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Climate change

Climate change is global in its manifestation. Yet the elements and processes that give rise to the global effects are rooted in decisions being taken daily by individuals and their organisations worldwide. When we influence decision making, we affect global change in the process. It is necessary that landscape architects draw attention to the plight of the cultural and natural landscape, and its peoples. It is essential to develop global plans, models, and position statements. And we need to take action in our professional lives at the regional, national and international levels.

This issue of *IFLA News* shows some of the climate change policy making, actions and outcomes of landscape architects worldwide. The coverage is not comprehensive. Many associations and institutes of landscape architecture have taken similar paths since climate change became real, and others are developing appropriate statement, plans, and actions.

While we act individually, climate change is a global issue. As the global body, IFLA is well placed to affect decision makers.

Background: a graphic global action plan developed by Craig Pocock (see p. 15 of this issue for further detail).

2

Robert Holden

Reflections on the November 2008 EFLA climate change seminar

4

Simon Swaffield & Carys Swanwick

Implications for landscape architects and a proposed IFLA agenda

6

Catherine Neilson Economics

Australia's Climate Change Adaptation Skills for Professionals Program

8

Nigel Thorne

Thoughts on the Landscape Institute's climate change position statement

11

Maria Isabel Kanan & Pamela Jerome

ICOMOS Committee on Earthen Architecture Heritage and climate change

13

Kerstin Manz & Mechtild Rössler

Climate change and world heritage

15

Craig Pocock

Letter to IFLA on a climate change action plan

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Climate change: the way forward

Reflections prompted by the EFLA seminar on climate change, Brussels, 14 November 2008

Robert Holden

There is still time to avoid the worst impacts of climate change, if we act now and act internationally. Lord Stern

Climate change is a trigger for all sorts of effects consequent on the stresses we place on the earth's resources and biosphere. Growth of population, urbanization, and the overall effect of people on the land are unbalancing. Global warming impacts fundamentally on our landscape and its ecosystems in ways we may judge as benign or adverse. For instance, northern Europe will see increased crop production, but there will be increased storms with consequent flash flooding. On current Intergovernmental Panel on Climate Change (IPCC) estimates, if there will be a 2°C+ rise in average temperatures, southern Europe will suffer lowering of rainfall and desertification (2/3rd of Spain would become desert), and generally there will be increasing sea level rises.¹ There will be vegetation changes and increased human death rates due to high temperature stress for the old, the ill and the young, and the malaria-carrying *Aedes* mosquito will spread across Europe.

Nat cat costs

Two industries take climate change very, very seriously: the insurance market and tourism. Fiscal safety, and sand sun and sex are all things we appear to crave. For example, look at the website of the world's largest reinsurance group, *Münchener Rück* AG [www.munichre.com/de] on the rise in insurance losses between 1980 and 2007. This has been caused by natural catastrophes (nat cats), for instance, the loss on coastal homes caused by sea level rise and river disasters. Nat cats are a concern. To quote *Münchener Rück*, the argument is basically³:

- Economic losses from nat cats rising faster than economic activity, e.g. due to population growth, globalization
- + man-made climatic changes and development of new risk
- + increase of man-made disasters and development of new risks
- + Increased globalization and interdependency of risks
- = Rising demand for non-life insurance.



So for the insurance market, climate change is both a problem and an opportunity. However, for those no longer able to insure their home against loss due to coastal retreat, these changes can be a financial disaster. Insurers measure the effects of climate change and charge a price on it.

According to the *Stern Review*, this is a part of an overall price we cannot afford. The 2006 *Stern Review on the Economics of Climate Change* undertaken for the British government by economist Lord Stern (former chief economic adviser to the Treasury) discusses the effect of climate change and global warming on the world economy. It argues that 1% of global gross domestic product (GDP) per annum is required in order to avoid the worst effects of climate change. It concludes that we cannot afford not to tackle climate change.²

Climate change will bring about a movement of summer tourism in Europe from the hot south to the Baltic and North Sea regions, with a consequent economic impact on both north and south. Head for Bornholm on the Baltic, not Ibiza!



Water

Water is going to be key. Desalination plants already dot the Mediterranean coastline, while in London a £0.25 billion desalination plant is currently being built in Beckton: south-east England is a water deficit area in most summers and ground water supplies are down. A restructuring of infrastructure is happening: solar power farms, wind farms, geothermal and tidal power and, dare one say, nuclear fission (and maybe fusion), the densification of development, and retrofitting of existing building with solar power. Denmark has achieved a figure of 25% of energy production from sustainable sources and has escaped from Arab oil dependency.

Urbanization increases river flows and storms overwhelm river basins, for example, the Rhine floods of 1995 and 2007.⁴ The watershed of the Rhine has lost 80% of its floodplains, and the River Elbe 85%, as an impermeable townscape has increasingly overlain a permeable landscape. European cities have expanded by 79% since the 1950s. The response in countries like Holland has been the national Water Plan (presented at IFLA World Congress in Apeldoorn).⁵

What can we do?

What follows is a checklist of climate change action in which landscape architects can play a part. Basically, we can aim to reduce the impact (prevention) and respond to the effects by increasing adaptation.

There are of two sorts of action that we, as individual landscape architects and as teams, can play a part in.

1) Change of lifestyle to reduce the growth of urbanization and reduce emission of greenhouse gases, for example by:

- promotion of renewable energy usage, such as solar, geothermal, wind and water power, by landscape planning environmental assessment.
- reduction of car usage/greater usage of railway and public transport, cycles and walking by infrastructure planning and design.
- densification by working on urban plans and projects.
- switching from predominantly animal and fish based diets to predominantly vegetable based diets by assisting the restructuring of agriculture and promotion of local horticulture (from allotments to agricultural planning).
- energy efficiency by urban and transport planning.

2) Amelioration of the effects of climate change, for example by:

- ecological corridors to promote migration of flora and fauna.
- water conservation.
- use of drought and temperature tolerant, varieties and species of diverse plants, and changes in cultivation.
- warm shade structures (e.g. roadside trees) to promote human comfort, and ameliorate the urban heat island effect.
- urban tree planting to capture atmospheric dust.
- green roofs to slow surface water run-off.
- management of coastal retreat policies due to rising sea levels.
- agricultural and landscape restructuring as the tree line moves upwards.
- Afforestation.
- recycling and composting.
- river basin management to cope with the loss of flood plains.
- soil conservation and soil carbon sink policy.
- promote cycling and walking in cities and elsewhere.
- wind farm, solar and hydrological energy, and energy distribution, network environmental assessment.
- promote and assist carbon trading markets.





In conclusion

Never again will we sit on the sidelines, or stand in the way of global action to tackle this global challenge. I will reach out to the leaders of the biggest carbon emitting nations and ask them to join a new Global Energy Forum.

Barack Obama 15 July 2008

So, we, including landscape architects, could switch to a Mediterranean diet, live in dense settlements a bit like medieval Florence, walk to work, and travel long distance by train and boat. A bit like my trip to Brussels, I suppose. I travelled by Eurostar train, which offsets all its carbon costs, then by tram, walked and drank French wine and Belgian beer. But sorry, I have to declare I did use a taxi.

The EFLA seminar is an annual international one-day seminar and teach-in prior to the Brussels EFLA General Assembly devoted to concerns and issues relevant to landscape architecture. The EFLA Seminar included presentations by Jan Vogelij, Past President of the European Council of Spatial Planners (ECSP)⁶, Rohan Uhen of the European Environment Agency⁷, Poul Pedersen of EFLA and former president of *Dansk Arkiteketer*⁸, and Nigel Thorne of EFLA and Past President of the Landscape Institute.⁹

References

- 1 Intergovernmental Panel on Climate Change (IPCC) [<http://www.ipcc.ch/>]
- 2 *Münchener Rück* [http://www.munichre.com/app_resources/pdf/ir/publication_s/presentations/praes_ir_2002_10_09_e.pdf]
- 3 *Stern Review on the Economics of Climate Change* (2006) [<http://www.occ.gov.uk/activities/stern.htm>] and [www.sternreview.org.uk/]
- 4 Dutch National Water Plan [<http://www.verkeerenwaterstaat.nl/onderwerpen/water/water%5Fen%5Ftoekomst/nationaal%5Fwaterplan/>]
- 5 The Rhine: Internationale Kommission zum Schutz des Rheins (IKSR)/International Commission for the Protection of the Rhine (ICPR) [<http://www.iksr.org/index.php?id=342>]
- 6 European Council of Spatial Planners (ECSP) [www.euctp.org/e/index.html]
- 7 European Environmental Agency (EEA) [<http://www.eea.europa.eu/>]
- 8 For illustrated information about Danish energy systems (in Danish, but use a translation machine) refer [www.energinet.dk]
- 9 For the Landscape Institute position statement on climate change refer [<http://www.landscapeinstitute.org/>]

Landscape architecture and climate change: implications and a proposed IFLA agenda

Simon Swaffield & Carys Swanwick

The Problem

The scientific evidence is now overwhelming - climate change is occurring, and presents very serious global risks. It is likely that human actions have contributed to global warming over the past 50 years, and if we continue as before, will increase the rate and extent of future change. The main human drivers of change are the release of greenhouse gases. This is primarily due to use of fossil fuels, but also to a lesser extent to agriculture and associated land use change. Fossil fuels are used in all parts of the modern industrial world, in manufacturing and distribution, construction, heating, cooling and lighting, and in transport and food production. Reduction of greenhouse gas emissions therefore requires a broad strategic perspective as well as detailed action.

The direct biophysical effects of climate change over the next 50-100 years can now be predicted with reasonable certainty. They include modest but significant increases in sea level, due to thermal expansion and melting of ice; an increase in average surface temperatures of between 2 and 4 degrees C, with the greatest change over land and in high northern latitudes; changing weather patterns resulting in more frequent drought in some areas, and increased precipitation in others; and more intense extreme events.

These changes will exacerbate water shortages in many parts of the world; seriously affect global food production; impact upon the health of communities; and lead to significant species extinctions. The landscape consequences will include increasing risks of flooding associated with floodplains and coastal zones; the emergence of new forms and patterns of food and biomass production and new energy sources that change land use regimes; transformation of settlements to accommodate new risks, lifestyles, energy regimes and more variable climate; and changing ecosystem dynamics.



The challenge

Climate change is a crisis that affects everyone on the planet. The poorest are affected most and earliest. It is global in its causes and consequences, and international cooperation will be critical in shaping an appropriate response on the scale required.

Landscape architects are agents of change. Landscape planning helps shape urban form and the wider landscape, and our design and management decisions influence the environmental and carbon footprint of projects. We have a professional commitment to collective environmental responsibility and action. What role can we play in responding to climate change?

The response

Two types of action are needed. First, and most urgently, it is essential to stop the problem getting worse, through various types of *mitigation*; second, to help and enable communities to *adapt* to the changes that are already inevitable.

Mitigation and adaptation are closely linked and need to be considered together. Without mitigation the costs of adaptation will be much higher, but the relationships are complex, and by no means always obvious.

Mitigation reduces our contribution to the causes of climate change. This means reducing net emissions of greenhouse gases through strategies that avoid their creation and release, for example by using alternative sources of energy; through using hydrocarbons more efficiently, for example by considering total life cycle carbon budgets in design; and through absorption of carbon, for example in forest sinks.

Adaptation is the adjustment in the way we live in order to better accommodate the increased variability, extremes and changes in climate and landscape systems, for example by stormwater management and water harvesting, and through enhancement of urban microclimate.

Drawing upon a literature review, a survey of key informants, existing professional statements and our own research and practice, we have identified a suite of landscape based mitigation and adaptation strategies at a range of scales:

At national and international scales

- to analyse the consequences of climate change for landscapes that are widely valued for their natural or cultural heritage
- to advocate for and contribute to the development of policy frameworks that promote and enable our contribution to climate change adaptation and mitigation at regional, local and site levels through landscape planning, design, and management.

At regional scale

- to predict the likely patterns and trajectories of landscape change;
- to identify carbon mitigation opportunities through landscape planning;
- to evaluate the comparative potential of different types of landscape to adapt to change and accommodate new patterns of land use, renewable energy and carbon sequestration;
- to develop scenarios for resilient landscape structures, settlements and urban form, using visualisation and modeling techniques that inform and enable communities to respond to the climate challenge.

At local and community scale

- to undertake creative design and planning that adapts and mitigates the public realm (waterways, streets, parks etc.) to new environmental conditions and social demands, using both proven and innovative landscape planning strategies, such as green infrastructure, and that enables low carbon design solutions in both public and private realms.

At site level

- to implement life cycle design thinking and regenerative design solutions that help mitigate climate change, through use of new technologies and management systems with low energy demands and low carbon footprints.

A research agenda

Implementation of these strategies needs new knowledge and new skills. We propose a *research agenda* with five components:-

1. The identification and communication of international best practice in landscape approaches to adaption and mitigation;
2. Comparative analysis of the effectiveness of different planning, design and management responses to climate change, over different time periods;
3. Formulation of new types of landscape policy that contribute to the wider climate change agenda;
4. Development of ways to integrate carbon accounting and sequestration into landscape planning and design processes; and
5. Implementation of design experiments to create innovative carbon sensitive solutions at local and site level.



We also propose an education agenda with two key components: First, to revise landscape architectural education programmes to include awareness of climate change issues and their design and planning implications, and new skills in carbon sensitive design and planning; and second, to implement continuing professional development strategies that build the professional capacity needed to undertake new roles. These need to include enhanced knowledge of scientific methods and metrics, systems analysis and critique, landscape modelling and monitoring, and political and community advocacy and leadership, in order to better understand landscape consequences, and recognize, promote and implement appropriate adaptation and mitigation opportunities and techniques.

How can IFLA encourage and enable the type of collective international response we have outlined? We believe IFLA should adopt a climate change protocol that incorporates these different types of collective action, and which encourages its constituent organizations to adopt and implement comprehensive climate change policies and action plans. A draft policy is under preparation and will be posted in due course.

Sources

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Adapting to climate change – where does landscape architecture fit in?

Catherine Neilson

**National Project Manager
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The following is intended as an informal background introduction to some of the ideas currently being examined within AILA's Climate Change Adaptation Skills for Professionals Program. The first phase of the program (funded by the Australian Government Department of Climate Change) is focusing on the development of a set of National Landscape Principles. These will be used to guide the implementation of climate change adaptation strategies and professional development programs for landscape architects, as well as increasing the knowledge/advocacy base within the profession when assisting clients and government with this critical issue. For further information on the project, including recently released consultation documents, go to: <http://www.aila.org.au/climate/>.

The role of landscape architecture in the current discourse on adaptation to climate change is a unique one. There is legitimate concern within our profession and the wider community that conventional land development and management practices have historically tended to inhibit rather than enhance the ability of landscapes to serve the needs of humanity and the wider environment on a sustainable, long-term basis. This has led to a situation where landscape - most notably within the context of urban form - is often treated as an afterthought, or an end-of-project issue. Yet it should actually be a central concern, as the question of how we value our landscapes directly impacts on critical areas affecting our long-term survival as a species. In simple terms, we as a profession need to articulate clearly the "triple bottom line" of landscape, i.e. the value of landscape in terms of its contribution to the economic, environmental, and social/cultural conditions that form the fundamental framework necessary for long-term human well-being.



Photo: Paul Costigan, from Using water wisely
[<http://www.canberragarden.com/water/xeriscape.htm>]

To do this effectively, a shift in thinking is required of our profession. Rather than accepting the prevailing view of landscape as an entity to be *acted upon* (with sensitivity or not), we now need urgently to reappraise our approach to become more closely attuned to the necessity for *understanding and working within* the context of a rapidly changing and increasingly complex environment. In this context, the *modus operandii* is no longer one of premeditated approaches towards “cemented” solutions, but rather a capacity for flexibility and adaptiveness. As landscape architects, our role as stewards of the landscape obliges us to direct our attention (perhaps for some with an uncomfortably sharp focus) on the link between how we choose to respond to the wider environment and the ultimate survival outcome for our species. It is rapidly becoming a simple equation of how intelligently we might adapt versus how swiftly we might perish.

Looking at landscape from a triple bottom line perspective raises the potential for new ways of analysing, designing and managing sites across a wide range of scales, and provides new possibilities for policy setting and practice that will enable us as a profession to negotiate better the uncertainties characteristic of the current debate on the impacts of climate change.

The triple bottom line perspective

1. The economic perspective

Landscape plays a vital role in supporting healthy, functioning environments, especially in relation to the significant value of the ecosystem services it provides, i.e. the “free” services provided by the ecological processes of healthy landscape systems that clean our air and water, pollinate plants, filter and recycle nutrients, modify our climate and enhance potential for human well-being through contemplation of, and interaction with, the natural environment.

To date, the contribution of this previously uncouneted landscape value has been largely ignored in urban land-use and management decisions, and has yet to surface in terms of economic analysis of the impacts of climate change. As a profession, it is vital that we address this situation. We must begin to advocate not only the *intrinsic* value of landscape, but also promote a deeper understanding of the *actual* value of ecosystem services for which nature is only just beginning to hold us to account.

2. The environmental perspective

The current approach to landscape management in relation to climate change adaptation strategies is focused primarily on the same issues as buildings, i.e. reduction of energy and water usage. However, this approach fails to recognise that landscapes (both built and natural) are fundamentally different from buildings in that they typically consume less energy, both in construction and operation, and they also have the unique, inherent capacity to *enhance and regenerate* natural resources.

A “sustainable” site, i.e. one that is designed and managed for long-term sustainability outcomes, can provide a range of valuable ecosystem services that actually improve environmental quality rather than simply minimize the damage to natural systems. On a practical level, we need to develop ways to assess and measure the value of ecosystem services preserved or increased through sustainable site practices. In this sense, active landscape management for sustainable outcomes can become a pro-active strategy for addressing the challenges posed by climate change, as well as a potent tool in mitigating the adverse effects of such change.

3. The social/cultural perspective

Whatever terminology we use to define the realm of human social and cultural interaction with the environment, e.g. “community”, “local identity”, “sense of place”, “beauty”, “aesthetics” etc., there is a growing understanding of the linkage between human well-being and our sense of connection with the natural world. Emerging research relating to the restorative and regenerative power of landscape in human health is an area rich with possibility for designers, especially in view of the potential implications of climate change for human health outcomes.

The same processes at the heart of global ecological degradation (namely the consumptive nature of development and the global economy) also threaten our ability to flourish mentally and spiritually to our full potential, particularly within the urban context, which for the first time in history is now home to more than half the world’s population. Our built form has become the most common landscape we rely on to support the entire spectrum of human physical and social needs. Clearly, there is an urgent need to ensure that such landscapes are planned, designed and managed within a much more holistic framework in order to maximize the potential for human flourishing in all its richness and complexity.

Developing a response to climate change

Ultimately, our profession should provide leadership in establishing standards and processes for interventions in the landscape that include clearly defined, measurable benchmarks for sustainability.



Our role as stewards of the landscape demands no less. There is an urgent need to establish quantitative methodology to link sustainable land practices with ecosystem services such as climate regulation, biodiversity, clean air and water. Equally critical is the need to refine and quantify current understanding of those often less tangible linkages between our sense of connection with the wider environment and human health/spiritual well-being. New research currently being undertaken by our project partners (CSIRO) provides valuable insight into current thinking in these areas, linking us to current research on urban metabolism and the impact of climate change on human health in urban environments.

Recent research on the international dimensions of urban design practice also supports the proposal that “reflective practice” is a useful guiding principle for designers working in an increasingly dynamic and complex environment (*Cross Cultural Urban Design* – Catherin Bull et al. eds., Routledge, London/New York 2007, p. 211).

The ideas outlined above underpin the current development of a set of National Landscape Principles to guide climate change adaptation strategies within our profession. This work will include an examination of how such principles might link with policies or strategies for measuring/quantifying how our landscapes can support both natural ecological functions as well as human needs in a more holistic, sustainable manner.

It is intended that the AILA National Landscape Principles will ultimately serve as a primary reference point for our own profession but also contribute to policy direction and processes within the broader framework of government agencies and organizations concerned with land management and planning issues. They will hopefully provide us with a set of new tools to help us function as “reflective practitioners” in a much more sophisticated manner than we have in the past, in order to respond with integrity to the challenges of an uncertain future.

Climate change: a position statement from the Landscape Institute

Nigel Thorne

...you bring together the skills, knowledge and passion that we need for the 21st century in the way that engineering shaped the 19th century. We need you in the fight against climate change. You can show people how it can be done.

These are the words of the Rt. Hon. Hilary Benn, UK Secretary of State for the Environment, Food and Rural Affairs, who addressed the Landscape Institute’s (LI) international conference on climate change in 2007. The conference was an integral part of a research and knowledge gathering exercise that has culminated in the recent publication of the LI’s position statement on climate change.

The position statement responds to the challenge set out by the minister in a variety of ways. Its intention is to demonstrate to stakeholders and government the critical role that landscape architects take and the need for them to be at the heart of the delivery process for climate change policy objectives. It identifies how commercial and public objectives can be met using the holistic, landscape architectural approach to development, and it provides guideline principles, with case studies showing a variety of approaches taken by landscape architects with due regard to climate change adaptation and mitigation.



Water's Edge Country Park Visitor & Business Centre, site of former clay quarries and industries associated with fertiliser and chemical production, the reclaimed country park now features more sustainable land use and facilities (David Lee Photography (LHS) & North Lincolnshire Council (RHS))



There is no longer any doubt that our climate is changing and this is at least in part due to the result of human activity. The need for adaptation and mitigation is one that must be determined with a sense of immediacy. The cumulative impacts of greenhouse gas emissions, which have arisen since the onset of global industrialisation, are set to continue. This presents an immediate and urgent challenge to all professionals concerned with the design, planning and management of the built and natural environment.



Moorgate Crofts Business Centre, a “business incubation centre” featuring geothermal heating and cooling, and a conference centre emerging from a green roof (RMBC)

As landscape architects, it is important to recognise the significant impacts likely to affect our global landscapes and how our response might be formulated. It is our global, collective response via mitigation and adaptation that will then determine just how successful we shall be in tackling the greatest challenge yet to be faced in the 21st century.

As a result of higher temperatures, the urban heat island effect will become much more intense, particularly during the summer months, which will inevitably increase health risks to populations living in an urban environment. Because of reduced rainfall and increasing evapotranspiration, water shortages will determine the vitality and level of productivity in agricultural and horticultural production. Contrastingly, there is a greater likelihood of increased flooding in many areas – specifically in built environment and flood-plain arenas – due to greater rainfall intensity and the propensity for more frequent storm events. Coastal areas will be affected by rising sea levels leading to the possible displacement of whole communities, the destruction of social infrastructure and previously unknown changes to the physical topography of these regions, which in turn will determine changes to previously established flora and fauna.

Changes to temperature and air-moisture content will alter regional biodiversity, possibly with permanent effect, which in turn may impact significantly on food production efficiency, public health and the spread of

diseases and the general health and aesthetics of our environment. As temperatures rise and ultra-violet radiation increases, air quality will deteriorate with a knock-on effect for population health and well-being. As the climate changes, so will the character of our landscapes, impacting upon the environmental, cultural, political and socio-economic make-up of our societies.

Unquestionably, there are parts of the world that are likely to suffer more severely than others; the impacts of drought and flooding may have devastating effects on people, wildlife and landscapes. In many areas there are already conflicts over water, energy and food and with the increasing effects of climate change human migration to more hospitable regions around the world will become inevitable as certain locations become uninhabitable. Thus, these competing demands dictate that new and regenerated landscapes be planned, designed, managed and maintained with a comprehensive understanding of the macro and micro issues relating to the inter-connectivity of natural processes and human life.

Multi-functional landscapes have the ability to provide food, energy, water and flood mitigation. They also present a fundamental resource for biodiversity and the promotion healthy societies in all aspects. Landscape architects, operating as master-planners, designers, managers, scientists and researchers, have a core responsibility for environmental stewardship; planning, creating and designing genuinely sustainable communities via balanced environmental, socio-economic and cultural scrutiny. Our engagement with the protection, conservation and enhancement of urban and rural landscapes will assist in mitigating and adapting to future climate change ensuring the survival of the communities within them.

In many ways and on a variety of levels, landscape architects can help reduce human-induced causes of climate change. As master planners, we can help shape all aspects of existing and proposed new communities to encourage more sustainable lifestyles. With landscape as the context for development, giving due regard to topography, vegetation and microclimate, there can be fully integrated and maximisation of benefits from shelter, energy and resource consumption, flood mitigation, and so forth. Appropriate public access to the external environment will contribute to the improvement of public health, well-being, and community engagement and integration. Localised ‘self-sufficiency’ with emphasis placed upon maximising the integration of local food production in the landscape will reduce the need for excessive transportation and energy consumption.



There can be site-specific intervention with the creation of carbon-sinks, the installation of green roofs and the creative use of open space for ground source heating and cooling. Local and sustainable sources for materials, man-power and carbon-reducing work-day practices all need to be encouraged and introduced into the equation to mitigate climate change impacts. There will need to be careful assessment of the appropriateness, scale, nature and location of renewable energy facilities in relation to the landscape context and aesthetic. As landscape architects, we must demand that renewable and low-carbon energy installations do not lead to perverse carbon impacts.



Sutcliffe Park, formerly Harrow Meadow and site of the meandering River Quaggy, was redesigned in 2003 as part of a scheme to alleviate flooding in South London: concrete channels and culverts have been complemented or replaced by more open, natural watercourses (Environment Agency)

Our work to mitigate certain aspects of climate change must be integrated with our determination to adapt our lifestyles and landscapes to the consequences of what has happened, which will remain with us for decades to come. The skills, knowledge and expertise of the landscape architect are required at the earliest opportunity in the design and delivery of projects to ensure that the creation or refurbishment of all environments are sufficiently robust, dynamic and flexible to all aspects of climate change. Whether it is at local, town, city or regional scale, effective adaptation to climate change can be facilitated by emphasising the need for a comprehensive green infrastructure to underpin all aspects of the planning and design. This will assist in the reduction of temperatures within urban environments, improve air quality and ameliorate surface water run-off; it aids flood risk reduction, provides wildlife corridors for species migration, benefits bio-diversity, increases opportunities for recreation and improvements in health, well-being and human comfort as well as contributing to place-making.

The LI's position statement makes twelve recommendations that will assist in the global response to climate change impacts. We recommend that climate change adaptation and mitigation action plans be incorporated into planning policy at national, regional and local levels. We ask that appropriate minimum regulatory standards are set for surface water run-off in new residential development and non-domestic buildings. We believe that government codes, both existing and future proposals, must incorporate objective landscape and urban design criteria and that landscape architects should be appointed in leadership roles on all regeneration projects at the earliest stages of the development process. It is imperative that inter-disciplinary team-working between design, planning and construction built-environment professionals becomes the basis for the creation of sustainable communities which are resilient to climate change and deliver a range of public and environmental benefits. There can be no question that management and maintenance of landscapes and green space must be adequately funded to reflect its undeniable value and benefit to society sustaining the original design concept and intention.

Sustainable urban drainage systems, the use or introduction of green roofs and walls should be essential prerequisites and new housing development will incorporate methods of sustainable food production, where feasible. Emphasis must be placed upon the incorporation of substantial vegetation cover at all scales of development and multi-functional design and management should be an essential ingredient of all aspects of new urban development. Finally, we recommend that landscape architects receive adequate training at all levels to enable us to continue to meet the demands of a changing climate.

In conclusion, with climate change determining every aspect of our society, economy and the ecosystems that support them, the role of the landscape architect becomes ever more central and increasingly important. We have the knowledge base, the skills, training and expertise to help address the environmental, cultural, social and economic challenges which are needed to present an holistic response to local, national and international concerns.

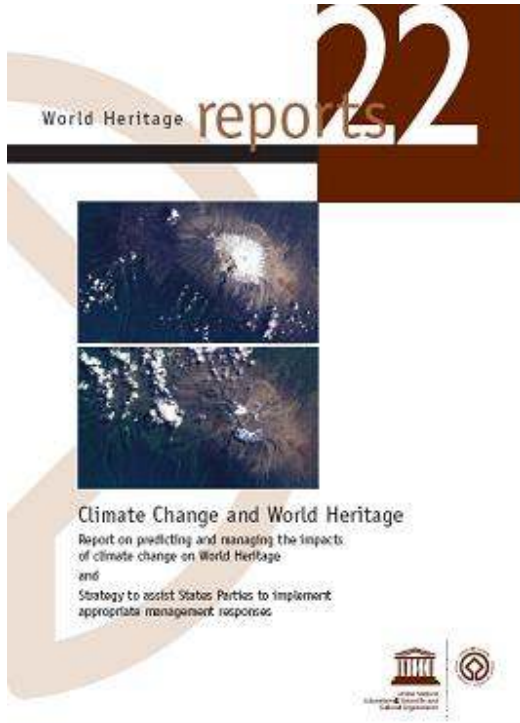
This article was written as a reflection upon the position statement released by the Landscape Institute in October 2008. For full details please access the document at:
www.landscapeinstitute.org



Climate Change and World Heritage

Kerstin Manz & Mechtild Rössler

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World Heritage sites represent a large variety of cultural and natural places of outstanding universal value. Impacts of climate change are being observed all around the world. World Heritage sites are no exception, but rather some of the most vulnerable places on Earth to experience rapidly occurring changes. The intergovernmental World Heritage Committee therefore noted in its decision in 2005 that "the impacts of climate change are affecting many and are likely to affect many more World Heritage properties, both natural and cultural in the years to come".

Since then, intensive consultations and research coordination have been carried out by UNESCO's World Heritage Centre to identify problems and possible solutions.

A first series of case studies on climate change impacts and possible responses on different types of World Heritage sites was completed in 2007, illustrating to what extent marine, mountainous, archaeological, and urban World Heritage sites are already witnessing changes likely to threaten their

outstanding universal value. Other publications have followed, yet they only represent the start of a long-term process involving UNESCO's World Heritage Centre, the Advisory Bodies ICOMOS, IUCN and ICCROM, and all signatory States to the *World Heritage Convention* to develop and implement pilot projects at World Heritage sites. See, for examples:

- *World Heritage Reports n°22 - Climate Change and World Heritage (UNESCO, 2007)*
- *Case studies on Climate Change and World Heritage (UNESCO, 2007)*
- *Policy document on the impacts of Climate Change on World Heritage properties (UNESCO, 2008)*

As an international treaty, the *World Heritage Convention's* comparative advantage lies in the scope of the signatory States' obligations to protect and manage their cultural and natural heritage sites around the world. Any actions taken at these iconic sites can therefore attract considerable attention and influence the adoption of good management practices elsewhere. Recognising the overarching objective of safeguarding the outstanding universal values of World Heritage sites, these sites can serve as laboratories where monitoring, mitigation and adaptation processes can be applied, tested and improved.

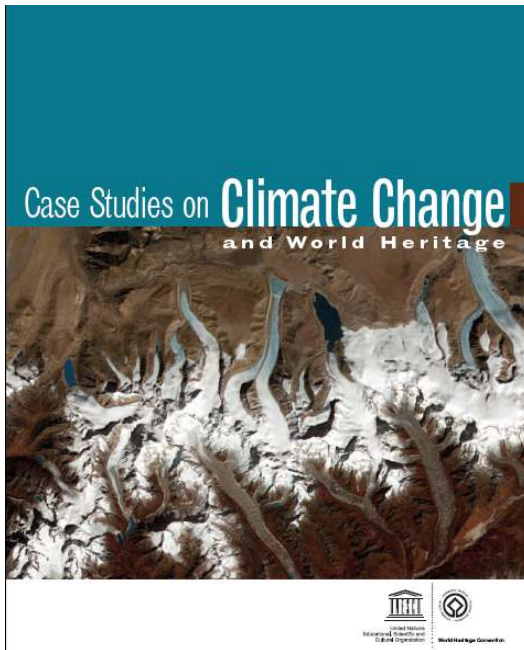
Managers of World Heritage sites are supported in undertaking site-level monitoring, mitigation and adaptation measures. These include climate change messages in communication, education and interpretation activities to build public awareness and knowledge of climate change, its potential impacts on World Heritage properties and their values, and the ongoing activities or available options for adaptation and mitigation. Problems experienced by managers are also translated into concrete research questions to ensure that gaps in knowledge are identified. These are then used to inform the development of relevant research programmes and translation of such research into useful guidelines and protocols for best practice.

While considerable research is underway on the impacts of climate change, particularly in relation to natural ecosystems, much of this research is not focused on World Heritage sites. There is presently a lack of data that are specifically relevant to understanding climate change impacts on World Heritage sites, particularly cultural properties.

Such lack of knowledge and capacity makes it difficult to assess the loss of key values of World Heritage properties occurring as a consequence of climate change. As part of its capacity building activities, the World Heritage Centre and the Advisory Bodies seek to address these gaps in knowledge, information and capacity. Performing



vulnerability assessments will assist in determining priorities for management action. The site-specific nature of the climate change problems facing World Heritage sites, make them indeed ideal as laboratories for long-term climate change impact monitoring and testing of innovative adaptation solutions.



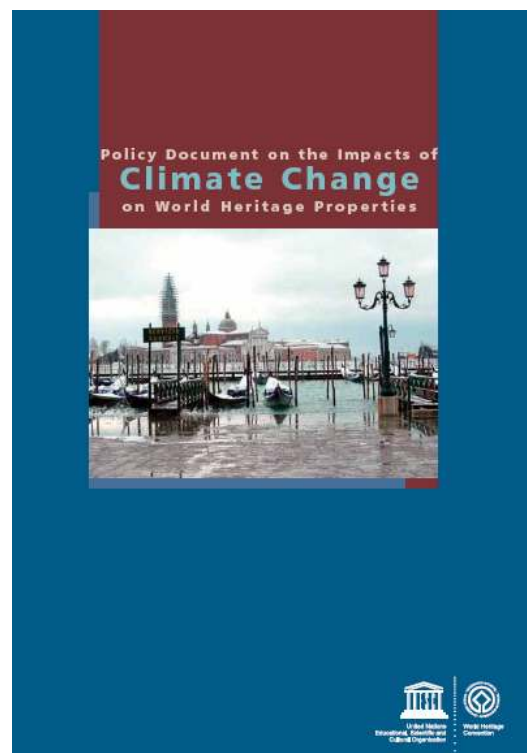
One of the main future challenges will be to find responses to increased risk factors, such as fire, drought, floods, avalanches, and glacial lake outbursts, to support disaster management plans for World Heritage sites. Research also needs to be done on the nature and sources of other stress factors (e.g. pollution, sedimentation, deforestation, and poaching) impacting on sites, which can greatly reduce their resilience to the impacts of climate change. In order to set priorities for a management response to climate change, research is particularly required in relation to impacts on the integrity of World Heritage properties. This is needed to identify key direct and indirect impacts as well as the most effective means to build connectivity between properties and surrounding landscapes (for example through habitat corridors and buffer zones) to promote resilience of species and communities.

Socio-economic studies are to be undertaken, applying cost-benefit analysis in order to value the economic losses from climate change and contingent valuation. Also, the impacts of climate change on societies need to be monitored more closely, particularly on traditional societies or on sites such as cultural landscapes where the way of life contributes to the outstanding universal value of the site. World Heritage cultural landscapes can play a crucial role in understanding how climate changes impact on our environment. They also hold the keys to understanding and learning about possible adaptation

strategies based on traditional knowledge and transfer of best practices among the regions of the world.

The World Heritage Centre and the Advisory Bodies support networking for research, information sharing, exchange of best practice, education and training, awareness raising, and capacity building between the *World Heritage Convention* and other Conventions, international bodies, universities, research institutions, the private sector, NGOs, and other relevant programmes working on climate change issues. All activities are designed to increase synergies to enhance effective implementation of the *World Heritage Convention* by capitalising upon each organization's strengths, and aiming to avoid duplication with, and respect the individual mandates of, other international organisations and mechanisms. For example, the use of the United Nations Framework Convention on Climate Change (UNFCCC) Compendium on methods and tools to evaluate impacts of, vulnerability and adaptation to, climate change is being promoted in World Heritage sites.

With this view, the World Heritage Centre strengthened its relationship with the UNFCCC and IPCC Secretariats. It explored how the Biodiversity Liaison Group can best assist in developing synergies, exploring existing processes in other conventions, including the UN Convention to Combat Desertification (UNCCD) and other UNESCO initiatives, such as the Man and the Biosphere Programme (MAB). Such partnerships will be crucial for the future of our common heritage.





Earthen architectural cultural landscapes and global climate change

Maria Isabel Kanan

Chair

Pamela Jerome

Vice President

ICOMOS International Scientific Committee on Earthen Architecture Heritage

Within the Scientific Council of the International Council on Monuments and Sites (ICOMOS), global climate change and its effects on cultural heritage has been the scientific theme of interdisciplinary research since 2006. First reviewed by three of the international scientific committees (ISCs), ISCEAH (Earthen Architectural Heritage), IPCH (Polar Heritage) and ICORP (Risk Preparedness), the theme was adopted by the Scientific Council and resulted in a one-day symposium in Pretoria, South Africa in October 2007, with published recommendations and a follow-up workshop in October 2008 in Quebec City, Canada. The topic continues to be researched cooperatively by the ISCs through the Scientific Council.

- *What is meant by earthen architectural cultural landscapes and how does climate change affect them?*

Within ISCEAH, one of the five broad areas of scientific research is earthen architectural cultural landscapes. The concept of earthen architectural cultural landscapes as heritage incorporates a wide range of significance including the interrelated connection between the physical, spiritual, social and environmental aspects of an earthen-built heritage. The identifiable quality and distinguishing characteristics of these ensembles are the way they embrace the environment with a strong material attachment. Typically, they include vernacular earthen structures linked and adapted to their regional environment in a variety of climatic conditions. This synchronic link is due to the use of local soil sources for materials and solutions. This is designed according to the needs of the local climate, the evolution of ancestral traditional knowledge since antiquity, the choice of sites within the landscape, the use of land and agriculture, the effective utilization of water resources, and the imbuing of such sites with intangible meanings.

Therefore, the cultural landscape of earthen architectural heritage is extraordinarily varied according to its topographical location and environment: rocky landscapes, deserts, plateaus, valleys, cliff sides, hilltops, etc.

The mud-brick high-rise construction of the World Heritage Site of Shibam in the Hadhramaut Valley of Yemen was recently threatened by an extraordinary amount of rainfall over a 36-hour period causing severe flash floods. Shibam Sahel, part of the cultural landscape of the walled city partially shown here in the foreground, was badly damaged.



Photo : Pamela Jerome



The fact that these characteristics are so specific to their regional location means that changes in the environment significantly affect the physical/cultural balance of these structures, traditional lifestyles and periodic maintenance regimes. Thus, the integrity of this type of heritage is extremely vulnerable to climate change. Climate change will result in modifications to traditional methods of earthen architectural heritage conservation by leading to the replacement of materials and techniques, alterations and loss of structures, and other social modifications like abandonment of tenuous environments no longer viable for human habitation. Climate change will affect amounts of precipitation and ground water levels, with potentially catastrophic results to earthen structures and subsistence activities, which could be washed away by cataclysmic rains and flash floods. The natural regenerative cycle of the weather will be affected, producing changes to irrigation, cultivation of fields, and altering landscapes.

Witness what has recently taken place in the earthen architectural cultural landscape of the Hadhramaut Valley of Yemen. Although normally affected by the cyclical weather patterns of the monsoon, extraordinarily heavy rainfall on 24 October 2008 lasting over 36 hours resulted in severe flash floods, which killed more than 50 people, swept away 250 traditional mud-brick houses in the historic city of Tarim. It is threatening the World Heritage Site of Shibam, often referred to as the Manhattan of the Desert for its unique ensemble of high-rise mud-brick structures. In addition, large expanses of farmland were destroyed, while beehives and livestock were swept away, severely impacting the capacity for maintaining traditional means of livelihood.

- *Can climate change be managed through a cultural landscape perspective, and is it helpful?*

If earthen architectural ensembles are viewed as cultural landscapes, a wider and more sustainable approach can be taken to conserve earthen architectural heritage. The application of the concept of earthen architectural cultural landscapes permits new possibilities for managing and controlling environmental changes while reducing their impacts. Reviewing traditional methods for human habitation in marginal environments could be key to sustained land stewardship and development.

- *ISCEAH's cultural landscape research group.*

The cultural landscape research group of ISCEAH is committed to discussing and reflecting on the significance and characteristics of this particular type of cultural landscape, and more specifically, the role this heritage could play in local sustainable development. The group began to define its focus of discussion after Terra 2008 (11th International Conference on the Study and Conservation of Earthen Architectural Heritage), which took place in Mali in February 2008. Post-conference tours to review sub-Saharan African earthen architectural heritage in impressive landscape settings made a tremendous impact on the participants of Terra 2008, and left no doubt as to the importance of conserving earthen architectural landscapes relative to the social significance of these cultural environments. Although much more research is needed, it is clear that earthen architectural cultural landscapes have the potential to serve as role models for managing a variety of problems that significantly affect earthen architectural sites. The cultural landscape research group of ISCEAH would like to open the debate about the conservation of earthen architectural cultural landscapes and is looking for other groups, committees, individuals and experts who would like to collaborate in this discussion.

In an attempt to stave off the frequency of mud plastering maintenance regimes, which have significantly increased because of changes to rainfall patterns, the aesthetics of the earthen architectural cultural landscape of Timbuktu in Mali has been dramatically altered by the re-surfacing of walls with stone veneers.



Photo : Pamela Jerome



Open letter to IFLA: Climate Change Action Plan Model

Craig Pocock

Over the last few months I have given the idea of creating an IFLA Climate Change charter a lot of thought. I reviewed the International Union of Architects/L'Union Internationale des Architectes (UIA) Declaration on Sustainability and Cultural Diversity as a starting point.

I started working on flow diagrams I but kept coming back to a more circular diagram that tended with my blurry, tired eyes to look like a molecule, with ideas in circles connected with lines. At this stage I turned to carbon molecules and found that one of the most readily identifiable is the C₆₀.

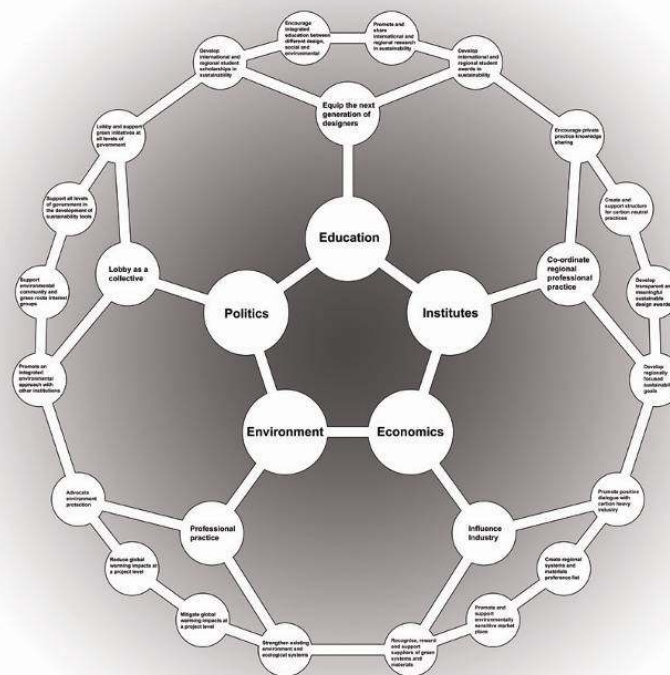
In many ways, the UIA Declaration's open-ended approach makes sense. Because of the complexity of the issues surrounding Climate Change and sustainability, it is hard to approach a charter at an "all encompassing" level without it becoming open ended and word heavy.

A tight, direct, and explicitly written charter that gives a clear road map of actions might potentially limit new approaches to Climate Change over time. So while there is a value to vagueness, it does not help individuals on the ground. For them the issue of Climate Change gets pushed to the side again.

I started writing a draft IFLA charter but it became clear to me that the first step should be to create a Climate Change action plan.

This needed to be detailed enough to start giving direction, but open enough to allow regional development depending on what core Climate Change issues were most significant to each region. I came to the conclusion that the action plan had to be visually based so that the complexity of ideas could be understood in relation to each other, and not a vertically word heavy document.

The diagram below shows the C₆₀ soot molecule as a means of creating an IFLA Climate Change Action Plan (The Soot action plan). The name is open for discussion.



IFLA Climate Change Action Plan
Craig Pocock

C₆₀ is one of the molecules found in soot. It takes the "buckyball" form discovered and made famous by R Buckminster Fuller, the writer of *Operating Manual for Spaceship Earth* and Geodesic domes.

It seems ironic that the Climate Change action plan could be based on the C₆₀ structure, and could be called the "soot plan" which has been one of the most readily identifiable forms of pollution since the Industrial Revolution.

What is useful about creating a Climate Change action plan in the soot graphic form is that it allows for the following:

- A fast, graphic understanding of core issues.
- There is no end point to the action plan, which can be continuously developed over time
- No one issue is weighed above another, allowing each region landscape institute to take the "base" soot action plan and develop it for its own region. This caters for each region's unique environment. For example, the approach of the institute in New Zealand (NZILA) and the weighting of issues for its model would potentially be different from those of other regional landscape institutes.



- You can link ideas, creating an understanding of the relationships and synergies between actions that is hard to show in the form of a word based charter document.
- The C₆₀ model gives you five directions which could be independently unplugged from the model, developed by an expert team and then re-plugged back into the model for everyone's benefit.

The Soot action plan was created as a starting point. It is not considered the end product, but a potential structure for addressing the complexity of Climate Change and the synergies between actions. I image that it will be discussed and developed as an ongoing process before an action plan was accepted. Once an action plan is identified, I believe it will then be the time to write the IFLA charter addressing Climate Change to support the action plan. I understand that this is not the order in which this is normally done but Climate Change I believe is too complex to use the "business as normal" model.

The final point I believe really needs to be addressed is this: If IFLA wants to make a significant positive impact on reducing globing warming then it has to be willing to bear its full weight on the issue. This may mean IFLA having to reconsider its role as an institute. As an international collective IFLA has considerable political and economic influence, which if used as a constructive tool could bring about the fastest positive change for Climate Change. We know that landscape architecture is a major client of international manufacturing (concrete, steel, copper, stainless steel, plastics, mined stone, timber), which is one of the most polluting sectors in the world, secondary only to agriculture. If IFLA were to start meaningful dialogue with manufacturing about the issues of environmental impact of material production, and empower its individual members with the information to make informed decisions on material selection, it would achieve a significant impact on Climate Change. The traditional approach of strengthening education and research is a positive step, but IFLA can make a greater contribution by starting to use it collective buying power for positive change.

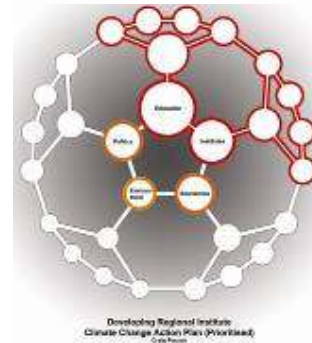
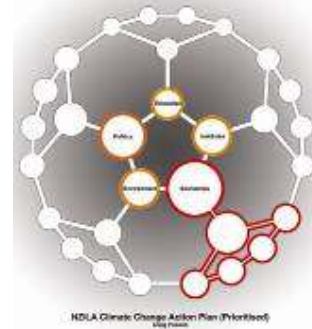
I hope this is helpful or will at least spark debate on the process and the role of IFLA and Climate Change. I have a range of further developed ideas on how to strengthen research, encouraging private practice to share information, creating transparent and meaningful sustainability design awards, how to approach industry, and so on. These can be developed once the base model idea has been considered by IFLA, and if found to be viable.

Kind regards,

Craig Pocock
 director, pocock design:environment limited
 +64 3 358 3040; 021 701 308

Please refer to www.carbonlandscape.co.nz to find readable images of all diagrams and a five-slide PowerPoint presentation on how the model works.

The diagrams below show the base Soot action plan being developed for three different IFLA regional councils to suit their present environmental conditions.



The diagram below shows the Soot action plan being developed for New Zealand, weighing the five core issues differently and how the issue of economics could be developed further than the base model shows

