Institution: **Anglia Ruskin University**

Unit of Assessment: **16 Architecture, Built Environment and Planning**

Title of case study:

A dynamic development route-map that enhances sustainable construction, improves project efficiencies, and reduces environmental impact.

1. Summary of the Impact (100 words)

This case study presents a dynamic development framework route-map (the Precinct Planning Design Standard, PPDS) that enhances sustainability and the delivery of a development's goals, aims, and objectives for medium-large mixed-use precinct developments and tourist resorts in developing countries. The standard shortens pre-planning timescales, achieves greater certainty in actual performance delivery and reduces environmental impact for developers, developments, and their infrastructure.

Through Earthcheck Pty PPDS is now commercially available and has been used to benchmark and certify ecological performance improvements of 30 Asia Pacific projects (US$ 25 billion development value). These range from 8,000 person community projects to medium sized tourism resorts and island developments. Our research has challenged existing standards and consequently influenced practitioners to rethink and improve the efficacy of their development processes.

2. Underpinning research (500 words)

When a strategic tourism stimulus results in significant development and construction, the potential for ecological damage is immense (Moore 2012). Since 2009, Moore's research has developed quantitative and qualitative framework modelling that can be applied through a project, from design-brief stage to end-user deployment.

His research analysed measurements and sustainability accreditation assessments of developments in Australia, China, Vietnam, Cambodia, Indonesia, Bali, and India. Exemplar projects include the Rise Noosa and Salt precincts in Australia, Alila Resorts at Uluwatu and Soori Bali in Indonesia, Hilton Hadahaa Island in the Maldives, and Banyan Tree's Laguna Lang Company, in Vietnam. During the developmental research, the Precinct Planning Design Standard (PPDS) was used as a sustainability modelling tool for the Australian State Government regulated, ecologically sensitive, United Nation biosphere area at Lake Weyba Noosa on the Sunshine Coast of Queensland Australia. PPDS provided greater certainty regarding predicted long term ecological performance improvements on this high profile ecologically sensitive project.

Moore (2010b) identified an early research focus on a process-based framework for delivering sustainable development for travel and tourism infrastructure in coastal, rural, or urban regions. He reviewed environmental, social and economic policy and strategies being pursued by international, national, state, region and local level and how they translate into the regulatory and development process. He also analysed existing statutory regulation and its integration of sustainable principles into the development approval process. Additionally, his research reviews and critiques existing sustainable models and tools and how they interface with the regulatory process. Linking the proposed performance based integrated process framework and its models and tools to the development approval process, Moore determined the barriers to the implementation of sustainable principles on medium to large mixed use precinct developments. Through case studies, Moore tested the framework, models and tools using several medium to large mixed use precinct developments to determine how good intent translates to actual performance.

The framework developed into the fully integrated PPDS tool incorporating planning and design,

construction management, and facility operations. It integrates the development process with ecological assessments for medium to large mixed-use precincts in one management tool. This helps clients, stakeholders and professional advisors, particularly the development manager, achieve goals brought on by ever-increasing sustainability demands and delivery pressures. PPDS meets industry demands to mitigate ecological impact.

Moore (2011) shows that existing development standards and tools adopt principles that define sustainable planning, design, and construction, but have only limited references to pre-development and operational needs. PPDS, however, (Moore, 2012) gives full regard to post-construction management and performance measurement. These two major omissions, pre-PPDS, indicate deficiencies in key standards such as the sustainability protocols existing as the Building Research Establishment Environmental Assessment Method (BREEAM) (UK), the Leadership in Energy and Environmental Design (LEED) (United States of America) and GreenStar (Australia). Sustainability principles were rarely initial or ultimate project objectives; projects merely responded to statutory authority requirements and only included environmental imperatives. Furthermore, earlier standards are limited by their assumptions about pre-determined site choice: the PPDS development tool incorporates early pre-planning and design phases of the development process. The development industry commonly separates construction and management (Moore, 2010a) leading to many of the industry's delivery problems such as poor quality, over-spend and poor programmed performance. Whilst pre-PPDS standards follow and perpetuate this unsatisfactory disconnection, PPDS provides a fully integrated design-brief to end-user approach. The Unit's on-going research, further refining the PPDS, explores how to disseminate the benefits of the framework approach into industry process and practice. This includes mechanisms by which institutional, social and regulatory barriers are overcome.

Initial research was funded in 2006 by the Australian Government and Earthcheck Pty at the University of Queensland, where Moore was then employed. Since joining Anglia Ruskin University as Senior Lecturer in 2009 he has extended and expanded this research within the submitting Unit.

3. References to the research

Key Research Outputs: The following publications have been peer reviewed and published internationally. The conference paper is included for research context as it is referenced in the narrative.

Journal Papers

Moore R. 2010a: Le Challenge De La Rénovation Durable D'un Bâtiment Historique (A Sustainable Refurbishment meets the Challenges of an Existing Building), Property Research Worldwide, Réflexions Immobilières 4th Quarter 2010 No 54 pp18-29 Joint Special Issue Publication A Perspective on Property IEIF (Institut de L'Espargne Immobilière et Foncière) and the RICS Paris France. Available from the submitting HEI on request.

Moore R. 2011: Delivering Ecological Visions and Goals, A Sustainable Development Case Study, The International Journal of Environmental, Cultural, Economic and Social Sustainability, Vol. 7 Issue 2 pp73-92 June 2011 The Sustainability Collection Common Ground Publishing Illinois, USA Available from the submitting HEI on request.

Chapter in a Book

Moore R. 2012: Island Sustainability 2 - Integrating Small Island Sustainability, WIT Press UK pp. 103-115 ISBN 978-1-84564-618-9. Available from the submitting HEI on request.

Conference Paper

Moore R, 2010b; A Framework for Sustainable Development, the 16th Annual International

Sustainable Development Research Conference May/June 2010 Kadoorie Institute, The University of Hong Kong. ISBN 978-988-18934-1-3. available via http://www.kadinst.hku.hk/sdconf10/Papers_PDF/p15.pdf

4. Details of the impact

Following the developmental research and its dissemination though non-academic conferences (e.g. Moore 2010b) the PPDS framework is now part of the international benchmarking and certification EarthCheck EC3 programme (Source 5.1) and is applied globally (examples given in Sources 5.2, 5.3). EarthCheck is the world's largest certifier of sustainable travel and tourism operators, having more than 1000 clients in over 60 countries. The programme provides benchmarking, certification and performance improvement systems to help businesses improve profitability and operational efficiencies. Published case studies have been used to challenge, develop and improve internationally accepted sustainability indicators. These indicators are used in the design process, project planning, and management activities across a wide range of mixed-use precincts, communities and tourist resorts. PPDS is now in commercial use. The PPDS framework has provided a means to overcome on-going impacts including environmental vulnerability (Source 5.4) over-exploitation, energy dependency, population loss, social depredation, debt, and economic volatility.

Discussions between EarthCheck and Royal Thai Government officials and representatives of Pattaya City Thailand have taken place to further exploit the success of the PPDS framework system. Both were seeking to improve the quality of life in one of the notorious tourist areas where exploitation of young women and boys employed in the sex trade had become rife. The discussions have led to the development of an international consortium incorporating SMEs and local Authorities from Asian countries including Indonesia and Malaysia. The primary aim of the collaborations is to seek to address the issues of disparity and promote strategies for the creation of sustainable process-based supply chains using process-based framework systems.

The PPDS framework, along with the related tool Building Planning and Design Standard (BPDS) arising from this research are now being utilised to offer a means by which major refurbishment of listed buildings in cities can be undertaken in a sustainable and ecologically sensitive manner (Source 5.5). For example, the City of Melbourne's Tourism Environmental Action Plan 2009 – 2013 addresses the challenge of growing tourism demands in the City. Challenges include increased tourism activity that puts pressure on the environment by consuming increased resources and energy whilst generating increased waste and carbon emissions. A feature of the City's governance is that its hotels now achieve accreditation using this internationally recognised system. EarthCheck Pty, who advised and created the vision for the promotional organisation Destination Melbourne, recommends the PPDS framework and standards. Whilst recognising that tourism underpins the socio-economic wellbeing of Melbourne by generating more than $10 billion in expenditure and employing 160,000 people, this cannot override the principles of sustainable development. The sustainability achieved using the PPDS and BPDS framework standards at the Rialto Hotel Melbourne (Moore, 2010a) has led to their prescription as voluntary regulatory frameworks for use on precinct and building proposals, including heritage buildings, in Melbourne City business district. The evidence from the Rialto case study indicates that these standards offer the potential of lower environmental and social impacts along with lower life cycle costs and higher returns on investment capital.

Early research showed that many developing countries and small island states in the Australasia region have experienced some of the largest increases in world tourism demand. Furthermore, travel and tourism provide a means of socio-economic restructuring. PPDS has led to extensive elimination or mitigation of the negative ecological impacts linked to tourism and its accompanying resort development and on-going facility management. The successful utilisation of the Framework is now being extended to a major regional governmental undertaking in Thailand where the City of

Pattaya, through the Mayor's office, is to use PPDS processes to interconnect and drive the redevelopment of the regional travel and tourism industry.

The PPDS approach is being further deployed by a SwitchAsia funding bid by the Unit, supported by Thailand's Designated Areas for Sustainable Tourism Administration (DASTA). DASTA is a national government organisation headed by the Prime Minister of Thailand in consortium with EarthCheck Pty; the founding member of this alliance of government, industry and research organisations. The project develops the PPDS themes to revitalise impoverished precincts to become good places to live, raise families, retire to or simply visit. The design-brief to end-user philosophy of PPDS will encourage respect for the environment and its bio-diversity within new or refurbished development projects.

5. Sources to corroborate the impact (indicative maximum of 10 references)

Key corroborators:

1. NALCO (an EcoLab Company) Senior Industry Development Manager, Hicom-Glenmarie Ind Ehsan Office, Malaysia.
2. Banyan Tree Global Foundation, Singapore Office Coordinating Director. Projects in Indonesia, Bali, China, Cambodia and Vietnam).
3. Alila Hotels and Resorts, Group Director of Engineering, Desa Pecuta Office, Bali, Indonesia. Projects in Singapore, Indonesia and Bali.
4. SM Development Services, Principal Project Director of Labrador Office, Gold Coast, Australia.
5. EarthCheck Pty (http://www.earthcheck.org/company/alliances.aspx) Chief Executive Officer Brisbane Office, Australia.