



Adaptation to the Changing Climate: Building Resilience

Introduction

As part of the 2015 Paris Climate Change Agreement, Australia has committed to keeping global temperature rise this century well below 2 degrees Celsius above pre-industrial levels. Australia's contribution to the Agreement is to reduce emissions by 26-28 per cent below 2005 levels by 2030. There is significant opportunity for emissions reduction in the design and management of Australia's cities and settlements, farming lands and natural environments.

As greenhouse gas emissions in the earth's atmosphere rise, the earth is warming and the climate is changing. These changes vary with place and are difficult to predict with certainty, however Australia is already seeing sea level rise with coastal inundation, ocean acidification, and increased occurrence of extreme weather events like droughts, heat waves, storms and flash floods. Changes to the climate will have substantial impacts on agriculture, water resources, the economy, human health, and natural systems.

In response to these challenges, governments are working with their communities to develop resilience strategies to prepare for future change. Committed to designing and creating a better Australia, landscape architects are well placed to play a leading role in developing and implementing these strategies. Landscape architects conceive, reimagine, and transform the outside world - from streetscapes to parks and playgrounds, to transport solutions and tourism strategies. With allied professionals, landscape architects can contribute to landscape-based solutions and integrated ecological outcomes to reduce climate risks and increase resilience.



Issues

It is imperative that effective mitigation strategies are implemented to avoid dangerous climate change by limiting global warming to below 2 degrees Celsius above pre-industrial levels. Climate impacts are already being observed and will continue. Adaptation strategies are needed to help individuals, communities, businesses, and natural systems deal with the consequences of climate change.

Protecting the health and wellbeing of our communities, economy, and our natural environment requires government, businesses, and communities to work together to tackle climate change and to deliver Australia's carbon reduction targets, as well as ensuring that Australian communities are well positioned to urgently develop resilience. This is a shared responsibility.

Key barriers to the implementation of landscape-based measures for carbon emissions reduction and adaptation measures include:

- Lack of bipartisan government support with resultant uncertainty in national carbon reduction policy and regulation
- Differing national, state and local policy and regulation
- Absence of long-term resilience strategies and fit-for-purpose risk management approaches to the planning and design of our built environments
- Lack of robust data and agreed methods for quantifying the economic benefits of landscape-based mitigation and adaptation to support the business case to financial decision makers
- Lack of robust data and agreed methods for quantifying the economic benefits of increasing landscape biomass to sequester carbon
- Inadequate awareness and acceptance of the role and importance of the landscape as living infrastructure for adaptation and resilience.
- Existing sustainability rating tools do not include landscape elements in the assessment of design and development proposals.



AILA's Position

AILA calls for all levels of government to show leadership and to work with business, industry, and the community to meet or exceed our obligations to keep global warming well below 2 degrees Celsius above pre-industrial levels.

AILA advocates for landscape architects to be included in development of:

- climate adaptation and mitigation strategies and planning
- living (green) infrastructure and urban ecology strategies
- economic frameworks that recognise the carbon sequestration value of landscape.
- policy and regulatory measures for new development and infrastructure to:
- support minimum performance standards for carbon [and other harmful emissions] as part of sustainable development metrics
- report progress of measures against carbon reduction targets across all levels of government and the business sector
- provide microclimate and context-specific solutions
- invest in climate adaptation measures such as urban green cover (urban forests, green roofs and walls etc), Water Sensitive Urban Design and development of Water Sensitive Cities.
- ensure that lifecycle assessment including carbon accounting and future climate impacts are considered in all capital works and development projects, and;
- embed climate risk assessment and management in planning and design as part of development and works approvals.

AILA advocates an integrated multi-disciplinary approach to address climate change mitigation and adaptation. AILA also advocates for more investment in research, education, and training to help government, businesses, and communities mitigate and manage climate change risks and adapt to the consequences of climate change. These include:

- quantifying the role of landscape and its components in mitigation and adaptation
- data and tools such as risk and vulnerability mapping, to better understand, predict and plan for a changing climate
- incorporating climate change adaptation and resilience, as well as ecosystems behavior, into tertiary and professional training
- guidance for land administrators to manage natural hazards in high-risk areas, including flooding, bushfires, coastal inundation, cyclones and storm surge.

Landscape architects can play a leadership role in planning, designing, managing and creating a better Australia that is adaptable, prosperous, and resilient to future challenges.



Case Studies

Resilient Melbourne Strategy, 2016

As part of the Rockefeller Foundation's 100 Resilient Cities' Network, Melbourne is the first Australian city to develop a strategy to help the city become more resilient to the chronic stresses and acute shocks that the 21st century will bring.

In order to ensure that Melbourne is viable, sustainable, liveable, and prosperous into the future, the strategy has four objectives – stronger together, our shared places, a dynamic economy, a healthier environment – which are addressed in four action areas: Adapt, Survive, Thrive, Embed.

Landscape architects will contribute to many of the projects within each action area. This is already happening in the action area Adapt, for example, where landscape architects are contributing to metropolitan urban forestry strategies across Greater Melbourne to “enable strong natural assets and ecosystems alongside a growing population” (p. 63, Resilient Melbourne Strategy). They will also have a role in The Neighbourhood Project, “to create and sustain buildings, infrastructure and activities that promote social cohesion, equality of opportunity and health”, helping “community groups transform under-used land around Melbourne into a network of new public spaces” (p. 75, Resilient Melbourne Strategy). Landscape architects can be expected to participate in projects in other action areas, as well, such as the community-led neighbourhood renewal and development pilot projects in action area, Thrive.

Objectives of Resilient Melbourne Strategy, 2016.

Image courtesy of: http://resilientmelbourne.com.au/wp-content/uploads/2016/05/COM_SERVICE_PROD-9860726-v1-Final_Resilient_Melbourne_strategy_for_web_180516.pdf

<http://www.melbourne.vic.gov.au/SiteCollectionDocuments/resilient-melbourne-strategy.pdf>



City of Salibury – Towards A Water Sensitive City

The City of Salibury, north of Adelaide, has developed a Water Sensitive urban forestry and development plan, which began as a landscape based habitat development and water harvesting project over 30 years ago. It is a brilliant Australian “how to” case study in world best practice for large scale water sensitive, ecological and landscape based sustainable development.

Initiated by the Council, it has attracted both federal and state government funding. Investment totaling over \$115M has enabled the City of Salisbury to successfully develop a comprehensive plan including innovative storm water harvesting in underground aquifers to provide water security, development of large scale urban forestry and parks, rehabilitation of the Barker Inlet mangrove swamps and the associated ecosystem, selling and trading water to local industries via a Water Business Unit, attracting businesses and industries to Salibury with increased employment opportunities. A second pipe has been established to deliver water to industry and new housing estates.

In addition to the economic benefits the program has also had a substantial social and community health impact, by increasing both passive and active recreation space and development of a stronger, resilient community.

[www.salibury.sa.gov.au/water sensitive cities paper.pdf](http://www.salibury.sa.gov.au/water-sensitive-cities-paper.pdf)

www.treenetmedia.com/up/pdf/2013/treenet13D1S07.pdf

www.citieseerx.ist.psu.edu/viewdoc/download?doi+10.1.1.455.3646&rep1&type+pdf

Adapting to Climate Change: Launching the Debate in the Lower Ouse Valley, LDA Design, Ouse Valley, Sussex, United Kingdom, 2014.

<http://www.lda-design.co.uk/projects/climate-change-vision-and-action-plan-for-the-lower-ouse-valley>.

Community engagement is essential to reducing climate change risk and promoting resilience. London-based landscape architectural firm LDA Design has worked with communities in Newhaven, Seaford, Lewes, and rural areas of England to raise their awareness of climate change and sea level rise, and to help them to adapt.

Using scenarios for long-term adaptation, the landscape architects and communities created local climate change visions and action plans. These included traditional flood defences and more innovative approaches such as managed realignment, relocation of buildings and infrastructure to higher ground or their elevation on stilts or floating platforms, and resilient farming practices.



Scenarios used by LDA Design in community consultation workshops in the Lower Ouse Valley, England. Image courtesy of http://www.lda-design.co.uk/wp-content/uploads/2013/12/CCE_Lower-Ouse-Valley.pdf

Room for The River (H+N+S Landscape Architects, team member), The Netherlands, 2002-03
<https://www.ruimtevoorderivier.nl/english/> .

Room for the River is an innovative program in the Netherlands to restore natural floodplains to manage high water levels generated by flooding upstream or rising sea levels.

H+N+S Landscape Architects, Netherlands, were the coordinating architects for the Nijmegen project within the Room for the River program. H+N+S Landscape Architects approach landscape architecture as a design process that interconnects functionality and beauty, characterizing their work as engineering art ([www. http://www.hnsland.nl/en/](http://www.hnsland.nl/en/)). Responsible for the landscape design, they developed the Nijmegen Council's preliminary design into a final design for the Urban River Park and its various elements.



Floodplain redevelopment to accommodate flood waters in Nijmegen, designed by H+N+S Landscape Architects as part of the Room for the River project. Image courtesy of <https://pbs.twimg.com/media/CNMOBiaWIAEJ7Ak.jpg>

Dutch Dialogues, (H+N+S Landscape Architects, team member, New Orleans USA and the Netherlands, 2007-11
<http://dutchdialogues.com>

Located in a delta, New Orleans is confronting challenges of progressive ground subsidence and damage from regular flooding behind the dikes, caused by extreme rainfall events. H+N+S Landscape Architects (Amersfoort, the Netherlands), as part of an international consortium, developed a new integrated water management strategy for the city, which celebrated water and made it visible in the urban landscape. Three principles underpinned the strategy: delay, store, and drain. At various scales within the city, water would be retained on-site and allowed to percolate into the subsoil. After the peak of the rainfall event, the water could be slowly discharged, thereby reducing pressure on the drainage system and associated flooding.



Integrated urban water management strategy for New Orleans, developed by international consortium, including H+N+S Landschaftsarchitecten. Image courtesy of <http://www.hnsland.nl/en/projects/urban-water-plan-new-orleans>.



Supporting research/links

Understanding and adapting to climate change impacts

<http://www.climatechange.environment.nsw.gov.au/>
<http://www.bom.gov.au/state-of-the-climate/>
www.climatechangeinaustralia.gov.au

Australia's 2030 Emissions Reduction Target

<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-emissions-reduciton-target>

Paris Climate Change Agreement

<https://www.environment.gov.au/climate-change/international/paris-agreement>

Strengthening Australia's resilience to climate change

<http://www.csiro.au/en/Research/OandA/Areas/Assessing-our-climate/Climate-adaptation-research>

Resilient Melbourne Strategy, 2016

<http://www.melbourne.vic.gov.au/about-melbourne/melbourne-profile/Pages/100-resilient-cities.aspx>

Establishing a national agenda for urban green infrastructure

<http://www.csiro.au/en/Research/LWF/Areas/Resilient-cities-21C/Green-infrastructure>

Urban Living Labs: a laboratory for living better

<https://blogs.csiro.au/ecos/urban-living-labs-a-laboratory-for-living-better/>

Australian Standard 5334-2013 : Climate change adaptation for settlements and infrastructure - A risk based approach

Cooperative Research Centre for Water Sensitive Cities into urban planning and water management in Australia and overseas

<https://watersensitivecities.org.au/>

Green Building Council of Australia (GBCA), Green Star Communities tool - Adaptation and Resilience Credit

Australian Sustainable Built Environment Council, Climate Change Adaptation Framework for the Built Environment

www.asbec.asn.au/research/

Planning Institute of Australia Climate Change Policy

<https://www.planning.org.au/policy/climate-change>

Engineers Australia Climate Change Policy

<https://www.engineersaustralia.org.au/about-us/policy-statements>



National Climate Resilience and Adaptation Strategy 2015

<https://www.environment.gov.au/climate-change/adaptation/publications/national-climate-resilience-and-adaptation-strategy>

Technical Guidelines for Urban Green Cover in NSW

<http://climatechange.environment.nsw.gov.au/Adapting-to-climate-change/Green-Cover>

Resilient Sydney Report

http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0006/263976/2016-503932-02-Report-Resilient-Sydney-City-Context-Report-FINAL-ISSUED.pdf

Other position statements

Cooling Cities
Green Walls and Roofs

Further information

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