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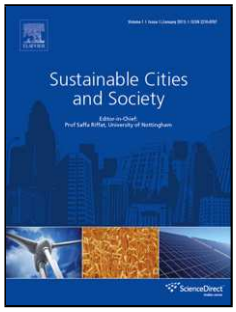

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THE RISE OF SUSTAINABILITY SERVICES FOR THE BUILT ENVIRONMENT IN MALAYSIA

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ABSTRACT

In the past two decades, the growth of the global sustainability agenda has led to the conception of a new business market, most commonly referred to as 'sustainability services for the built environment'. For developing countries, the emergence of this market represents an opportunity to meet sustainability goals by improving access to skills necessary for improved performance in the design, construction and operation of buildings. Set against global trends in policy and market growth, this paper examines the rise of sustainability services in Malaysia – a developing country with a relatively young, undeveloped market with potential to benefit from market growth. Drawing on first hand experiences of consultants offering sustainability services in Malaysia, the current status of the market and the key barriers are discussed. The paper explores the business opportunities this emerging market has to offer to the Malaysian built environment sector and concludes with the potential it presents to contribute to the country's aspirations for sustainable development.

Key Words: sustainability, Malaysia, built environment, sustainable development

1. INTRODUCTION

Policies and practice that support sustainable development have become more widespread following concerns over the extent of man's activities on the natural environment. The Rio Earth Summit in 1992 and the preparation of the Agenda 21 by the United Nations (United Nations, 1992) brought to a global audience the need to address the earth's deteriorating environmental conditions.

One aspect of development recognised as a major contributor to global environmental degradation is the built environment. Understood as the man-made surroundings that provide the setting for human activity, the environmental impacts of the built environment

include high energy consumption, solid waste generation, rising greenhouse gas (GHG) emissions, pollution, environmental damage and resource depletion spanning the design, construction and operational phases of a project (Masnavi 2007; Zimmermann et al. 2005; Melchert 2005). Recent studies indicate that buildings are responsible for almost 40 percent of global primary energy use (Huovila, 2007) and in the United States (US), the building sector accounts for approximately 48 percent of annual GHG emissions (Nassen 2007; American Institute of Architects 2006). Tackling the environmental impacts of the built environment, therefore, has the potential to bring about important sustainability benefits for the world as a whole.

Since the early 1990s, numerous national and global initiatives have been developed to stimulate improved sustainability practices. The UK's Green Deal and Energy Bill, and the Better Buildings Initiative in the US are examples of governmental devised policies to support improved sustainability practices in the built environment. International organisations are also involved in promoting improved practices as shown by the UNEP's Sustainable Buildings and Climate Change Initiative which focuses on collective action for building sector stakeholders (UNEP, 2011).

This decade was also characterised by the emergence of a new market: one addressing the rising demand for sustainability skills and knowledge in the built environment. Referred to as 'sustainability services for the built environment', this market has grown following the introduction of more stringent governmental legislation on sustainability performance and a resulting demand from the construction, energy, transportation corporate and public sectors (Yudelson 2008; Kibert 2007; Brandon and Lombardi 2005).

Globally, market growth has not been homogenous. Economic prosperity and more stringent governmental legislation have led to greater market growth in developed countries as compared with developing countries (United Nations Human Settlements Programme 2009; Ozen and Kusku 2009; Marsden 2000). In turn, this has created an uneven trend in market development reflecting a difference in the market maturity of sustainability services between countries in the developed and developing world.

Considering the uneven growth of sustainability services across the world and recognising the expected growth in sustainability of the built environment in developing countries, this paper examines the rise of sustainability services in Malaysia, a country with a relatively underdeveloped market but with lofty sustainability ambitions. Malaysia has experienced over thirty years of consistently high economic growth and is now aiming to adopt more stringent sustainability policies to support recent national development strategies (Economic Planning Unit 2010; Hezri and Hasan 2006). Examining the current status of the market, the

extent to which it is evolving, and analysing the factors required to help overcome the barriers and constraints will help to determine how sustainable development can be supported in Malaysia's urban environment.

The paper draws on experiences of consultants working in sustainability services in Malaysia with particular attention to the policy mechanisms, tools, constraints and barriers to market growth in the built environment. The final section of the paper identifies potential opportunities for market growth in sustainability services in Malaysia and offers ways of capitalising on these opportunities as a means to stimulate improved sustainability in the built environment.

2. THEORY

Set against the context of sustainable development and global trends in the sustainability services market, this section provides background to the evolution of sustainability policy in Malaysia. The first sub-section explores the development of the sustainability services market with focus on their particular role in the built environment. The second sub-section considers the global context by examining international trends in sustainable service market development before the third sub-section explores national policies and mechanisms that support current sustainability policies in Malaysia.

2.1 Sustainability Services in the Built Environment

For the purpose of this paper, sustainability services are defined as services offered by engineering consultants primarily to developers aiming to enhance and sustain the natural and built environment in line with the principles of sustainable development. In terms of the built environment, these services tend to relate to sustainable design of a particular building, group of buildings (i.e. residential estate) or town/settlement and incorporate principles of low impact design, water conservation, renewable energy and energy efficiency, waste minimisation and management, and broader sustainability themes such as sustainable transport and biodiversity (Bauer et al. 2010).

An important distinction to make at this juncture is the difference between sustainability and environmental services offered by consultants to the built environment sector. Sustainability services consider social, economic and environmental aspects, whereas environmental services tend to focus more closely on environment aspects (e.g. pollution prevention, regulatory compliance, Environment Impact Assessment[1]). Whilst there is certainly an

[1] An EIA is generally understood as an analytical process that systematically examines the possible environmental consequences of specific projects, programmes and policies (Organisation for Economic Co-operation and Development 2001).

overlap between environmental and sustainability services, the latter is the focus of this paper.

The rise of sustainability discourses during the 1990s and 2000s had a profound impact on the sustainability services market, especially in countries where governments took an early initiative (Yudelson 2009). During this period, a mushrooming of sustainability legislation led to more stringent technical and planning requirements for new developments. Some examples of legislation include the Building Regulations 2010 in England and Wales, The Site Waste Management Plans Regulations 2008 in England, and The Building Regulations 2006 in Australia.

To meet these requirements and explore the different options for sustainability, developers have sought increasing levels of expertise, particularly in the areas of sustainable design, energy efficiency, waste management, resources and materials efficiency and holistic sustainability assessments (Bauer et al 2010; Kibert 2007; Yudelson 2008; Brandon and Lombardi 2005).

The lack of technical knowledge amongst private and public property developers subsequently fuelled a demand for technical sustainability service providers ranging from specialist consultants, planning consultants, architects to more traditional engineering firms. In relatively mature markets, such as those in the UK, USA and Australia, many companies have sought to broaden their mainstream service offering to take advantage of this growing business sector. This is especially the case where increased competition has led to companies vying for private and public sector contracts (Verdantix 2011).

Legislation and requirement for technical knowledge has allowed firms with specialist sustainability expertise to become essential stakeholders playing a role in the delivery of sustainable development in this sector. Their importance is emphasised during the period of economic recession in Europe during the late 2000s where sustainability services remained an important business line as property developers sought out the expertise to meet legislative requirements (Bauer et al 2010).

2.2 Global Trends in the Sustainability Services Market

Since the early 1990s, the sustainability services market for the built environment has experienced a rapid growth; however, globally this growth has not been homogenous. Developed countries have tended to enforce more stringent sustainability policies and mechanisms which have stimulated a demand for sustainability services (Ozen and Kusku 2009) whereas in developing countries, market growth has been markedly slower in

response to a clear focus on the goals of economic development (United Nations Human Settlements Programme 2009).

An example of the uneven growth of sustainable services is demonstrated through an analysis of the global adoption of sustainable building assessment tools. These tools are frequently used by sustainability consultants as a means to assess the sustainability design and options of a building; analysing when these tools become officially recognised provides a partial indication of the maturity of the respective sustainability markets.

Since the launch of the Building Research Establishment's Environmental Assessment Method (BREEAM) in 1990, numerous green building assessment methodologies have been developed across the world (Hassan et al 2011; Kibert 2007). A number of country specific examples and the year in which they were launched are shown below in Table 1.

Table 1: Global examples of sustainable building assessment tools and their respective launch dates

Sustainable Building Assessment Tool	Country	Year of Launch
BREEAM	UK	1990
HK-BEAM	Hong Kong	1996
HQE	France	1996
LEED	US	1998
Green Building Tool	International	1998
Green Globes	Canada	2000
Green Star	Australia	2003
Protocollo Itaca	Italy	2003
CASBEE	Japan	2004
Green Mark	Singapore	2005
LiderA	Portugal	2005
Green Building Assessment Standard	China	2006
Green Star	South Africa	2008
LEED	Brazil	2008
LEED	India	2008
Green Building Index	Malaysia	2009
Estidama	United Arab Emirates (Abu Dhabi)	2010

Source: various sources

In order to examine global trends in the sustainability services market, the theory of diffusion innovation (Rogers 1962) has been applied. In the 1990s, developed countries such as the UK, Hong Kong, France and the US lead the way by establishing their own country specific

sustainable buildings assessment tools. These include BREEAM in the UK, LEED in USA and HQE in France. According to diffusion of innovation theory, these countries can be described as the 'innovators' and 'early adopters' (Rogers 1962) and these tools have helped to set the approaches taken for other countries.

The early introduction of such tools in the 'innovator' countries reflects the direction of government policy making at that particular time. For example, BREEAM was established in the UK as a voluntary measurement rating and was devised by a government funded research body called the Building Research Establishment (BRE). In all these 'innovator' countries, subsequent government policies have followed to ensure more stringent requirements and regulation of the sustainability performance within the built environment.

In the 2000s, a number of developed countries followed the trend by developing their own tools. Described as the 'early majority', countries include Canada, Australia, Italy, Portugal, Japan and Singapore. These countries followed suit once a sustainability assessment tool become more formally recognised by the built environment sectors in the respective 'innovator' countries.

The third group in Table 1 comprises primarily of developing countries and includes China, South Africa, India, Brazil, United Arab Emirates, and Malaysia – referred to as the 'late majority' countries, all these developed their own country specific sustainable buildings assessment methodologies after the 'early majority'. The formal acceptance of building assessment tools across many countries, the adoption of more stringent building regulations and expectations for improved sustainability performance by clients and public alike, has contributed towards a rapid uptake of adopted and bespoke assessment tools in the last five years.

This final group in Table 1 includes three of the four BRIC countries (Brazil, Russia, India and China) (O'Neill 2001). Although Russia does not appear in Table 1, the Russian Green Building Council (RuGBC) became a member of the Global Green Building Council in 2009 and it supports the adoption of BREEAM Europe, LEED and the DGNB Certification System, the latter being formally recognised by the German Green Building Council.

As shown in Table 1, Malaysia launched its country specific green building assessment tool as recently as 2009. Known as the Green Building Index (GBI), this tool follows a similar methodological approach to tools such as BREEAM and LEED and has been developed specifically for Malaysia's tropical climate, environmental and developmental context, cultural and social needs (GBI, 2011). Further discussion on the use of GBI in Malaysia is presented later in the paper.

2.3 The Evolution of Sustainability Policy in Malaysia

As the global sustainability agenda gathered pace towards the end of the twentieth century, the Malaysian Government took steps to enshrine the principles of sustainable development into national policy plans. In 1991, the former Prime Minister Mahathir bin Mohamad introduced Vision 2020, a policy document which forms the basis of subsequent national development agendas. With a strong economic and social focus, Vision 2020 sets out the country's drive for economic growth and highlights Malaysia's aspirations to become a fully developed nation by 2020 (Economic Planning Unit 2008). Protection of the environment is given priority in the country's overarching long term policy objective highlighting: 'Malaysia must ensure that in the pursuit of economic development and adequate attention will be given to the protection of the environment and ecology as to maintain the long term sustainability of the country's development' (Economic Planning Unit 2008).

Despite the pro-environmental rhetoric in Vision 2020 and more recent support for the principles of Agenda 21 (Law 2003), currently no national sustainable development strategy exists, including no explicit framework to address sustainability in the built environment. A National Policy on the Environment (MOSTE 2002) does exist and it identifies eight principles to balance economic development with environmental needs, including sustainable use of resources and environmental conservation. It also develops the country's green strategies for six areas including integrated development planning and pollution prevention. Whilst this is the closet policy document to a national strategy for sustainable development, there is no explicit reference to the built environment.

At a sub-national level, certain states have developed sustainability strategies. In 2000, the state of Selangor prepared the first sustainable development strategy at a sub national level (Hezri and Hasan 2004; Selangor 2003). The strategy covers the themes of poverty and hunger alleviation, environmental protection and preservation, human health and wellbeing and closing the gap between the rich and the poor. As with other existing national plans and programmes, a sustainability framework for the built environment is not present.

From a regulatory viewpoint, the Environmental Impact Assessment (EIA) Order has been effective since 1988. The Order mandates EIA for 19 categories of activities (Hezri and Hasan 2006) including housing, infrastructure, transportation, power generation and industry amongst others. Despite the fact that the EIA process was introduced to prevent environmental damage, some commentators have questioned its current effectiveness (Hezri and Hasan 2006; Memon 2000; Nor 1991).

2.4 Growth Opportunities

Whilst there are a number of policy shortfalls, including the absence of an overarching national strategy for sustainable development and an explicit policy direction for sustainability in the built environment, more recent governmental initiatives offer potential market growth opportunities for the sustainability services sector. The latest national development plan for 2011-2015, also known as the 10th Malaysia Plan (Economic Planning Unit 2010) places greater emphasis on sustainable development than previous national plans. This is demonstrated by the introduction of tax incentives in order to boost the uptake of Green Building Index certification and the provision of sustainable cities.

In 2010, in an effort to promote sustainable practice, the Malaysian Government introduced financial incentives to certain environmental activities. Examples include income tax exemption and investment tax allowance on qualifying capital expenditure incurred for renewable energy generation and energy conservation, waste recycling, handling and treatment of hazardous waste (Ministry of Energy, Green Technology and Water 2010). Tax exemptions have also been introduced for property developers and stamp duty exemption for buyers of green buildings (Ministry of Energy, Green Technology and Water 2010).

In addition, as part of the 2010 Budget, the Green Technology Financing Scheme was announced offering RM1.5 billion (circa £0.3 billion) in soft loans for companies in the energy, building, transportation, water and waste sectors interested in investing in green technologies. Although uptake has been slow (Lee 2010), the scheme has been designed to reduce capital cost to companies investing in green technologies by reducing interest incurred. It is clear some of the initiatives do apply to the built environment; however, they do provide an indication of the financial support being offered to developers with ambitions for high levels of sustainability.

In conclusion, the emphasis on sustainable development in Malaysia's national and state policy and regulation is beginning to spur some interest in sustainability in the built environment (Hassan et al 2011; Hezri and Hasan 2006), which in turn is providing a platform for the potential growth for demand in sustainability services. Although critics highlight weaknesses in sustainability policy implementation and enforcement (Hezri and Hasan 2006), Malaysia's sustainability services market has the potential to grow and contribute to sustainability in the built environment. The remainder of the paper examines the experiences of consultants working in Malaysia's sustainability services sector to examine the barriers, constraints and potential opportunities for development of the sustainability services market in Malaysia.

3. METHODOLOGY

Six semi-structured interviews with representatives from three engineering consultancies offering sustainability services for the Malaysian built environment provided insight into industry perspective on the country's sustainability policies, barriers, constraints and opportunities. Employees of various positions, ranging from Vice President to Senior Engineer, were interviewed as part of this study. It was agreed that the interviewees would remain anonymous in order to encourage an open and frank discussion which, in turn, would enhance the quality of the data gathered. Interviewee anonymity was also preferred to protect commercially or otherwise sensitive information.

The style of the interviews was semi-structured in order to allow a certain level of flexibility and fluidity to the discussions. This format allowed opportunities to introduce new questions in response to the interviewees' responses and comments. A framework of key themes and questions for discussion was prepared and shared with the interviewees in advance of the interview. The framework of questions for the interviews was as follows:

- Brief company profile
- Sustainability services for built environment in Malaysia offered by company
- Extent of sustainability assessment tools used by company
- Barriers and constraints to market development in Malaysia
- Opportunities for market development in Malaysia
- Strategy for overcoming barriers and creating market demand in Malaysia.

The qualitative data collected through the interviews were analysed through a series of analytical processes such as categorisation, reduction and rearrangement, recognition of patterns and relationships. Initially the data collected in the form of interview notes was classified into meaningful categories partially derived from the interview framework of key themes and from the data itself. The process of reduction and rearranging of data into a more manageable and comprehensible form allowed for emergent patterns and relationships to be recognised. Finally, the data were presented under three main themes, namely 'sustainability assessment tools for the built environment', 'barriers and constraints' and 'opportunities' for growth of the sustainable services market in Malaysia, as illustrated in Figure 2.

3.1 Sampling of Engineering Consultancies

In order to identify engineering consultancies in Malaysia offering sustainability services for the built environment, the publically available GBI database of certified facilitators was used as a starting point[2]. Additional information regarding the type of organisations listed on the GBI database and the exact nature of the services these organisations provide, was collected from a number of sources. These included the Board of Engineers Malaysia, the Business Council for Sustainability and Responsibility Malaysia, the Construction Industry Board and the individual organisations' websites. According to GBI's database, 206 organisations had GBI certified facilitators at the time of writing. The 206 organisations were further categorised according to the primary role they perform and the services they provide into the following groups:

Architect (69); Assets or project manager (8); Contractor or supplier (26); Developer (8); Engineering consultant (12); Government body (6); Financial institution (2); Engineer (mechanical, electrical or civil) (44); Quantity surveyor (5); Specialist consultant (12) and University (4). For 10 organisations, the researchers were unable to collect this type of information.

The small number of engineering consultants registered as certified GBI facilitators (12) serves as an indicator of the relatively small and underdeveloped nature of the market. Of these, only nine had an office in Kuala Lumpur or neighbouring states and three agreed to an interview. The profiles of these companies are discussed below.

3.2 Engineering Consultancies Profiles

AECOM, Arup and Kaer were selected because they represent the diverse nature of the Malaysian sustainability services market, in terms of size and mixture of local and international skill base and expertise. Brief company profiles of the three consultancies are followed by their perspectives on the challenges and opportunities this emerging market offers.

AECOM is a global provider of professional technical and management support services to a broad range of markets, including transportation, buildings, facilities, environmental, energy and water. With approximately 51,000 employees around the world, AECOM serves clients in more than 100 countries and reported revenue of $US6.3 billion during the 12-month period ended 30 June 2010 (AECOM 2011). According to Engineering News-Record (ENR) Top Engineering Firms Sourcebook published in April 2010, AECOM was raked first Design Firm overall in terms of revenue, and forth in Green Design (Engineering News Record

[2] According to GBI, the role of GBI facilitators is to provide services in order to enable building projects to achieve GBI accreditation.

2010). In Malaysia AECOM offers sustainability assessments of buildings (GBI, LEED, Green Mark etc), sustainable building engineering and design, energy efficiency and renewable energy advice, corporate sustainability strategies, green travel and transportation plans.

Arup is a leading private firm of designers, planners, engineers, consultants and technical specialists offering professional services such as buildings and infrastructure design, economics and planning, management consulting and specialists technical services. With 90 offices across Europe, North America, Africa, Australasia and South East Asia and over 10,000 people worldwide, Arup reported in 2009 an annual turn-over of £889millions (Arup 2011). Arup offers sustainability services for the built environment to Asia, including Malaysia, through their Environmentally Sustainable Design team, based in Singapore.

Kaer was the first energy efficiency and environmental solutions provider founded in South East Asia in 1993. The company has offices in Malaysia, Singapore and Indonesia and project experience across 10 Asian countries. Kaer's core services include energy audits, management and optimisation for building systems, environmentally sustainable design, mechanical and electrical design and consultancy, design and build, project and facilities management.

3.3 Limitations

Due to the relatively underdeveloped nature of the market, only a small number of companies are currently offering sustainability services for the built environment in Malaysia as indicated by the small number of registered GBI certified engineering consultants. This condition limited the number of interviews that were practically feasible. In view of the small number of interviews achieved for this study, the researchers recognise this limitation and intend to build on the findings of this preliminary study by continuing the research as the market develops into the future. It is hoped this study will provide a starting point in which to research the development of this market as it evolves in Malaysia.

4. RESULTS AND DISCUSSION

Malaysia's urban landscape has experienced an unprecedented transformation since the 1970s (Arif and Nobukazu 2005). Iconic landmarks such as the Petronas Twin Towers and infrastructure such as the Kuala Lumpur International Airport and the Putrajaya Township are symbols of the country's ambition for development and internationalisation. Considering Malaysia's rapid and sustained economic growth over the last thirty years and its ambition for sustainable development (Economic Planning Unit 2010), the current status of the

sustainability services in the built environment, barriers and opportunities are examined and discussed.

4.1 Sustainability assessment tools for the built environment

In Malaysia, the most applied sustainability assessment tool for buildings is the Green Building Index (GBI). Designed by the Malaysian Institute of Architects and the Association of Consulting Engineers Malaysia (ACEM) and launched in 2009, GBI fits Malaysia's current social, infrastructure and economic development. Figure 1 illustrates the six different criteria for the GBI assessment and includes water efficiency, energy efficiency and materials as well as assessment of innovation, indoor environment and sustainable site planning and management. According to the rating system, points are awarded for achieving and incorporating specific aspects related to these criteria with ratings ranging from the lowest certification (certified) to the highest certification (platinum) (Malaysia Productivity Corporation 2010).

Figure 1: The six criteria for GBI rating

Green Mark is another sustainability rating tool designed to address the needs of Singapore and according to the interviewed consultancies it is frequently requested by Singaporean property developers working in Malaysia. Leadership in Energy and Environmental Design (LEED) is often adopted by international property developers in Malaysia, as LEED is a globally recognised tool.

Table 2 below shows the number of buildings currently certified or registered under a sustainability assessment scheme in Malaysia. According to published data, only 16

buildings had achieved certification by November 2010. The low uptake of green buildings certification can be attributed to a number of barriers and constraints discussed in the following section below.

Table 2: Number of buildings certified and /or awarded under a buildings sustainability assessment tool in Malaysia

Type of Buildings Sustainability Assessment Tool	**Number of Buildings with Provisional Certification, Certification or Award**	**Source ***
Green Mark	4	http://www.greenmark.sg
GBI	39	http://www.greenbuildingindex.org
LEED	5	http://www.usgbc.org

*Databases visited on 3 November 2011
**Not all registered projects may appear in databases due to client confidentiality

4.2 Barriers and constraints

As raised by AECOM and Kaer, despite the positive policy rhetoric, there is limited evidence of legislation ensuring mandatory practices of sustainability for the building sector. This is apparent in the limited requirements for property developers to deliver projects that achieve a certain level of sustainability, GHG emissions reduction or energy efficiency. Interviewees from Arup pointed out that the one exception is the mandatory requirement for all non-residential buildings larger than 4000 m^3 with air conditioning to comply with MS 1525 2007 Code of Practice on energy efficiency and use of renewable energy for non-residential buildings[3]. Due to the limited legislation, sustainability efforts in the design, construction and operation of buildings are primarily carried out on a voluntary basis as demonstrated by the relatively low number of GBI certifications in Table 2. Whilst the Ministry of Housing and Local Government is considering revising the Uniform Building By-Laws (Laws of Malaysia 1984) to ensure mandatory practice for the use of sustainability assessment tools, a solid commitment is yet apparent.

The majority of the interviewees agreed that another important constraint to the adoption of sustainability in the built environment relates to the economy's reliance on Government subsidies. In 2009, 22 per cent of Government expenditures were subsidies with petrol subsidies alone taking up 12 per cent (Business Times 2009). As a consequence, virgin materials and utilities are especially cheap which serves to weaken arguments for resource

[3] MS 1525 2007 promotes energy efficiency solutions as part of the design process

efficiency, reuse, recycling, and sustainable design. Subsidised energy and utility costs are in contradiction to efforts by the Government to promote the development of green technology through the Green Technology Financing Scheme and as a result uptake of this scheme has been slow. Although the Malaysian Government has considered removing subsidies, a formal plan across all sectors is considered unlikely in the current economic environment.

Cost is one of the most critical factors of property developers' decision making process (Abidin 2010). This was the experience of all interviewees. On the whole, green certification increases project costs associated with registration, application, design and construction, in return for lower operational costs and higher value of the building that aim to balance off the costs over the building's lifetime. According to the World Green Building Council (2011), green building practices can reduce a building's operating costs by as much as 9 per cent, increase building values by 7.5 per cent and realise a 6.6 percent increase in return of investment.

As Kaer highlights, in Malaysia, investing in green certification currently has limited appeal as sustainable design is still perceived as an added cost to a project without any obvious commercial benefits. Despite the prospect of financial gains over the long-term from energy, water and waste savings, factors such as the low cost for raw materials has disincentivised the initial investment in sustainable designs. Moreover, in developing countries such as Malaysia, where the energy efficiency benchmarks are low, the cost savings are perceived as relatively low which ensures that green certification is a less attractive option from a financial viewpoint. This is a constraint that interviewees from AECOM and Arup are faced with when proposing sustainable building engineering design advice to their clients. Whilst the GBI estimates a cost increase of between three to five percent depending on the level of certification to be achieved (GBI 2011), this added cost is significant enough to persuade against a wide adoption of green certification by developers.

One of the main drivers for local property developers to apply sustainability in building design is marketing and differentiation from competitors (Abidin 2010). Sustainability is perceived as a method to enhance a company's public image and promote a positive impression to endorse the Corporate Social Responsibility (CSR). Based on the experiences from AECOM and Arup, in Malaysia there tends to be an emphasis by developers on the 'visible' aspects of sustainable design, such as green facades and externally placed renewable energy technologies (i.e. photovoltaics) rather than less visible solutions such as energy efficiency and passive design. This kind of practice takes away from the full extent of

sustainability savings and results in a high proportion of resources allocated towards the visible design features as compared with the non-visible.

With only a small number of buildings registered under a green accreditation scheme, Malaysia's market for sustainability services is small and relatively undeveloped. According to the interviewees from Arup and AECOM, in cases where the property developer does choose to deliver a more sustainable building, there exists a shortage of appropriate experience, knowledge and skills in the design, construction and operation stages. In Malaysia, there are limited numbers of local building engineers with previous experience on designing sustainable buildings and the vast majority of the knowledge and skills are located in international companies. From the building contractors' perspective, there is minimal demand from clients for sustainability and because the selection process is heavily based on cost, the incentive to invest time and effort on developing sustainability expertise remains low.

A lack of expertise and experience also extends to the post-construction phases on a project. In Malaysia, there tends to be limited expertise and experience with regards to the appropriate maintenance methods for a building which, in turn, impacts on how effectively the sustainability features of a building operate over the long term. Maintenance is an important part of the successful integration of sustainability in buildings and, therefore, a lack of knowledge by local contractors and facilities managers can counteract all the positive efforts made during the planning, design and construction phases.

The interaction of the ultimate end user with the building itself is another factor influencing the sustainability performance of a building. As interviewees from AECOM highlight, the low levels of awareness about sustainability amongst the public in Malaysia result in inappropriate use of buildings. Engaging with the end users and raising the public's awareness on sustainability, communicating the benefits of resource efficiency and sustainability features in buildings, and educating the end user on how to maximise these features are crucial for the appropriate use of a building.

4.3 Opportunities and Future Directions for Malaysia

Considering the developing nature of Malaysia's sustainability services market and the potential for market growth as discussed earlier, this section explores the opportunities and potential future directions for sustainable development in the built environment.

Whilst it is possible for the built environment sector to drive change, the more conventional model of centrally controlled legislation could offer a more immediate solution to Malaysia's lack of implementation. Ensuring green certification for new buildings, such as GBI, Green

Mark, BREEAM and LEED, is made a mandatory requirement in the planning process would increase the number of green buildings delivered and steer the industry towards sustainable design.

The same principle can be applied at a master-planning level for larger developments and new urban centres, where mandatory requirements for sustainable transport plans, resource and waste management strategies, water, energy and natural habitat conservation schemes can be incorporated. These mechanisms can be implemented either at the national level, for all new Government buildings for example, or at a local authority level for private developments. Such a move has the potential to boost the sustainability services market and encourage a healthy competitive climate amongst property developers, engineers, architects and construction companies to demonstrate innovation and leadership (Organisation for Economic Co-operation and Development 2003).

A prerequisite to the success of this type of policy mechanism is the development of the appropriate skills in the marketplace (BRE 2008). As discussed previously, the Malaysian market for sustainability services is still developing and is partially held back by the lack of suitably qualified experts. Knowledge transfer and capacity building would be essential to the development of sustainability services in Malaysia starting with professionals involved in the design stage, through to the construction and operational phases of a building. This can involve training courses delivered through the relevant professional bodies and associations to train the existing work force, and also establishing programmes in higher education in order to produce highly qualified future professionals.

In addition, the issue of low public awareness in relation to sustainability in Malaysia needs to be addressed. The public is often a 'silent stakeholder' in construction projects with limited knowledge and power. Should public stakeholder engagement become a mandatory requirement for any new proposed development, the public could gain a voice and potentially facilitate change. Appropriate use of buildings can deliver significant environmental benefits, therefore education of the end users should form part of Malaysia's implementation strategy for sustainability. For this to be successful, awareness schemes would be necessary to educate the public as well as foster a change in culture, values, attitudes and behaviour (UNEP 2005).

A method to drive change is the use of appropriate financial instruments. For example, tax relief and capital grants can have positive short and long term impact as developers look to take advantage of financial rewards. This is an approach that the Malaysian Government has embraced as discussed earlier. Likewise, financial disincentives also have the potential to drive change (Dangelico and Pujari 2010; Majumdar and Marcus 2001), especially if the

alternative to sustainability becomes very costly. One suggestion in support of this approach relates to Malaysia's heavy reliance on subsidies. Removing subsidies to reveal the true cost of fuel and natural resources would certainly support a fresh drive towards sustainability emphasising the need for greater resource conservation and energy efficiency.

As a final point, Malaysia's sustainability services market offers a wealth of opportunities for the country both from an environmental and a business perspective. The GHG emissions reduction potential associated with the built environment can significantly contribute to the country's sustainability aspirations and this emerging market has the potential to evolve into a mainstream business sector following global trends (Dangelico and Pujari 2010; Yudelson 2009; Yudelson 2008).

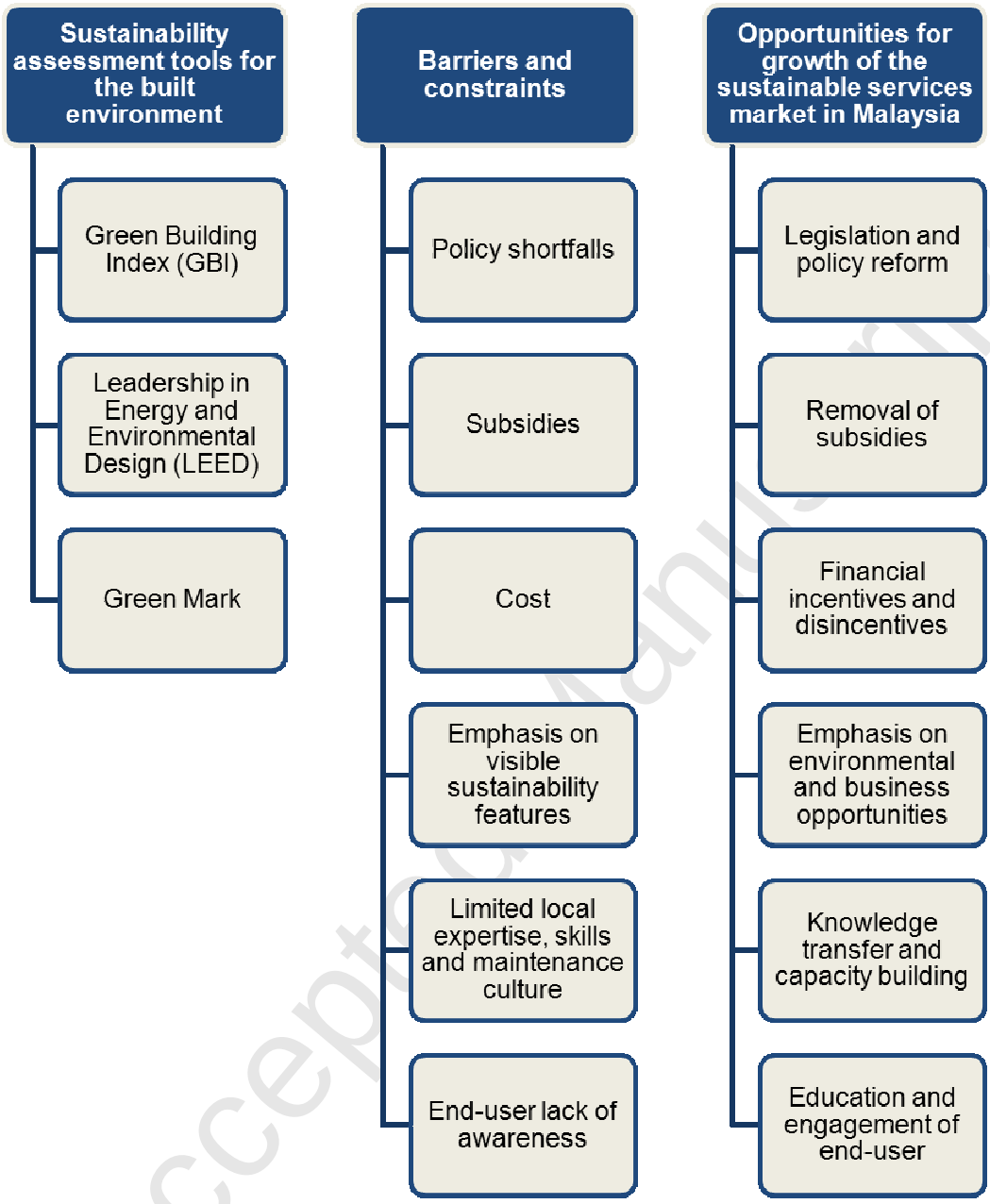

Figure 2: Results Summary

5. CONCLUSION

The growth of sustainability services for the built environment has been characterised by a distinct global unevenness; relative economic prosperity in the developed world has afforded market and policy expansion whilst developing countries have been unable to prioritise sustainability in the same way (Ozen and Kusku 2009). Based on global trends of evolution

of sustainability services, opportunities for Malaysia have been identified and include improved policy instruments, capacity building, and public awareness.

Should Malaysia follow the trends observed in the developed countries, sustainability in the built environment will become a more mainstream part of the sector (Dangelico and Pujari 2010; Wimmer et al 2010; Payne and Raiborn 2001). Currently, the Malaysian built environment market offers a unique opportunity for businesses to invest and develop sustainability services whilst the market is relatively immature. Companies focusing on capacity building and development of skills and expertise in sustainability will benefit from an advantage over competitors if greater sustainability policy implementation and enforcement follows in the future (Cronin et al 2009). The same companies will benefit from a strong Corporate Social Responsibility commitment, enhanced public image and increased recruitment opportunities (Brandon and Lombardi 2005).

Malaysia's present sustainability market position offers not only business opportunities but also opportunities for wider sustainable development. The envisaged market growth in Malaysia will improve the environmental performance of buildings and other related infrastructure delivering significant GHG emissions reductions in the built environment sector. The less tangible social aspects of sustainability in the built environment, such as aesthetics and amenity quality, connectivity and safety, equality, culture and heritage (Haughton and Hunter 2003), will also benefit by the growth of the sustainability services market. In conclusion, the rise of the sustainability services market for the built environment in Malaysia has the potential to contribute to the country's sustainable development aspirations from an economic, environmental and social viewpoint.

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