48.0%

Table 4. Strong Agreement on Environmental Quality			
	City Administration	Barangay	External Stakeholders
I am worried about flooding, particularly in some low-lying areas of Manila.	67.9%	32.6%	52.0%
I would like to walk more, but walking is difficult to do in the city.	32.1%	N/A	25.0%
I would like to use my bicycle more, but there is not enough space in the city.	30.8%	N/A	31.8%
Walking is the best way to get around my barangay.	N/A	60.4%	N/A
Bike Space should be made more available in my barangay.	N/A	22.2%	N/A
Cars should be limited in parts of my barangay.	N/A	35.4%	N/A

Table 5. Strong Agreement on Environmental Behavior			
	City Administration	Barangay	External Stakeholders
As the cost of water and electricity increases, I will use these resources more efficiently and wisely.	71.0%	62.0%	68.0%
If the cost of gasoline (petrol) increases I will use public transportation more.	53.3%	N/A	56.0%

Table 6. Office/Barangay Sustainability Practices			
My office/barangay has:	City Administration	Barangay	External Stakeholders
A Program to conserve water.	42.3%	31.1%	16.7%
A program to conserve energy	60.0%	33.3%	66.7%

Table 7. Best Ways to Promote Sustainability as Perceived by Stakeholders			
Ways to Promote Sustainability	City Administration	Barangay	External Stakeholders
Schools and colleges should do more to educate students on sustainability.	76.9%	62.5%	88.0%
Government should lead by example in sustainability	88.0%	60.4%	88.0%
Government should provide more incentives and funding for environmentally-sustainable initiatives.	75.0%	60.5%	76.0%
There should be more city ordinances that provide for environmentally-sustainable initiatives.	60.0%	68.2%	64.29%
Businesses should voluntarily lead by example in sustainability.	72.0%	50.0%	75.0%

Table 8. Support of Selected Sustainability Initiatives by Stakeholders		
The City should:	City Administration	External Stakeholders
Have a Mission Statement on Sustainability.	87.5%	100%
Have a person or agency responsible for promoting sustainability.	75.0%	100%
Have an environmentally-friendly purchasing program.	79.2%	96%
Purchase alternative energy vehicles for its fleet.	58.3%	87.5%
Place solar panels on selected city-owned buildings.	45.8%	87.5%
Tract its electric and water uses and reduce when possible.	70.8%	96%
Have a septic system clean-out program	70.8%	95.8%
Require city officials and staff to live in the city.	33.3%	69.6%
Lead a city-wide campaign to reduce energy and water usage.	83.3%	95.8%

Notes

[1] The concept of the triple bottom line was first enunciated by Andrew W. Savitz with Karl Weber in, *The Triple Bottom Line: How Today's Best-Run Companies are Achieving Economic, Social, and Environmental Success,* published by Jossey-Bass, 2006. Daniel C. Esty and Andrew S. Winston in *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value, and Build Competitive Advantage,* published by Yale University Press, 2006, all deals with the concept.

[2] Local Governments for Sustainability (ICLEI) is an international organization of local governments found at www.idei.org that has advanced and promoted the concept of sustainable communities. Robert W. Taylor in "Beneficial Urban Sustainability and Asia: The Metro Manila, Philippines Experience," published in *Urban Dimensions of Environmental Change –Science, Exposures, Policies, and Technologies,* ed. Huan Feng, Lizhong Yu & William Solecki, 2005 (Science Press: USA.)

[3] The concept of sustainability today is largely driven by awareness of climate change, the production of greenhouse gases, and issues of deforestation. See the article, "The Challenge of Sustainable Development in Asia: Balancing Competitiveness with the Need to Protect the Environment," in *the International Herald Tribune,* June 16, 2008 for an

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Down With ECO-Towns! Up With ECO-Communities. Or is there a Need for Model Eco-Towns? A Review of the Current Eco-town Proposals in Britain in 2009

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Background- Housing Green Paper July 2007

The Labour Government's 2007 Housing Green Paper advocated the construction of 240,000 dwellings every year to meet goals of 2 million housing units by 2016 and 3 million by 2020. 650,000 houses would be in 29 specified growth areas with another 100,000 in 29 "new growth points". This included:

a) 200,000 new homes to be built on surplus public sector land by 2016 using 340 sites owned by British Rail; 130 sites owned by the Highway Agency and 50 sites by the Ministry of Defence.

b) 60,000 new homes on brownfield sites to provide affordable rented homes.

c) 50,000 new homes to be located in 5 new eco-towns to become new growth points with the towns to achieve zero-carbon development standards.

A £300 million Community Infrastructure Fund was earmarked for growth areas, new growth points, and particularly "eco-towns". These new eco-towns, new free-standing settlements between 5,000 and 20,000 units, are described as '*communities with renewable energy sources, high energy efficiency, low carbon emissions, water efficiency, and waste minimalisation*'. The original real purpose of the eco-towns was to help attain the national goal of a 24 to 36 per cent reduction in carbon emissions by 2020. They were "*intended to exploit the potential to create new settlements to achieve zero carbon development and more sustainable living using the best design and architecture*" (Gordon Brown, 2007).

Previously in 2005 the Government had launched the growth points initiative. Local authorities were invited to bid on 29 growth points which became the basis for the location of the eco-towns. [7]

The new houses will not be council houses in the traditional sense. They have to be built by private house-builders, housing associations and/or by new types of local housing companies. Once local government built tens of thousands of houses per year, but now the government depends on the private sector to meet the targets. This makes low cost housing subject to the changes in house prices. Since these 2007 proposals, the housing market has collapsed.

Initial Eco-Town Site Proposals

From proposals for 57 potential eco-town sites, 15 potential sites were selected in March 2008. In addition to the zero-carbon development criterion, there were to be underground systems for waste recycling, free public transport, a vehicle speed limit of 15 mph and green walking routes to school. Bath water would be used to irrigate communal flower beds. Each home would feed excess electricity from solar panels and turbines back into the National Grid. These 15 eco-towns (Table 1 and Fig. 2) would count towards District Housing Targets, making them preferential to urban extensions.
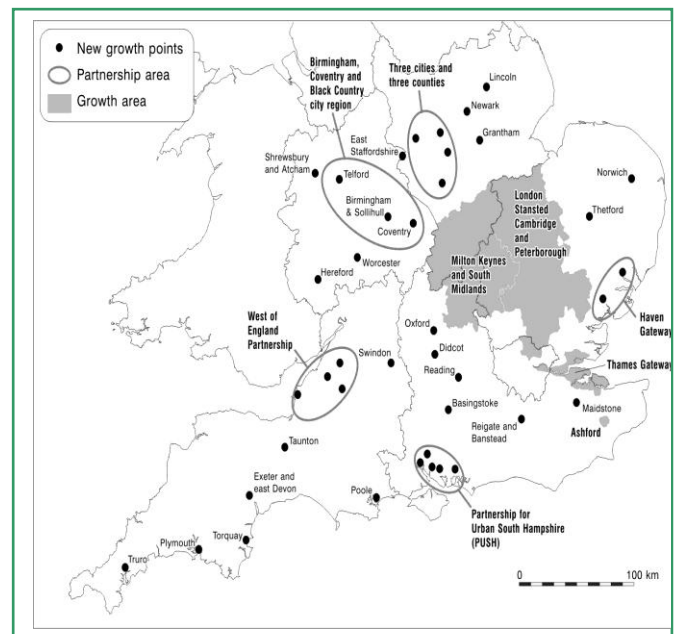

Fig 1. Growth Points

Table 1. First 15 Eco-town schemes short-listed for final selection		
Site number	**Region and town**	**Number of homes**
1	Leeds City region Selby	Not yet known
2	Nottinghamshire , Rushcliffe	Not yet known
3	Leicestershire, Pennbury (proposed by the Co-op)	12,000-15,000 homes,including 4,000 affordable homes
4	Cornwall, St. Austell. Primary aim is to create jobs affected by the closure of clay pits	5,000 homes
5	Staffordshire , Corborough	5,000 homes
6	Warwickshire , Middle Quinton (site of old Royal Engineers depot)	6,000 homes
7	East Hampshire, Borden and Whitehill (East Hampshire District Council) - Ministry of Defence sites	5,500 – with 2000 affordable homes
8	Ford	5,000 homes
9	Oxfordshire, Weston Otmoor	10,000-15,000 homes
10	Bedfordshire, Marston Vale	15.000 homes
11	Northeast Elsenam	5,600 homes including 1,800 affordable homes
12	Cambridgeshire, Hanley Grange (Developed by Tesco)	8.000 homes including 3,000 affordable homes
13	Lincolnshire, Manby (East Lindsay District Council)	5,000 homes
14	Norfolk, Coltishall- an RAF airfield supported by the Dept of Communities & Local Government Rackheath desired by Norfolk DC as part of the planning process	5,000 homes
15	Rossington	15,000 homes
16 (already created)	Cambridge, Northstowe (first official eco-town)	9,500 homes
	Total proposed homes:	111,600-119,600 homes, including 10,800 affordable homes

The Conservatives claimed that the Labour Government had chosen locations in Tory constituencies, as only 3 of the 15 were in Labour areas, including Rossington. Later the Manly, Lincolnshire, Corborough Consortium and New Marston Gallager Estate proposals were dropped. Hanley Grove initially added 4000 homes to be developed by Jarrow Investments, but later the original 8,000 proposed by Tesco were withdrawn. Tesco later sent a modified application through the Regional Spatial Strategy (RSS) procedure. The then Housing Minister, Hazel Blears, blocked Multiplex's plan for 5,000 homes in Mereham, Cambridge, expressing concern that the Cambridgeshire Councils could not handle the three large applications on this large scale. Northstowe was left as the principal eco-town in Cambridgeshire.

In June 2009, a challenge by Arun District Council, led the Government to agree that eco-town proposals would be subject to full planning procedures. The planning applications would have to include key reports, including an environmental statement, a transport assessment, a sustainability appraisal, and a community involvement statement. It is expected that the outline planning application would be "called in" for decision by the Secretary of State, who would hold a public inquiry conducted by an independent inspector.

Some people are urging a Special Development Order by the Secretaryof State in the manner of the New Town Development Order.
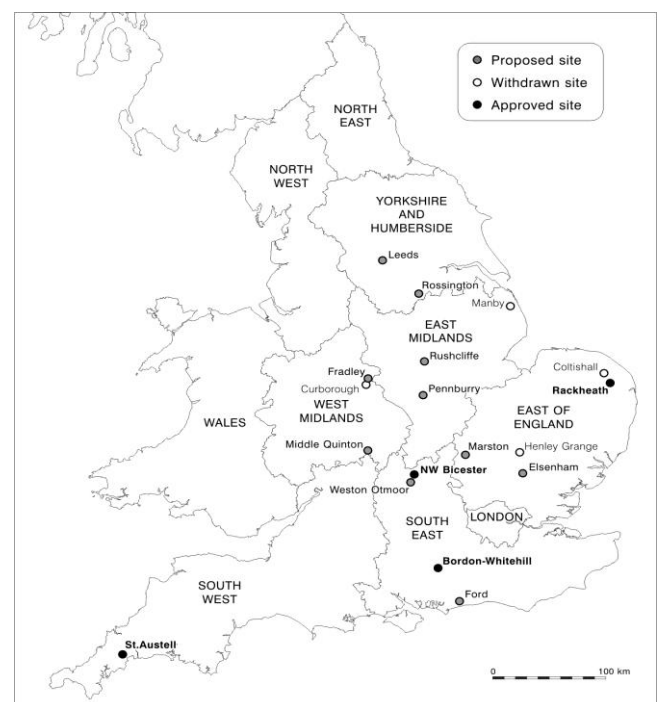

Fig 2: The fifteen potential Eco-town sites nominated in March 2008[8]

The outline planning application procedure is painfully slow and allows land values to rise, providing less planning gain for the eco-towns. Thus

only the best sites are likely survive against the anti-housing lobby.

Choosing the Eco-Towns

By June 2008, the 15 chosen towns became 13, which the Department of Local Government and Communities (DCLG) said would be reduced to 10 towns. David Lock stated that "*The term "Eco-Town" turned out to be a powerful pairing of words, much stronger than "urban village" and approaching "garden city" for its ability to stimulate a wide range of people to pool their ideas*".[9v] Meanwhile, the Tory Shadow Government announced that, if elected, there would be no new eco-towns at all.

The Anti-Eco-Town Lobby

The anti-eco-town lobby was active throughout 2008 - 9 and continues to protest. One of the eco-town proposals that came under the wider RSS review was Middle Quinton, Warwickshire. Against the town is the Better Accessible Responsible Development (BARD), who went to the High Court to try to halt the development without success. They appealed against the High Court decision by saying there was not proper consultation on the Housing Green Paper but lost that appeal.

Opponents to Weston Otmoor also fought the eco-town proposal but both groups were over-ruled by the High Court Judge who said the procedure had been adequate. The villagers of Ford, on the former Battle of Britain airfield, created "Communities against Ford Eco-town" (CAFE). They claimed that the transport structure could not support communities of up to 20,000 people, that there was a lack of jobs, and that, rather than creating local employment eco-towns would overwhelm the existing prospects. They sought redevelopment of the 617,000 empty properties in England, improvement of neglected suburbs and a green template for carbon-neutral existing neighbourhoods. They were against the Labour Government's commitment to build 3 million new homes by 2020, and Minister Caroline Flint's statement: "*we will revolutionize how people live*"[3]. Although supporting the rejuvenation of the area, the Campaign for the Protection of Rural England (CPRE) asks for more account of the needs of the local communities, the area's environmental limits and the nature of the infrastructure. Because it could not demonstrate this the Ford proposal was defeated.

In May, 2009, the then Housing Minister, Margaret Beckett, announced that she hoped to approve up to ten schemes, but that the proposals all needed work to meet the green standards set by government. Beckett argued that eco-towns are a good way to set a high bench-mark for other housing developments. If Margaret Beckett, a former Foreign Minister, had been able to stay as Housing Minister, the eco-towns might have had a fair chance. She resigned as Housing Minister in the cabinet reshuffle over the MP's expenses scandal.

New Communities

There is an opposing point of view that the money for new towns should go to new communities as part of urban extensions. The Leeds City -Region Partnership wants to develop a number of eco-communities in place of a single free-standing eco-town, using four brownfield locations including the Aire valley and the Bradford canal corridor. Following a judicial review the Government admitted that alternative approaches to affordable housing might be possible.

In principle, eco-towns should make sense not because the land is available or that they can express new environmental criteria but because they are related to existing centres of population, transport infrastructure and employment. Size does matter. Eco-towns of 5,000 - 10,000 people will struggle to provide transport and to provide diversity of employment, unless they are attached to existing cities as urban extensions.

Following the May 2010 election, the new coalition government said that it would audit eco-town projects before releasing any more cash to the planned schemes. The first four confirmed eco-town sites, Whitehill-Bordon in Hampshire, St Austell in Cornwall, Rackheath in Norfolk and north-west Bicester in Oxfordshire, each received just over £9 million for 2009/10. The four councils involved have been told that these sums are not affected by the audits and will not be reduced. But allocations of £2 million to £6 million earmarked for the projects in 2010/11 will be halved, and will only be paid if the Government's criteria are met. These locations could house up to 30,000 people in eco-friendly dwellings in five years' time.

The four approved projects all had their local critics, but the issue was also a national one, a newspaper article claiming "Eco-towns are just vandalism dressed up in a trendy green coat"[4]. While people recognized the need for 'more housing in the area' in almost every case, many doubted that the projects were reconcilable with sustainable development of their areas. In Oxfordshire, one proposal was criticised because it might yield negative effects on local biodiversity, exacerbate congestion through encouraging commuting and prejudice the development of a neighbouring municipality. The consultation processes themselves had weaknesses. A normatively prescribed consultation process, for example, seeking responses to a questionnaire prepared without prior community participation, may have devalued the empowerment of citizens in the critical evaluation of community projects that is encouraged under a sustainability paradigm.

New Urbanism

The New Towns of the New Urbanism movement are the newest models for the eco-towns. The architects, Andres Duany and Elizabeth Plater-Zyberk (DPZ), are famed for creating Seaside, a resort town in the Florida panhandle. Although their most famous New Urbanism creation, it is still an isolated resort town and

not a complete community. In 1988 they applied their traditional neighbourhood development principles at Kentlands, Maryland, to a year round working community. In 1996, they created the Charter of the New Urbanism, showing how their approach could be extended beyond neighbourhoods and small resorts to suburbia and urban extensions.[2]

New Urbanism includes:
a) Interconnected streets, friendly to pedestrians and cyclists in modified grid patterns (no cul-de- sacs)
b) Mixed land uses
c) Careful placement of garages and parking spaces to avoid auto-dominated landscapes
d) Transit oriented development
e) Well-designed and sited civic buildings and public spaces
f) Use of street and building typologies to create coherent urban form
g) High-quality parks and conservation lands used to define and connect neighbourhoods and districts
h) Architectural design that shows respect for local history and regional character

At both Seaside and Kentlands, DPZ devised individual design codes to control the architectural elements and maintain a clear division between private, semi-public and public spaces. Builders and homeowners had to abide by the Code that specifies such details as front porches and white picket fences to promote neighbourliness. The result is that in Kentlands each residential block is a unique ensemble, giving Kentlands a variety of house types, as in the principles of New Urbanism[5], as well as fully grown trees and surrounding greenery.

Kentlands

Kentlands was planned for a 120 ha site, set within normal suburbia as a community for 5,000 residents and 1,600 dwelling units. By 2001 it was virtually complete. The gross density is low at 35 persons/ha, but higher than the normal density of conventional American suburbs. Unlike the cul-de-sacs of normal suburbs or the garden city, Kentlands' streets are based on interconnected grids adapted to the gently rolling topography, with easy access to the primary schools and the shopping centre.

Kentlands has a well organised street hierarchy of residential streets and alleys and boulevards which gather the traffic from the streets and connect to the regional motorways. The residential streets (16 metres right of ways) are narrower than most suburban streets of 21 metres.

One particular feature of the housing units is their tiny gardens or no gardens at all. The housing units are accessible from both the street and the back alleys, which provide access to hidden garages. The alleys serve as a kind of buffered play area and semi-public social space used by children, since there are hardly any private gardens.

Kentlands also has squares, like European cities, which are open to the streets. Retail and office facilities are correctly relegated to the edge of the neighbourhood but the shops and supermarkets are big warehouse boxes surrounded by unattractive parking lots. There is nothing to be learnt. The parks are located on an average of 400 feet away from the housing and thus within walking distance. The park system consists of 100 acres or 28 per cent of the total land use and the open spaces vary in size. Greenways and the lake are towards the middle of the site.

Summary of New Urbanism Principles
1) New Urbanism focuses on vernacular architecture-commonplace buildings of the past, embodying folk wisdom about design and construction, while at the same time giving the interiors the light, openness and mechanical convenience expected in houses today.
2) New Urbanism promotes neighbourliness and a friendly social atmosphere with their detailed design features with their emphasis on front porches, picket fences, mews, and garages in the alleys and tight street elevations, all of which provide considerable social interaction.
3) Although New Urbanism stipulates that neo-traditional designs reduce the number of vehicle trips and trip distances, the mixed arrangement of the land uses, the densities and more route choices are the key to reducing traffic.
4) New Urbanism prefers transit use. Although commuter rail stations exist in the Washington D. C area, they are not yet connected to Kentlands.
5) Because some builders believe that mixed use is financially risky, new urbanism houses cost 12% more than the average house. However as the quality is so much higher, plenty of people are willing to pay more[6]

Summary of the Current Position on Eco-Towns

Eco-Towns and the planning process
Although many including the CPRE, the Local Government Association, and naturally the Royal Town Planning Institute (RTPI), consider that the eco-town programme should be initiated through the statutory development plan system, the statutory development plan moves very slowly and it is thought that it might take 7-10 years to prepare the planning application. The Town and Country Planning Association wishes the Government to shoulder the development risk by means of the existing 1981 New Town Development Act or on a joint venture basis by agreement with the landowners through the participation of an agency like the Homes and Community Agency [9iii]. Using the 1981 Act would still require a full public inquiry in each case.

The criteria for the eco-new town
The only survey as to what people really think of eco-towns has been the YouGov Survey of 2008 which

showed that 46 per cent of people in England welcomed the eco-town idea and 34 per cent would not mind seeing one close by where they live [9][iv]. The CPRE, RTPI and the Local Government Association are all against the idea. They see a suburban nightmare, car dependent housing estates built on green field sites against the opposition of local people. Lord Rogers claims they are a big mistake. Building only for 5,000-10,000 people means it has to be car-based and will be a walking community.

What does the eco-town provide? The main idea of the eco-town is to be a place of experimentation and innovation and to raise standards throughout England. The eco-town's main role therefore is a learning device - the leading edge of the Government's sustainable community's programme. They would aim to:

1) Exceed the standards of environmental performance achieved elsewhere.
2) Place emphasis on reaching zero-carbon development standards
3) Provide good facilities and quality infrastructure particularly in waste management
4) The proponents also argue that 50,000 homes is a decent proportion of the 3,000,000 homes required by 2020
5) Providing a green structure as a primary consideration, as an interconnected network; with the green infrastructure factored into land values; and enhancement of the area's locally distinctive character and to provide multi-functional places, which help adapt the climate process.

The first four eco-town sites confirmed by the Coalition Government in 2010, Whitehill-Bordon in Hampshire, St Austell in Cornwall, Rackheath in Norfolk and north-west Bicester in Oxfordshire, each received just over £9 million for 2009/10.

St.Austell comprises six eco-settlements achieved by creating villages or expanding existing ones with housing targets. Some say the location is totally unsustainable and unsuitable in planning terms for the scale of the development proposed. If it were not for the eco-town initiative the planning system would never have proposed it [8][iii].

The future of the four approved eco-towns is still uncertain. The contributing factors included the community's lack of involvement and the local planning process need to play a full role in scrutinising eco-town proposals. The surviving proposals all have the support of their local authorities. As a consequence of all the considerations, an eco-town proposal can now be rejected if it does not comply with the local development framework, which means that future plans must go through the plan-making process. Two of the proposed towns are town extensions and the other one is not on a single site.

The planning policy statement states the government's point of view that the standards might be adopted by other developers as a way of meeting climate change policy and will ensure that the eco-towns will be "exemplars of good practice and provide a showcase for sustainable living".

Conclusion

The fate of the eco-towns is in the hands of the political process which is currently highly volatile. This author would hope that these eco-towns will survive to set an example to the rest of the country of a new way of life.

Notes

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Land Transformation and Environmental Degradation in Jaipur Urban Region.

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Introduction

Land transformation is defined as changes in the physical, chemical and biological characteristics of land, whether permanent or semi-permanent, due to impact of natural and anthropogenic factors.

The Princely City of Jaipur, popularly known as the Pink City of India, is proud to be one of the few planned cities of the world. Now the capital of the state of Rajasthan, the city's foundation stone was laid by Maharaja Jai Singh II, on November 18, 1727. Designed by Vidyadhar Bhattacharya, a Vastukala specialist (architect and engineer) from Bengal, Jaipur was laid out in rectangular blocks over an area of 6 km^2 which was increased to 65 km^2 in 1941, and to 300 km^2 by 1991. The Jaipur Region Master Plan (1991 – 2011) proposes that the city grows to 1,464 km^2, with 385 villages, and 32 urban nodes, 20 being in the main urban area and the other 12 forming satellite towns.

Geographical Setting

The city is located 260 km south-west of Delhi on a sandy triangular plain conjectured to be the bed of a dried up lake. This sandy plain is enclosed on three sides by hills, which are the north-eastern continuation of Aravali Mountains, the oldest mountains of India, with an average altitude of about 500 meters. Climatically, Jaipur falls in a semi-arid zone, characterised by high temperature (mean temperature 36 C, low rainfall and low relative humidity). As late as 1940, the hills and dunes that add beauty to the city were covered with thick forests and green foliage. Even the plain on which the city was originally built was full of forests in the 18th century. Today, the trees and shrubs are gone – not from only the plain – but also from the hilltops. The plain on which the city stands is fortified by the bordering hills. Several key factors influenced Jai Singh's choice of the site: the availability of water – because of higher water table; a strategic position; drainage; building materials; communications with the outside; room for expansion in the future; and a diverse scenery.

History of the City

How was the Site Chosen?

The city was planned as the new capital of Amber state whose earlier capital was a town by the same name. Amber town was built in a narrow valley between anti-clinal ranges of the Aravallis, by the Kachchwahas, who came into prominence in the beginning of the 16th century. The rulers of Amber constructed magnificent palaces and temples within their strong fort walls, but Maharaja Sawai Jai Singh II (1699 – 1743) greatly enlarged the boundaries of his state and became the most powerful ruler in the region.

Jai Singh consulted a Brahmin scholar, Vidhyadhar Bhattacharya of Bengal to help him design the architecture of the city. The principles laid down in the Hindu 'Shilp Shastra' formed the basis in the city plan. A sketch layout plan of the time shows gridiron pattern roads running due north-south and east-west, with two Chaupads, as well as the hills and the Darbhavati stream. The roads are clearly not at their modern location, but towards the valley in the northeast, nearer Amber town.

Jaipur has passed through different phases of growth, stagnation, decay and development. Planned to accommodate 100,000 people in 1727, it had 2 million in 1996 and 2.34 million in 2001. The growth reflects the expanding role of the city, not only as the state capital but also as a major trading and service centre and as a major tourist centre.

Planning Principles

The city was planned as a rectangle divided into 9 blocks (nidhis) representing the nine treasurers of the mythological Kuber (Fig. 1). The blocks were defined by roads, mainly running at right angles to each other; three of them running north-south and intersected by the main 3.5 km long east-west axis. A 3.5 metres tall, 2 metres thick crenelated masonry wall surrounded the city, which could be entered through seven gateways.

Four Stages of Development

Infant Jaipur (1744 – 1835)
After 1744 the city developed slowly as the rulers were involved in several conflicts with frequent attacks from the Maratha and Mundaries. Nevertheless, some remarkable monumental constructions, such as Ishwar Latt and Hawa Mahal, were built at this time. The depression to the north of Ramganj was gradually filled with sand and debris. The rain fed *nallah* of the east was also canalised.

Geomorphologically, the Walled City is located on a stable dune surface. It was a small business centre catering for the local population with no big industries. Building activities generally were in equilibrium with the geomorphological forces. The natural forest vegetation around the city allowed clear water to seep through the old consolidated dunes underlying the urban area, giving a plentiful supply of groundwater.

Adolescent Jaipur (1835 – 1922)
For long confined within the city walls, largely because of insecurity and conflict, the population began to settle outside the walls at this time due to changed political, social and economic circumstances. Only a few colonies of Meenas and sweepers lay outside the walls - such as Nawabpura and Jalupura to the west. The peace established during the reign of Sawai Ram Singh II (1835 – 1880) saw the construction of Ram Bagh Palace, Ram Niwas garden, Mayo Hospital, Civil Lines, railways, roads and residential areas. Sawai Ram Singh II also gave the city its pink colour, constructing buildings like Jalebi Chowk and offices and roads and highways both within the city, and linking it to Agra and Ajmer. During the reign of Sawai Madho Singh II, a 120 km meter gauge railway line from Sanganer to Sawai Madhopur and the 175 km Jaipur Shekhawati Railway were built.

Youthful Jaipur (1922 – 1949 A.D.)
The start of Sawai Man Singh II's reign (1922 – 1970) saw the beginning of the modernisation of Jaipur City, with the ending of the medieval practice of closing all the city gates at 11.00 p.m. The Jaipur Municipality was recognised in 1926 and a new Municipal Act was enforced in 1929. The process of urbanisation was accelerated by the development of civic amenities and promotion of industrial growth. Affluent families moved from unhygienic and crowded area conditions in the old town to the suburbs, and the municipal area of Jaipur was expanded from 7.7 km² to 65 km². In 1935 the first step towards housing workers outside the city wallsoccurred in 1935, when the "New Colony", was built between the city walls and the present Mirza Ismail Road. The Municipality took over its maintenance in 1946.

In 1942, Sir Mirza Ismail took over as the Diwan of Jaipur. Five major land development schemes outside the city walls were prepared: i) Fateh Tibba; ii) medical College and the Gangwal Park area; iii) Ashok Nagar; iv) New Colony and E. Jalupura; v) Bani Park. In the year 1942, Sir Mirza Ismail, the then P.M. of Jaipur State initiated the large scale expansion and beautification of the city. He planned the residential development popularly known as the C-Scheme and now regarded as an up-market area. In 1944 the Urban Improvement Board was created, forming part of the State Secretariat, becoming an autonomous body by 1956. Following the partition of India in 1947, the Ministry of Rehabilitation planned Adarsh Nagar colony in the South East of the city for refugees from Pakistan.

Jaipur of Vigorous Growth (1949 to date)
The rapid population growth over the last 60 years and unplanned land use, mostly for residential and commercial purposes, has led to highly unsustainable growth of the city with widespread urban degradation. Construction ignored municipal requirements, and lacked both drainage and precautions against soil erosion and dunes. The major 1948 Gandhi Nagar settlement scheme to house refugees was modified many times, government servant quarters being added in 1954. The Rajasthan University campus was established at Gandhi Nagar.

The first two industrial areas in Jaipur grew up near the railways, while others were developed at Jhotwara, and Sudarshanpura. In the post-independence period the city grew without taking environmental constraints into consideration. Pollution of the soil, water and air and deforestation of hills has greatly affected the quality of life in the city.

Population Growth and Land use
In 1870 Jaipur had 187,887 persons. It has grown rapidly since then (Table 1) and, if the trends of the last three decades continue, Jaipur will have 5.5 million people in 2016. Since 1971 the residential areas have expanded greatly and agricultural land has been drastically reduced (Table 2).

Table 1: Jaipur – Population Growth (1881-2001						
Year	Total Population	Growth Rate	Population (Walled City)	Variation in percent	Population in Suburbs	Variation in percent
1881	142,578	-	125,785	-	16,793	-
1891	158,787	-	132,421	+5.28	26,366	+56.99
1901	160,167	-	132,091	-.24	28,076	+6.49
1911	137,098	--14.40	111,585	-15.52	25,513	-9.12
1921	120,207	-12.32	94,216	-15.56	25,991	+1.87
1931	144,179	+19.94	115,589	+22.68	28,590	+9.99
1941	175,810	+21.94	134,601	+16.45	41,209	+44.33
1951	291,130	+65.59	217,968	+61.91	73,162	+77.84
1961	403,444	+38.58	274,093	+26.16	129,351	+76.84
1971	610,575	+52.50	353,732	+29.05	256,840	+98.56
1981	977,165	+59.42	448,178	+26.67	528,987	+105.95
1991	1,458,483	+44.28	582,628	+30.09	875,755	+65.57
2001	2,322,275	+59.37	736,301	+26.30	1,586,274	+81.11

Table 1 Jaipur population growth 1881 - 2001

Table 2: Land use in Jaipur City, 1971-1991 and 2011 Source: JDA Reports (Mater Plan 1971-1991 and 1991-2011						
Land Categories	Land use in 1971 and 1991			Proposed Land use 2011		
	1971 (acres)	Percent of Developed Area	1991 (acres)	Area (acres)	Area (hectares	Percent
Residential	5,000	50.1	17,200	34,150	13,825	44.8
Commercial	340	3.4	1,600	5,095	2,064	6.7
Industrial	710	7.1	4,460	5,205	2,107	6.8
Governmental	210	2.1	440	1,496	602	2.0
Recreational	330	3.3	1,000	8,550	3,461	11.3
P & S.P	1,680	16.8	2,580	10,112	3,241	10.5
Tourist facilities			2,006,020			
Circulation	1,730			11,710	4,741	
A) Railway Station & Yards				430	174	.6
B) Bus and Truck Terminals				490	198	0.6
C) Roads				8,840	3,580	11.6
D) Airport				1,950	789	2.6
D) Total developed Area	10,000		33500	76,150	30,830	100.0
Nurseries & Orchards				351	142	
Govt. Reserved Areas	1,990			1,549	627	
Water Bodies				1,731	701	
Regional Parks				884	358	
Urbanisable area	14,410			80,665	32,658	

Table 2 Land use in Jaipur City

The Slums (Katchi Basties)

Slum settlements demonstrate the non-availability of formal housing for the poor in urban areas as a result of increasing land and prices and of the inability of the urban poor to pay for formal housing. Slum housing is known as *jhuggi-jhopri* in Delhi, *jophar patti* in Bombay and *katchi basti* in case of Jaipur. *Katchi basti* are generally slums with illegal occupation of public or private land with uncontrolled, unplanned and haphazard development. The areas are generally overcrowded and unhygienic.

During the pre-independence period *katchi basti* had a very strong correlation with social factors. Most of the *katchi basties* were located on the outskirts, inhabited by the people of lower caste like sweepers, regars, Khatik and dhbi. These were in the form of clusters of shabby houses and straw huts with highly unhygienic conditions and were the outcome of the feelings of untouchability. In 1942, some new housing schemes outside the walled city led to families being relocated and the building of Kacha houses. By 2001, the total slum population of Jaipur in 2001 was 32 per cent of the city's total, comprising 650,000 living in 217 *katchi basti*es (Table 3).

Table 3: Growth of Katchi Basties (K.B.) in Jaipur
Source: JDA Reports

Year	No. of Basties	Population	K.B. population as % of total city
1901	15	2,000	1.2
1911	17	2,198	1.6
1921	19	2,250	1.9
1931	21	2,390	1.7
1941	21	2,500	1.4
1951	60	30,309	10.4
1961	60	65,605	16.3
1971	109	96,604	15.2
1981	178	255,690	25.2
1991	180	440,000	31.8
2001	217	650,000	23.3

Most *katchi basties* have emerged near work centres. These *basties* developed on open public land, which was meant for the construction of public facilities such as parks, playgrounds and plantations. They have also encroached on major roads, hindering the movement of traffic flow.

Land Transformation Analysis

Analysis of landsat data of 1975 and IRS data of 1986 showed a three-fold expansion of urban land use in Jaipur and a corresponding decline in agricultural uses. Encroachment on good agricultural land to the south and south-west of the city was particularly marked. IRS data reveal *s*ubstantial changes in land use between 1986 and 1991 when the area under transformation increased by 10 km^2 from 1986 to 1991. The land use changes were mainly from agricultural land to urban land; from sand dunes to agricultural and urban land; and from hill areas to quarry areas. Before 1975 most of the urban expansion and industrial estates had been confined to open spaces and sand dunes/sheet area only.

Historically, Jaipur had been one of the best examples of a human settlement of more than 100,000 population able to live in harmony with their natural environment for over 250 years. Jaipur has a distinctive ecological history. The preservation of places of historical and aesthetic value is of paramount importance to sustain this heritage. It is equally important to take steps to rectify the damages already done. This was evident from the unprecedented rains and floods in the year 1981. The main spheres of environmental hazards are (1) the remobilisation of formerly stable dunes, (2) deforestation and degradation of hill and dune vegetation, (3) extensive quarrying on the hill faces on the urban flanks (this was stopped in 1992), (4) untreated disposal of sewage and dumping of garbage, (5) pollution of water bodies and (6) construction of buildings on relatively loose dunes formations.

Jaipur is not just a city; it is a national heritage. Each road and each building speaks of Indian culture and its aesthetics. But the new Jaipur now being created may ultimately prove to be its antithesis. The iron-grid pattern of roads is not being maintained the city outside the walls and ugly buildings are beginning to spoil this city. Even in the walled city, modernisation has started defacing the heritage of the city, despite modern town planning emphasising the value of conserving our urban heritage. The traditional art and architecture of the Pink City should not be replaced by 'modern' architecture within the walled city, and should be preserved where it occurs beyond the walled city, at least that in major and prominent locations. This could be achieved by training a band of masons in traditional medieval art and architectural design and by providing subsidies to help property owners in the walled city who cannot afford to reconstruct the dilapidated structures facing the bazaars.

The Master Plan of Jaipur city had inaccurate population projections and a new Master Plan had to be produced before it expired. The urban population has already exceeded the region's safe environmental limits for water supply, sewage disposal, and biosphere conservation. The establishment of industrial estates in a north-south line to the west of the city has violated the fundamental principles of town planning as the prevailing winds coming from the north-west, west and south-west carry atmospheric pollution from these areas eastwards to all parts of the city. Instead, tree and forest belts should be developed to arrest the pollution. New industrial estates ought to be developed east of the Jhalana range where all the geographical factors favour the growth of industries: national highways and railways, the Dhund River, the transport Nagar, the badlands unfit for cultivation and the Jhalana hill range which would restrict atmospheric pollution during the monsoon season.

A recent campaign of the Local Self Government to clean the city's lanes and alleys is a step to stop the city from becoming a stinking city. The development of Jalwahar Circle near the Sanganer Airport, a most beautiful attraction, unparalleled in Asia, would invite a new generation of tourists. However, the plans to take drinking water from the Banas River must be realised as quickly as possible, otherwise all the efforts of cleaning and beautifying the city will be marred.

Fortunately, in the proposed Master Plan 2011, the Jaipur Development Authority has changed the land use from rural to ecological zone. The proposed ecological zone on the Agra road covers about 4000 ha, in which such activities as agriculture, forestry, water parks, wildlife reserves, and recreational areas will be permitted.

Toward a New Future: The 2011 Master Plan

The draft Master Plan's main recommendations include a population of 5.5 million by 2016; maintaining the city as an administrative and commercial centre and tourist destination; retaining 27,000 ha of land for urban growth; building six satellite towns and keeping the walled city area as a Heritage City. Wholesale and specialised markets will be developed in the "satellite towns" to relive pressure on the walled city. The satellites will also house government offices and new industrial estates. By-pass roads will link industrial areas and alleviate traffic congestion. New urban transportation will be developed and new railway stations will be built. Valuable scenic areas around the city will be preserved as open space. Comprehensive water supply and sewerage systems, solid waste management facilities and new slaughter houses will be developed to serve the entire city.

Conclusion

Jaipur is one of the fast growing metropolitan cities of India. It registered one of the highest growth rates of population during 1991 – 2001. The municipal area of Jaipur has increased from 6km² in 1727 and 65 km² in 1941, to more than 200km² in 1991. The urbanised area has increased from 5832 ha in 1971 to more than 13,216 ha in 2001. The physical growth of Jaipur has changed the character of peri-urban areas producing a hybrid landscape, neither rural nor urban. It has the worst features of both. Rapid increase of population has changed the internal structure of the city. The unauthorised development in the fringe areas has become a liability because it has now become the responsibility of the city to provide infra-structural and other civil facilities.

In sum, Jaipur, like many other Indian metropolises, faces unprecedented problems created by dramatic population growth and equally rapid economic and political change in the city. The urban development of Jaipur needs more planning and less politics. Populist policies can give some instant electoral results to politicians but in the long run even politicians lose. The civic community however is the main sufferer. In a fast changing polity like India, pressures from the dispossessed to share the development gains to satisfy their basic needs are growing. Wisdom lies in adopting a strategy of conflict resolution, which satisfies their aspirations. If the authorities concerned are sensitive to both social realities and planning and development imperatives, our cities can achieve both economic transformation and a good quality of life for the people.

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Obstacles and Solutions to Maximising Biodiversity in Major Urban Development Schemes

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Abstract

Concern regarding global biodiversity loss led many governments to sign the international agreement '*Halting Biodiversity Loss by 2010 and beyond*' in 2001.[8] The UK government, as one of the signatories, has consequently focussed its efforts by commissioning specific technical guidance and supporting the UK Biodiversity Acton Plan (BAP) targets. The government's greatest influence on current biodiversity levels operates through the town planning system. The increased regulation pertaining to biodiversity protection and enhancement experienced over the last decade, combined with the promotion of associated benefits and incentives, should equate to the maximisation of biodiversity value as an achievable goal on most, if not all, development sites.

Successful practical application is rare, due to process obstructions prevalent within 'urban' and 'major' development schemes. A questionnaire survey completed by local government ecologists in England, together with insights from action research, specialist interviews, and case studies reveal the key process obstacles and lead to preliminary recommendations.

Introduction

Global biodiversity loss and human density

The current Holocene extinction phase, the 6th biggest extinction phase known to the globe[14,37] is predominantly due to anthropogenic activity and has dramatically accelerated over the last 300 years. It is now known as the 'biodiversity crisis'[21] with the last 50 years having seen the most rapid transformation of the biosphere ever occurring in human history[33]. The crisis is driven the accelerating human population growth and related impacts such as land degradation through development activity, climate change, pollution, resource depletion, habitat disturbance and fragmentation.

England already has the third highest density in Europe (390 people per km², ONS, 2007), and is expected to have 55 million people by 2026[5]. This growth gives rise to continuing demand for developments (whether residential, services, infrastructure, or other) whose cumulative impacts affect global biodiversity. Thus we need to provide for biodiversity in all new development schemes.

Urbanism

Around May 23rd, 2007[2] the global population became more urban than rural.[38] In addition to ecocentric or ethical reasons to halt global biodiversity loss, '*urban*' biodiversity particularly provides humans with a range of ecosystem services.[22] Poor biodiversity in urban areas means that "*Billions of people may lose the opportunity to benefit from or develop an appreciation of nature*"[35]. Thus all new developments should incorporate biodiversity features and habitat opportunities for human well-being, and to sustain the connection between citizens and wildlife in cities. Tackling the biodiversity crisis –requires a paradigm shift from '*protection and conservation*' to '*increase, enhance and repair*'. Current UK national policies and legislation in part still reflect the old paradigm of '*protect and conserve*', whilst others reflect the new paradigm of 'enhance, increase and repair'.[4]

The 'increase, enhance and repair' paradigm can be facilitated through urban development schemes - even where biodiversity baselines are zero[3]. Actively encouraging species to re-colonise by providing habitat features; habitat creation; repair of fragmented links in green networks, and ecologically sensitive management are examples of how this can be achieved. Cumulatively, these '*local*' enhancements can help to slow and potentially halt '*global*' extinction rates.

Biodiversity and the Development Process

New developments could become the biggest contributor to biodiversity improvements due to: supporting policies; the volume of developments (occurring and predicted); and the potential impact on a range of spatial scales. Biodiversity policy could be one of the major challenges for planning policy and processes in England requiring policies and processes that deliver the right level of protection and enhancement to the natural environment.[5]

Improving regulatory systems and the demonstration of benefits to developers to support enhancement of biodiversity ought to equate to a relatively straightforward process of agreeing proposals for maximising biodiversity in developments. However, the range of temporal, spatial, organisational, and trans-disciplinary complexities means that where proposals are initially agreed, they often do not come to fruition. This paper addresses the nature of these

obstacles to maximising biodiversity in major development schemes on a local level.

Research methods

As part of a wider research project employing questionnaires, site-based case studies, key-informant interviews and action research to focus on maximising biodiversity within major and urban development projects in England, a web-based questionnaire was emailed to all members of ALGE (The Association of Local Government Ecologists). The 81 respondents represent approximately half of the contact emails. Questions were either multiple choice or matrix questions, and also had an 'additional comments' field to capture additional insights.

The questionnaire's main objectives were to seek respondents' views of development in relation to: 1) the key obstacles to maximising biodiversity, and at which stages they occurred, 2) how 'urban' biodiversity was being tackled, 3) testing insights and theories generated from action research and research interviews - with regards to- recording, enforcement and common obstacles, 4) previously unidentified issues.

Research results

Professional Role

Respondents were mostly general ecologists and biodiversity officers (41%) followed by specialist planning ecologists (20%), management/ team leader ecologists (15%) and then 'other' related professions (24 per cent). 'Other' included: countryside officers; parks managers; a combination of ecologist with policy or similar; a countryside ranger; and a renewable energy project manager.

Experience

The majority of respondents (93%) had over two years professional experience while 91% had a degree/ higher degree, and half were members of Professional Institutions (the majority being: the Institute of Ecology and Environmental Management, or the Institute of

Biology); this lends confidence to the knowledge and experience of respondents to the questions below. The non-ecology / biology institution memberships included chartered or associate members of the Landscape Institute (LI) (seven respondents). Whilst the vast majority of local authorities have urban areas within their boundaries, only half (51%) of respondents had professional experience in 'urban' ecology. Two comments on question 9 (related to 'urban' biodiversity), revealed that Development Control (DC) officers often requested urban biodiversity advice, but found a lack of relevant knowledge amongst ecology specialists.

Planning Application Forms

The Standard Planning Application Form 1APP[1] was introduced in England in April, 2008 and to streamline the planning system by giving planning applicants greater certainty of expectations now contains questions on biodiversity in paragraph 14: Biodiversity and Geological Conservation, in the following format:
"Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?
Protected and priority species:
Designated sites, important habitats or other biodiversity features:" [30]

Applicants are required to tick either: Yes or No, to whether there is interest 'on' or 'off' site. This then triggers whether ecological consultation or site surveys are required. In the questionnaire respondents were asked how effective they thought the change to include biodiversity questions had been, to which 33 per cent indicated it had been ineffective and 36 per cent that it could be effective in the future (Figure 1).
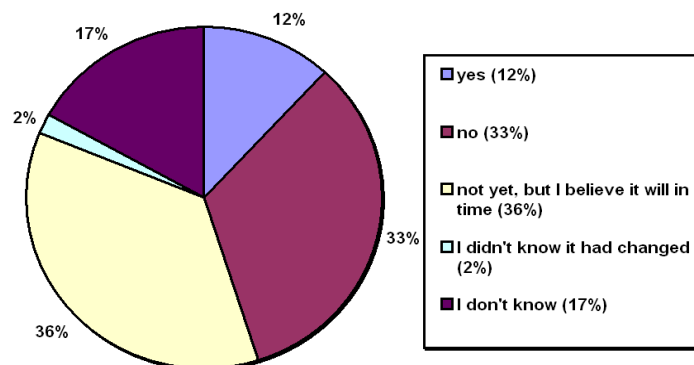

Fig. 1: Pie Chart Illustrating Effectiveness of Standardised Planning Application Form

Further comments (41 respondents) related to planning applicants inaccurately ticking 'no', when there 'were' features on site, which could lead to inaccurate validation of applications (16 comments). However, several local authorities are aware of this and attempt to tackle the issue by producing guidance sheets. Additionally, ALGE has produced draft pilot guidance on validation, available from their website.[1]

Other comments related to seeing some improvements in survey requests "*but these are still being done at inappropriate times of year*"; the need for stronger enforcement and strategic awareness; and issues regarding local authorities with no in-house ecologist, "*…or at least a call-off contract with an ecological consultancy, have very little chance of preventing or even minimising negative impacts on biodiversity…*".

Recording biodiversity agreements and proposals

Respondents (64 respondents) were asked to tick all possible answers (see key, Figure 2) with regards to 'recording' biodiversity agreements on individual development sites (Figure 2).
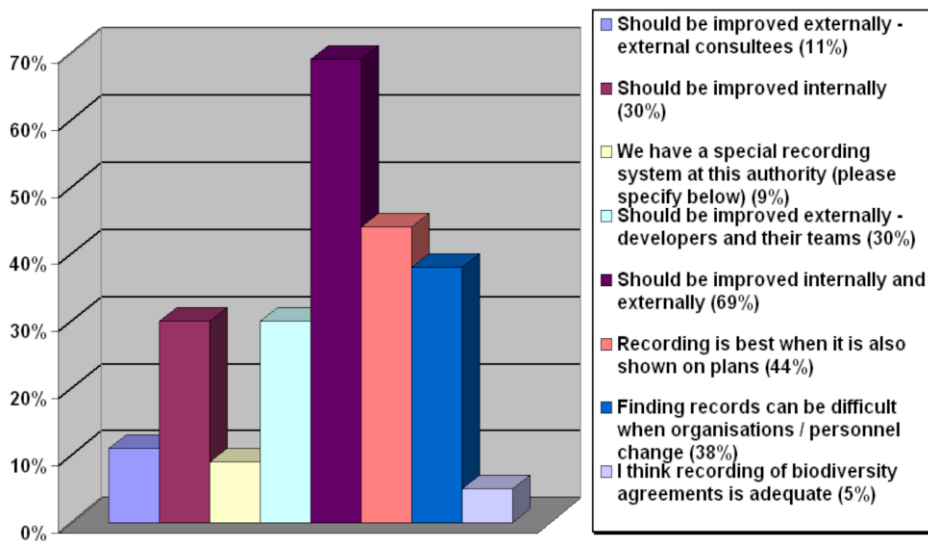

Key:
- Should be improved externally - external consultees (11%)
- Should be improved internally (30%)
- We have a special recording system at this authority (please specify below) (9%)
- Should be improved externally - developers and their teams (30%)
- Should be improved internally and externally (69%)
- Recording is best when it is also shown on plans (44%)
- Finding records can be difficult when organisations / personnel change (38%)
- I think recording of biodiversity agreements is adequate (5%)

Fig. 2: Bar Chart - 'Recording of biodiversity agreements and proposals'

A significant issue arises in the way biodiversity proposals are recorded both externally and internally to the LAs. Previous 'action research' particularly found issues during construction and management phases, where biodiversity features had not been implemented correctly, or at all, due to not being shown on site master plans (as site staff did not possess, or had not read the ecological reports). Unexpectedly, only 44% of respondents believed records of proposals were best when also shown on master plans. In contrast, 6 of the 7 LI member respondents agreed that recording on master plans would be better. Agreements lost, misunderstood, or forgotten agreements over time, were key recording issues, and sometimes related to personnel, or organisational change. While most respondents comments suggested they knew that recording biodiversity agreements on development sites was failing in some way, the task seemed to difficult too untangle with available resources.

Obstacles to maximising biodiversity and the key developmental phases in which obstacles occurred

Obstacles
Respondents (64 respondents) were asked 'If you had to choose, what would you rank as the top three obstacles to gaining biodiversity enhancements, which need to be solved?' They were given comments boxes, where they could write their: first (64 respondents); second (61 respondents); and third choices (57 respondents) (Table 1). The reasons for the complexity were far-ranging being related to different phases and different actors involved in developments. However, common obstacles did emerge, as did some previously unconsidered points.

RESPONSES	ISSUE	RANKING	WEIGHTING
24	Reluctant developers: lack of incentives/ pressure	1st, 2nd & 3rd	to 1st choice (13)
22	Knowledge, commitment, attitude and priorities of planners	1st, 2nd & 3rd	to 2nd choice (12)
16	Cost/ finance/ perceived cost by developer	1st, 2nd & 3rd	to 3rd choice (9)
14	Lack of monitoring and enforcement issues	2nd & 3rd	to 3rd choice (9)
10	Stronger, more robust legislation and policy needed (or more definite wording of planning statements, or policies to determine level of enhancements)	1st, 2nd & 3rd	to 2nd choice (5)
10	Lack of understanding of biodiversity enhancements	1st,2nd & 3rd	to 3rd choice (5)
9	Lack of in house planning ecologists, or specialist knowledge	1st & 2nd	even
9	Consideration not early enough / lack of design input	1st & 2nd	to 2nd choice (6)
9	Long term management issues (often difficult to establish/ agree / enforce/ fears of)	2nd & 3rd	even
7	Politics (conflicting policies / lack of will)	2nd	
7	Competing issues / biodiversity less of a priority in comparison to social enhancements	2nd & 3rd	even
5	Lack of time to initiate and implement	2nd & 3rd	even
5	Poor communication between parties (and lack of consistency)	1st, 2nd & 3rd	even
5	Need for some kind of standardisation / method of quantifying upfront what enhancements should be - what is reasonable to ask for	1st, 2nd & 3rd	even
4	Ineffective use of money for biodiversity enhancements / resource allocation. This related to too much money being spent on surveys at the sake of actual enhancements.	3rd	
2	No consideration unless already designated sites, protected species, or existing interest present.	1st	
2	Lack of options due to site restrictions	1st	

Table 1: Table illustrating patterns in key obstacles to gaining biodiversity enhancement

The generally low prioritisation of biodiversity issues uncovered in this study, along with a lack of in-house biodiversity specialists and ineffective enforcement, is certainly attributable to many of the obstacles to maximising biodiversity enhancements.

Development phases and obstacles

Respondents (64 respondents) answered a matrix style multiple-choice question choosing from a list of development phases and possible obstacles derived from the authors' experience. Results from the previous 'Question 5', reflect key obstacles listed here, assigning credibility to those selected.

To summarise: lack of ecological consultation was highest at pre-app and application stages, while communication issues internally were significantly higher in the pre-app and application stages. Communication issues externally were not significantly greater for any particular phase of development. Poorest records of biodiversity agreements occurred between construction; completion/ handover. The management phase was associated with the highest recording issues. Prioritisation was highest between pre-app and detailed design. Ineffective regulations and policy were relatively high issues throughout the development lifecycle.

However, regulations and policy had a significantly higher number of respondents at the management stage. Lack of incentives to off-set delays and/or costs were highest during construction, although they were also relatively high at the pre-application and application stage too. Lack of knowledge and guidance appeared to be high across all phases.

Enforcement

Assuming a negative stance, the question began with the following statement: "Enforcement relating to biodiversity and developments is not always effective i.e. sometimes no enforcement action is taken; sometimes the enforcement action is 'dropped'; or even when enforcement action is fully taken, the resulting fines or procedures do little to put off offenders in the future" Respondents (58 respondents) were then asked to select as many of the possible answers as they felt relevant (Fig. 3).
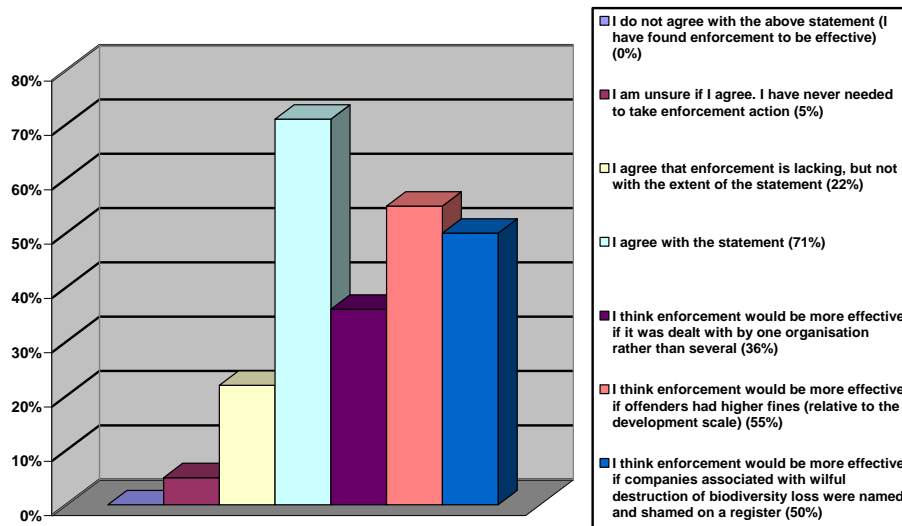
Fig.3: Bar chart illustrating the level of agreement with the enforcement statement

Respondents' comments referred to a lack of resources of police and LA enforcement officers (financial and staffing), leading to low enforcement and monitoring levels (five comments). However, respondents recognised that enforcement issues exist across all areas of planning, but biodiversity (protection/ enhancement) was more difficult to enforce or suffered from a greater lack of will to enforce than other planning issues.

Provision of 'urban' habitat/feature specifications

Of the 58 replies to the question: "the developers and their agents who you deal with generally able to provide 'urban' habitat/feature specifications to the standard you require?" 40 per cent answered yes and 48 per cent no, suggesting that there is a significant issue with obtaining urban habitat and feature specifications. Comments included: green infrastructure raises the profile, but a more strategic approach to biodiversity enhancements is needed; developers and consultants experienced in previous urban habitat schemes illustrate a learning curve; specifications need to consider what locally present species can be attracted to a site; developers need to provide sufficient areas for habitat features; due to the hierarchical approach to biodiversity, many developments affecting sites of local value are covered by landscape architects with no involvement from ecologists; and, urban biodiversity science is misunderstood, even amongst ecologists.

Understanding of 'urban' biodiversity

58 respondents to an 'urban' biodiversity question (Table 2) showed good knowledge by forward plans/LDF policy officers, probably because of their regular work with green-network maps and PPS 9.

Table 2: Understanding of urban biodiversity (and the potential for improvement and enhancement through new developments) by different groups	
Group	Respondents comments
1. Forward plans /Local development Framework (LDF) policy officers	Best understanding of 'Urban' biodiversity (out of all groups in the matrix).
2. Developers/ developer's teams, and members/ planning board	Worst understanding of urban biodiversity.
3. Development control planning officers	Improving in their understanding the most.

The encouraging improvement in Development control planning officers' knowledge generally reflects the findings of the wider research. Responses of elected council members (number 2 in Table 2), with the power to grant or decline planning permission, correspond to findings from action research and research interviews. For example, a senior planning officer said "*Members do not always understand planning policy. Their knowledge can be poor, as it is a voluntary position. How democratic decisions are maybe questionable for the same reasons. Enforced training [regarding biodiversity] would be helpful.*" [23]

Discussion and recommendations

Major obstacles to biodiversity enhancements in major urban development schemes

Knowledge and Experience

Increasing theoretical and applied information is available on urban biodiversity. Protection and enhancement of urban biodiversity is y not a new concept, influential textbooks, e.g. Gilbert[16] being widely available, while inextricable between human and societal processes and ecological systems are wll understood.[11,12] Groups promoting urban biodiversity, such as the UK MaB Urban Forum and the ALG, are active. Many LA's have local BAPs or Supplementary Planning Documents (SPDs), covering urban areas and brownfield sites.

The lack of knowledge raised in questionnaire responses may be due more to the accessibility of this knowledge, or the need for specialist training for certain groups, than its unavailability. There is still a general lack of understanding and experience of urban biodiversity within professions who deal directly and indirectly with biodiversity and development (including approximately half of ALGE members who answered the questionnaire). A small proportion of respondents did not deal with urban areas (12%), while 49% had no urban biodiversity experience, indicating that ecologists are 'dealing' with urban biodiversity, but do not feel 'experienced' enough in the topic.

The 'biodiversity toolkit' to be hosted on the 'Planning Portal' proposed by the ALGE should alleviate some of these issues. Additionally, the Commission for Architecture and the Built Environments (CABE) advocates *"seeing urban development as an opportunity for enhancing biodiversity through good design of both buildings and spaces"*.[7] If CABE space incorporated case studies of urban biodiversity enhancements on their website, with relevant links, it would help professionals using the website for information. Research shows that successful 'learning curves' are evident, for example, once developers have provided urban biodiversity enhancements due to regulations, they are likely to want to provide biodiversity enhancements on other schemes, even when note required by regulations.[31,36]

Prioritisation

Prioritisation of biodiversity is required at the chief executive level of LA's, as effective change needs to be filtered down to all, to bring about a new understanding of biodiversity significance (other than protected species and habitats). This complies with the biodiversity duty placed on all public bodies by the NERC (Natural Environment and Rural Communities) Act[24]. ALGE has attempted to tackle some of these issues through their publication *'Increasing the Momentum.'*[29] However, real change will require intervention to foster better inter-governmental and societal perception and prioritisation of biodiversity issues, coupled with national training raising awareness of PPS 9, and biodiversity enhancements for planning officers and elected planning board members who reside on planning boards. as stressed in the Government response to 'The Killian and Pretty Review[3, 10]

Wales uses the assigning of 'Biodiversity Champions' among LA council members by chief executives / head of cabinets along with biodiversity training by the Welsh Local Government Association (WLGA). The Countryside Council for Wales (CCW) have found this to be an effective process.[32] Its replication should be investigated in England.

Specialists

Lack of in-house biodiversity planning specialists obstructs gaining biodiversity enhancements. This is part of general labour shortages and skills in planning (ODPM / DCLG, 2009). Where new staff members cannot be afforded, using qualified, experienced consultants could be considered.

Policy

Failure to develop local policies in sufficient detail to be effective occurs both in the UK and in Sweden.[13] Such local policies should reflect the new biodiversity paradigm in clear, concise terms throughout the hierarchy. All LAs should provide specific 'urban' biodiversity guidance to developers and write specific, relevant biodiversity enhancement requirements into LDF policies.

Misdirection of funds

Biodiversity funds should be used to facilitate habitat enhancements, rather than just surveys. This should benefit many species, not only expensive translocations of small numbers of protected species, such as the Great Crested Newt requirements.

Recording and Communication

Improvements need to be investigated for recording biodiversity agreements and proposals [question 4]. This is particularly necessary regarding developers handing over development sites after the construction phase [question 6]. Spatially recording biodiversity agreements on individual development schemes should also be considered [question 6 and insights from several other questions].

Greater partnering and co-operation between planners, council members, developers, ecologists and landscape architects is necessary. Ecologists could help planners to make more favourable recommendations for biodiversity, by summarising specific biodiversity features to select from; calculating approximate costs ; listing and mapping the species to encourage in particular situations and technical specifications for common habitat features.[23]

Enforcement

A senior solicitor dealing with planning and the environment field, P. Harrow, interviewed in the research believed there maybe a flaw in the legislation,

in that, the legal system (planning inspectorates and magistrates) tends to value biodiversity from a visual rather than a biological perspective. *"There tend to be better results in court when there is a link to visual amenity. Biodiversity tends to have to be linked to something else, before it is considered"*.[18]   He also stated that he felt biodiversity fines tended to be unduly low and that: "There is a wide variation in magistrate's benches with regard to fines relating to biodiversity".[18]

A significantly high proportion of respondents had experienced a range of obstacles to taking enforcement action for biodiversity related offences [question 7]. Poor enforcement rates could also be correlated with poor developer incentives to provide biodiversity enhancements in the first instance. A lead authority could centralise all biodiversity enforcements. In addition there could be magistrate training; greater fines; streamlining of the evidence process; more effective monitoring of work on development sites.

Procedure

Early ecological consultation at the pre – application and application stage, highlighted by the questionnaire and wider research is need, because once developers acquire sites, they proceed with speed, in order to prevent cash-flow problems. If developers do not include biodiversity in their plans from the start, it is almost impossible to get them added later.[15] *"Writing specific biodiversity conditions can be difficult, as planners are not experts in this area - so they need assistance in writing the planning conditions, but there is often a lack of understanding from consultees on what can technically be said in a planning condition. There needs to be an understanding of one another's technical language"*.[19]

Incentives and Promotion

 Lack of developer incentives and pressure' was cited as the most common key obstacle in question 5. Multifunctional benefits and other developer incentives should be publicised and discussed in negotiations with developers during the planning stages of a new development project. Promotion of successful case studies and technical specifications would further urban biodiversity enhancements. Greater incentives to off-set issues, especially at the construction stage, should be investigated.

Conclusion

The survey questionnaire used identified the key and common obstacles to enhancing biodiversity on major urban development schemes. It also identified which stages within a development's life cycle the key obstacles are most likely to occur, as well as some of the key professionals and non professionals who are involved.   The generally low prioritisation of biodiversity issues uncovered in this study, along with a lack of in-house biodiversity specialists and ineffective enforcement, is certainly attributable to many of the obstacles to maximising biodiversity enhancements. This information helps to prioritise areas for possible solution-finding and formulation of guidance for the remainder of the wider research project. Further research, through case studies and specialist interviews, will therefore focus on furthering the provisional recommendations made during the course of the discussions above.

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Notes

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The importance of greenspace in towns and cities

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The attractiveness of towns and cities everywhere is enhanced by the style and spacing of their buildings and the arrangement and size of their open spaces. If those areas between buildings have trees, flowers and grass they draw even more people into them. Such pieces of "urban greenspace" are to be found throughout the Commonwealth, many of them were initially established as parks or gardens over 100 years ago, either as part of the planning of cities by governments, or on the initiative of key individuals who believed that parks were an amenity to improve the cities and the health and well-being of urban dwellers.

Through the Commonwealth, major cities have significant traditional parks, many founded over 100 years ago, such as Albert Park in Brisbane, Fitzroy Gardens in Melbourne, Hyde Park in Sydney, Mount Royal Park in Montreal, The Maidan in Kolkata, Uhuru Park in Nairobi, Lake Gardens in Kuala Lumpur. The Domain in Auckland, Central Park in Wellington, Victoria Park in Freetown and Albert Park in Durban, Botanic Gardens in Melbourne, Port Moresby Wellington, Freetown, Cape Town and Singapore and nature reserves in Mumbai, Lilongwe, London, Manchester, Birmingham, Edinburgh and Belfast are further examples of official managed urban vegetated spaces that are well used by the general public. To these must be added the huge variety of private gardens, sports ground, golf courses, and heaths in towns.

People enjoy urban nature in many ways, from the passive enjoyment of parks and gardens to active involvement in wildlife conservation and the creative conservation of wildflowers. Yet nature poses many problems to people, from the predations of urban foxes to the bacteria that attack food and the vectors that bring diseases. To understand and manage the complexity of nature in cities requires knowledge of the dynamics of both ecosystems and social systems.

In the first decade of the 21st century, urban people became aware of the need for greater self-sufficiency, increased sustainability of lifestyles and more local food production. These three concepts are practical everyday realities for many of the urban poor in Africa, Asia and Latin America, but for most urban dwellers in Australasia, Europe and North America they require changes in ways of living and new thinking. Nevertheless, many people are putting forward new ideas and are making practical examples of ways of creating new opportunities for food production, for creating novel gardens and for using vegetation to make cities more liveable and to mitigate the impacts of climate change. Managing urban ecosystems in this way brings multiple benefits, from the practical control of storm runoff to the aesthetic enjoyment of pleasing landscapes.

Natural England, the government agency for nature conservation in England, argues that our everyday nature is on our doorsteps. It can take many forms. It might be a place designated for wildlife – a nature reserve, woodland or a country park. Some of those natural areas are still in the heart of modern cites, much reduced, but still reminders of the natural vegetation, such as Bukit Nanas in Kuala Lumpur, Malaysia. Others are on the periphery, such as Kuring-gai Chase National park to the north of Sydney, Australia and the Royal National Park to the south. However, for most people, contact with nature takes place in local neighbourhoods, such as the local park, the scrap of land at the bottom of the street, and a piece of derelict land adjoining a canal. Such places should be no less special than 'official' sites.

Greenspace for growing food

Many people are also fortunate enough to have their own garden, or shared access to a communal garden, where nature can be enjoyed and where food can be grown. For many less fortunate others, any patch of land where food can be grown is an opportunity to improve the family diet, and perhaps to earn a few cents by selling surplus crops to neighbours. In Nairobi, Kenya, the land used for urban agriculture was 32% private residential land, 29% roadside land, 16% along river banks, and 16% other publicly-owned space. Urban farming, whether officially sanctioned or opportunistic, is a way of life for large numbers of people.

Urban agriculture helps to reduce urban poverty and food insecurity and enhance urban environmental management. It also helps to enhance urban food security in the face of rising costs of food supplied from rural areas and imports and inadequate affordable supplies to meet the needs of the poorer sectors of the population. Food growing in the city assists local economic development, poverty alleviation and social inclusion of the urban poor and women in particular, as well as to the greening of the city and the productive reuse of urban wastes. Many examples from Commonwealth countries demonstrate this economic and social importance of urban agriculture.

In Accra, Ghana, 90% of the city's fresh vegetable consumption is from production within the city. In Kampala, Uganda, children aged five years or less in low-income farming households were found to be significantly better-off nutritionally (less stunted) than counterparts in non-farming households. Urban producers obtained 40 to 60 percent or more of their household food needs from their own urban garden.

In Dar es Salaam, Tanzania, urban agriculture forms at least 60% of the informal sector and is the second largest urban employer (20 percent of those employed). In 1993, urban fresh milk production was worth an estimated US$ 7 million. The annual gross output of over ten thousand urban agricultural enterprises in the city of Dar es Salaam totalled 27.4 million US$, with an annual value added amounting to 11.1 million US$. In 1991, the individual urban farmer's annual average profit was estimated at 1.6 times the annual minimum salary. In Nairobi in the early 1990s, agriculture provided the highest self-employment earnings among small-scale enterprises and the third highest earnings in all of urban Kenya

Urban wastewater is widely used as low-cost alternative to conventional irrigation water, for example in India and West Africa, supporting livelihoods and generating considerable value in urban and peri-urban agriculture. However, the health and environmental risks of this largely unregulated practice are poorly understood.

Wood products are important in urban areas; large parts of the urban population of Africa, for example, being still heavily dependent on fuel wood. Systematic planting of street trees for timber production is widely practiced in Malaysia. Timber from urban trees may provide construction material for buildings. Urban green areas also provide non-wood forest products such as mushrooms, berries, medicinal herbs, and rattan.

Ecosystem services provided by urban greenspace

Natural green places provide natural solutions to many 21st century diseases: obesity and inactivity; heart disease and strokes; depression and mental illness. In

difficult times, they provide cost effective treatment and improve people's lives. Green spaces also help lower the impacts of climate change. Trees, green roofs and public parks can make urban areas cooler. They help reduce the impacts of flooding, keeping homes and businesses dry. These multi-functional green areas provide carbon free air conditioning and natural flood protection for millions of people. They make good economic sense too.

Nowadays people frequently discuss nature in the city in terms of the "wild", or what might be regarded as the unmanaged growth and movements of organisms in urban areas. This notion of "naturalness" in urban ecology is set against the image of landscape design and maintenance or gardening as a correct or "proper" way of using plants to beautify and gain the benefits of trees, flowers, shrubs and grass. Nevertheless, both the managed and the unmanaged vegetated urban sites provide ecosystem services and contribute to the natural capital of cities. All the diverse open areas provide some kind of habitat. Plants and animals also invade derelict buildings, colonise walls, exploit cracks in pavements and accumulate in unmanaged drains

Urban ecosystem services include air filtering (gas regulation), micro-climate regulation, noise reduction (disturbance regulation), rainwater drainage (water regulation), sewage treatment (waste treatment), food production, erosion control, biodiversity maintenance, recreation, health and cultural values.

In a crowded world, where the globally wealthy minority consumes land and other resources at a rate far above the capacity of the world to sustain all people at such a level, managing urban areas to maximise ecosystem services must gain multiple benefits from every tract of land. Such efforts require collaboration between a variety of agencies and a willingness to invest in the long-term future (at least the expected lifetime of a building, or piece of green infrastructure) by land and property owners, tenants and investors. They also need access to readily assimilated scientific information of what will grow where, what kind of

substrate is required, what organisms will colonise a given area, and what type of ecological succession can be expected in that area.

Decisions have to be made about sharing urban ecosystems among species, including human beings. Different community groups and institutions have conflicting goals for particular tracts of urban greenspace. Some of these bodies can exert strong influence through ownership and land tenure, but other bodies, from local planning authorities to wildlife trusts, have stewardship responsibilities that can use either legislation or persuasion to protect particular urban ecosystems or habitats. In the range of concerns about urban environmental change, from the battles to save individual inner city trees to conflicts over new airport runways in urban greenbelts, the multi-faceted character of interplay between institutions and organisations is readily apparent.

Once developments have occurred, ecological changes produce new problems of maintenance of green areas, not only in the face of damage and deterioration through human use, but in the face of invasive species, pests, climatic extremes and inter-specific competition. For example, many restored former brownfield areas have suffered through lack of maintenance. Elsewhere, growth of trees may threaten houses, through risk of falling branches or subsidence during drought, and health and safety arguments may mean a loss of vegetation.

Urban greenspace and green infrastructure

For some urban greenspace may have an economic value, enhancing property prices and also potentially offering an economic return, for example through forest product sales from urban forests. Others may be forced to forgo economic gains by demands for greenspace provision in new housing or retail developments that reduce the number of homes built in a certain area, or cut the car parking spaces available. The search for win-win situations suggests that some

urban ecosystem service benefits may be gained while also meeting economic demands. Techniques such as green roofs and sustainable urban drainage systems bring benefits to both human residents and urban ecosystems.

In northwest England the regional green infrastructure has been mapped in detail. Individual local authorities and city regions have prepared their own infrastructure maps (Fig. 1). Green Infrastructure should be provided as an integral part of all new development, alongside other infrastructure such as utilities and transport networks
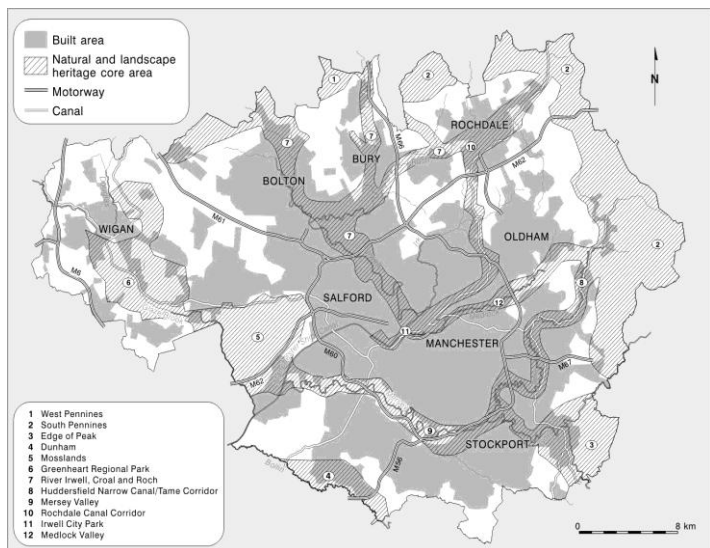

Figure 1   Map of the green infrastructure of Greater Manchester in northwest England, including hills to the north and east, river valleys running through the urban area, and reclaimed former mining land in Wigan Greenheart Regional Park.

The regional green infrastructure strategy for south Hampshire, southern England aims to develop the benefits of greenspaces both within and between urban areas. Its key themes are: sustainable economic development, attractive workplaces and desirable tourist destinations; maximising biodiversity opportunities, adapting to change and protecting European sites; landscape quality and diversity, distinctive features, cultural heritage and appreciation of sense of place; access to the countryside and green spaces, providing recreational opportunities and experiences; providing high quality water resources, managing flood risk and increasing water retention; providing high quality water resources, climate change adaptation and mitigation; food, fibre and fuel production; and well-being and health.

Cities throughout the Commonwealth have urban greening and greenspace plans. For example, in South Africa, the Durban Green Corridor (DGC) - extends inland from the beachfront and Kings Park Sport Precinct, offering exposure to the natural beauty, majestic terrain and multi-cultural character of the uMngeni Valley. The DGC aims to rehabilitate the

natural environment of uMngeni Valley and to create jobs and grow the regional economy through sport, recreation and tourism development. Durban planted over 62,500 trees to help green an area near the Buffelsdraai landfill site in Verulam, the city's biggest rubbish dump, providing a wildlife habitat that also helps reduce the odours coming from the landfill site. The Wildlands Conservation Trust has set up a "treepreneurship" scheme to reward people who collect seeds and plant trees, with cash, food, clothes, bursaries and bicycles. The trust also gives the volunteers farming implements to carry out the work. Similar re-forestation projects are under way in KwaJobe in Mkuze, and Mzimela at Ongoye, with an emphasis on planting indigenous trees.

Policies for urban greenspace: planning for the official, tolerating the informal

The wild in the city is often temporary and unregulated: patches of derelict land, undeveloped land between construction sites, abandoned railway sidings, remnants of woodland and long neglected, overgrown cemeteries.   Much urban farming is conducted on river banks, roadside verges and unoccupied slopes. All the sites are opportunistic and informal, but a key parts of the urban green infrastructure and contribute to the ecosystem services from which the people of the city benefit. However, they are difficult to administrate and what is interesting and important for some inhabitants may be an eyesore to others.

Thus sustaining much urban greenspace is a constant challenge, developers wanting to build, food growers wanting to farm, animal lovers seeking to preserve natural habitats, sports enthusiasts wanting space for football or golf, and engineers needing space for flood basins and power line easements. The authorities often argue that if the proposed use, or actual use, is not in the zoning plan it cannot be permitted. Sometimes they deliberately clear the site of illegal occupiers. Increasingly however, there is sensible comprise, with people engaged in food production permitted, or at least temporarily allowed, to continue to grow their food or a derelict site is retained temporarily as a natural area until construction work starts. In many cases the zoning plan is modified, as people become increasingly aware of the value of all the ecosystem services provided by urban greenspace.

In Ghana, for example, policy makers and other government officials initially did not tolerate urban agriculture. They recognized only the potential negative effects of urban agriculture on humans and the environment, citing the administrative, public health, and social impacts. Eventually, socio-political, economic, and nutritional factors compelled officials to accommodate urban agriculture.

The value of both "official" and the "opportunistic" urban greenspace is thus established. Now it is time for all cities and urban administrations to think about the green infrastructure as they plan for new

developments, the redevelopment of old areas and the regeneration of sites with inadequate housing and poor drainage and services. The value of the green infrastructure must now be allowed to slip between departments concerned with highways, drainage, housing and planning. It is the responsibility of all concerned with managing cities and towns, the places in which most of the Commonwealth's and the world's people live.

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Policies, Plans and Programmes for Urban and Peri-Urban Forestry and Greening in Developing Countries – Constraints for an Efficient and Effective Implementation

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Abstract
This article discusses constraints for an efficient implementation of policies, plans, and programmes for urban and peri-urban forestry and greening in developing countries, based on literature review. After having introduced the topic, relevant international agreements will be discussed, followed by the discussion of main constraints for urban forestry and urban greening in developing countries.

Introduction
The world is increasingly urbanising, due to population growth, but principally through migration from rural areas. It is expected that by the year 2050, more than two-thirds of the world's population will be living in urban areas. Almost 90 per cent of the increase in urbanisation will occur in developing countries [14, 10, 5; 2]. This urbanisation process is taking place without an effective legislative and planning framework to guide this development, resulting in a range of economic (unemployment, lack of energy supply and infrastructure, …), social (poverty, lack of drinking water and food, need for recreational areas, …) and environmental problems (pollution of air, water and soil, erosion, heat island effect, floods, biodiversity loss, …) [15; 14; 21].

Urban and peri-urban forestry and greening has received limited attention by politicians and decision-makers in developing countries and particularly by populations who are more concerned with day-to-day live. Urban greenery often is being perceived as a luxury by deprived populations [14; 10; 21]. However, developing multifunctional urban green structures can be an important contribution to sustainable urban development. Due to their multiple economic, environmental and social benefits, urban and peri-urban forests and green areas (UPFGA) have potential to ameliorate living environment and well-being for urban dwellers [17]. These benefits have been discussed elaborately in the literature [16; 13; 14; 27; 13; 22, 21] and will not be discussed further in this article. Specific benefits of UPFGA for developing countries are poverty alleviation, securing supply of food, fodder and fuelwood and provision of livelihoods [15; 4; 4; 21]. 1

Existing forests and green areas are under constant pressure in urbanising areas, as they provide needed resources to fuel the development (e.g. fuel wood, non-timber forest products, and crops) as well as space for further development. Due to the lack of a well-developed (forest) law and urban planning systems, authorities are incapable to stop the deforestation and improper use of (peri-) urban green areas [10]. On the other hand, the development of new UPFGA is not effectively taking place, due to an inefficient urban planning system. According to Knuth [10] and Jim [8], tree planting has been carried out across the world. But, due to a lack of space, knowledge or awareness, no large-scale landscape development has been possible in urban areas of many developing countries.

A range of definitions and concepts of urban forestry and urban greening (UPFG) have been developed in the literature (see i.e. [11; 12; 14; 10; 25; 1]). This paper builds on the broad definition of urban and peri-urban forestry and greening by Knuth [10], including all urban and peri-urban vegetation, such as green spaces or urban and peri-urban vegetated areas, encompassing recreation parks, agro-forestry, farming and forestry systems. Geographically, this definition includes the administrative limit of urban local authorities, as well as surrounding environments influenced by urbanisation.

International policy framework for UPFGA
There are no specific legally binding agreements on urban forestry and urban greening at the international

level [10]. However, numerous agreements influence urban forestry and urban greening, discussed below.

UN-Habitat is the UN agency for human settlements and strives toward socially and environmentally sustainable towns and cities. The Habitat Agenda, approved during the Habitat II-conference in 1996, challenges urban poverty and environmental degradation. In order to improve the urban habitat, the Agenda commits to: financing shelters and human settlements, minimising rural-to-urban migration, improving living conditions and increasing the parks and recreation areas. The Habitat Agenda has some important repercussions for urban forestry and urban greening. For example urban trees can provide construction wood for shelters and settlements. However, to increase the parks and recreational areas, the development of sustainable land use planning system and appropriate planning and management for urban green areas is required.

Agenda 21 has been approved during the UNCED-conference in Rio de Janeiro (1992). Agenda 21 recognises the benefits of urban greening for the urban poor by calling for the activation of "*green works*" to create employment and initiate sustainable development (1). Chapter 11 (Combating Deforestation) refers specifically to urban forestry: "*Stimulating development of urban forestry for the greening of urban, peri-urban and rural human settlements for amenity, recreation and production purposes and for protecting trees and groves*" (article 11.14 (h), [9]).

In addition, 'Forest Principles' were declared during the UNCED-conference in Rio de Janeiro in 1992. The aim of these Principles is "*... to contribute to the management, conservation and sustainable development of forests and to provide for their multiple and complementary functions and uses*" (Preamble (b), [9]). The Forest Principles refer to greening: "*Efforts should be undertaken towards the greening of the world. All countries, notably developed countries, should take positive and transparent action towards reforestation, afforestation and forest conservation, as appropriate*" (article 8 (b), [9]).

Furthermore, the Convention on Biological Diversity, concluded at UNCED (1992), urges the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits. This convention is relevant to UPFGA because of the vital role of urban green areas in (urban) biodiversity. The convention promotes biological diversity in urban and peri-urban areas with regard to green spaces and urban forests. Therefore, UPFGA could be an effective tool in slowing down biodiversity loss [10].

UPFGA also play their role in the climate change policy. Article 2.1 (a) (ii) of the Kyoto-protocol deals with sinks and reservoirs of greenhouse gases, and states "*... promotion of sustainable forest management practices, afforestation and reforestation*" [23]. Afforestation and reforestation projects are eligible as *Clean Development Mechanisms* (CDM), in which funds from industrialised countries are used to combat climate change in developing countries [26]. The (re-development of urban forests is a possible example of a CDM-project. It is likely that in the future the REDD (Reducing Emissions from Deforestation and Degradation) tool will provide additional funding for urban forestry projects in developing countries, through which existing urban forests can be conserved and managed in a sustainable way.

The UN Convention on Combating Desertification deals with, among others, the relation between forests and desertification. Urbanisation can lead towards deforestation, which is a first step towards desertification. Some cities (e.g. in Iran) have been building greenbelts to protect the city against deforestation [1].

Importantly, the Millennium Development Goals, established in 2000, seek to reduce world poverty by half by 2015. The seventh goal (*Ensure Environmental Sustainability*) includes two targets relevant for urban forestry and urban greening, namely Target 9 (*Integrate principles of sustainable development into country policies and programmes, to reverse loss of environmental resources*) and Target 11 (*Achieve significant improvement in the lives of at least 100 million slum dwellers by 2020*). UPFGA can play a role in improving the quality of the urban environment [10; 1; 18; 7; 24], or as FAO states: "*Promoting a green environment for cities is seen as a key element of their strategy for achieving the Millennium Goals*" [6]. Achieving Target 9 will be an important prerequisite to improve the urban quality of live.

During World Environment Day 2005, the Urban Environmental Accords were signed by more than one hundred mayors. These accords are aimed at creating grassroots movements at city's level, and comprise 21 non-binding specific actions that can make cities greener, such as creating an accessible park or recreation area within half a kilometre of every resident by 2015, and adopting urban planning to take into account open space systems for recreation and ecological restoration [3; 1].

Lastly, the Food and Agricultural Organisation (FAO) sees an increasingly important role for forest plantations and trees outside forests (including UPFGA) as a source of wood and non-wood products, and to deliver environmental and social services such as ensuring food security and sustaining livelihoods. To implement multidisciplinary actions in this domain of urban development, urban agriculture and urban forestry, the Priority Area for Interdisciplinary Action (PAIA) on 'Food for the Cities' has been set up. This action will, among others, develop the concept of 'Forest and Trees for Healthy Cities: Improving Livelihoods and Environment for All' (5; 12; 19).

Constraints for implementing policies, plans and programmes for urban and peri-urban greening at national, regional and local level

The constraints for efficiently planning and managing UPFGA can be categorized in three main categories:

political, legal and institutional constraints. The political lack of awareness on UPFG and its positive effects on poverty alleviation and the urban environment is a major constraint as the decision-makers have to provide the necessary political back-up and funds for conserving, maintaining and developing urban green space [14; 10; 21]

On the legal site, the lack of specific laws and regulations on, and legal definitions for, UPFG, is hampering efficient implementation of UPFG. However general legislation (in the fields of forestry, urban planning, environment, etc.) and local regulations and by-laws have an important impact on UPFGA [10]. Jim [7] recommends that cities develop a dedicated 'tree law' that encompasses the spirit and stipulation of the urban greening strategy.

Urban planning is on the cross-section of legal and institutional constraints. Planning is the key to successful urban greening; urban and peri-urban planning and zoning systems must provide the framework for UPFG [10; 7]. Without proper urban planning, UPFGA will be negatively influenced by uncontrolled urban expansion. However, efficient urban planning systems are lacking in most developing countries, especially at the urban fringe where urbanisation takes place - and which is regularly situated at other municipality's territory and then the core city [1]. Murray [20] points out that many of the existing problems in urban forestry could be resolved by a more universal commitment to (urban) planning at the strategic and negotiation level. Based on his study of urban and peri-urban forestry in Latin America, Merzthal [18] suggests that including UPFG in urban planning will be an important factor to promote UPFG in Latin America.

The scattered ownership and the lack of clarity concerning ownership of urban green spaces do not ease the development of UPFG in developing countries. Some green areas are owned by public owners, ranging from, for example, the state forest administration, regional road and water authorities, or parks agencies at municipalities and districts. Other green spaces are in private hands, which complicate imposing conservation and management measures. Land reform (e.g. in the former Soviet states) and privatisation policies result in former public urban green space to be transferred to private actors [10; 1], which further complicates planning and management of these green spaces.

Other institutional constraints for the efficient implementation of UPFG in developing countries are related to: funding; insufficient knowledge and capacity base; law enforcement and corruption; and co-ordination and co-operation [17; 10; 1; 7]. The available financial resources for UPFG in developing countries are scarce. This is connected with the limited awareness for the multiple benefits of UPFGA and the perception of urban greening as luxury [7]. Government funds are complemented with funds from donor countries, international organisations (both governmental and non-governmental), national and local NGO's, the public and private actors (e.g. developers and forest industries) [1; 7]. Decentralisation of the authority on urban-greening to the lower levels (e.g. in West and Central Asia) is usually not complemented with the decentralisation of the necessary funds [1].

UPFG is defined as a multidisciplinary approach, in which forestry and urban planning are only some of the involved disciplines [14; 1 06; 7]. To be able to effectively implement urban-greening, the professionals involved need a broad knowledge and capacity base. Given the multitude of actors and administrations involved (due to the dispersed ownership structure and management responsibilities), there is a need for a strong co-ordinating agency or public-private organisation, which can link with all actors involved [17; 7]. Jim & Liu [8] give the example of the urban forest management system in Guangzhou City (China). This management system consists of 22 actors, co-ordinated by the Administrative Bureau for Urban Parks and Forestry, and acting under the authority of the Construction Committee, and the Municipal Government. Apart from these professional actors, the public and private actors are also involved in UPFG initiatives [1; 7]. Private actors can provide land and budget for developing UPFGA. The general public may participate at three levels: through participation in official planning bodies and advisory committees; through contacts with community action groups, NGO's and through public oriented activities; and through partnerships with the private sector [17]. As "*people-centred forestry benefits local livelihoods*" [1], UPFG has to take public participation seriously.

Conclusion

Urban forestry and urban greening has potential to play an important role in developing sustainable urban environments in developing countries. The main constraints that limit the fulfilment of this potential are the lack of awareness of the potential benefits of urban green areas which can benefit the urban poor. Moreover, the lack of appropriate laws, regulations, urban planning, financial means, competence and coordination is hampering the effective implementation of policies, plans and programmes on urban forestry and urban greening in developing countries.

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Keynote: The Future of Human Ecology

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Introduction

My immediate response, when invited to speak on 'the future of human ecology' before the Manchester conference, was delight. But I quickly realized how daunting it was. The scope of human ecology is vast. Its subject matter begins with the emergence of human beings on this planet. In the words of Gerald Young, a leading scholar of the history of human ecology, "The actual origins of human ecology are lost in the mists of time, with the Neanderthal and in the Neolithic, or even further back..." Since then, hardly any part of this earth has remained untouched by human activity.

   Human ecology – the actual term – is about a century old. It has been applied to a diverse family of speculative and scientific lines of thought. For a growing number of people, it has become a unifying expression for the intersection of two important realms in the living world. As Paul Shepard said, "Perhaps the central problem of human ecology may be characterized as the relationship of the mind to nature". Human ecology cannot be subdivided according to academic traditions; its mandate is undeniably interdisciplinary and integrative. It demands a multiplicity of perspectives in the search for connections among otherwise segregated ways of knowing.

The Facets of Life

No crystal ball exists to show the future of human ecology. Even the World Futures Society's fascinating high-tech visions fall short. The best comparison, for me, is akin to a cubist sculpture or painting – a composition of multiple facets. Each plane is a reflection (or a window) illuminating the complexity of human-environment relations. When viewed together, perhaps, a more integrative perspective may be revealed.

   The full conference presentation, on which this summary is based, drew on thoughts and aspirations of many others who have considered the future of human ecology. In this abbreviated version, only the outline and selected highlights may be given. Nonetheless, I hope a glimpse of the issues and opportunities that lie before us may be sensed. We begin by considering the evolutionary and historical background, and then the contextual nature, of human ecology. From there we move from the environmental realm to explore the mental or human dimensions of imagination and meaning. Next we consider academic and applied human ecology as an interdisciplinary domain.

And lastly, as a final integrative theme, we reflect on human ecology as a perspective.

Evolutionary and historical background of human ecology

Our first facet orients us backwards in time. It frames the beginnings of life and humans' place in it. Charles Darwin, a century and a half ago, disclosed a common origin of the living world. "We are", he said, "all netted together". Ernst Haeckel soon followed, coining the term oecologie – as the comprehensive study of the relationships of organisms to their environment. Since then, we have learned a good deal about evolution and ecology. But as the eminent scientist Lewis Thomas noted, "The only piece of scientific truth about which I feel totally confident is that we are profoundly ignorant about nature".

   Knowledge of prehistoric humans is likewise incomplete. Evidence is scattered and scant. Skeletal remains and simple tools, along with early indications of fire and burial rituals, give a preliminary picture of proto-human ecology. But one thing is clear. Cultural changes and uses of environmental resources were often accompanied by technological innovation. Human creativity and artistic expressions also altered relationships to the living world. As agriculture replaced hunting and gathering, societies became more specialized and complex. We are still on this path – though with far greater capacities to modify our environments and the biology of our own beings. Human evolutionary and historical studies bring the past to light. They reveal important biological, cultural and medical knowledge. Looking backwards is a window for looking ahead. It enriches self-understanding, gives insight to the origins of consciousness, and delivers valuable lessons from past errors.

Context of human ecology

Human ecology – like natural ecology – is a highly contextual way of looking at the world. Ecological views often look at the 'distribution and abundance' of organisms. Humans have always been on the move. When the first band of hunter-gathers emigrated out of Africa 65,000 years ago they were just a few hundred strong. It took all of human history – from then up to

1800 – for the population to reach its first billion. The second billion took only until 1930. A mere three-quarter of a century later, well beyond six billion humans inhabit the planet. Human migration is still a major factor. Many urban centres draw more that 25 per cent of their population from distant regions. Dozens more have immigrant populations in hundreds of thousands. The overall pattern of movement is from regions of impoverishment towards areas of opportunity. Most of humanity now lives in urban environments – a trend that is expected to continue.

We also see worldwide growth in general mobility – for business and tourism and in air travel and automobile ownership. The number of commercial airplanes and private automobiles will double in the next two decades. Other forms of interaction are rising rapidly too. A galloping horse was the fastest mode of communication two hundred years ago. Now, with wireless telephones and internet connectivity, the world communicates at the speed of light. As human affairs are more tightly inter-woven, the natural world is facing enormous extinction threats from habitat destruction, pollution and climate change. According to the Harvard biologist, E. O. Wilson, one fifth of all species are expected to become extinct in the next thirty years. Humans are not exempt from these forces. Of the 7000 languages still spoken in the world, half will disappear in this century. This is not merely a loss of words. Whole systems of meaning, history and human experience are disappearing. We are swimming in an ocean of accelerating and complex technology. How we adjust to and manage these uncharted waters is vital for the future.

Imagination and human ecology

The next two facets shift from an objective (i.e., external) stance towards a more subjective or introspective point of view. Here we consider human consciousness directly. Imagination is defined as "the act or power of forming a mental image of something not present to the senses or never before wholly perceived in reality". Imagination takes us beyond science and social science – into the realms of creativity, arts and aesthetics. The capacity to create new realities gave humans, as Loren Eiseley put it, "a second world" – one wherein teleological thought and intentionality reshape the natural world. The powers of foresight have been a world-changing force, in Mikhail Gorbachev's words, "ever since humankind first conceived the morrow".

Our imagined tomorrows may inspire us with nature's wonders or alarm us of its loss. We hold in our minds the powers to mesmerize ourselves with countless visions – from progress and consumption, to sustainability and wonder. A half-century ago, the central question of human-environmental relations was "Can nature absorb the impact of humans?". Increasingly, the problem has become "Can human consciousness comprehend our relations with the living world?"

Ecology of Meaning

Humans are meaning-making beings. The specific images we create of possible futures are embedded in broader systems of beliefs. The worldviews we construct and the stories we tell ourselves matter greatly. The nature writer Annie Dillard expresses the issue this way: "The universe is real and not a dream, not a manufacture of the senses", i.e., the world really exists. But also, she adds, "Thought advances, and the world creates itself". For Dillard this happens in the pages of creative non-fiction and the world of literature. New visions may also be expressed in physical terms as landscapes, bricks and mortar. For the pioneers of human ecological planning – like Ian McHarg and Rusong Wang – ecological meaning unfolds in the concepts and realization of green building, regional sustainability and eco-cities.

Human ecology expands our ways of looking at the world and invites new frameworks of meaning. As the human and natural worlds become ever more tightly connected, the necessity grows for ecological knowledge and applications. Entirely new futures come into focus through the lenses of bio-mimicry, conservation ecology, watersheds, food-sheds and sustainability. Taken together, these views hold unforeseen opportunities for achieving common values and creating meaningful livelihood.

Human Ecology as an Interdisciplinary Domain

Our fifth facet is borrowed from the title of Gerald Young's 1976 scholarly review of human ecology. Emphasis here is on human ecology's interdisciplinary and applied dimensions. I am reminded, for example, of Prince Philip's opening statements for the first CHEC conference on education in Malta in 1970:

"No subject is causing such worldwide concern as Human Ecology…. It is an immensely difficult subject as it involves value judgments, conscience and a whole mass of conflicting interests. I suspect that the sheer complexity of the problems has tended to discourage people from tackling them".

H. G. Wells, nearly a half-century before also said it clearly: "Sooner or later human ecology, under some name or other, will win its way to academic recognition and to its proper place in general education". Others have made similar claims, in various ways. "The aim of education", for Alfred North Whitehead was "acquisition of the art of utilization of knowledge." Gregory Bateson likewise warned "Break the pattern which connects the items of learning and you necessarily destroy all quality."

These commentaries bespeak the hope of an interdisciplinary human ecology. They also warn of the academic world's penchant to carve reality into fragments. Even Henry Thoreau noted the problem in Walden: "The mode of founding a college, commonly, is to get up a subscription of dollars and cents…following blindly the principles of a division of labour to its extreme…." When Thoreau graduated

from Harvard College in 1837 there were only a few hundred students. Today's universities number in the thousands of students. In a recent New York Times article on "The End of the University as We Know It", Columbia University professor Mark Taylor decried the fragmentation of specialist, "limited knowledge – all too often irrelevant to genuinely important problems". "If higher education is to thrive it must be completely restructured", he urged, by creating "problem focused programs". I agree wholeheartedly with Taylor. Whether we can do these things is our challenge as educators.

Human Ecology as a Perspective

Ed Kaelber, founding president of College of the Atlantic, first introduced me to the notion of human ecology as a perspective. COA is a non-departmentalized, interdisciplinary college of human ecology, where I served as academic dean for 20 years. As Ed put it, "Human Ecology is not a discipline. I understand discipline to mean 'a subject that is taught: a field of study'. Human Ecology is a perspective or point of view which signals the importance …of… finding effective ways of interrelating disciplines and of relating thought to practice". Kaelber was guided by A. N. Whitehead's reminder that "the progress of philosophy…. essentially consists in the enlargement of thought where by contradictions and agreements are transformed into partial aspects of wider points of view". A similar sense of integration, at the personal level, comes from Rachel Carson: "It is not half so important to know as to feel…." So here is where the future of human ecology lies, amidst the philosophical, the personal and the practical.

In sum, we need more of these integrative perspectives. I agree with Paul Shepard. Ecology is a 'subversive' science, filled with insights about nature and challenges to our sense of responsibility. Our aim is to go towards nature – not away from it, or against it. The great promise of human ecology, Shepard proffered, may not come from grand research reports. It will come as works of art – not from landscape paintings – but in how we fashion our cities, shape our landscapes and conceive liveable futures. To do this we must re-envision education – from formal and public education, to the continuing education of decision makers. We know technology changes culture. We need to work with it and use it: to bridge the islands of knowledge; as tools for synthesis; to help arrange affairs so people will work together; to guide growth; and to manage complexity. Can this be done? I believe so.

Earlier this year, I came across an award-winning public service video[1] from the Climate Matters contest called "Save It" 3. The writer and director was a ten-year-old boy, Nikos Spiridakis. In a mere 20 seconds he linked the personal (his family, their car, fuel prices, a dirty windshield, and his father's hand on the fuel pump) to the global (smokestacks, air pollution, economics, hurricanes, floods, endangered animals, oil spills, polar melting and global climate change). A ten-year-old boy, in twenty seconds, gave us his human ecological perspective. If he can do it, we can do it. There rests the future of human ecology.

[1] *Award winning video from Climate Matters contest called "Save it" may be seen at www.1sky.org or www.youtube.com*

CHEC Mission Statement:

Human Ecology embraces the principles of natural and moral philosophy. It draws on knowledge and understanding from the sciences and humanities, to develop and promote holistic, integrative, sustainable initiatives, ideas and developmental projects to enhance and strengthen people's relationships with each other and the natural and built environment on which they depend.

Human Ecology operates at all levels of human co-operation, from families and communities to global initiatives such as those of the United Nations agencies. Human Ecology emphasises the contribution of the individual, the sharing of skills and experiences, and the dignity and insight of social and cultural and religious experiences. From this standpoint, human ecology works to create sustainable, lasting improvements in people's lives by fostering projects that engage and enhance the skills of local communities, involve all sectors of society, improve livelihoods and maintain environmental benefits.

Human Ecology is a philosophy and a process, constantly learning and adapting, but educating, encouraging and stimulating others. It has become an academic field of enquiry, a developmental philosophy, an approach to sustainability, and a new means of unifying political, economic and social endeavours to provide a meaningful future for rural and urban people everywhere.

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