

Policy issues of sustainable built environment research



International Networking for Young Scientists 2007
Participants' report and concluding declarations

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INTERNATIONAL NETWORKING
FOR
YOUNG SCIENTISTS (INYS) 2007

Policy Issues of
Sustainable Built Environment Research

Conference & Discussion Workshop

Participants' Report and Concluding Declarations

Hong Kong, 24 – 25 January 2007

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Table of Contents

List of welcoming and keynote speakers	1
List of speakers	2
List of conference & discussion workshop session chairmen	3
Organising committee	4
Welcome speeches	5-7
1.0 Introduction	8
A. Aim of this book	
B. Structure of this book	
2.0 Programme overview	9
A. About INYS conference	
B. Theme	
C. Aims	
D. Programme rundown	
3.0 Key issues raised by speakers	10-19
4.0 Declarations	20-23
A. Prelude	
B. Scope of the conference	
C. Concluding remarks	
D. Recommendations	
Appendix I	24-26
Appendix II	27-30

List of welcoming speakers

- Wynne Kam - *Education Partnerships Manager*
British Council Hong Kong
- Professor J. M. Ko - *Vice-President (Research Development)*
The Hong Kong Polytechnic University

List of keynote speakers

- Andrew N. Baldwin - *Dean, Faculty of Construction and Land Use*
The Hong Kong Polytechnic University
- Patrick S. S. Lau - *Legislative Councillor (Architectural, Surveying and Planning)*
HKSAR
- Otto L. T. Poon – *Chairman, Strategy Sub-Committee*
Council for Sustainable Development, HKSAR

List of speakers

United Kingdom

- Malcolm Bell - *School of the Built Environment*
Leeds Metropolitan University
- Abbas Ali Elmualim - *School of Construction Management and Engineering*
The University of Reading
- Alexandros Gasparatos - *Construction Management Research Unit*
Division of Civil Engineering, University of Dundee
- Ya Wang - *School of Construction Management & Engineering*
The University of Reading
- Yangang Xing - *Construction Management Research Unit, Division of Civil Engineering*
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- Grace W. Y. Cheng - *Department of Building and Construction*
City University of Hong Kong
- Daniel C. W. Ho - *Department of Real Estate & Construction*
The University of Hong Kong
- Stephen S. Y. Lau - *Department of Architecture*
The University of Hong Kong
- Grace K. L. Lee - *Department of Building and Real Estate*
The Hong Kong Polytechnic University
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The University of Hong Kong
- Wong Wah Sang - *Department of Architecture*
The University of Hong Kong
- Justina H. W. Yung - *China Business Centre*
The Hong Kong Polytechnic University

List of conference & discussion workshop session chairmen

- Edwin H. W. Chan - *Department of Building and Real Estate*
The Hong Kong Polytechnic University
- Lee Ngok - *Public Policy Research Institute*
The Hong Kong Polytechnic University
- Horace K. W. Mui - *Department of Building Services Engineering*
The Hong Kong Polytechnic University
- Edward C. Y. Yiu - *Department of Real Estate and Construction*
The University of Hong Kong
- K. K. Yuen - *Public Policy Research Institute*
The Hong Kong Polytechnic University

See Appendix I and Appendix II at the end of this report for further information on speakers, session chairmen and other conference participants.

Organising committee

Chairman

Prof Edwin H. W. Chan *Department of Building and Real Estate*
The Hong Kong Polytechnic University

Members

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The Hong Kong Polytechnic University

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Prof Stephen Lau *Department of Architecture*
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British Council Hong Kong

Dr Edward Yiu *Department of Real Estate and Construction*
The University of Hong Kong

Dr K. K. Yuen *Public Policy Research Institute*
The Hong Kong Polytechnic University

Welcome speeches

Wynne Kam - British Council Hong Kong

Good morning ladies and gentlemen.

I am honoured to be here this morning. Firstly, I would like to thank one of our working partners, the Hong Kong Polytechnic University, for hosting this event and to welcome our speakers from the UK, as well as from universities in HK.

The British Council is committed to fostering partnerships between individuals and institutions in the UK and Hong Kong to share the benefits of science and create a wider public awareness of science and technology.

The International Networking for Young Scientists brings HK and UK researchers together to facilitate the exchange of ideas and expertise on various science agendas and the theme for this year is policy issues of sustainable built environment research. There is no doubt that this topic is of global interest and we are grateful for the support and advice from our local partners who work with us in developing a programme that meets local needs. That is what we hope to achieve in all our work.

Wynne Kam
Education Partnerships Manager
British Council Hong Kong

I wish you a fruitful and enjoyable workshop in the next few days. I also hope the discussion does not end here, but will be carried forward to develop international collaborations for research and academic exchanges that foster innovation and best practices on sustainable built environment.

Thank you.

Professor Ko Jan-ming - The Hong Kong Polytechnic University

The Honourable Patrick S. S. Lau (Legislative Councillor of HKSAR), Otto Poon (Chairman of the Strategy Sub-Committee, Council for Sustainable Development, HKSAR), Ms Kam of the British Council Hong Kong, guest speakers from the United Kingdom, ladies and gentlemen.

It is my pleasure to welcome you to The Hong Kong Polytechnic University (HK PolyU) to take part in this conference, which is co-organised by the British Council Hong Kong and the HK PolyU. This event is part of the British Council's educational exchange programme of **International Networking for Young Scientists (INYS)**, which provides a platform for academic exchange between post-doctorates and academics in HK and the United Kingdom. We are glad to be invited as the main co-organiser of the event, and the university treasures this type of activity that intensifies the internationalisation of the university. We welcome our friends and scholars from universities in the United Kingdom who will share with us their expert knowledge and mix with the local researchers through discussions and technical visits in the next two to three days.

As the theme of this conference is **Policy Issues of Sustainable Built Environment Research**, it logically calls for the collaboration of the Public Policy Research Institute and the Faculty of Construction and Land Use of the university. **Sustainability** is an all-embracing word and it involves all issues concerning mankind. It is

difficult to find any research nowadays that is not related to the importance of sustainability. Hence, research on sustainability cannot be the privilege of any specific research group or centre, but the research requires cross-discipline collaboration.

In the field of built environment, the Faculty of Construction and Land Use has been carrying out research concerning almost all aspects of the built environment. We hope today, through participation of the faculty members in this conference, they could share with you their research. As for policy issues, the Public Policy Research Institute was set up by the university two years ago to undertake cross-discipline research on policy issues that affect the general public. Over the years, through the joint effort of academic staff from various departments, the institute has carried out contract research for the Hong Kong government, including three projects for the Sustainable Development Council of the government.

In this conference, other local universities and professional institutions have been actively involved and will be sharing their knowledge here. We have speakers from The University of Hong Kong, The Chinese University of Hong Kong and the City University sharing research findings from their areas of expertise.

From industry, we have the key supporting organisation the **Professional Green Building Council**, which was set up by the five professional bodies in Hong Kong representing architects, engineers, landscape architects, planners and surveyors, who are directly involved in shaping our built environment. Their work and dedication in delivering sustainable built environment can be seen from the exhibitions in the foyer outside this conference hall. Please find time to look at them during conference breaks.

At the end of today's programme, there will be a round-table forum involving all conference participants to contribute your views towards the theme of this conference. Through this collaborative effort, I am sure the conference will be successful.

Professor J.M. Ko
Vice-President (Research Development)
The Hong Kong Polytechnic University

On behalf of HK PolyU, I thank you all and would like to express my sincere appreciation for the participation of various universities from Hong Kong and the United Kingdom, the sharing of practical examples from industry, the dedication of the Organising Committee and the generous funding support from the British Council that make this conference possible. Thank you!

1.0 Introduction

A. Aim of this book

This book was originally conceived in October 2006. The idea was developed immediately after the Organising Committee accepted an invitation from the British Council Hong Kong to hold the INYS Conference 2007. This book aims to record the latest research outputs and achievements on the issues related to sustainable built environment. The materials in this book have been contributed by a number of scholars in Hong Kong and the United Kingdom who actively participated in the INYS 2007.

This book provides an insight into various study areas such as land use matter, technology development and policy issues on sustainable built environment. It is believed that those interested in the subject, such as practitioners, students and researchers, will find this book useful.

B. Structure of this book

This book comprises four main sections. In Section One, the introduction, the aim and the structure of this book are given. Section Two provides some background information of the INYS Conference 2007 including its theme, aims and programme rundown.

Section Three summarises the key points raised by the speakers from Hong Kong and the United Kingdom during the conference in each of the following sessions:

Section One- Sustainable Urban Development and Renewal / Regeneration

Section Two- Urban Space Planning, Building Performance and Life Cycle

Section Three- Sustainability Assessment of Development Scheme and Legislative Control over Sustainable Urban Design

Section Four- Urban Policy of Hong Kong, in the Context of the Pearl River Delta Region, and in the United Kingdom

The book culminates in Section Four, with the concluding declarations of the conference. After the INYS Conference 2007, a discussion workshop was held the following day. The scholars from the United Kingdom and Hong Kong shared their experiences and discussed the issues of sustainable built environment raised by the conference speakers. Through consensus and understanding among the participants, concluding declarations on sustainable built environment were drafted and circulated to all participants to comment on before finalising the declarations into those published here. Since this event was held in Hong Kong, the major focus of the discussion was on the context of the Pearl River Delta Region.

2.0 Programme overview

A. About the INYS conference

Since 2004, the British Council Hong Kong has co-organised with the universities in Hong Kong several educational exchanges under the council's International Networking for Young Scientists (INYS) Programme, which encourages exchange between post-doctorates and academics in Hong Kong and the United Kingdom. This year, Prof Edwin H. W. Chan of The Hong Kong Polytechnic University (Faculty of Construction and Land Use, and Public Policy Research Institute) was invited to co-organise the event and chair the Organising Committee.

The theme of the INYS programme 2007 was to discuss policy issues on sustainable built environment and a conference and discussion workshop were held on 24 and 25 January 2007.

B. Theme

The theme of this event was Policy Issues of Sustainable Built Environment Research. Sustainable development is a proclaimed policy of the Hong Kong government and it has aroused public concern in recent years. For sustainability, many studies focusing on technological innovation have been carried out and appropriate policy support should be developed to implement the technical findings. In order to share the outputs and achievements on sustainable development of the practitioners and academia, and review the existing and future direction of land use, technology development and policy issues on sustainable built environment, it is necessary to have a platform for detailed discussions. This conference and discussion workshop provided a great opportunity for practitioners and academia in Hong Kong and the United Kingdom in exchanging their ideas, and exploring areas for further investigations.

C. Aims

- To enable young scientists in the United Kingdom and Hong Kong to exchange ideas, knowledge and expertise on policy issues of sustainable built environment.
- To promote international collaborations for research and academic exchanges that foster innovation and best practices on sustainable built environment.

D. Programme rundown

Wednesday 24 January: Conference & discussion forum

- A full day event from 8.30 a.m. to 6.00 p.m.

Thursday 25 January: Discussion workshop to develop the declarations and technical visit to Urban Renewal Authority

- Concluding discussion from 10.00 a.m. to 12.30 p.m.

Friday 26 January: Technical visits to One Peking and Hong Kong Wetland Park

3.0 Key issues raised by speakers

This chapter summarises the key issues raised by the speakers from Hong Kong and the United Kingdom in their presentations during the conference.

Session 1 - Sustainable Urban Development and Renewal / Regeneration

Topic 1.1

Sustainable Urban Regeneration: Any Relevance to Hong Kong?

Speaker

Dr Ng Mee Kam (Centre of Urban Planning and Environmental Management, The University of Hong Kong)

Key points

- Sustainable urban regeneration is an inclusive process that aims at the formulation of a multi-dimensional strategy that involves the physical fabric, social structures, environmental conditions and the economic base.
- Integration of top-down and bottom-up approaches is required to ensure that the constraints, challenges, needs and concerns, etc. of the stakeholders in the public, private and third sectors are taken into account.
- Identifying the partners, aspirations of the community, capacity of existing systems, possible impact on economic, environmental and social systems, and implementation and evaluation mechanisms of community participation is crucial for sustainable development planning.

- It is time to review local urban renewal policy, the Urban Renewal Strategy and Urban Renewal Ordinance, and to define the roles, positions, future directions and the 4R approach adopted by the Urban Renewal Authority (URA) in Hong Kong.
- A community planning workshop should be conducted to find out the views of the community and a SWOT analysis should be carried out to identify the best approach for renewing run-down urban areas.

Topic 1.2

The Sustainability Debate

Speaker

Dr Abbas Elmualim (School of Construction Management and Engineering, The University of Reading)

Key points

- Sustainable construction provides ecological, economic and social benefits for present and future generations by matching the demand and supply of the natural resources for the built environment based on transportation and technologies currently available.
- Sustainable development involves a series of decision-making processes in which different dominant groups have their own interests. Critical Discourse Analysis is valuable in identifying the hidden agenda of different concerned parties and to examine their inter-related social contexts or conjunctures.
- It is necessary to make the best use of natural power sources like wind power, wave power, solar power, biomass, bio-fuels and hydrogen-fuel cells to generate renewable energy and to adopt appropriate designs to reduce the consumption of energy, water and materials, and reduce the generation of wastes.
- High living standards cannot be achieved and sustainable communities cannot be created without the integration of design, construction and facility management, continuous discourse among stakeholders and working partners, and the presence of foresighted decision markers.

Topic 1.3

A Revolution in Hong Kong Urban Renewal

Speaker

Grace K. L. Lee (Department of Building and Real Estate, The Hong Kong Polytechnic University)

Key points

- Urban renewal projects cannot be regarded as successful unless the proposal has taken into account the three sustainable development objectives, i.e. economic development, environmental conservation and social well-being.
- Urban design is crucial to compact urban development as well as urban renewal in Hong Kong in creating a sustainable environment. This is due to urban renewal projects having to deal with the different interests of various stakeholders in a confined site, restricted by existing infrastructure provisions.
- Key urban design principles for achieving sustainable urban renewal are identified as:
 - Compact design and intensive development
 - Proper mix and balance of land uses
 - Establishment of inter and intra-regional linkages
 - Respect for positive identity
 - Plan for comfort and quality living
 - Maximisation of community participation
- A systematic way to assess the design quality of an urban renewal proposal before and after implementation is required. The suggested Sustainable Assessment Model which is based on the opinions of the citizens (the end-users) and design practitioners (professionals in urban design) is valuable in evaluating the stakeholders' views on the design of urban renewal projects in Hong Kong.

Topic 1.4

Full Cost Accounting for Sustainable Urban Development Policy Analysis and Making: A Review of Current FCA Models and Practices

Speaker

Dr Yangang Xing (Construction Management Research Unit, Division of Civil Engineering, University of Dundee)

Key points

- It is necessary to have a comprehensive accounting system for urban developments to analyse the environmental, social and economic costs and benefits at different spatial scales and at different stages in the life cycle.
- A full cost assessment process should be conducted in order to establish sustainable urban policy.
- Many models and assessment tools are available worldwide but a full cost accounting model, which is expected to be the standard assessment procedure in the future, has not yet been developed. The full cost assessment model mentioned has provided a framework to evaluate the economic, resource, environmental and social impacts in money terms which can be used for further discussion.

Session 2 - Urban Space Planning, Building Performance and Life Cycle

Topic 2.1

Urban Compactness in Hong Kong and its Implications on Open Space

Speaker

Stephen S. Y. Lau (Department of Architecture, The University of Hong Kong)

Key points

- There are two forms of urban development - compact urban form and sprawling urban form. In Hong Kong, compact high density urban form with mixed land uses, short distances between different uses and an efficient public transport network is adopted to meet the demands of an increasing population and the scarcity of urban land.
- High density Multiple Intensive Land Use (MILU) development in Hong Kong usually clusters around the mass transit nodes or alongside the main roads and streets.
- High density compact urban form has both positive and negative implications on the quality of public open space, which plays an important role in building sustainable neighbourhoods and communities in compact cities like Hong Kong.
- The data analysis results of a questionnaire survey conducted in six public housing estates showed that satisfaction with open space provisions, privacy, social interaction and safety levels in open spaces have a significant positive influence on optimum open space satisfaction. Crowding in open spaces and an increase in travel time to open spaces have a negative influence on open space satisfaction, but their influence is not significant.

Topic 2.2

The Life of Victoria Harbour - A Sustainability Problem

Speaker

Dr Wong Wah Sang (Department of Architecture, The University of Hong Kong)

Key points

- Victoria Harbour in Hong Kong has provided a source of land supply through reclamation in past decades for urban development and construction of infrastructure like Kai Tak airport, Eastern corridor, the railway network and highways.
- Minimisation of reclamation, preservation of views to ridgelines and thoughtful harbour front planning are effective means of conserving Victoria Harbour and achieving sustainability objectives.

Topic 2.3

Building Performance Measurement

Speaker

Dr Abbas Elmualim (School of Construction Management and Engineering, The University of Reading)

Key points

- Post-occupancy Evaluation (POE) is essential in evaluating the quality of design and construction, and the overall building performance by comparing the energy benchmarking and design targets.
- In order to increase the reliability of the POE results, continuous monitoring and testing of the system installed, and surveying occupants using structured questionnaires and informal interviews should be conducted.
- It is necessary to adopt a 'user centred approach' through the whole life cycle of building projects.
- Integrative models for sustainable design, construction and facility management can help to enhance building performance and improve businesses and client / user value whilst lessening the impact on the environment.

Topic 2.4

Building Quality Assessment for Sustainable Urban Development

Speaker

Dr Daniel C. W. Ho (Department of Real Estate & Construction, The University of Hong Kong)

Key points

- The Building Quality Assessment suggested is a long-term approach to arresting urban decay and improving living standards.
- Favourable assessment results can provide positive recognition and encouragement, and promote quality designs, proper maintenance and management.
- HKU have been developing a building quality index (BQI), a building classification system, which is a protocol to grade buildings into different classes with reference to the performance of building on certain pre-defined objectives.
- Building age, number of units on a floor, number of blocks in an estate, form of building management, etc. can affect the health and safety performance of the buildings surveyed.
- The assessment scheme can distinguish good quality buildings from the bad in terms of health / safety, provide valuable information for the public when choosing properties and probably influence property prices.

Session 3 - Sustainability Assessment of Development Scheme and Legislative Control over Sustainable Urban Design

Topic 3.1

Attitude and Related Behavioural Responses of Building Professionals on Sustainable Development: A Comparative Study Between Hong Kong and Cities in Mainland China

Speaker

Grace W. Y. Cheng (Department of Building and Construction, City University of Hong Kong)

- Building professionals, e.g. architects, planners, surveyors, structural/building services engineers, contractors, etc. play an important role in sustainable built environment and they have diverse views on sustainability.
- Building professionals surveyed in Shenyang, Beijing, Wuhan and Hong Kong, in particular the younger generation between 18 and 40 years old, are well aware of the global issues like global warming and exhaustion of natural resources, and local issues such as air and water / river pollution.
- Building professionals surveyed had a positive response in promoting sustainable development but if they were asked for actual actions, their responses tended to be apathetic.

Topic 3.2

How to Avoid Managing the Model: The Importance of Feedback and Evaluation in the Development of Sustainable Buildings

Speaker

Prof Malcolm Bell (School of the Built Environment, Leeds Metropolitan University)

Key points

- It is not uncommon to have deficiencies between notional performance and actual performance of buildings because design performance is always degraded by construction. Therefore, it is important to have feedback and evaluations in the development of sustainable buildings.
- The actual performance of buildings can be evaluated through continuous measurement and testing.
- It is not enough to look at technical performance alone. All technical performance is the product of a socio-technical process of design, construction, maintenance and use. In developing and maintaining a sustainable built environment it is crucial that we understand not only technical performance but also the systems within which designers, constructors and users work.
- The evaluation process must be continuous and it will be necessary to ensure that change of the models, design and construction practices takes place in response to the feedback.
- Quality building performance requires good control, not only of design and construction, but also of use, putting significant emphasis, for example, on high levels of facilities management.

Topic 3.3

Different Concepts of Value and their Implications in Sustainability Assessments

Speaker

Alexandros Gasparatos (Construction Management Research Unit, Division of Civil Engineering, University of Dundee)

Key points

- There are a number of metrics, models and tools available for measuring the diverse sustainability issues within the context of urban developments, e.g. biophysical models, monetary tools and sustainability indicators/composite indices.
- But is it really justifiable to assess the progress towards sustainability by using single metrics? Such a choice seems increasingly non-justifiable not least due to these metrics' methodological imperfections and limits. Additionally, our recent awareness of economies, societies and even cities as complex adaptive systems that cannot be fully captured through a single perspective further adds to the argument.
- Given that different sustainability tools utilise different concepts of value (biophysical vs. monetary), choice of a tool is indirectly a choice of a value system which in turn is inherently a choice of perspective. Nevertheless, excluding legitimate perspectives from a sustainability assessment prevents the dissemination of important information to stakeholders and policy makers.

- As a result, further elaboration and refinement of current metrics is not adequate to entail frameworks for comprehensive sustainability assessments. Adoption of diverse metrics seems more likely to be the key for concrete sustainability assessments.

- It is necessary to adopt an approach capable of assessing sustainability in a holistic manner through considering the different legitimate perspectives. This methodological pluralism coupled with stakeholder involvement will most likely culminate in better informed policy making.

Topic 3.4

Recent Developments of Legislative Measures for Environmental and Sustainable Design in Hong Kong

Speaker

Prof Edward Y. Y. Ng (Department of Architecture, The Chinese University of Hong Kong)

Key points

- Global warming, urban heat island and rising sea level are alarming issues in the world as these problems can adversely affect the health and lifespan of all human beings especially for the old and the weak.
- In order to obtain the largest possible return for the money invested in land, a congested form of development has been adopted and, therefore, many packed buildings can be observed in Hong Kong.
- Lack of natural lighting and ventilation is a major consequence of high density development. Since natural lighting and ventilation is closely related to public health and human comfort, the adoption of design measures facilitating natural lighting and cross ventilation, and a review of current lighting and ventilation requirements can help to create a healthier built environment in the future.
- Air Ventilation Assessment (AVA) is valuable to assess the effects of major planning and (re)development proposals on external air movement for achieving an acceptable macro wind environment and to promote a better layout of building blocks.

- In addition to the performance based AVA requirement, appropriate qualitative design guidelines on ventilation, as stipulated in the Hong Kong Planning Standards and Guidelines, should be incorporated into the development proposals in order to minimise the negative impact on air ventilation.
- Proper building design can facilitate better urban air ventilation, mitigate the urban heat island effect, enhance the pedestrian environment and provide more urban greenery which in turn supports a sustainable urban living space in Hong Kong.

Topic 3.5

Sustainability and Competitiveness of Design Firms in China

Speaker

Ya Wang (School of Construction Management & Engineering, The University of Reading)

Key points

- The Chinese Professional Service Design Firms (PSDFs) perform well in the domestic market but not in the international market. In order to increase the international revenue of Chinese PSDFs, it is necessary to increase the competitiveness of the firms.
- The model suggested is based on environmental, financial, organisational, social and technical criteria to assess the competitiveness of Chinese PSDFs.
- The model is valuable for the Chinese PSDFs to self-diagnose their competitiveness and for the clients to pre-qualify the firms and to identify the most competitive firms to undertake their projects.

Session 4 - Urban Policy of Hong Kong in the Context of the Pearl River Delta Region and in the United Kingdom

Topic 4.1

Urban Policy of Hong Kong in the Context of Pearl River Delta Region

Speaker

Dr Justina Yung (China Business Centre, The Hong Kong Polytechnic University)

Key points

- With the exception of some discussions on the connection of infrastructure in the border area, interplay between the HK colonial government and Pearl River Delta (PRD) government bodies was kept to a minimum prior to 1997.
- More in-depth discussions with PRD government bodies, such as the Guangdong and Shenzhen governments, relating to urban development and transportation cooperation have been conducted since 1997, and several new cross-boundary transport infrastructures, (Hong Kong-Shenzhen Western Corridor, Sheung Shui to Lok Ma Chau Spur Line, Hong Kong-Zhuhai-Macao Bridge and the Guangzhou-Shenzhen-Hong Kong Express Rail Link) are going to be built.
- Highways and roads have been the most important transportation system from Hong Kong to the PRD since the 1980s. However, under the 11th Five-Year Plan (2006-2010), the Central Government shifts transportation orientation from the road system to railways. Under the new Guangzhou intercity express railway plan, Guangzhou will become a regional core upon railway completion.

- Hong Kong may be marginalised from the PRD economic circle in the future due to the inadequacy of its railway network and the fact that it is not included in Guangdong's Co-ordinated Township Plan 2004-2020. Therefore, its role and positioning in relation to other PRD cities have not been thoroughly considered or well-defined.
- Hong Kong cannot stand alone, it is necessary for Hong Kong to join the city network that connects PRD cities through railway construction, economic and societal integration.

Topic 4.2

The Assessment of Urban Cluster for Locating Production Systems in China

Speaker

Ya Wang (School of Construction Management & Engineering, The University of Reading)

Key points

- The model mentioned adopts a multi-criteria decision-making approach to assess urban clusters for locating production systems in China.
- By assessing the availability of natural and social resources like minerals, water and energy supply, government services and human resources, and the natural and social conditions of the cities, it is possible to select the most favourable location among different options.

Topic 4.3

Learning to Tango: Sustainable Development and the Multidisciplinary Dream

Speaker

Prof Malcolm Bell (School of the Built Environment, Leeds Metropolitan University)

Key points

- Urban policy needs to recognise all facets, such as economic conditions, social and political aspirations, the technology and knowledge currently available, and human behaviour.
- Sustainable development cannot be achieved without a co-operative multi-disciplinary team which is not a collection of individuals but a well integrated team that produces collective rather than parallel work products and takes collective responsibility.
- A good model of multi-disciplinary activity should be able to identify the problems first, then share understanding of the problems, use collective insights to explore possible solutions and finally produce collective work products.
- The members in a multi-disciplinary team should have intellectual proximity to, coordinate and communicate with one another. They have to know when to take the lead and when to support or accompany.
- Much more work is required to understand how such processes should operate in the context of sustainable development.

4.0 Declarations

This section was drafted by Dr Edward C. Y. Yiu (Department of Real Estate and Construction, The University of Hong Kong) and the contents were discussed and refined by all participants.

The scholars from the United Kingdom and Hong Kong held a discussion workshop in the morning after the INYS Conference 2007. They reviewed and discussed the issues surrounding sustainable built environment raised by the conference speakers. The following concluding declarations on sustainable built environment were developed after a draft version from the discussion workshop was circulated to all participants for comment.

A. Prelude

Sustainability has been widely used in all disciplines. The participants focused on the contribution of the built environment towards sustainable development by lessening the damage caused.

B. Scope of the conference

The declarations are the joint results of the discussions and experience sharing among the scholars from the United Kingdom and Hong Kong on the sustainability issues of the built environment in the context of the Pearl River Delta Region.

There were four sessions, each of which focused on different issues, namely:

1. Sustainable Urban Development and Renewal / Regeneration.
2. Urban Space Planning, Building Performance and Life Cycle.
3. Sustainability Assessment of Development Scheme and Legislative Control over Sustainable Urban Design.
4. Urban Policy of Hong Kong in the Context of Pearl River Delta Region and in the United Kingdom.

C. Concluding remarks

Key concluding remarks (see also Figure 1)	Issues discussed in the Conference that needed further consideration
<p>1. Sustainability can only be achieved by a truly multi-disciplinary co-operation and integration of all disciplines' efforts and stakeholders' concerns. For Hong Kong, it has to work not only on an intra-city scale, but also requires inter-city and cross-border co-operation with mainland China.</p> <p>2. It is not enough just to support, but it is more important to take action. It is time to retain what is still sustainable at present and to save what is depleting now.</p> <p>3. One of the current problems is the lack of common agreed principles and indicators for the assessment of sustainability in the built environment. Different metrics, costing models and value systems need to be integrated and linked for practical use.</p> <p>4. Quality living space is critical and actual performance of buildings should be considered, instead of just relying on design calculations. Post-occupancy Evaluation (POE) and building performance assessment should be carried out and the involvement of facilities management in the design and maintenance of buildings is relevant.</p>	<ol style="list-style-type: none"> 1. Global warming 2. Greenhouse gases and waste 3. Community participation 4. Social benefits and externalities 5. Natural renewable energy and recycling 6. Compactness urban system & high density urban development 7. Stakeholders' values of good urban design 8. Building performance measurement 9. Diverse metrics of value assessment 10. Support without taking action 11. Transportation & infrastructure development in cross-border co-operation 12. Save the harbour and blue sky 13. Collective discourse 14. Diverse views of professionals on sustainability

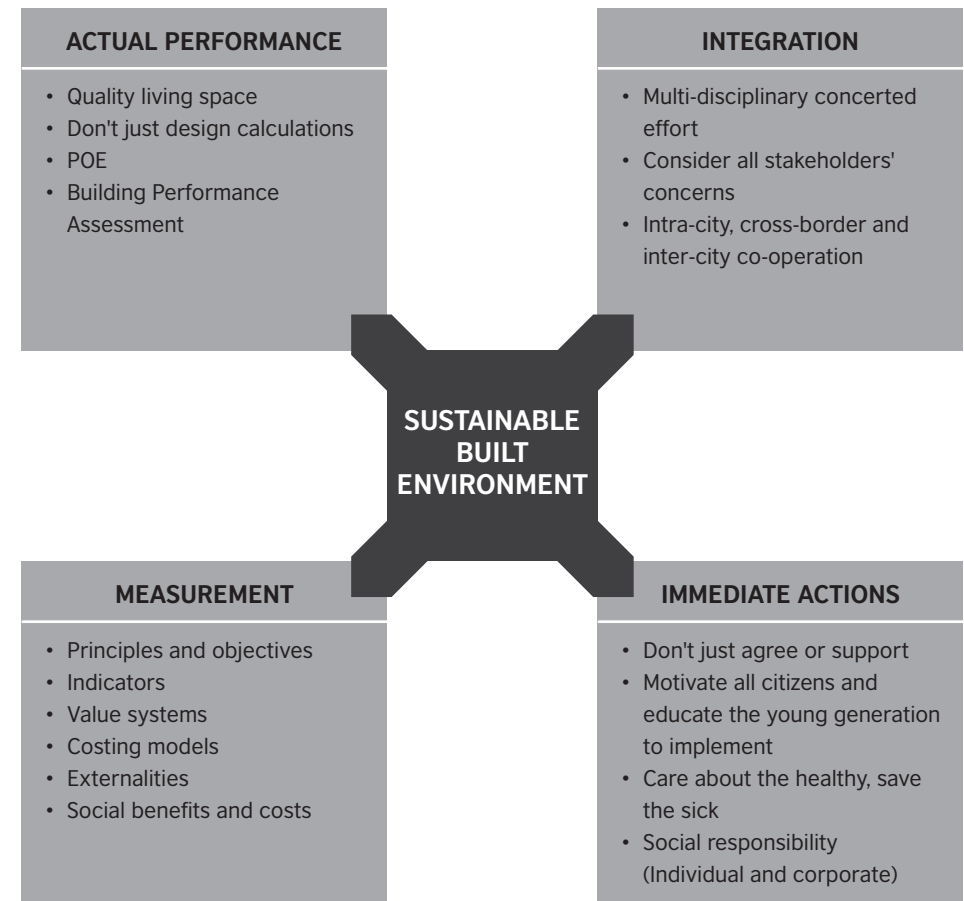


Figure 1 The Framework

D. Recommendations

1. To identify common agreed principles, strategic aims, indicators and actions of sustainable built environment that can be implemented.
2. To build a platform to integrate stakeholders' efforts and concerns, strengthen intra-city, cross-border and inter-city co-operation between Hong Kong and mainland China.
3. To explore *how* to achieve a better synergy among stakeholders and cities.
4. To encourage more in-depth studies of all different disciplines and to stock-take the current situations preparing for future integration (e.g. technology, sociology and economy) and to provide a platform for in-depth studies to refine their research direction in order to address the big picture as far as sustainability is concerned.
5. To review (and to continue the current review) current policies, development and building control systems, and cross-border co-operation mechanisms, to achieve sustainable built environment by a dense urban development approach in Hong Kong.
6. To have collective discourse to motivate the general public to participate and particularly to educate the young generation and help them realise the impact of small contributions towards the overall aim of sustainable development.

'Hong Kong is used as an example of a dense city to explore the best practices required of the built environment for the endeavour of sustainable development in the INYS 2007. The framework summarised in these declarations can be equally applicable to other dense cities all over the world.'

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