



# Future Challenges in Evaluating and Managing Sustainable Development in the Built Environment

Edited by  
Peter S. Brandon,  
Patrizia Lombardi  
and Geoffrey Q. Shen

**WILEY** Blackwell

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Apart from providing a platform for deliberating each chapter of the book and making necessary amendments, the workshop also provided an opportunity to celebrate Professor Peter Brandon's remarkable achievements in education and research within the built environment over the past 40 years, particularly in the field of construction economics and management, information technology applied to construction and the evaluation of sustainable development.

Peter Brandon was appointed the UK's first Professor of Quantity and Building Surveying at the University of Salford, where many of the authors of this book have worked or studied. In the first five years of his time at Salford, he helped to raise the research performance of the School to the highest level attainable under the UK's Research Assessment Exercise, and in 2003 became Pro Vice Chancellor for research. In 2006 Professor Brandon led the University to the highest rise in the league tables of any university and, few years, later has been awarded an OBE in the HM The Queen's Birthday Honours List.

In addition to his academic career at Salford, Professor Brandon has held many major posts related to surveying and construction in the UK, including Chair of the Construction and Built Environment Panel of the Science and Engineering Research Council, Inaugural Chair of the Research Committee of the Royal Institution of Chartered Surveyors, Chair of the Built Environment Panel of the UK's Research Assessment Exercise in 1996 and 2001 and Chair of the Ross Priory Group (incorporating all the major research organisations in the Built Environment in the UK) and many others. He has also been on a number of committees and delegations of the Higher Education Funding Councils and has toured the Institutional bodies of Vice Chancellors and Senior University staff in Europe addressing the subject of Research Quality Assessment.

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## Chapter 1

# Initiative and Obsolescence in Sustainable Development

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### 1.1 Introduction

There comes a time within every academic discipline or topic where we need to stop and take stock, consider the future and recognise that some of our cherished ideas must die. We can no longer persevere with the norms we have enjoyed in our research and we must think anew about discarding those which no longer have anything to offer, regenerating those which still have potential and exploring the horizon for new insights which will give us encouragement in the future. It is the history of scientific discovery and is often referred to as a paradigm shift (Kuhn, 1962).

Sustainable Development has been a latent factor in emerging research for a very long time although not always made explicit as such. Since the concept was formalised largely through the concerns about pollution, climate change and non-renewable resources. It has become almost a cliché. After more than 50 years of international focus it has become an umbrella term which encompasses many different things for many different people. The underlying concept of intergenerational justice (not penalising future generations by what we do today) permeates all discussion. However this important notion can give rise to everything from making people happy to conserving the planet to planning resilience to disaster and much more. This creates difficulties in establishing a vocabulary for communication of ideas and determining where to focus attention in research and application. Each focus has different ideas and different processes and often their own language. The temptation is to retreat into reductionism and, by so doing, ignore the dependencies between the complex variables which go to make up a sustainable environment. While we focus on climate change we may miss the importance of social cohesion. If we focus on energy production we may miss the side effects of other pollutants which are just as dangerous. If we concentrate on crime in a community we may miss the underlying problems of design of buildings which enable people to live together in harmony. If we focus on conservation we may play down the impact on the economy by which we maintain our style of living.

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These examples of inter-dependencies are reflected in the way we classify and structure the subject. They are also prevalent in what we measure and how we assess performance. Measurement and assessment enables us, or should enable us, to determine whether we are making progress in the field and also challenges us to make explicit what we mean by sustainable development. We cannot measure if we are not able to define the term explicitly.

This book attempts to shine light on some of these issues within the Built Environment. This admittedly is a subset of the whole subject of sustainability. It is however a significant sector dealing as it does with the quality of life (in accommodation for most human activity), the heavy use of scarce resources (including energy) and the transport and movement of people and goods across the globe. The subject, by its very nature, is concerned with the future and how we should design and shape it. What cities do we want to live in? What relationship do we want between ourselves? How do we want to travel? How do we protect ourselves against future possibilities of failure? What level of comfort do we want to achieve and how will we achieve it? How do we create harmony in all aspects of life? The list is endless but vital to our understanding of how and what we bequeath to future generations.

The book has been divided into three sections, each with experienced and knowledgeable authors who are leading thinkers in that field. The grouping is:

- Section 1 – World Views and Values
- Section 2 – Design and Evaluation Tools and Technology
- Section 3 – Engaging with Practice, Stakeholders and Management.

These groupings are important for a number of reasons. First, the world view helps us identify the lens by which we view the problem. Do we use the economy as the key feature by which we view and evaluate all others or is there something else? It would seem in most Western nations the economy would be the pre-eminent concern but is it right? Second, the growing use of information and other technologies in design is allowing us to communicate effortlessly between each other and promote ideas to much larger groups. Will this allow us to democratise decision making or will it lead to autocratic rule demanded by the controller of the machine? As artificial intelligence begins to make inroads into our decision making, upon whose values and whose world view will it be based? These are not trivial questions but must be addressed if we are to seek a sustainable future. Third, we need to devise methods by which the future thinkers can link with existing practice to create a seamless development so there is not a divide between theory and practice which has been the downfall of so many bright ideas. Here we have included, for example, a case study in Chapter 13 by Trevor Mole which illustrates how a small professional firm is engaging with the subject within its business plan. It is not an academic paper but it demonstrates that the subject can provide competitive advantage.

Some will argue that science is a major factor in understanding sustainable development. One feature of science is that we use the existing paradigm to build our accepted knowledge for as long as it meets the need of the problem it seeks to understand or seeks to solve. There is a natural inclination to give up what we know to move forward into a new way of thinking. John Brockman (Brockman, 2015) edited a book which is entitled

'*This idea must die*'. It contains 165 short essays by a varied group of authors, spelling out what current ideas should be jettisoned within the natural sciences because they are blocking progress. Similarly there may be a requirement for us even at this stage of sustainable development to challenge our current thinking and decide which paths should continue and which should stop!

This book attempts to identify problems caused by existing methods and provide a challenge for the future. Paradoxically it uses active researchers to explain from their own research what these challenges might be and what ideas might be left on the junk heap of discarded imagination.

## **1.2 Section 1: World views and values**

At the heart of any debate about the future is the lens through which we focus and view the whole problem. If we feel that little can be done without ensuring that economic development continues unabated then our prism is the economy. If we think that conservation of all non-renewable resources is key then we will look at preservation as being the key factor, that is, we do not want to leave future generations with an absence of key resources. On the other hand, if we consider that religion is central then we seek out the precepts of a religion and its beliefs and adhere to these at all costs. If we think that science and technology will eventually resolve our problems then that is where we put our effort.

It may be hard to harmonise these broadly and firmly held views (and others) but if we are to seek a global consensus then we shall have to try and seek common ground.

The root of the world view can be seen in its definition of sustainable development. Perhaps the most well known and well used definition is the WCED Brundtland Commission (WCED, 1987) which states the following:

'Sustainable Development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

This definition does not attempt to define the needs of the present or the needs of the future, both of which are difficult to assess. If we cannot define our present needs without compromise then what chance have we of understanding future needs? This definition is often quoted but the real world view it represents is seen in the next paragraph of the report which says:

'In essence sustainable development is a process of change in which exploitation of resources, the direction of investments, the orientation of technical developments and institutional change are all in harmony and enhance current and future potential to meet human needs and aspirations'.

Now we see a shift towards what many people would say would be the predominately Western view of development although it does leave scope for others. It does not talk about sharing or making sacrifices for future generations. It appears to be the sort of

statement large global companies would want to make to secure their future. The statement may be right but who has the power to implement and what will be their priorities? It may be that we all have to make sacrifices even for selfish reasons to avoid social conflict but will the people with power really choose this world view? It is an enormous agenda just to find the harmonious common ground.

So what is a world view? At the heart of a discussion on sustainable development must be the very essence of the attitudes and beliefs which influences our thinking. One definition of a world view is as follows:

'A comprehensive view or personal philosophy of human life and the universe' (Collins, 2000)

Others have enlarged upon this definition and Wikipedia has suggested:

'A World View is the fundamental cognitive orientation of an individual or society encompassing the entirety of the individual or society's knowledge and point of view. A World View can include natural philosophy, formative, existential and normative postulates; or themes values and ethics ... additionally it refers to the framework of ideas and beliefs forming a global description through which an individual, group or culture watches and interprets the world and interacts with it.'

Probably it is the latter part of the last statement which is most pertinent to this book. In particular it is the way in which we interpret the world and how this interpretation allows us to interact with it which is important. In fact professional knowledge and skill within the design and construction professions is largely based on the way we interpret and act upon our understanding of the built environment.

Leo Apostel (1925–1995) was a Belgium philosopher who was interested in bridging the gap between exact science and the humanities (Anon, 2015). He suggested that a 'world view' is an ontology or a descriptive model of the world and should comprise six elements, namely:

1. An explanation of the world
2. A futurology answering the question 'Where are we heading?'
3. Values, answers to ethical questions such as 'What shall we do?'
4. A praxeology or methodology or theory of action
5. An epistemology or theory of knowledge 'What is true or false?'
6. An aetiology (the study of causation) as it should contain an account of its own building blocks, its origins and construction on which it is based.

These six facets give us an indication of what we should be addressing when we explore and challenge the issues related to Sustainable Development. This book is mainly concerned with item two, futurology examining where we are heading. Since Sustainable Development covers such a wide range of subject matter this is not a trivial matter. It is not surprising, that in general debate, one or more of these characteristics is missing. Andrew Basden in Chapter 19 uses the work of the Dutch philosopher Herman Dooyeweerd to provide a framework for discussion which is outlined by Brandon and



Lombardi (2011). The Dooyeweerd approach to the cosmos (Dooyeweerd, 1955) is gaining momentum and may assist in dealing with the inter-dependencies between various aspects of what make development sustainable.

In this book, John Ratcliffe (Chapter 2) calls on his vast knowledge and experience in considering sustainability futures to examine the changes that are likely to happen to cities. Chrisna du Plessis (Chapter 3) uses her renowned knowledge of examining sustainable development in developing countries to challenge the prevailing views of sustainable development, while Patrizia Lombardi (Chapter 4), through her extensive work on evaluating sustainable development, focuses on the post carbon city and whether resilience has a part to play in future assessments. Finally, Ian Cooper (Chapter 5) reflects on the outcomes of the successful European BEQUEST network – one of the pioneer projects in the field – where he had a key role in analysing the methods by which sustainability in the built environment was evaluated. All these chapters reflect on the persistence of current world views and those which should replace them.

It is unlikely that we will ever get a full and complete World View defined but our explanation and recognition of what World View we are using may help us to understand our limitations and may help us appreciate others. Even within a single world view we find a large number of unintended consequences caused by not taking a holistic view of the problem. For example the Aswan Dam in Egypt, built to stop flooding of the river Nile and to generate hydroelectric power, has also stopped the natural deposition of silt during the annual flood. The farmers now require artificial fertiliser, which leads to pollution of the river as the fertiliser seeps out from the land. One solution provides another problem! If it is a problem within one world view then it is likely to be a greater problem when more than one view is seeking to be harmonised with others.

### ***1.3 Section 2: Design and evaluation tools and technology***

The recognition of a world view influences our view of how we should act to realise development of that view in practice. To achieve this we need a series of tools which enable us to act in a sensible and structured way. These tools allow us to communicate and build knowledge as a community. They can vary from paper-based calculations derived from measurements and evaluations, to technical support, all in the form of solutions to various aspects of the physical built environment. These might include innovation in heat storage, passive design for energy reduction, extraction of materials, dealing with pollution and in fact the list could go on forever! Alternatively they might be more abstract issues which deal with qualitative judgements, feelings and emotions which are difficult to assess. Our way of handling this complexity is to build models with different levels of granularity to address different levels of knowledge and hopefully at some time we can bring them together to deal with the interdependence they have upon each other. Gaining harmony among the myriad of models is probably one of the most difficult and challenging things we seek to achieve, as it is in real life. A decision in one area can have repercussions in any number of different areas and in ways which are not always predictable. Nevertheless the way forward must be to strive for models which give us a better picture of the world as we observe it and which can be inter-related.