

the influence of permaculture on landscape architecture in Australia



present and potential

'The influence of permaculture on
landscape architecture in Australia:
present and potential'
July 2004

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This paper is the final thesis for the
Advanced Studies in Landscape
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I would like to express my thanks to the following people for their assistance with this paper

Dr. David Jones
Graham Brookman
for their guidance and resources

Nathan Alexander
Greg Cater
Kate Cullity
Keith Davis
Patrick Graham
Brett Grimm
Carolyn Herkes
Graeme Hopkins
Jacqui Hunter
Sharon Leith
Victoria Mastermind
James Nancarrow
Jo Nelder
Steve Poole
Margaret Rainbow Web
Debbie Saegenschnitter
Deborah White
Jared Wilson
for their contributions

Thanks to Ross, Kathryn, Clare, Jarrod
and Rosy for their support

This paper presents an inquiry into the present and potential influence of permaculture on landscape architecture in Australia, and in South Australia specifically. The results of the Australian literature review and survey of South Australian landscape architects and permaculturalists indicate the present exposure and understanding of permaculture by Australian landscape architects is varied. The overall interaction with, and influence of permaculture concepts is very limited, and where present, unpublicised. Key issues contributing to this low level of interaction and influence are determined as current community and client priorities, differences in approaches to aesthetics and the role of animals, and establishment and maintenance timeframes. In addition, the subtleties of professional identity, stereotypes and terminology, are contributing elements. A discussion of the common ground between the two disciplines and the fundamental importance of landscape architecture to contribute to sustainability are the catalysts for the argument that exciting opportunities and innovation would result from a greater interaction with permaculture concepts within the profession in Australia.

The emergence of landscape architecture as a distinct profession and the development of permaculture as a concept and movement in Australia has occurred simultaneously over the last three decades. Permaculture is a theoretical and design approach to the achievement of permanent culture. Within the context of the development and current status of landscape architecture and permaculture in Australia, this paper explores the understanding of, interaction with, and influence of, permaculture on the landscape architecture profession in this country. Through the exploration of these issues the future potential of this relationship is discussed.

Section one of this paper contains the statement of inquiry and outlines the inquiry questions, its perspective and scope. Background information on the permaculture movement and the landscape architecture profession in Australia is included to establish a context for the sections to follow. Section one also contains the methodology explaining the processes undertaken for its two components; a literature review and a survey of professionals.

Section two outlines and analyses the information gained in the literature review and professional survey. The literature review content is initially separated into Australian permaculture literature, Australian planning and landscape architecture literature and international literature, before overall conclusions are drawn on the results. The professional survey responses, firstly from the landscape architects and secondly the permaculturalists, principally based in South Australia, are summarised.

Section three of the paper is a discussion of the inquiry questions based on the results of the literature review and the professional survey. This discussion begins with a comparison of the outcomes of the two components of the inquiry. Key issues related to each question which have emerged through the inquiry process are explained. The section concludes with ideas for the future potential influence of permaculture on landscape architecture in Australia.

Section three also contains the conclusion and questions for further inquiry. Section four concludes with the bibliography and appendices of the paper.

Motivation for inquiry

This paper provided an opportunity to pursue an interest in improving my understanding of the concept permaculture and its relationship to landscape architecture. My previous, but extremely brief, exposure to the term had stimulated great interest and excitement in the potential for a synergy between permaculture and landscape architecture. It seemed logical that any exploration of this potential should begin with an analysis of the current situation and issues surrounding it. Through this analysis and discussion it is my intention to stimulate interest, further discussion and inquiry [be it by individuals, offices or as a profession] into the potential of the relationship between permaculture and landscape architecture in Australia.

Inquiry area

The influence of permaculture on landscape architecture in Australia generally, and specifically in South Australia

Inquiry Questions

_What has been the influence of permaculture on the built environment in Australia?

_What is the current understanding of, influence of, and interaction between permaculture and landscape architecture in South Australia?

_What are the key issues effecting this interaction?

_What are the similarities and differences between permaculture and landscape architecture as an approach/profession?

_What is the potential for greater influence and interaction between permaculture and landscape architecture in Australia?

Inquiry Perspective

As a student of landscape architecture the inquiry questions have been approached from a landscape architecture perspective. As this is my principal area of education, knowledge and interest, the purpose of the inquiry is to analyse and discuss the issues listed above with a focus on the current situation, perception and potential within the Australian landscape architecture profession.

Inquiry Scope

While this inquiry focuses strongly on the landscape architecture profession [meaning those professionals trained as landscape architects], the scope has been deliberately broadened. Landscape architecture as a distinct profession is relatively young and small, therefore many 'landscape projects' have previously, and continue to be, undertaken by professionals not specifically trained in landscape architecture, e.g. urban planning, architecture, horticulture, landscape design and engineering. Particularly at the large scale [often urban planners] and residential scale [often landscape designers] landscape architects are not the dominant field engaged.

The context

To establish the context of this inquiry, very brief descriptions of permaculture and landscape architecture have been included. Both permaculture and landscape architecture are broad and complex in scope and these overviews particularly that on permaculture, are intended only to provide an introduction to the key ideas and relevant issues. It is not the aim of this paper to present a detailed account of the development of permaculture as a distinct concept, nor debate the internal variations in approach, definition and application of those involved in the movement.

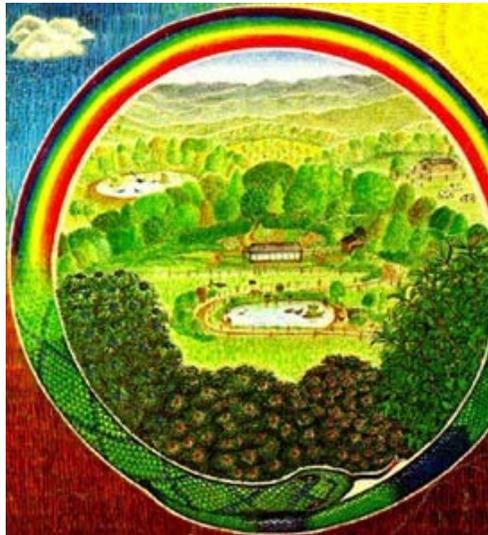


image one

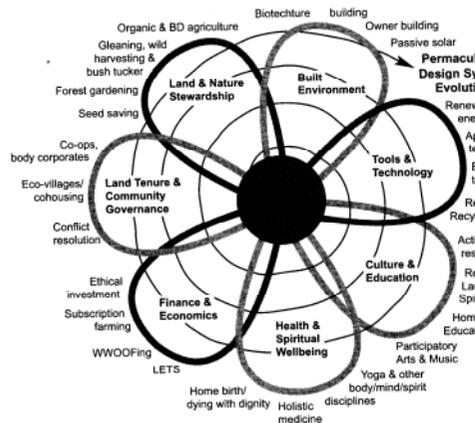


image two

Defining Permaculture

The word permaculture was coined by Bill Mollison and David Holmgren in the mid-1970s to describe an “integrated, evolving system of perennial or self-perpetuating plant and animal species useful to man”¹. A more current definition of permaculture, which reflects the expansion of focus implicit in *Permaculture One*², is “consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for provision of local needs.”³

“Permaculture (permanent agriculture/permanent culture) is the conscious design and maintenance of agriculturally productive ecosystems which have the diversity, stability, and resilience of natural ecosystems. It is the harmonious integration of landscape and people providing their food, energy, shelter, and other material and non-material needs in a sustainable way.

Permaculture design is a system of assembling conceptual, material, and strategic components in a pattern which functions to benefit life in all its forms. The philosophy behind permaculture is one of working with, rather than against, nature; of protracted and thoughtful observation rather than protracted and thoughtless action; of looking at systems in all their functions, rather than asking only one yield of them; and allowing systems to demonstrate their own evolutions.”⁴

Inherent in the formation of permaculture was the notion of a permanent culture. The focus on agriculture was because it is chiefly through agriculture that people’s most essential requirements are supplied and “that people without a healthy interdependence on their

natural resource base have no hope of maintaining a durable culture and society.”⁵ More current explanations of permaculture highlight design as the principal activity which combines the physical, social and conceptual elements into a “beneficial assembly of components in their proper relationships”⁶. The deliberation of social aspects such as legal, economic and cultural dynamics and further progression of the philosophical and ethical foundation of permaculture has been driven by the acknowledgment that these factors are essential to any development of sustainable land use.⁷

“Permaculture is about values and visions, and designs and systems of management that are based on holistic understanding, especially on our bio-ecological and psychosocial knowledge and wisdom. It is particularly about our relationships with, and the design and redesign, of natural resource management systems, so that they may support the health and well-being of all present and future generations”⁸

Permaculture Ethical and Design Principles

Ethical principles, and also design principles, were not explicitly listed in early permaculture literature. Since the development of the Permaculture Design Course, ethics have generally been covered by three broad principles:

- Care for the earth
 - Care for people
 - Set limits to consumption and reproduction, and redistribute surplus.⁹
- These principles were distilled from research into community ethics, as adopted by older religious and cooperative groups. The third principle, and even the second, can be seen as derived from the first.¹⁰

Holmgren Design Principles

Permaculture design principles evolved from a way of viewing the world often described as “systems thinking”. Permaculture principles are brief guiding statements for direction and decision making in design. “These principles are seen as universal, although the methods which express them will vary greatly according to place and situation”.¹¹ Mollison and Holmgren have each developed their own specific list of design principles.

Mollison design principles

1. Work with nature, rather than against the natural elements, forces, pressures, processes, agencies, and evolutions, so that we assist rather than impede natural developments
2. The problem is the solution; everything works both ways. It is only how we see things that makes them advantageous or not.
3. Make the least change for the greatest possible effect.
4. The yield of a system is theoretically unlimited. The only limit on the number of uses of a resource possible within a system is in the limit of the information and the imagination of the designer.
5. Everything gardens, or has an effect on its environment.¹²

The development of permaculture

Permaculture emerged from an intense but short working relationship between Mollison and Holmgren in 1970's Tasmania¹³, a focus point of environmental activism and innovation in Australia. Permaculture was founded on

the belief in the need for a “positivistic” response to the “environmental crisis facing modern society” and a number of assumptions drawn from this.¹⁴

Through the initial text *Permaculture One* and the public forums and design courses that soon followed, interest and support for this burgeoning concept spread. From this beginning permaculture has remained a grass roots movement, now with enthusiasts in many countries. “Permaculture is... a worldwide network and movement of individuals and groups who are working in both rich and poor countries on all continents to demonstrate and spread permaculture design solutions. Largely unsupported by government or business, these people are contributing to a more sustainable future by reorganising their lives and work around permaculture design principles”¹⁵ (A list of organisations and publications relevant to this inquiry is listed in the bibliography in the appendices)

The quality and certification of the education of permaculture through design courses has been formalised somewhat through the Permaculture Institute, founded by Mollison.¹⁶ This organisation promotes and protects the education of permaculture, ensuring it is delivered by qualified teachers accredited by the institute. However, the nature of permaculture as a concept and the drive of Mollison, Holmgren and others has seen the ideas contained within the original manifesto tested, developed and extended, often with different focuses and priorities, resulting in permaculture as an evolving, multifaceted approach.

image three



The formal presence of landscape architecture as a distinct and recognised profession in Australia has only emerged in the last forty years. Despite this there is a long history of landscape and garden design in Australia dating back to the nineteenth century in the form of government initiated botanic gardens and public parks.¹⁷ A number of international and local designers undertook work in public and private gardens, notably Gertrude Jekyll, Charles Bogue Luffman and Edna Walling.¹⁸

The development of the profession in Australia fluctuated during the twentieth century. In the fifties, Australian designers who became members of The International Federation of Landscape Architects (IFLA), which formed in 1948, began moving to establish a professional body within Australia. The first tertiary courses were post graduate and emerged during the sixties in Melbourne and Sydney.

It was not until 1970 that the title *Australian Institute of Landscape Architects* was accepted and formally incorporated.¹⁹ This was recognition of the distinct training and role of landscape architects as opposed to other associated design and environmental professions. "Landscape architects combine art and science to provide creative designs and land management solutions specific to individual sites, meeting the particular requirements of their clients and the environment."²⁰

Undergraduate courses were established soon after the formation of AILA helping to boost the profession from five landscape architects in the early sixties to the current number of over a thousand.²¹ Since the 1970's it is not only the

number of landscape architects in Australia that has grown, but also the scope of positions and projects undertaken by those trained in the area. This has developed the need for a range of skills and "the profession of Landscape Architect now encompasses professionals with increasingly diverse backgrounds including environmental science, urban design, planning, graphic arts, arboriculture, horticulture, and project management."²²

AILA and its associated journal *Landscape Australia* have continued to provide a vehicle for debate within, and promotion of, the profession. While the definition and role of Landscape Architects continues to be somewhat ambiguous it can be described as designing "the built environment of our neighbourhoods, towns and cities while...[working to] protect and manage the natural environment of our forests, mountains, rivers and coastlines...Landscape architecture is the profession committed to the creation of meaningful and enjoyable outdoor places and to the sustainable management of our environment."²³

AILA official literature draws attention to the issues of "increasing urbanisation and growing pressures on natural systems" and to the importance of sustainable strategies in projects. In addition to this, the Institute on behalf of the profession highlights the vital role of public space, in which the majority of landscape architects work, as an effective "venue for social interaction, celebration and human endeavour."²⁴

These two issues require integrated solutions, which landscape architects can play a leading role in providing. The broad scope of work undertaken by landscape architecture professionals in Australia, and the improving recognition of their unique knowledge and skills, means there is much potential for this leadership role. "Landscape architects [can] strive to be not only creative in planning and design but also effective in influencing policy, priorities, allocation of resources and public perceptions and expectations."²⁵

Literature Review Methodology

The inquiry incorporated a literature review of Australian permaculture, urban planning, and landscape architecture literature including:

Published books
Conference proceedings
Journals and
Online material

Searches of databases included:

The University of Adelaide Library Catalogue
The University of South Australia Library Catalogue
Flinders University Library Catalogue
The State Library of South Australia Library Catalogue
ARCH The Australian Architecture Database
The Avery Index to Architectural Periodicals
Google and AltaVista internet search engines

A review of selected international literature relevant to the statement of inquiry was also undertaken.

Professional Survey Methodology

The professional survey component of this inquiry was a series of individual interviews with landscape architects, planners, designers and permaculturalists in Adelaide endeavoring to cover a cross section of backgrounds, approaches and areas of professional work. The professional survey of landscape architects based in Adelaide is not intended to provide statistical data representative of South Australian or Australian landscape architecture professionals with regard to the issues of this paper. Rather the survey acts as a resource for comparison with the literature review and as a source of opinions and issues for the discussion of the inquiry questions.

The information gained from this survey will be analysed against the 2001 AILA Membership Survey²⁶ to allow some educated speculation on broader trends across the Australian profession.

The aims of the landscape professionals interviews was to gauge participants:

- § Level and medium of exposure to permaculture
- § Understanding of the concept of Permaculture
- § Perception of the influence of permaculture on their approach to landscape architecture and urban design
- § Opinion of the current and future key issues in the work of landscape architects
- § Opinion of current level of interaction between permaculture and landscape architecture in Australia and the issues surrounding this.
- § Opinion of the future potential for permaculture to inform landscape architecture particularly urban design and urban public space.

The aims of the permaculturalists interviews were to gauge participants:

- § Understanding of the definition and scope of Landscape architecture
- § Personal application of permaculture
- § Opinion on the potential of urban permaculture
- § Opinion of the current level of interaction between permaculture and landscape architecture in Australia and issues surrounding this.
- § Opinion of any differences between permaculture and other approaches to sustainable design
- § Opinion of the opportunity for greater interaction between permaculture and landscape architecture, particularly in the urban context.

- ¹ Bill Mollison and David Holmgren, *Permaculture One: A perennial agriculture for human settlements* 3rd edition (Aust: Tagari Books, first published 1978, this edition 1987), p1.
- ² Bill Mollison and David Holmgren, *Permaculture One: A perennial agriculture for human settlements* 3rd edition
- ³ David Holmgren, *Permaculture: principles and pathways beyond sustainability* (Aust: Holmgren Design Services, 2002), p xix
- ⁴ Geoff Lawton, *Permaculture defined on The Permaculture Research Institute Site*, <http://www.permaculture.org.au/article.php?articleid=18>
- ⁵ David Holmgren, *The Development of Permaculture*, 1991, <http://www.holmgren.com.au/DownloadableFiles/PDFs/10PCdevelop.pdf>, p6
- ⁶ David Holmgren, *The Development of Permaculture*, 1991, p6
- ⁷ David Holmgren, *The Development of Permaculture*, 1991, p7
- ⁸ Stuart B. Hill, *Foreword to David Holmgren, Permaculture: principles and pathways...*
- ⁹ Bill Mollison, *Permaculture: A designer's manual* (Aust: Tagari Publications, 1988), p2
- ¹⁰ David Holmgren, *Permaculture: principles and pathways...*, p xxv
- ¹¹ David Holmgren, *Permaculture: principles and pathways...*, p xxv
- ¹² Bill Mollison, *Permaculture: A designer's manual*, p35
- ¹³ David Holmgren, *Permaculture: principles and pathways...*, preface
- ¹⁴ David Holmgren, *Permaculture: principles and pathways...*, preface
- ¹⁵ David Holmgren, *Permaculture: principles and pathways...*, p xx
- ¹⁶ Bill Mollison, *Permaculture Institute website*, <http://www.tagari.com/Permlnst/PermlnstHome.htm>
- ¹⁷ John Gray, "Establishing Landscape Architecture in the Public Domain" in *Landscape Australia*, 1/2002, p50
- ¹⁸ Margaret Hendry, *The profession of landscape architecture in Australia: some historical influences on theory and practice*", in *Landscape Australia*, 3/1997, <http://www.aila.org.au/information/landscape-architecture/historyhendry/history-hendry.htm>
- ¹⁹ Margaret Hendry, *The profession of landscape architecture in Australia*
- ²⁰ AILA, *What is Landscape Architecture?*, <http://www.aila.org.au/information/landscape-architecture/about-information.htm>
- ²¹ Margaret Hendry, *The profession of landscape architecture in Australia*.
- ²² AILA Industry Employment Statement, October 2002, <http://www.aila.org.au/information/landscape-architecture/AILA-employment.pdf>
- ²³ AILA *What is Landscape Architecture?*
- ²⁴ AILA Industry Employment Statement, October 2002
- ²⁵ AILA Industry Employment Statement, October 2002
- ²⁶ Linda Corkery, *Snapshot of a Profession: A report on the 2001 AILA Membership Survey*, www.aila.org.au/conference/papers/2001-survey

Australian Permaculture Literature

The concept of permaculture was first presented in published literature in 1978 by Bill Mollison and David Holmgren in *Permaculture One*. Bill Mollison immediately expanded on this text with *Permaculture Two* (1979). It was these two books, predominantly *Permaculture One* that greatly assisted the spread of permaculture ideas throughout Australia and the world. Since the initial publication, both Mollison and Holmgren have consistently contributed to permaculture literature through published books, journals, newsletters and more recently online material. The co-founders, like other's who were inspired by their concept, have each pursued their exploration of the permaculture concept with different perspectives and focus. This has provided permaculture with a rich diversity of literature format and subjects.

Consistent in the content of published permaculture literature is an explanation of the theoretical and ethical principles behind the concept, although the length and complexity of this explanation varies significantly. Almost without exception published permaculture books focus on providing design principles and practical information for the implementation of the permaculture concept, reflecting the practical focus of the movement. A pivotal text illustrating this combination of theory and practical strategies is Mollison's *Permaculture: a designer's manual* (1988). The majority of texts, including international examples, provide this information within the context of individuals driving the implementation. Many of the contributions to the movement's literature resources outline practical details such as plant lists and strategies for the private residential or rural scale permaculture.

There are several reasons why this may be the case. Importantly permaculturalists are often 'doers', not theorists, who are driven to make a practical difference through their individual actions. In tandem with that priority, because the key texts already provide a clear ethical and design approach as well as much practical information for the type and scale of projects being undertaken by permaculturalists, there isn't a major need for expansive texts reiterating what has already been written. Thirdly, permaculturalists around the world have developed structured methods of education and strong community networks to share ideas and innovation within their own bioregions and on a larger scale, which mean formal extensive publications are often unnecessary.

After several publications outlining practical case studies David Holmgren's most recent book *Permaculture: Principles and Pathways beyond Sustainability* (2002) has a different purpose. His self stated aim is "to explain permaculture to a wider audience that may not have been attracted by the organic gardening label. It is especially aimed at activists, designers, teachers, researchers, students and others grappling with the vexed issues of sustainability within a wide range of fields".²⁷ This book is a return to, and evolution and invigoration of the intellectual debate, theoretical basis and conceptual principles at the roots of the permaculture movement.

From the beginning permaculture has developed under the framework of formal organisations, predominantly the Permaculture Institute. Other organisations include The Permaculture Research Institute, many state

and bioregional associations and the Permaculture International Journal, also based in Australia. Extending permaculture's strong journal and newsletter program of information sharing, most permaculture organisations and many individuals make use of the internet and email as an efficient medium of information exchange. These websites often contain writing on permaculture (particularly David Holmgren's site), conference proceedings and extensive links to similar sites within Australia and internationally.

The aim of the literature review, aside from the obvious development of my understanding of permaculture and its broader influence in Australia and internationally, was to analyse the literature for evidence of reference to, opinion of and interaction with, design professionals, specifically landscape architects.

In *Permaculture One* there is no particular mention of the role of design professionals in the future development or implementation of the concepts. Briefly, in reference to urban strategies, the authors refer to past specific instructions to "city engineers and public landscape professionals... not to plant useful trees or shrubs, and this accounts for the curiously barren nature of the public plantings we see today." The author's argue "... it is past time for change, in this as in other environmental factors..."²⁸. A point in the final concise restatement of the concept explained "every discipline, trade and skill can be utilised in the planning, control and production of the system"²⁹.

Mollison argues in *Permaculture: a designer's manual* that "as the basis of permaculture is beneficial design, it can be added to all other ethical training and skills, and has the potential of taking a place in all human endeavours"³⁰. In this book, Mollison devotes chapter three to methods of design, in which he discusses many diverse methods including analysis, observation, data overlays [attributed to design courses at modern colleges], random assembly, zoning and incremental design.

His summary that "all the approaches outlined are not only useful, but necessary..." illustrates the broad design influences on the development of permaculture. Included within this same chapter is a diagram, entitled *Impetus to Design* juxtaposing permaculture with [then] present -day design (image six).

Later, in the preface to *Introduction to Permaculture* (1994) referring to the development of the permaculture concept, Mollison contended that "the professional community was outraged because we were combining architecture with biology, agriculture with forestry and forestry with animal husbandry, [so] that almost everybody who considered themselves to be a specialist felt a bit offended."³¹

In a paper entitled *The Development of Permaculture* (1992), Holmgren argues that "permaculture has been a catalyst contributing to creative new directions by thinkers and practitioners who are at the forefront of sustainable land use. These people are generally identified with much more mainstream concepts and fields such as whole farm

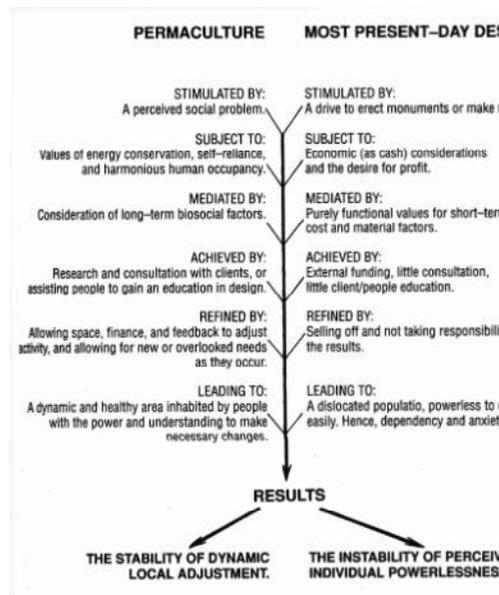


image six

planning, land care, agroforestry, third world development, the planning, landscape design and architecture professions. They may not identify what they are doing as permaculture for one or more of the following reasons:

- ÿ Lack of confidence that their work fits within permaculture or is a significant outcome of the application of permaculture
- ÿ Fears of being marginalised within their field by association with such a “radical alternative”
- ÿ Their own criticisms of the permaculture movement and its promotion as selling a simplistic message to the public and maintaining exclusive control over the concepts.³²

The introductory chapter of *Permaculture: principles and pathways beyond sustainability* (2002) contains a discussion of many issues related to the movement including ‘popular conceptions of permaculture’ and ‘academic, professional and official reaction’. Holmgren’s thoughts on these issues are examined in the discussion section of this literature review.

Australian Planning and Landscape Architecture Literature

Before discussing the evidence of interaction between permaculture and urban planning and landscape architecture exhibited in Australian literature, it is important to discuss more broadly its magnitude and content. There have been valuable regular contributions to Australian planning literature in the past twenty years. Largely these texts have addressed Australian urban form and its ability to impact on environmental and social issues. The consistent dominant theme of these texts are various alternative urban forms derived from the author’s perspective on the best solutions to the city’s environmental impact. A key point of discussion is the effect socially and environmentally of our current car dependency in our urban environments. Several design texts investigate the potential of sustainable or ‘green’ Australian cities through planning strategies.

“The contribution of cities to the consumption of environmental resources and the use of the environment as a sink for waste products have come to prominence in planning theory and practice, both in Australia and overseas...Even though there is a common failure to appreciate the contradictions between economic and ecological imperatives, some elements of the Australian planning profession have begun to accept the need for ecologically sustainable urban development. Schemes for ‘eco-cities’ have begun to appear ... [and] serious consideration was given to issues of ecological sustainability in planning at two conferences held in 1997...”³³

Within the body of Australian planning literature there is practically no direct reference to the term permaculture. Despite this, the “ecologically sustainable” and “green city” arguments, theories and strategies presented contain common paradigms to permaculture. Most of these scheme’s strength is within water management and to some extent biodiversity. There is very limited reference to the potential for productive urban landscapes, with only minor discussion of urban forestry. The majority of concepts are presented as distinct separate chapters and not delivered as a cohesive integrated approach, as is the basis of permaculture.

An example of literature espousing at least a similar desired outcome to permaculture, if not containing the necessary detailed strategies for its achievement is the government initiated *Australian Urban and Regional Development Review’s 1995 Green Cities: Strategy Paper #3*. It presents a vision of what an ecologically sustainable Australian city could be like:

“The city includes areas reserved from urban uses, which serve to protect prime agricultural land (particularly where it provides fresh produce for use in the city) and sensitive ecological areas which contribute to regional biodiversity and have a reciprocal relationship with the city. Natural creek lines have been reinstated in as many areas as possible and form critical elements in storm water management systems, as recreation areas and fauna and flora habitats...”³⁴

The body of literature devoted to landscape design and architecture in Australia is somewhat polarised. While not formally part of this literature review it is worth acknowledging the strong gardening and residential landscape

design media industry, reflecting our populations’ interest in this type of personal leisure activity. Permaculture has been part of the gardening, particularly ‘organic’ and ‘productive’ focused content, since its inception. It can be argued this popular forum of information is within the landscape architecture professional’s radar and therefore contributes to their exposure to permaculture.

In comparison to this abundance of ‘popular residential landscape’ literature, published landscape architecture texts are minimal and until recently were dominated by historical overviews and specific case studies. This is reflective of the emerging state of the profession in Australia, which also leads to a process of discovering and recounting its historical development. Landscape architecture and urban design publications in the last fifteen years have illustrated the examination within the profession of the concept and importance of place and also the direction of the profession itself.

Catherin Bull’s *New conversations with an old landscape* (2002) is the first major collection of Australian landscape architecture projects in book form. This type of collection - relating “how landscape architects are, as contemporary Australians, listening more closely to the language of the landscape and how they are designing new landscapes in response”³⁵ - has been long awaited. As Julian Raxworthy contends in his review of the book: “the language in which Bull conducts her conversation is broad and inclusive, suggesting that this book is [for] a general audience as well as the industry itself. Correspondingly, the book acts as advocate for, and exponent of, landscape architecture.”³⁶

While landscape architecture literature in the form of published books is limited, *Landscape Australia* as the Institute's journal has provided a consistent forum since its establishment in 1978. The single article listed under the topic of permaculture in the journals 1979 to 2001 index is a book review of Mollison's *Designers manual* in 1989. Helen Armstrong, then senior lecturer at the University of New South Wales argues "...the two most significant contributions to the area of environmental design are those of P. G. Yeomans and the Keyline system of water and soil management and Bill Mollison's [sic] theory of permaculture"³⁷ Armstrong contends that this latest publication illustrates how far the movement has come in the ten years since its establishment. She sees *Designers Manual* as "a timely and important book" which "helps landscape designers to work through the principles and methods of permaculture design to develop integrated approaches to many of our environmental problems"³⁸

Searches using the ARCH database uncovered several other journal articles related to permaculture however these were building focused, published predominantly in *Owner Builder* magazine and not highly relevant to this inquiry. A full list of database search results is contained in the appendices.

International Literature

While the statement of inquiry clearly constrains the scope of this paper to the influence of permaculture on landscape architecture in Australia, the literature review content included key international books and journals widely available and read in Australia in acknowledgement of the impact these have on the local profession. In addition to the similar content included in the Australian literature, the international body also contained greater direct reference to permaculture as well as books discussing very similar ideas and examples of specific case studies. Register in his book *Ecocities: building cities in balance with nature* (2002) introduces permaculture as "a whole systems approach to agriculture that leads into aspects of ecocity design and goes a long way towards fleshing out a new paradigm"³⁹ He goes on to describe the concept in more detail and explains how "nowadays, the concept encompasses much more: a planning and design method with the aim of creating stable self-supporting systems, a sustainable culture based on ecological principles, which not only supply wholesome food for people, but energy, warmth, beauty and meaningful pursuits".⁴⁰ Another international planning and urban design text which clearly defines permaculture is the English *Sustainable communities : the potential for eco-neighbourhoods* (1999).⁴¹

Perhaps even more accessible than these texts are the international journals heavily subscribed to by Australian firms. A search of the *Avery International Database* revealed nineteen relevant articles to permaculture. While some of these are in obscure journals with little circulation in Australia there are several worth discussing.

In *Landscape Design* (1994) Richard Webb presents his reasoning that “the principles of permaculture offer a practical and balanced design approach”.⁴² A *Landscape Architecture* article entitled “*Llamas in the landscape*” (1994) uses a case study of a co-housing project in Colorado as the starting point to debate whether “permaculture may point the way towards a new type of practice”.⁴³

Conclusion

A strong permaculture literature body exists in Australia of key texts and ongoing journals. Permaculture as a concept also has some presence in popular gardening magazines. However reference to permaculture in Australian planning and landscape architecture literature is almost non-existent. The body of Australian landscape architecture literature is small in general, particularly published books focusing on contemporary projects and issues within the profession. International books and industry journals which Australian landscape architects have exposure to contain some examples of basic overviews and case studies incorporating the principles of permaculture. To conclude, the literature review has revealed a strong separation between permaculture literature and landscape architecture and planning literature resulting in little evidence of interaction with, or influence of, permaculture on landscape architecture in Australia.

Landscape architects

The survey group

Fourteen landscape architects based in Adelaide were interviewed as part of the professional survey. The background, level of experience, type of employment and projects undertaken varies greatly, in accordance with the aims outlined in the methodology. The landscape architects represented the cross section of positions available in South Australia including members of large commercial firms, small offices, single practitioners, recent graduates and members of council and government departments. A significant percentage of interviewees had previously studied and worked in other states of Australia.

Exposure to permaculture

The level of exposure to permaculture was extremely varied amongst the survey group. Consistently interviewees commented that there had been none to very little exposure to the concept through their formal university education. People who had undertaken horticultural studies indicated some exposure through this training and the *AILA Membership Survey* (2001) indicates in the range of twenty percent of members have qualifications in horticulture.⁴⁴ Participants who described their exposure as very minimal to medium often referenced popular media, gardening and horticultural journals as a point of contact. Across the sample group it was agreed there was very low permaculture content in Australian industry literature, though participants recollected articles in American journals widely read in Australia. Those with a medium to very high exposure had gained this through personal interest and exploration of the concept via

published texts and permaculture design courses. Several had also either met Mollison and Holmgren or been actively involved in permaculture networks.

Understanding of the concept

Reflecting the variation in medium and level of exposure to permaculture, the understanding of the concept is also mixed. Naturally contributors with previous or current interest and/or involvement in permaculture possessed a high level of understanding of its key ideas. The answers of participants with self confessed little to medium understanding (determined to likely be the majority of the profession in South Australia and Australia), ranged but with some similar themes. Consistent ideas were that permaculture was related to environmental issues with a focus on plant selection and structure. Function, productivity, self-sufficiency and efficiency of the landscape were common terms used. Interestingly several people with different levels of contact and understanding were of the opinion that permaculture has been interpreted and developed in different tangents since its establishment. Overall, the survey indicated that younger practitioners have had less exposure to the concept of permaculture. According to the *AILA Membership Survey* approximately 30% of members have been practicing for ten years or less and 60% of members for less than fifteen years, illustrating this low level of exposure and understanding is likely to be held by the majority of Australian landscape architects.⁴⁵



image seven



image eight



image nine

Influence of permaculture on individuals

Participants' perception of the influence of permaculture on their work as landscape architects was important to the broader question of the influence of permaculture on landscape architecture as an industry in Australia. Logically potential personal influence was restricted to those survey contributors who had been exposed to the concepts of permaculture. The survey group contained examples of people who are influenced by permaculture at an ethical and theoretical level, but who acknowledge the limitation in applying these ideas through their professional work. While not practicing 'pure' permaculture, it informs their personal lifestyle choices. Other interviewees who had previously investigated the concept responded that permaculture did not have a direct influence or relevance to the type of projects and clients they engaged with. Several people indicated that while not consistently influenced by permaculture, it had heavily influenced specific projects they had worked on, often at the request of the client. Summarising the level of influence of permaculture on the individual landscape architects interviewed, overall it can be concluded that it has some theoretical impact, but is perceived as having little to no affect at a general project level.

Influence of permaculture on landscape architecture

In reply to prompts for their opinion of the influence of permaculture on the broader landscape architecture and landscape design industry in Australia, respondents were largely in agreement. The perception is that the environmental movement (of which permaculture is a component) has strongly

altered the issues and approaches to the built environment, including landscapes in this country. More specifically, permaculture is seen to have impacted on residential scale landscapes, particularly organic and productive gardening, but is not considered to have noticeably influenced landscape architecture.

A large section of interview time was spent discussing the participant's thoughts on the reason for this low level of interaction between permaculture and the landscape architecture industry. Many thoughtful and valuable points were made which inform the content of the discussion section to follow. In brief overview issues raised revolved around the different types and scale of projects undertaken, the differences in background, focus and approaches to design, and the level of exposure, understanding and perception of both landscape architects and permaculturalists to each other's fields.

Focus of landscape architects

Since the literature review indicated the likely low level of direct influence and interaction between permaculture and landscape architecture, part of the survey process was to determine the issues and strategies landscape architects are currently exploring in their work to examine any similarities with those theorised and/or practiced in permaculture. While it is acknowledged that landscape architects in Australia are working on a broad range of scales and types of projects incorporating many different issues and solutions, some consistent themes have emerged which provide an opportunity for the comparison contained in the discussion to follow.

A dominant theme identified by the South Australian participants of the survey was the importance of 'place'. People spoke of landscape architecture involving and contributing to social and community fabric, identity, involvement and empowerment. Another central topic was that of sustainability. Sustainability was mentioned as a broad issue but two specific areas driving the work of landscape architects are water sources and use and plant selection.

Potential for urban permaculture

Research into permaculture projects in Australia has indicated the majority have occurred on rural or semi rural private properties or developments. Initiatives in suburban and urban context are also at the small residential or occasionally the 'community garden' scale. Since many landscape architects are working in the commercial and public urban domain the question of permaculture's potential in this area is relevant to this paper's inquiry. Perception of the potential for permaculture to inform urban development and projects differed. Points raised as possible barriers include community understanding and support for strategies, particularly productive landscapes, and the flow on affect of this on council and government departments. Other related points were aesthetic aims, cost, maintenance and liability concerns in public spaces. The majority of contributors discussed these issues from a solution orientated tact indicating they perceived that incremental changes in education, community priorities, and institutional policies and structures, combined with positive examples in new developments, could improve the potential for more permaculture strategies to become a reality in the urban context.

Potential for permaculture influence

The opinion of landscape architects participating in the survey on the potential for greater interaction between their profession and permaculturalists was often dependent firstly on the types of projects they were involved in and secondly their perception of the relevance of permaculture to this work. Most participants agreed though that as sustainability issues continue to increase as a priority for the community, landscape architects could benefit from a greater understanding of the permaculture approach to design. Many discussed the nature of landscape architect's broad scope of work and the necessity of engaging with specialist consultants, such as permaculturalists, to provide quality outcomes for projects. Several contributors saw future interaction as very much a two way process, where permaculture could benefit from the knowledge and approach of landscape architects.

Conclusion

From the survey of South Australian landscape architects it can be seen that there are significant variations in exposure to, and understanding of, the concepts of permaculture, often reflective of personal interest and exploration and also the age of the landscape architects. Consistently the level of interaction with permaculture was low or none and the influence of permaculture concepts on landscape architects was isolated. The search for a 'sense of place' and sustainability were highlighted as key themes in the profession. There was positive interest in the potential for permaculture to inform landscape architecture generally and specifically in the urban context. However a number of issues were raised as potential obstacles to permaculture strategies being employed in certain projects.

Permaculturalists

Discussions of the inquiry issues with permaculturalists were smaller in number due to the approach to the paper from a landscape architecture perspective and also time constraints. The South Australian permaculturalists who contributed to my understanding of the concept and the inquiry issues represent a wide variety of backgrounds and areas of application of the concept. Each permaculturalist interviewed emphasised permaculture as heavily influencing their personal ethics and through this, their lifestyle choices.



image ten

Permaculturalists cited several areas they perceived the movement as having the most influence in Australia. These areas are community gardens and private properties, educators (particularly at a primary level), eco-villages and community planning, particular credit unions and the development of ethical investment portfolios. Permaculturalists' understanding of the landscape architecture profession varied somewhat depending on their exposure. Generally they perceived that landscape architecture was a profession that balanced knowledge from many different fields and that residential scale projects was not the dominant area of work.

The permaculturalists involved in the survey agreed that interaction between their movement and landscape architecture as a profession was low. They believed that while landscape architects would have heard of the term, many would have a very limited or inaccurate understanding of the concepts. While permaculture has influenced individuals working in landscape design, even many of these

designers would not identify their work as often similar to the reasons presented by the landscape architects. These included the priorities of the clients of landscape architects, aesthetic differences, animal integration and also the time frame of permaculture developments. It was also raised that the majority of landscape architects have less training in horticulture and plant use, a focus of permaculture.

Permaculturalists spoken to discussed the potential of permaculture to inform Australia's approach to our urban space at a range of scales. Several argued that permaculture provided a mode of thinking and strategies that can be employed at a planning level citing community building initiatives, car free zones and the use of the parklands as three specific examples. At a neighbourhood scale the potential and also current obstacles were discussed with similar themes to those raised by landscape architects emerging. It was noted that the retrofit of permaculture concepts into an existing urban area is a great challenge in comparison to the more common implementation in new eco-villages. Areas where permaculture has proven successful and could continue to contribute is in school and hospital projects.

The permaculture contributors cited specific examples of landscape designers (though not necessarily trained as landscape architects) currently integrating permaculture strategies into their professional work. Permaculturalists, while very passionate about their personal beliefs and the concepts of permaculture, recognise that permaculture's impact as a

movement will be strengthened, not undermined, by its continuing development and the adoption of elements by other professions. While water and native plant selection strategies are now wide spread, the permaculturalists argued future generations of designers dealing with Australia's landscapes will be addressing even more issues of sustainability, which permaculture has the knowledge to assist.

Conclusion

This series of interviews with South Australian permaculturalists reinforced the strong ethical framework that is the basis of the movement. It also illustrated the variety of areas permaculture has had influence. Importantly permaculturalists identified very similar issues to those of the landscape architects in relation to the reasons for the current level of interaction and any future potential. Clearly, proponents of permaculture are passionate about opportunities for improving sustainability and are open to ideas for new applications of the permaculture design approach and strategies.

²⁷ David Holmgren, *Permaculture: principles and pathways...*, p xi

²⁸ Bill Mollison and David Holmgren, *Permaculture One*, p94

²⁹ Bill Mollison and David Holmgren, *Permaculture One*, p94

³⁰ Bill Mollison, *Permaculture: a designer's manual*, p6

³¹ Bill Mollison, with Reny Mia Slay, *Introduction to permaculture* 2nd ed. (N.S.W. : Tagari Publications, 1994) preface

³² David Holmgren, *Development of the Permaculture Concept*, p 8

³³ Brendon Gleeson and Nicholas Low, *Australian Urban Planning: new challenges, new agendas* (Aust: Allen and Unwin, 2000), p167

³⁴ *Green Cities: Strategy Paper #3*, Australian Urban and Regional Development Review (Aust: Commonwealth of Australia 1995), p184

³⁵ Catherin Bull, *New conversations with an old landscape: landscape architecture in contemporary Australia* (Aust: Images, 2002)

³⁶ Julian Raxworthy, *Landscape Radar* in *Landscape Australia*, March/April 2003

³⁷ Helen Armstrong, *Book Review: Permaculture: a designers manual* in *Landscape Australia* 3/89, p 272

³⁸ Helen Armstrong, *Book Review: Permaculture: a designer's manual*, p 272

³⁹ Richard Register, *Ecocities: building cities in balance with nature* (USA: Berkeley Hills Books, 2002), p116

⁴⁰ Richard Register, *Ecocities: building cities in balance with nature*, p116

⁴¹ Hugh Barton (ed), *Sustainable communities : the potential for eco-neighbourhoods* (London : Earthscan, 1999)

⁴² Richard Webb, *Permaculture in practice* in *Landscape Design* Sept 93, p 14

⁴³ Kathleen McCormick, *Llamas in the Landscape* in *Landscape Architecture*, 05/89, p54

⁴⁴ Linda Corkery, *Snapshot of a profession, A report on the 2001 AILA membership survey*, www.aila.org.au/conference/papers/2001-survey

⁴⁵ Linda Corkery, *Snapshot of a profession, A report on the 2001 AILA membership survey*

Comparison of literature review and survey results

The literature review process discovered a clear absence of material indicating any significant interaction with, or influence of, permaculture on landscape architecture in Australia, opening up the question of why? The literature review provided minimal leads in this area aside from occasional speculation in permaculture texts and conclusions that can be drawn on the size and content of Australian landscape architecture literature in general. This being, as discussed in the literature review, that Australia's landscape architecture literature body is underdeveloped in the areas of published texts on contemporary influences, projects and practice issues. In addition, within the content of industry journals (lead by *Landscape Australia*) debate on the theoretical or conceptual approaches to the role of landscape architecture in sustainability is isolated. Since even supposedly high profile contributing influences and projects in Australian landscape architecture are under exposed in literature, it is not surprising then that should a lesser level of influence from permaculture exist, it is likely to not be evident in formal media.

The professional survey produced a far greater diversity of content to discuss in response to the inquiry questions. While clearly inappropriate as representative data for the entire landscape architecture industry in Australia due to the small size of the South Australian sample group, the survey information provides indicators for the absence of literature content and most valuably, a richness of opinion and ideas to contribute to a examination of the

the potential for greater connections between permaculture, landscape architecture and their literary content.

The current state of understanding, influence and interaction

Question: What has been the influence of Permaculture on the built environment in Australia?

The permaculture concept and network can be seen as an important element of the wider environmental movement and awareness in Australia, which has resulted in a greater recognition of environmental issues in many areas. This environmental movement has certainly impacted on the considerations of built environment projects to the extent where ideas considered radical thirty years ago are now mainstream policies. More specifically, it can be argued that permaculture has influenced the built environment on a number of fronts. Permaculture has been a significant influence on eco-village developments and community gardens. Within agriculture and gardening permaculture has contributed to the development of the organic, biodynamic and bush food industries.⁴⁶ Other areas where permaculture strategies have been applied are revegetation and soil rejuvenation.⁴⁷ At a conceptual level permaculture has influenced the thinking of many people involved at all levels of the protection and development of our environment.



image eleven



image twelve

Question: What is the current understanding of, influence of and interaction between Permaculture and Landscape Architecture in South Australia?

Firstly to address the understanding of permaculture by landscape architects in South Australia and from this the likely understanding in Australia. As discussed in detail in the survey outcomes, this varies significantly among the profession, often reflective of the age and priorities of members. This variation in understanding, particularly a low level of understanding among younger graduates, is the first barrier to current and any future influence by, and interaction with, the concepts of permaculture. While interaction between the two areas occurs through individuals, there is virtually no formal cross over via education, conferences or journals in Australia, but with some examples in international resources. The perceived influence of permaculture on their work by landscape architects where relevant, exists at the broader ethical thinking more so, and occasionally, often for specific and isolated jobs, at the project implementation level. Importantly a number of landscape architects recognise the consistency of elements of their work with those of permaculture but do not specifically identify these with the concept. To conclude, the understanding, interaction and influence of permaculture on landscape architecture in South Australia is mixed, but predominantly low, isolated and unpublicised. This state is likely to be reflective of Australia as a whole.

Question: What are the key issues effecting this interaction?

Community and client priorities

The Australian community's and correspondingly our corporate, government and council organisation's understanding of sustainability issues is constantly improving but it is a gradual process requiring much promotion and education. As such the fundamental concepts contained in permaculture are not mainstream; the majority of the community has different priorities. This impacts on the interaction between permaculture and landscape architecture on a number of fronts.

The significant majority of projects landscape architects are involved in are within the corporate, government and council spheres. The requirements and priorities of these clients are reflective of those of the wider community and often there is limited opportunity for landscape architects to introduce strategies like those contained in permaculture. This is not to say initiatives to improve sustainability, particularly water and biodiversity issues are not being implemented, rather that clients and the general community are not pushing for, or embracing the over riding concepts and consequent changes in lifestyle promoted by movements such as permaculture. Since landscape architects work firmly within the public domain, there is a limit to the extent they can influence project briefs and therefore their own priorities of knowledge are affected, constraining their contact with permaculture. Alternatively, people open to and interested in exploring the application of permaculture in their project usually either undertake



image thirteen



image fourteen

education themselves or specifically employ a certified permaculturalist rather than a landscape designer to assist them.

Community priorities influence the community perception of permaculture. It is recognised by both landscape architects and permaculturalists that many people perceive the permaculture movement to different degrees as 'alternative', 'left-wing', 'hippie', 'environmental extremist' and 'on the fringe' of mainstream society. Not necessarily inaccurate or negative images or realities depending on your perspective! However, public (and possibly landscape architect's) opinions such as these, often formed from low levels of understanding, impact on the ability of proponents of the term to promote ideas under the permaculture banner and importantly in this inquiry, make other professionals wary of identifying with the specific term permaculture because of client's and colleague's pre-existing misconceptions and bias.

Perception of aesthetics

Permaculturalists agree that the concept is not about aesthetics. "...in designing a productive habitat for humans which meets the ethical needs we've... discussed, being aesthetic doesn't count as a use."⁴⁸ In his most recent book, Holmgren explains "... the rejection of landscape aesthetics in permaculture was necessary to counter the assumption that only aesthetic design issues are worthy of debate, which leaves functionality as simply a matter of technical detail. Only vigorous debate about the nature of functional design ...can expose the dysfunctional forces driving design of our inhabited landscapes and built environments."⁴⁹

The disregard for aesthetics as a legitimate design agenda was presented as a fundamental difference in approach by landscape architects and also permaculturalists. Landscape architect's believe strongly in the human desire for beauty and its role in building stronger communities through creating meaningful places, improving social health, pride, identity and economic activity.

Recent permaculture literature has reopened this debate. "...Any holistic design will include an aesthetic aspect...Just because permaculture emphasises ecological and human scale functionalism does not mean that aesthetic appreciation has no place in permaculture."⁵⁰ Holmgren's perception of the role of this aesthetic appreciation is contained within the view that the ecological role of aesthetics is in representing "the distillation of the essence or truths of a design culture in forms that have a sensory or inner (spiritual) resonance." Leading to aesthetics as "distilled patterns specifically attuned to human sensory response, which reinforces the recognition of appropriate patterns".⁵¹

While the gulf in the perception of the importance and role of aesthetics is an obvious difference between permaculture and landscape architecture, it is argued it is not a barrier, and certainly should not be a reason preventing greater interaction and influence. Aesthetics in permaculture and sustainability generally presents an exciting challenge for the landscape architecture profession. It is a test of our approach and ability as designers but one that we are capable of undertaking and indeed must undertake to follow through on our assertion to contribute to sustainability and to the quality of Australia's landscapes.



image fifteenth

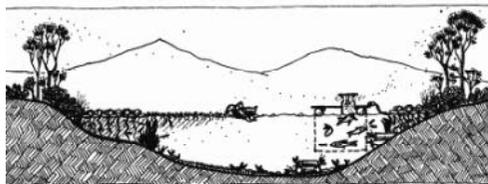
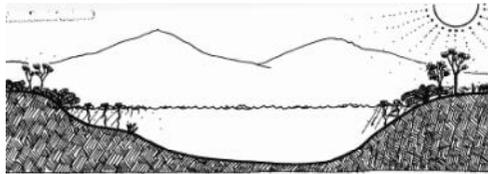


image sixteen

Role of animals

The use of animals as an element of landscape design is a concept landscape architects are largely unexposed to. The issue of fauna biodiversity is now more regularly considered in select projects, usually resulting in solutions incorporating habitat in some form. But exploration of the innovative provision of habitat in highly urban areas is scarce. Beyond these issues of biodiversity landscape architect's education does not delve into the possibilities of animals as a functioning element of a landscape system. In permaculture, animals are an intrinsic part of the design. "Animals perform valuable work, contribute to the structure of a full ecosystem and create products useful to other animals or humans."⁵² The types and roles of animals in each design will vary greatly. While this is an area largely unexplored by landscape architects and it is likely the role of animals would not be as extensive if applied by landscape architects, in their public work; permaculture provides the argument and base for understanding and exploring animals' innate characteristics as design features in a landscape system.

Time and maintenance

A perceived significant hurdle in the application of permaculture to common landscape architecture projects is the establishment time frames and on going maintenance of a permaculture system. Depending on the complexity of the permaculture system being established, the desired relationships between, and functions of different elements can often take years to reach maturity. In all landscapes approached through permaculture the system is in a constant state of change and therefore at various times input (e.g. maintenance, new plantings etc) are required.⁵³ The majority of clients are looking for a landscape solution that

provides them with quickly visible results. Almost always, designers are not involved in the ongoing maintenance of sites; therefore a system requiring detailed knowledge and ongoing management is not looked upon favourably by clients. However currently, particularly in local government, significant resources are already invested in the maintenance of landscapes. What is achievable then is both the adoption of permaculture principles suitable for projects, but also the redirection of management priorities, knowledge and resources to the maintenance of landscapes that have a positive impact environmentally, not just culturally and aesthetically and in the long term will benefit us, including economically.

Professional identity

The difference in background and education as well as the desire for identity as a profession and movement is another element contributing to the low level of interaction between landscape architecture and permaculture. Landscape architecture is a relatively new profession in Australia and as such both individuals and the Institute are looking to establish their identity and promote our knowledge and ability. A component of this is the nature of our extended tertiary education and its broad content distinguishing landscape architecture from other landscape design, architecture and horticulture courses. Permaculturalists are people from a great diversity of backgrounds, often with training and experience in many different areas including education, horticulture, science and environmental studies for whom the permaculture course and texts are the unifying knowledge. Proponents of permaculture are in

somewhat of a similar position to those of landscape architecture in that they are seeking to maintain the quality of permaculture promotion and education, in particular the accreditation of those who actively teach. It is vital that pride and promotion of one's personal profession or association does not lead to disregard for the skills and knowledge traditionally associated with another field.

Old news?

The exposure and interest permaculture received when it was first established by Mollison and Holmgren in the late seventies and early eighties was significant and spread internationally. While permaculture; its concepts and networks have continued to evolve and expand since then, recent broad community exposure, including to younger landscape architects has reduced. Landscape architects, particularly those who have been involved in the profession for less than fifteen years are now more familiar with terms such as 'sustainability', 'urban ecology' and 'ecologically sustainable design (ESD)'. Permaculture may be associated by this generation of designers, who are looking for the latest innovative concepts and projects, as a seventies phenomenon that is now outdated or has been superseded by new approaches. Therefore, it is not even explored in any detail by these landscape architects, meaning the potential adaptation of already conceived and tested ideas is lost.

A primary concern is that 'sustainability' as a buzz word, as already argued by many including landscape architects, is a vague and potentially overwhelming concept. This leads to landscape architects attempting to practically contribute to sustainability being undirected and ineffective. Critically, these problems

result in the isolated development of strategies within individual offices and a lack of comprehensive material from which the next generation of landscape architects can learn and build on.

David Holmgren's latest book *Permaculture: principles and pathways beyond sustainability* is the first major permaculture focused Australian publication in the last decade. Its format and content provides an excellent opportunity for a reinvigoration of permaculture's wider exposure and as an introductory piece for landscape architects unfamiliar with the developed concepts of permaculture.

A rose by any other name...?

The point made by survey respondents from both areas that the name for what we as designers and citizens are doing is not as important as our aims and the positive impact our action can have is whole heartedly agreed with. Landscape architects were implementing before permaculture and have continued to implement, many strategies that can be strongly identified under the permaculture banner, but are not by the individuals. Added to this the desire by the most vocal of permaculture promoters that as a concept and movement it should continue to constantly evolve and adapt means any definition will always be ambiguous.

Repeatedly permaculture is referred to as 'just common sense'⁵⁴. This may be so, but this common sense is not a reality even in a form that is achievable in today's world, and therefore exposure and understanding of permaculture is valuable for designers wanting to contribute to sustainability. It is not the aim of this inquiry to argue that permaculture as a rigid concept and particularly as a term should be used widely by landscape architects.

However many landscape architects have not had exposure to the sustainability aims, concepts, principles and strategies in the holistic form that they are presented through permaculture. This seems a waste of a significant resource developed largely within our own country. The term permaculture is not important, but the approach it represents is and it is yet to be replicated or surpassed by other similar concepts in the quality and comprehensiveness of its principles and strategies.

Common ground

Question: What are the similarities between Permaculture and Landscape architecture as an approach/profession?

The issues discussed above illustrate the key reasons why the interaction between permaculture and landscape architecture in Australia has been low to date. However, these obstacles are resolvable and more importantly there exists underlying mutual ideas and aims between permaculture and landscape architecture.

Passion for landscape

Both enthusiasts of permaculture and landscape architecture are passionate about Australian landscapes. They believe in the importance of the health and quality of our natural systems and our broader environments including our urban spaces. There is a common interest in understanding and responding to the landscape rather than dominating it.

Power of knowledge and design

Permaculture and landscape architecture are both grounded in the power of good design to have a positive impact on our landscapes and our communities. This ability to produce excellence in design is reflective of recognition in both areas of the importance of a continual pursuit of knowledge and extension of ideas.

Contribution to and from community

Although approaches and parameters may differ within and between permaculture and landscape architecture, there is a fundamental interest in projects responding and contributing to communities and the ability for design to involve and empower people.

In search of sustainability

The pursuit of a sustainable existence for the human race is the driving force behind the development of permaculture. For landscape architects, through education and personal priorities, contributing to sustainability through our professional work has risen to be one of the key issues in the profession today. The existing similarities in strategies employed in this search provide a firm starting point for further interaction, influence and innovation.

Future potential

Question: What is the potential for greater influence and interaction between Permaculture and Landscape Architecture, particularly in the urban context?

Why would it be valuable?

The brief overview of the key areas of common ground between landscape architecture and permaculture illustrate the great potential for constructive interaction and positive influence in both directions. The issues raised as reasons for the previous and current low level of influence across the broader landscape architecture profession are important to recognise but should be seen as catalysts for internal dialogue within the profession and across disciplines, rather than as insurmountable barriers. Landscape Architecture as a profession in Australia is increasing in size and influence on our country's environments. Increasingly landscape architects will assume influential positions within decision making organisations and specific projects, a reflection of the unique combination of their knowledge and skills. Landscape architects are in a position to have a significant impact on the nature of Australian places, particularly the reality of our cities as we continue the trend as a highly urban population.

The proposition resulting from this inquiry is that there is a great potential for a stronger dialogue between landscape architecture and permaculture and for permaculture to influence and enrich the knowledge and skills of landscape architects in Australia. To date this opportunity has been under-utilised. Increasingly the imperative of all projects, in combination with other requirements, is to contribute to sustainability.

To do this effectively, it makes sense for landscape architects to be exposed to the most comprehensive existing concepts, especially those formulated within our own environment. Permaculture, despite differences in some of its origins and priorities, provides this exposure and the flexibility for exciting adaptation within landscape architecture.

Openness and Education

Any change in the level of interaction between permaculture and landscape architecture will need to be supported by multiple levels of education and open thinking. Firstly education of landscape architects in permaculture (either through formal training or self instigation), via the key texts and design courses provides a well informed basis to explore any potential. This process of exploring permaculture requires an open mind and interest in the possibilities of combining ideas from different fields.

“To design requires that we are familiar with models generated by nature and humanity (past and current solutions and options) as well as having an ability to visualise some new adaptation, variation or possibility. The capacity to imagine other possibilities is another important aspect of design thinking. The most creative design involves the promiscuous hybridisation of possibilities from apparently disconnected, or even discordant sources to create a new harmony.”⁵⁵

“Permaculture the name describes a process and that process will be different at different times and in different cultures. Feel free to make your own contribution to spreading the idea...permaculture should be alive, and if it didn't grow and change under your touch, it would not be a durable offering”⁵⁶

Secondly education, understanding, and from this, interest and support from the wider community is vital for all sustainability initiatives. The responses to the professional survey indicated that the client ultimately determines the parameters of a projects brief and therefore their understanding and openness to permaculture strategies (specifically identified as such or not) affects landscape architects ability to implement any skills they do have. The survey also drew out landscape architects belief in the importance and power of education, citing that although changes in community attitudes can take time, today's broad water awareness is testament to the success of strong education campaigns.

Thirdly, a combination of the first two forms of education is the role of the landscape architect as educator. The challenges and rewards of presenting ideas outside of the brief to clients and new innovations in design to the wider community were discussed by many participants of the professional survey for this inquiry. It is a role which takes a degree of skill and practice but one that landscape architects see as a vital part of the professions contribution. Landscape architects have the ability to not only react to the requirements of the client and community, but to inform them and provide leadership.

Framework for a holistic approach to sustainability

“...Sustainability is a search rather than an outcome, a continuous flow of innovation will be needed to sustain a continuous cascade of solutions...Past conceptions of sustainability (and permaculture) drew on the steady state, climax model of nature. More recent pulsing models of nature suggest more dynamic understandings of sustainability that can deal



image seventeen

with continuous change"⁵⁷ In the search for sustainability the importance of a holistic concept containing a framework or principles to guide what would otherwise be an overwhelming task, is paramount. Permaculture provides this framework as a clear starting point for designers. "It is this holistic approach which distinguishes permaculture from otherwise similar ecologically-based systems of design..."⁵⁸

The principles are suitably conceptual that they create goals and impart direction but can still be applied universally. "...design principles are our primary tools for assessing and filtering the diversity of possibly relevant information and models for the inevitably unique context in which we design and act. Thus the efforts to both refine the tools, explain and make better use of them are central issues..."⁵⁹ It is this refinement and application that is open for landscape architects to explore.

Wealth of practical strategies

In addition to the conceptual approach and design principles, permaculture as a movement has developed and tested many innovative design strategies. While the majority of examples exist on residential or rural property projects, the lessons learned are as valuable for the public and commercial scale projects undertaken by landscape architects.

Opportunity for Innovation

An understanding of permaculture design principles and strategies in combination with landscape architects existing skills, presents an exciting opportunity for experimentation and innovation. The areas identified as current differences such as aesthetics, use of animals, time frames and maintenance expectations,

along with plant palettes and associations, could become the spheres within which landscape architects push current design practice.

Our urban future

The huge majority of Australians spend their lives in our urban spaces. It is the form of our cities that impacts so significantly on the role of the remaining land and the sustainability of the earth. To date permaculture has had a limited influence on urban initiatives aside from occasional private residences and scattered community gardens. This is largely because a permaculture landscape is perceived as unrealistic for Australia's urban space. Landscape architect's urban interventions, regardless of scale, are vital to the long term quality and sustainability of our urban form. A complete urban permaculture landscape is an idealistic and impractical aim today and into the foreseeable future. But projects containing innovative approaches to sustainability and urban form incrementally implemented and expanded upon will result in changes in community priorities and the possibilities for our urban spaces in the future. Landscape architect's, in a position of growing mainstream acceptance and influence as a profession, must continue to encourage this change in our urban form, and must have the knowledge of principles and practical strategies to do so.

The discussion section of this paper has sought to provide a dialogue on the key inquiry questions and provide findings and ideas for further debate. The literature and survey research has illustrated that the understanding of permaculture by landscape architects in Australia varies, and is likely to be lower in younger professionals. Overall the level of influence and interaction between permaculture and landscape architecture is very minimal and where present isolated and unpublicised. Issues contributing to this current state include the priorities of landscape architecture clients, community perception of permaculture, different perceptions of the importance of aesthetics and the role of animals in design and the establishment and maintenance requirements of permaculture landscapes. Matters related to the background and identity of the landscape architecture profession and the permaculture movement, and the ambiguity or relevance of specific terminology have also arisen in the analysis of the current state of influence.

These current issues affecting the influence of permaculture on landscape architecture are seen as resolvable and more importantly underlying mutual aims and ideas between permaculture and landscape architecture exist. In summary these are a common passion for landscapes and belief in the power of knowledge and design to contribute to community and sustainability as important issues. These findings have formed the basis for the argument promoting the significant potential for permaculture to positively influence landscape architecture in Australia into the future. The rationale behind this argument for greater interaction centres on the importance of landscape architects having the knowledge and practical skills to strongly contribute to the sustainability of Australian landscapes, a particularly our urban form.

Permaculture, concept developed largely within the Australian environment, is the most comprehensive existing response to this search, and has much to offer landscape architects through holistic principles, practical strategies and opportunities for adaptation and innovation. If landscape architects recognise the wealth of information and openings contained within the permaculture movement, and explore this with a mind open to the value of different perspectives, the role of the profession in Australia will be strengthened and enriched. The search for sustainability is a great and urgent challenge, but also an exciting one for landscape architects with much passion and ability to offer their communities.

“...a dynamic interplay between two phases: on one hand, sustaining life within the cycle of the seasons, and on the other, conceptual abstraction and emotional intensity of creativity and design...the relationship between these two [is] like the pulsing relationship between stability and change. It is the steady, cyclical and humble engagement with nature that provides the sustenance for the spark of insight and integration (integrity), which, in turn, informs and transforms the practice. The first is harmonious and enduring; the second is episodic and powerful. The joyful asymmetric balance between the two expresses our humanity”⁶⁰

Written as the aspiration for permaculture by David Holmgren, this appropriately describes the quest for a balance between the environments natural systems and our design creativity that should be much the aim of landscape architecture. It is hoped that the inquiry contained in this paper sparks renewed exploration of what is achievable through a combination of the rich knowledge and skills present in both permaculture and landscape architecture in Australia.

The nature of the questions this inquiry explored and the research undertaken to answer them has exposed many related areas of interest for possible further exploration.

_the current roles and recognition of animals in systems designed by landscape architects and the possibilities for greater exploration of this element in landscape architecture education and practice.

_the permaculture aesthetic; examples and opinions of the existing and future role of aesthetic in the permaculture movement and possible implications.

_Management and maintenance of public spaces; current expectations and practices and possibilities for changes in priorities and training to support more sustainable public landscapes.

_Identification of the key areas of permaculture most compatible with current landscape architecture project issues and the medium for providing this information

- ⁴⁶ David Holmgren, Development of the Permaculture Concept, p 5
- ⁴⁷ David Holmgren, Development of the Permaculture Concept, p 3
- ⁴⁸ Graham Bell, The Permaculture Way: practical steps to create a self-sustaining world (London : Thorsons, 1992), p31
- ⁴⁹ David Holmgren, Permaculture: principles and pathways, p151
- ⁵⁰ David Holmgren, Permaculture: principles and pathways, p152
- ⁵¹ David Holmgren, Permaculture: principles and pathways, p152
- ⁵² Dan Earle and Sue Hutchins, Animals in Permaculture, <http://home.klis.com/~chebogue/p.com.Animals.html>
- ⁵³ Information learned through survey of permaculturalists.
- ⁵⁴ Richard Webb, Permaculture in Practice in Landscape Design, Sept 93, p 18
- ⁵⁵ David Holmgren, Permaculture; Principles and Pathways....,p14
- ⁵⁶ Graham Bell, The Permaculture Way, p212
- ⁵⁷ David Holmgren, Permaculture: Integrating Theory and Practice, 2003, www.holmgren.com.au/DownloadableFiles/PDFs/IP_C7.pdf, p2
- ⁵⁸ Richard Webb, Permaculture in practice in Landscape Design, Sept 93, p14
- ⁵⁹ David Holmgren, Permaculture: Integrating Theory and Practice, p 3
- ⁶⁰ David Holmgren, Permaculture: principles and pathways...., p 271

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_Kathleen McCormick, "Llamas in the Landscape" in *Landscape Architecture*, 05/89, p54

_Frazer Osment, "Sustainability? Just do it" in *Landscape Design*, Sept 02, p313

Database: ARCH The Australian Architecture Database

Extract from database description: The Australian Architecture Database (ARCH), produced by Stanton Library, North Sydney Council, is a bibliographic database that indexes and abstracts articles from material held by the Stanton Library, North Sydney Council. Source documents include journal articles, exhibition reviews, obituaries, editorials, conference proceedings, news items, project articles and award features. Journals in the ARCH database include Architecture, Landscape Architecture, Building construction and some design, craft, lifestyle and heritage publications. Fifty plus journals. Number of records: 23,150+

Search: permaculture

Record 1 (ARCH)

Title: t2000: modular.mass.mobile.

Author: McEoin Ewan

Source: AR Australia Summer 2000 pp 38-41

Abstract: The t2000 a modular construction system developed by architects William Smart Design is discussed. The system is mass-producible, transportable and environmentally friendly. The t2000 are shipping container sized and are designed to be stackable, various panels are removable to design the interior of the structures. Green technology was considered including geothermal air conditioning, a solar photovoltaic roof, a permaculture garden and a waste management system.

Record 2 (ARCH)

Title: Crystal waters

Source: Owner Builder No 89 Oct/Nov 1998 pp 29-34

Abstract: Two houses at Crystal Waters Permaculture Village, Maleny, Queensland, designed by owner builders are described. The houses are constructed of hardwood timbers and rammed earth, with one house having a feature of a sod roof.

Record 3 (ARCH)

Title: Straw Bale Home

Author: Mayo Annie

Source: Owner Builder No 80 Apr/May 1997 pp 7-11

Abstract: A straw bale house in Dunsborough, south of Perth, Western Australia, the first of a future strata titled permaculture village, is described. The house is designed to be a meeting, training, sleeping and entertaining centre. The problems encountered with building licences are discussed and solar and wind power generation techniques. All houses in the village will have to generate their own power as the village is not on the grid.

Record 4 (ARCH)

Title: Straw Bale Housing

Author: Dom Gary

Source: Owner Builder No 77 Oct/Nov 1996 pp 30-33

Abstract: The construction of solar powered straw bale buildings is described, including integration of building, energy and food systems and promotion of Permaculture design and sustainability.

Record 5 (ARCH)

Title: Pole Frame House

Author: Andrews Russell

Source: Owner Builder No 53 Oct/Nov 1992 pp 6-11

Abstract: Article on the owner building of a pole frame house at the Crystal Waters Permaculture Village in South Eastern Queensland.

Record 6 (ARCH)

Title: Permaculture House

Author: Andrews Russell

Source: Owner Builder No 48 Dec/Jan 1991/92 pp 34-39

Abstract: Article on the design features of a solar efficient mud brick home at Hepburn Springs in Victoria. The house features a greenhouse on its north side.

Record 7 (ARCH)

Title: Designing For Energy Efficiency

Author: Holmgren David

Source: Owner Builder No 9 Oct 1983 pp 14-20

Abstract: Permaculture is a permanent, self sustaining system of agriculture where the approach is carefully planned to create an integrated environment. David Holmgren is part of the team who coined the term Permaculture. In 1980 his mother offered him the opportunity to design and build her house, which could also be used to demonstrate the possibilities of integrated buildings and landscape design. The author describes the design and construction process. The floor was made of rammed earth on top of a Fortecon Membrane, and the bath is in the greenhouse.

Database: Avery Index

Extracts from database description: The Avery Index to Architectural Periodicals offers a comprehensive listing of journal articles published worldwide on architecture and design, archaeology, city planning, interior design, and historic preservation. Avery indexes not only the international scholarly and popular periodical literature, but also the publications of professional associations, US state and regional periodicals, and the major serial publications on architecture and design of Europe, Asia, Latin America, and Australia. Expanded coverage includes obituary citations providing an excellent source of biographical data — often the only information available for less-published architects. Coverage is from the 1930s (with selective coverage dating back to the 1860s) to the present. The Avery Index now surveys more than 2,500 US and foreign journals. Three-fourths of these are not indexed in any other source. With access to 13,000 records of biographical information.

Search: [permaculture](#)

Record 1

Title: Water world: centuries ago, Pueblo farmers manipulated their harsh environment to capture the most prized treasure in an arid land

Author: Stephanie Woodard.

Source: Preservation: the magazine of the National Trust for Historic Preservation 2003 July-Aug., v.55, n.4, p.44-46, 1

Record 2

Title: Living on the edge: combining traditional Pueblo knowledge, permaculture, and archaeology

Author: Louie Hena, Kurt F. Anschuetz.

Source: CRM: [bulletin] 2000, v.23, n.9, p.37-41.

Record 3

Title: Permaculture

Author: Mac Griswald.

Source: Garden design 1995 June-July, v.14, n.3, p.60-65,

Record 4

Title: Llamas in the landscape

Author: Kathleen McCormick.

Source: Landscape architecture 1994 May, v.84, n.5, p.54-56.

Record 5

Title: Permaculture in practice

Author: Richard Webb.

Source: Landscape design 1993 Sept., n.223, p.14-18

Record 6

Urban ecology

Title: Bermuda: an observation lab for the world?

Author: Souhaila Sarkis.

Source: Topos: European landscape magazine 2003 Dec., n.45, p.44-51,

Record 7

Title: Green good, better, and best: effective ecological design in cities
 Author: Kristina Hill. photos.
 Source: Harvard design magazine 2003 Spring-Winter, n.18, p.37-40.

Record 8

Title: Greening cities: a new urban ecology
 Author: Linda Corkery, Noel Corkery.
 Source: Landscape Australia 2003 Sept., v.25, n.3 (99), p.28-30,

Record 9

Title: Opening a big can of whup-ass on designers
 Author: Kristina Hill, Miranda Maupin.
 Source: Arcade 2003 Summer, v.21, n.4, p.[25]-26.

Record 10

Title: Stirring still: the city soul and its metaspaces
 Author: Raoul Bunschoten.
 Source: Perspecta 2003, n.34, p.56-65.

Record 11

Title: What can we do?: a symposium on sustaining nature, Harvard Design School
 Source: Harvard design magazine 2003 Spring-Winter, n.18, p.46-61.

Record 12

Title: A critical study of theoretical models of sustainability through structural equation systems
 Author: Joan Guàrdia, Enric Pol.
 Source: Environment and behavior 2002 Jan., v.34, n.1, p.137-149, I

Record 13

Title: A future ecology of urban parks: reconnecting nature and community in the landscape of children
 Author: Julie M. Johnson, Jan Hurley.
 Source: Landscape journal 2002, v.21, n.1, p.110-115,

Record 14

Title: Nature's neighborhood: urban environmental history and neighborhood planning
 Author: Wendy A. Kellogg. maps, site plans, charts.
 Source: Journal of the American Planning Association 2002 Autumn, v.68, n.4, p.356-370.

Record 15

Title: Green on top
 Author: Katrin Scholz-Barth
 Source: Urban land 2001 June, v.60, n.6, p.82-87,96-97.

Record 16

Title: Lawns and toxins: an ecology of the city
 Author: Paul Robbins, Annemarie Polderman, Trevor Birkenholtz.
 Source: Cities 2001 Dec., v.18, n.6, p.369-380,

Record 17

Title: Not-so-wild things: coping with wild animals - and vice versa
 Author: Christine Kreyling.
 Source: Planning 2001 Oct., v.67, n.10, p.18-23,

Record 19

Title: Ecological building is a real political issue [Denmark]
 Author: Erik Nygaard.
 Source: Arkitektur DK 1999 May, v.43, n.3, p.131-137

Landscape Architects' questions

- .. What is your understanding of the term [concept, theory] Permaculture?
- .. Where has your knowledge [understanding] of Permaculture come from?
 - § E.g. Uni, professional contacts/projects, personal exploration
- .. Do you think Permaculture has influenced debate on, and development of, the built environment in Australia since the 1970's/now?
 - § How?
 - § Has it changed over time?
- .. What do you perceive are the key similarities and/or differences between Permaculture and other theories including urban ecology, ecologically sustainable design etc?
- .. Can you recall discussion of Permaculture at industry conferences or in professional journals?
- .. Has your approach to landscape architecture been influenced by Permaculture?
 - § How and why?
- .. Are there similarities between your approach to landscape architecture and Permaculture?
- .. Are there specific projects you have been involved in that contain either explicit or implicit Permaculture principles/concepts?
- .. What is your opinion on the level of interaction between Permaculture and its proponents and the landscape architecture profession?
 - § Why is it like it is?
- .. Can you comment on your opinion of the role of landscape architecture in contributing [leading] to urban design and urban projects responsive to sustainability issues?
- .. What is your understanding of the potential role of Permaculture in the urban context?

- .. What is your opinion of the potential for permaculture to inform landscape architect's approach to urban design and urban projects, particularly urban master planning and public space projects?
- .. Any other comments

Permaculturalists' questions

- .. What is your background and how were you initially attracted to permaculture?
- .. What is your personal interest and application of permaculture?
- .. How are you applying permaculture?
- .. What is your opinion of the potential of permaculture in the urban context?
- .. What do you perceive are the key similarities and/or differences between Permaculture and other theories including urban ecology, ecologically sustainable design etc?
- .. Do you think Permaculture has influenced debate on, and development of, the built environment in Australia since the 1970's/now?
- .. What is your understanding of the definition and scope of Landscape Architecture?
- .. What are your comments on the level of interaction between permaculture and landscape architecture in Australia?
 - § Why is it like it is?
- .. What is your opinion of the potential for permaculture to inform landscape architect's approach to urban design and urban projects, particularly urban master planning and public space projects?
- .. Any other comments

Cover image (from left to right):
_Taylor Cullity Lethlean , Geelong Waterfront, Victoria http://www.aila.org.au/AWARDS/awards-2002/awards/design/design_2002.html
_Hassell, Commonwealth Law Courts ForeCourt, Mebourne,
<http://www.aila.org.au/AWARDS/awards-2000/Comm%20Law%20Crts.htm>
 _ CONTEXT Landscape Design with Bligh Voller Neild and NDY Light, University Mall, University of NSW, Sydney, <http://www.aila.org.au/AWARDS/awards-2000/Uni%20Mall%20NSW.htm>
_ Pittendrigh Shinkfield and Bruce. Green and Gold Bell Frog Habitat at Homebush Bay, NSW,
http://www.aila.org.au/AWARDS/awards-2002/awards/design/design_2002.html
_Crystal Waters Ecovillage, Australia,
<http://www.urbanecology.org.au/links/images/crystalwatersgarden.jp>

image one: front cover of *Permaculture Two*, see bibliography

image two: the permaculture flower, David Holmgren's *Permaculture: principles and pathways...*, page xx

image three: David Holgrem's design principles in *Permaculture: principles and pathways...*

image four: AILA coat of arms from *Landscape Australia 01/2002*, page 50

image five:
<http://www.aila.org.au/information/landscape-architecture/about-information.htm>

image six: *Impetus to Design in Bill Mollison's Permaculture: a designer's manual*, page 59

image seven: **Pittendrigh Shinkfield and Bruce, *Green and Gold Bell Frog Habitat at Homebush Bay, NSW*,**
http://www.aila.org.au/AWARDS/awards-2002/awards/design/design_2002.html

image eight: **Taylor Cullity Lethlean , Geelong Waterfront, Victoria,**
http://www.aila.org.au/AWARDS/awards-2002/awards/design/design_2002.html

image nine: **Taylor Cullity Lethlean and Mary Jeavons Landscape Architect, *Carlton Gardens Playground, Melbourne*,**
http://www.aila.org.au/AWARDS/awards-2002/awards/design/design_2002.html

image ten:
<http://www.welcomeproject.org/images/garden.gif>

image eleven:
<http://cww.octec.org.au/educ/wilcannia/perma/PermaSec2.GIF>

image twelve: The Bronx, USA from *Permaculture: a designer's manual*, image page 24

image thirteen: Kurunda, Queensland, from *Permaculture: a designer's manual*, image page 7

image fourteen: Kualapuu, Hawaii, from *Permaculture: a designer's manual*, image page 7

image fifteen: Moloka'i, Hawaii, from *Permaculture: a designer's manual*, image page 6.

image sixteen: Evolution of a design system from *Permaculture: a designer's manual*, page 67

image seventeen:
<http://www.cityfarmer.org/NYskycasi.jpg>

