THE POTENTIAL OF SUSTAINABLE BUILDING RATING SYSTEM IN THE MALAYSIAN BUILDING INDUSTRY

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ABSTRACT

A cursory glance at recent news headlines reveals growing problems in the Malaysian built environment, e.g., landslides, floods, environmental pollutions etc. On another front, the recent energy crisis also demands a re-look into the way we design, construct and operate our buildings. Various measures such as policies, regulations and environmental programmes have been adopted by the Malaysian government to resolve these issues: but these problems continue to exist. There is a growing acknowledgement throughout the world that a sustainable approach is a much-needed panacea to the many environmental crises. In the building industry, many countries around the world have introduced building assessment, rating and labeling systems to evaluate the environmental or sustainability performance of a building or development as one of the solutions. However, there is yet to be such effort in Malaysia. This paper explores the potential success of introducing and implementing SBRS (Sustainable Building Rating System) in Malaysia by using Trudgill's AKTESP (Agreement, Knowledge, Technology, Economic, Social and Political) framework which identifies a number of common challenges for a better environment. The challenges are identified through existing literature, government initiatives and surveys. The paper concludes by suggesting some measures how these challenges might be overcome to ensure the success of SBRS in Malaysia.

Keywords: building industry; sustainable building rating system; barriers; market change mechanisms; policy

1. INTRODUCTION

Since the 1992 Earth Summit sustainable development has taken universal prominence for future development worldwide. Malaysia, experiencing severe disasters caused by such calamities as hillside landslides, mudslides and flood during the past decade, has been confronted with several crucial environmental problems and sustainability issues. The recently announced three economic development corridors, namely Iskandar Development Region (IDR), Northern Corridor Economic Region (NCER) and Eastern Corridor Economic Region (ECER) will further add huge pressure to the environment if they are not approached in sustainable manner. Therefore, the adoption of sustainable development in the Malaysian building industry is timely and very crucial.

To ensure sustainable development is pursued by the building industry, Larsson (2000) suggested four categories of measures which ought to be taken by government and private sectors, namely 1) regulations, 2) enabling mechanisms i.e. education & training programmes, 3) financial incentive programmes, and 4) measures to change market demand. A number of these measures have been adopted by the Malaysian government including policies, regulations and programmes. However, they are still inadequate to mitigate the problems mentioned above. This is reflected in the climate change report card where Malaysia is ranked 55 out of 56 nations assessed for efforts to mitigate global warming (Williams and Dair, 2007).

Studies have shown that a national system of sustainable building rating system (SBRS) is among the most effective measures to shift market demand (Larsson, 2000; Cole, 2005). In other words, the desired end state of building industry is to ensure that the market demands buildings that are high performance or sustainable. SBRS is conceived as being voluntary and motivational in its application and their current success can be either taken as a measure of how proactive the building industry is in creating positive change or its responsiveness to market demand. Through the design and implementation of suitable SBRS, professionals, contractors and building owners can be motivated to pursue set targets for achievements and recognitions. By doing so it fulfil national and global objectives towards sustainable development.

SBRS has yet to be developed in Malaysia and thus its potential success is questionable. Hence, the purpose of this paper is to explore the potential success of implementing SBRS in Malaysia by using Trudgill's AKTESP (Agreement, Knowledge, Technology, Economic, Social and Political) framework which identifies a number of common challenges for a better environment. The study also seeks explanation as to why environmental problems still persist despite years of effort to address the issues by the Malaysian government. The challenges are identified through existing literature, government initiatives and surveys. It further recommends some future strategies to overcome these challenges in ensuring the success of SBRS in Malaysia.

2. ENVIRONMENTAL IMPACTS OF THE BUILDING INDUSTRY IN MALAYSIA

For the past two decades, Malaysia has undergone a fast pace of urbanization largely attributed to rapid economic growth and industrialization. However, rapid economic development comes with a price. Activities concerning construction industry are one of the major causes of environmental problems in Malaysia. One of these activities is the careless opening of highlands for building construction purposes which are not managed based on environmental concerns. Increasing pressure on natural forest areas by construction activities has led to land erosions during heavy rains as well as sedimentation of rivers which in turn causes flooding in low-lying areas and flash floods in urban areas (UNDP, 2005). Sand mining is another activity that creates negative impacts on river systems.

In term of energy, Malaysia is ranked 33rd in the list of global electricity consumption, and 25th in the list of man-made carbon dioxide emissions (Mohd Yunus, 2007). These are unfavourable positions for a country of 26 million population. This phenomenon is somehow explained by Ang (2007) and Yoo (2006) whose studies reveal that there is a bi-directional causality between energy consumption and economic growth in Malaysia. Statistics show that Malaysian buildings account for about 12.85% of the total energy consumption and 47.5% of the country's electricity consumption (Department of Electricity and Gas Supply Malaysia, 2001). Of these, commercial buildings consume almost a third of the country's electricity consumption. Ahmad and Kasbani (2003) highlighted that 55%-65% of electricity used in buildings is for cooling purposes while 25%-35% is for lighting purposes. If energy consumption continues to increase at its current rate, domestic petroleum reserve in Peninsular Malaysia is predicted to be depleted by 2014 and Sarawak by 2020 (UNDP & EPU, 2005).

Malaysian construction wastes form a significant portion of wastes that is eventually disposed off in landfills. A study by Hassan, Yusoff et al. (2004) reveals that Malaysian construction sector has produced as much as 28.34% of national wastes. Furthermore, waste reduction during the planning and design stage to minimise the generation of waste is rarely considered (Begum et al., 2007).

These predicaments reflect the imbalance between the environmental and development demands; thus, the benefits of development are negated by the costs of environmental damage. If this were the case, then the current Malaysian construction and building practices can be deemed as not sustainable.

3. POTENTIAL ROLE OF SBRS IN THE BUILDING INDUSTRY

With alarming increase of environmental issues pertaining to development activities, the adoption of sustainable approach in the Malaysian building industry is rather crucial. The economic, social and environmental benefits of sustainable buildings are numerous. The increase in construction and use of sustainable buildings is indeed a key component in maintaining the health of this planet. Therefore, in a developing country like Malaysia, the adoption of sustainable building rating system (SBRS) is becoming necessary to encourage the building industry to get onto the sustainable bandwagon.

Cole (2005) posits that attaching a label of environmental performance for improved environmental qualities increases the real market value of buildings and motivates change in the construction industry and market transformation. Larsson and Cole (2001) argue that a major increase in building environmental performance will depend on changes in market demand and this cannot occur until building investors and tenants have access to relatively simple methods that allow them to identify buildings that perform to a higher standard. Assessment and measurement of sustainability are important components in guaranteeing measurable and meaningful changes.

The past 17 years have witnessed a rapid increase in the number of SBRS used worldwide, such as BREEAM (UK), LEED (US), HK-BEAM (Hong Kong) and CASBEE (Japan). Singapore had launched a scheme in January 2005 called the Green Mark Scheme under their Ministry of National Development. This scheme rates existing and new buildings on their environmental sustainability, quality, safety and innovation, and allocates cash incentives for buildings that win top ratings (BCA, 2006). The Green Mark Scheme currently works on a voluntary basis but is planned to be mandatory

by 2008 (Neng, 2007). In Malaysia, however, the issue of sustainability is still a new concept for the construction industry and there is no evidence of any official building rating system that has been established. It is important to note that an adoption of existing SBRS in Malaysia is rather inappropriate. One reason for this is that most SBRSs are developed for local use in their countries of origin and do not allow for national and regional variations (Al Waer and Sibley, 2005; Crawley and Aho, 1999). It is therefore argued that the absence of appropriate systems and mechanisms which can assist the building stakeholders' decision-making to reflect sustainability values and principles significantly inhibits transformation from conventional to sustainable practice in the Malaysian built environment.

4. METHODOLOGY

Having identified environmental problems and the potential role of SBRS, it is thus necessary to seek and understand the barriers that may hinder the development and implementation of SBRS in Malaysia. Stephen Trudgill (1990) has identified six major groups of barriers to a better environment—namely, agreement, knowledge, technological, economic, social and political—which are collectively referred to as the AKTESP barriers. These barriers need not exist all at the same time and need not be in the order listed. Several might also overlap. The barriers are:

1. AGREEMENT: Situation uncertainty; Situation recognition but problem denial; Problem recognition but problem rejection; Problem acceptance but causal uncertainty; Problem dismissal.
2. KNOWLEDGE: Knowledge inadequacy; Knowledge adequacy but knowledge rejection; Knowledge adequacy but knowledge inappropriateness; Knowledge adequacy but knowledge uncommunicated.
3. TECHNOLOGICAL: Technological unavailability; Technological availability but technological complacency; Technological availability but technological inappropriateness.
4. ECONOMIC: Economic insufficiency; Economic denial; Economic inappropriateness; Economic exploitation.
5. SOCIAL: Social value systems; Social resistance; Social leadership; Social allocation; Social morality.
6. POLITICAL: Political cynicism; Political ideology.

In barrier identification, it is necessary to ask if each stage impedes progress towards a solution. For example, if the first hurdle of agreement to the problem is overcome, the next step is to identify whether there is adequate knowledge on the causes of the problems. On the other hand, even if the problem is agreed and the causes and their effects are clearly known, a lack of appropriate technology to solve the problem may then prove to be a major barrier. Likewise, if the technology is available to solve the problem, it may cost too much to do so or it may not be appropriate for the social structure or there is lack of political will.

Trudgill's framework has been adopted in various studies for various reasons. For instance, Ling, Ashmore et al. (2000) examined the suitability of Trudgill's framework as decision analysis for the development of acid rain policy in the UK. Noble and Bronson (2006) formulated a survey based on Trudgill's framework to explore the principal barriers to health integration in environmental assessment whereas Selman (2002) used it as a basis for structuring his argument on the barriers to energy efficiency.

This paper adopts Trudgill's framework to predict the potential success of introducing and implementing SBRS in handling environmental problems related to the building industry in Malaysia. The problem has been approached in 6 sequential phases of framework, namely:

1. AGREEMENT on unsustainable construction practice and resulting environmental problems, and on the relevance of SBRS;
2. KNOWLEDGE on sustainability in general and on SBRS;
3. TECHNOLOGICAL barriers on the technicalities of SBRS;
4. ECONOMICAL barriers in implementing SBRS;
5. SOCIAL barriers in terms of readiness and acceptance of SBRS among building industry players, and
6. POLITICAL support from the government in terms of incentives as well as enforcing SBRS as regulatory mechanism.

The discussion of the above six barriers is based on information solicited from various sources. Some of the information is available in existing literature, while some are made available through a survey (Shari, Jaafar et al., 2007). The various sources of information are shown in Table 1. The survey conducted by Shari, Jaafar et al. (2007) also solicited the opinion among building industry players on their knowledge, relevance and acceptance of SBRS. These data are presented here for the purpose of establishing the level of 1) Agreement, 2) Knowledge and 3) Social acceptance. The survey involved six groups of sampling: 1) Academic/ Researcher; 2) Private Professional, i.e. architect, engineer, project manager etc.; 3) Public Professional, i.e. architect, engineer, policy maker, town planner etc.; 4) Developer; 5) Facility/ Energy Manager

and 6) Contractor. 120 questionnaires were sent out and 56 (46.6%) respondents replied. This rate was good and provided a significant amount of data for the analysis. The distribution of the respondents among six groups is shown in Figure 1. It can be seen that half of the respondents (51%) are Private Professionals. The second most represented group is Academics/Researchers (19%); and third is Government Officials (13%). Facility/Energy Managers, Developers, and Contractors make up the rest with a total of 7%, 6% and 4% respectively. This study relied more on quantitative research techniques and various statistical methods were used in analysing the data. Statistical analyses were done using SPSS Version 11.5 software.

Table 1: Sources of information to identify AKTESP barriers in Malaysia.

AKTESP Barriers	Sources of information
1. **A**greement	Survey data, news archive, leader's speech
2. **K**nowledge	Survey data
3. **T**echnology	Existing literature
4. **E**conomic	Existing literature
5. **S**ocial	Survey data, existing literature
6. **P**olitical	Existing literature, news archive

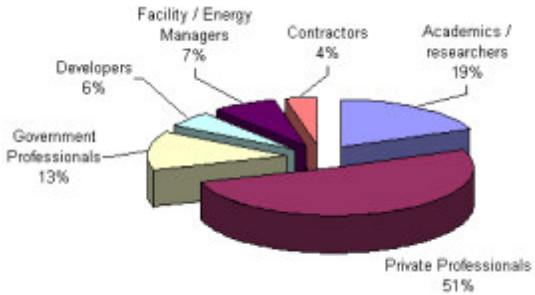

Figure 1: Distribution of respondents.

5. POTENTIAL SUCCESS OF SBRS IMPLEMENTATION IN MALAYSIA

There are many challenges that need to be addressed in evaluating the potential for SBRS to gain market prominence and its effectiveness in promoting sustainability in the built environment. The focus of this section is to determine these challenges as identified under the headings of Trudgill's model of AKTESP barriers.

5.1 Agreement Barriers

Trudgill has cited awareness of 'environmental problems' as of paramount importance. Creating consensus around the importance of sustainability solutions – 'gaining agreement' – is the first barrier to sustainability. Trudgill (1990) defined agreement barriers as "the difficulty of achieving consensus about the scope of solutions and means of achieving them and about ultimate goals. There are also arguments over whether a given problem actually exists at all, what its significance is, what the nature of the problem actually is and whether it matters or not." In assessing the agreement of the problem in Malaysia, three levels of agreement are discussed: 1) there are environmental problems in general, 2) there are environmental problems caused by building industry and 3) SBRS has the potential to be one of the solutions.

Firstly, the paper discusses the environmental problems in general based on the perspectives of the government and building industry players. In Malaysia, the environmental problems are well recognised and accepted by the government as proven when Malaysian former Prime Minister, Tun Dr. Mahathir participated in the United Nations Conference on Environment and Development in Rio de Janeiro in 1992. In his speech, he stated, *"…Malaysia has come to this conference because we are concerned about the environment. We are here to seek ways to achieve sustainable development and to establish a solid foundation for worldwide cooperation on environment and development"* (Mohamad, 1992). Malaysia then became a signatory to the UN Convention on Climate Change and the Kyoto Protocol in 1999 and committed herself to take steps to reduce greenhouse gas emissions. A State government also implemented the Project on Strategies for Sustainable Development and Agenda 21 (Selangor) in 2003 (Selangor State Government 2003).

Meanwhile, the agreement to environmental problems in general among building industry players is obtained from the survey conducted (Shari, Jaafar

et al., 2007). The mean scores of all 13 questions are averaged. The results are shown in Table 2 which reveals that the respondents generally 'agree' (mean = 4.0148, SD = 0.435) that Malaysia is currently experiencing environmental problems.

Table 2: Mean Scores of Respondent's Attitude towards Environment

		Min	Max	Mean	SD
1	The state of the environment in Malaysia is unfavourable for healthy living.	1	5	3.34	1.133
2	Humans are consuming too much natural resources than what nature can provide for.	2	5	4.00	.763
3	Publications and programmes on environmental awareness should be intensified.	1	5	4.36	.802
4	Recycling should be implemented as a national programme.	3	5	4.41	.682
5	Global warming is a serious problem that needs to be given priority in all dec-making.	2	5	4.39	.705
6	Government must spend more money to improve the quality of public transportation.	3	5	4.52	.687
7	The role of environmental NGOs is very crucial for sustainable development in M'sia.	1	5	4.05	.840
8	The higher cost of energy-saving lightings is worth it.	2	5	3.87	.818
9	High initial cost of solar energy system is worth the effort to save the environment.	2	5	3.96	.713
10	Willing to pay more for organic food in order to reduce environmental degradation.	1	5	3.64	.883
11	Rainwater collection for washing and toilet flushing should be made mandatory.	2	5	3.91	.920
12	Timber logging in Malaysia has caused massive ecological damage.	2	5	4.07	.931
13	Stop buying environmentally harmful products.	2	5	3.84	.848
	AVERAGE	2.77	5.00	4.01	.435

'strongly disagree' (=1), 'disagree' (=2), 'neither agree nor disagree' (=3), 'agree' (=4) and 'strongly agree' (=5); N = 56

The relationship between unsustainable building practices and environmental degradation has been discussed in Section 2. Hassan (2004) pointed out that *"the most problematic issue in building industry commonly raised today is uncontrolled development of urban growth as its construction system is not managed based on sustainable and environmental concern."* There have been many disasters relating to the building industry as reported by the media over recent years such as the collapse of the Highland Towers Condominium in Hulu Klang, Selangor in December 1993 with 48 casualties; the mudslide in Kampar, Perak in August 1996 with 40 casualties; disastrous flash floods in Johor Bharu in December 2006 and Kuala Lumpur in June 2007; careless opening of highlands for building construction purposes in Bukit Cherakah, Bukit Gasing and Balik Pulau; and the collapse of the hillside Perak State Park Corporation's administrative building near Bading Lake, Gerik in November 2007. The unsustainable state of local building industry has been raised to the public's attention by the government. The Minister of Natural Resources and Environment in his opening speech for a conference on Climate Change held in Kuala Lumpur, declared that project proposals and developments suffer inadequate environmental input due to lack of knowledge on environmental issues among government officials and their persistence on following the old ways of working which contribute to the practice of cutting corners when developing projects (Khalid, 2007). Thus, it can be argued that there is a general agreement by the public on this issue.

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Finally, the agreement on the potential of SBRS as a solution is concluded from a survey conducted by the authors (Shari, Jaafar et al., 2007). Opinions of the respondents were sought on the relevance of a SBRS for Malaysian building industry (refer Table 3). The survey found that 86% of the respondents (Mean = 0.87) agree that SBRS is relevant to the Malaysian building industry. Hence, there is agreement on the existence of the problem and on SBRS as a potential solution.

Table 3: Mean Score of Respondent's Agreement on the Relevance of SBRS

	Yes (%)	No (%)	Total (%)	Mean
Building in Malaysia should be rated based on their sustainability performance.	49 (88)	7 (12)	56 (100)	.89
SBRS would lead to a more sustainable industry in Malaysia	49 (88)	7 (12)	56 (100)	.87
Buildings awarded with a high sustainable performance rating would have a higher market value.	46 (82)	10 (18)	56 (100)	.84
AVERAGE	48 (86)	8 (14)	56 (100)	.87

'yes' (=1) and 'no' (=0) ; N = 56

Table 4: Mean Scores of Respondents' Knowledge on Sustainability Issues

	Min	Max	Mean	SD
Local Agenda 21	1	4	2.55	1.060
Montreal Protocol	1	4	2.29	1.057
Kyoto Protocol	1	5	2.54	1.293
Green Peace Movement	1	5	2.89	0.908
Brundtland Report	1	5	2.05	1.197
MS1525: Code of Practice for EE & use of RE for Non-residential Bldgs.	1	5	2.66	1.240
Sustainable Building Assessment, Rating & Labeling	1	5	2.50	1.250
AVERAGE	1	4.14	2.49	0.921

('nil')=1), 'little' (=2), 'conversant' (=4) and 'expert' (=5) answer; N = 54

5.2 Knowledge Barriers

This section discusses two areas of knowledge, namely knowledge in sustainability in general and knowledge in SBRS in particular. To assess the level of knowledge on sustainability, respondents were asked to rate their familiarity with several key issues regarding sustainability. The mean scores of all seven items were then averaged. The result is shown in Table 4. It finds that the respondents have 'little' (mean = 2.49, SD = 0.921) knowledge with regards to sustainability. In relation to the respondents' specific knowledge on SBRS as a possible solution, the result reveals that the respondents have "little" knowledge on sustainable building assessment, rating and labeling system with the mean of 2.50 (SD = 1.250). Moreover, a separate survey conducted by Shari, Jaafar et al. (2006) to identify the barriers in promoting sustainability in Malaysian architectural education also revealed similar result. The study revealed that the most cited barriers fell under the category of 'educators factors' which comprised the following: lacking exposure or knowledge, lacking training/education in sustainable design/construction, lacking awareness, ignorance and negative attitude towards sustainability, and lacking interest and enthusiasm. The results of both surveys support Shafii and Othman's (2005) argument that one of the major barriers holding back the development of sustainable buildings in Southeast Asia is the lack of awareness of sustainability issues in related professions. While the lack of knowledge in sustainability issues in general may prove to be a big stumbling block in the introduction of SBRS, the lack of knowledge on SBRS in particular would be a further challenge to its success in Malaysia. The situation can be classified as 'knowledge inadequacy' (Trudgill, 1990).

5.3 Technological Barriers

If a problem has been recognised and accepted, the issue then is the availability of the means to deal with it. In many cases, the issue of appropriateness of the technology to the society involved is considered more crucial than whether a mean exists or not. This is particularly true when applied to the context of SBRS. Given the fact that there are several assessment methods and rating systems already in use in the developed world, it is tempting to import one of them for use in Malaysia. However, existing assessment methods are considered as being restricted to environmental dimension of sustainability (Kohler, 1999) and originated in developed countries (Cole, 2005). UNEP (2001) affirms that developed countries can emphasise their effort to create more sustainable buildings by upgrading existing building stock through innovative technologies to reduce environmental impacts while developing countries are more likely

to focus on social equity and economic sustainability. These differences suggest that the direct transfer of building assessment methods from developed countries to developing ones is inappropriate. Furthermore, assessment tools are context specific in terms of its environmental, climatic, socio-cultural, economic and energy-use factors. Larsson and Cole (1998) claim that existing building assessment methods are not explicitly designed to handle regional-specific issues. In summary, existing SBRS need to be customised to suit the Malaysian context and priorities if they were to be adopted.

5.4 Economic Barriers

If technology exists and can be used effectively, the barriers then may involve economic, social and political factors which could lead to resolution avoidance and/or resolution deferral. Therefore, these economic barriers are inextricably tied to the knowledge barriers mentioned earlier. Due to the fact that the Malaysian building industry players have "little" knowledge on sustainability in general as well as on SBRS in particular, it can be argued that they also lack knowledge on the economic benefits of sustainable approach as well as in implementing SBRS. Furthermore, the economic issue (i.e. cost incurred) of implementing SBRS is a major concern among Malaysian construction industry players. This is reflected in the survey result which indicates that 91% of the respondents agree that project development that adopts SBRS should be rewarded with fiscal incentives (Shari, Jaafar et al., 2007). This implies that the government should play a proactive role in making this effort a success.

5.5 Social Barriers

To assess whether there are social barriers in terms of readiness and acceptance of SBRS among Malaysian building industry players, respondents were asked their opinions regarding their acceptance and readiness of the idea. The results are shown in Table 5. The majority of the respondents do not resist the idea of a Malaysian SBRS. 82% voted that it should be made mandatory whilst 62% think that the country is ready to implement SBRS.

Table 5: Mean Score of Respondent's Acceptance of SBRS

	Yes (%)	No (%)	Mean	SD
Building in Malaysia should be rated based on their sustainability performance	88	12	.89	.312
SBRS would lead to a more sustainable industry in Malaysia	88	12	.87	.334
Buildings awarded with a high sustainable performance rating would have a higher market value	82	18	.84	.371
Agree for SBRS to be introduced	93	7	.95	.227
Malaysia is ready to implement SBRS	62	38	.58	.498
SBRS to be made mandatory	82	18	.79	.414

'yes' (=1) and 'no' (=0); N = 56

5.6 Political Barriers

To assess political barriers, the study analyses potential support from the government in terms of providing incentives as well as enforcing SBRS as regulatory mechanism. This analysis is based on a few initiatives on regulatory mechanisms undertaken by the Malaysian government to ensure the incorporation of environmental considerations into project planning decisions. These regulatory mechanisms include Environmental Impact Assessment, Energy Guidelines and Standards and Local Agenda 21. Lessons learnt from these initiatives are deemed to be the contributing factors to the potential success of enforcing SBRS as regulatory mechanism in Malaysia as discussed forthwith.

5.6.1 Initiative 1: Environmental Impact Assessment

Environmental Impact Assessment (EIA) has been mandatory in Malaysia since 1988 as a proactive tool to incorporate environmental considerations into project planning decisions (Department of Environment 2004). However, EIA has encountered a series of problems. A survey conducted by Vun, Latif et al. (2004) revealed that only 27% of the EIAs reports were found to be satisfactory in their ecological input whereas the others were at borderline or poor. The short period of time and limited resources allocated to EIA consultants could be part of the cause. Department of Environment (DoE) claimed that some

reports had a lot of weaknesses including inaccurate information on the environmental situation of the development area, non-scientific impact assessment and proposed preventive measures that were not effective (Nik Anis, 2007). DoE also asserts that *"The environmental consultants are unqualified, irresponsible and incompetent. They just want to ensure their EIA report is approved, even when they know the project is not suitable"* (Ibid.).

Although EIA has been mandated by the Malaysian government, political and business support in ensuring the success of the system is low and environmental agencies are virtually powerless compared to economic development agencies (Boyle, 1998). Briffett, Obbard et al. (2003) argue that in spite of its extensive use in many Asian countries, it has been relatively ineffective in protecting natural resources. Among the political-related problems encountered in the implementation of EIA are: 1) Weak enforcement and an absence of strong commitment by local politicians; decisions for go-ahead with certain projects were made before ecological consideration could be summoned (Memon, 2000); 2) Improper registration of EIA consultants; hence, poor quality EIA reports (Vun, Latif et al., 2004); 3) Inability to provide comprehensive, unbiased, reliable and consistent information by EIA consultants when carrying their assessment on the environment (Vun, Latif et al., 2004); and 4) Slow process of approval (Harding, 2003).

5.6.2 Initiative 2: Energy Guidelines and Standards

Energy efficiency aspect of buildings has also been given emphasis by the government. It was first introduced in 1989 in the Malaysian Energy Efficiency Guidelines (Malaysia Ministry of Energy Telecommunication and Posts, 1989). The intention was to eliminate energy-intensive design practices and to encourage acceptance by the building design community. Nonetheless, the guidelines were not adhered by serious enforcement measures. Hence, they did not have the desired impact on the building industry. The 1991 General Design Guidelines for Offices issued by the Kuala Lumpur City Hall (Planning and Building Control Deparyment, 1991) made reference to the Energy Guidelines but the guidelines were not enforced (Ibrahim and Abbas, 2001).

In 2001, the same barriers existed when the government reintroduced the guidelines in the form of a Malaysian standard code of practice, MS1525: the Code of Practice for Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings in 2002 (Department of Standards Malaysia, 2001). In early 2002, two major local authorities—Kuala Lumpur City Hall (KLCH) and the Putrajaya Corporation (PJC)—began to enforce the Code on all new office projects. This mark a new phase of energy efficiency implementation in Malaysia. Despite several meetings on this issue, the MS1525 is still not part of the Uniform Building By-law 1984 (Government of Malaysia, 1984). Thus, it impedes the progress towards producing more green office building in Malaysia. The lack of coordination and integration among various relevant government agencies are the major reasons for this slow process of legislation and enforcement.

5.6.3 Initiative 3: Local Agenda 21 (LA21)

Along with many other countries in the world, Malaysia has implemented Local Agenda 21 (LA21). LA21 is a programme to forge cooperation between local authorities (such as District Councils, Municipal Councils, City Councils and City Halls), communities and the private sectors to plan and manage their built and natural environments towards sustainable development. As negative impacts of development become more apparent, it is recognised that Selangor has reached a point where development activities must be carried out in a more holistic way. In line with this awareness, the Selangor State Planning Committee in 1998 commissioned the *Formulation of Sustainable Development Strategy and Agenda 21 of Selangor*—a pioneering state government initiative to prepare a blueprint for sustainability at the state level (Yuen, Ahmad et al., 2006).

Petaling Jaya Municipal Council (MPPJ) has taken the lead in adopting the Selangor *Sustainable Development Strategies and Selangor Agenda 21* which contained the strategies and action plans to bring Selangor towards sustainability (Selangor State Government 2003). The implementation of Local Agenda 21 also suffers the same political constraint as the MS1525. Poor coordination and integration among government agencies as well as limited administrative capacity within the Selangor state government has somehow restricted its move towards achieving sustainability.

5.6.4 Summary

In summary, it is argued that the initiatives taken to move the Malaysian building industry towards sustainability have been hindered by politically-related constraints such as slow legislation process, inadequate enforcement, poor coordination and integration among agencies and improper registration of consultants. Hence, these challenges are anticipated and necessary actions ought to be taken to redress the shortcomings.

6. DISCUSSIONS AND RECOMMENDATIONS

Based on the assessment using AKTESP framework as mentioned in the previous sections, a set of recommended actions can be proposed here to ensure the success of implementing SBRS in the Malaysian building industry. They are based on five factors: knowledge, technological, economic, social and political.

6.1 Knowledge Factors

The study reveals that in general, Malaysian building industry players including developers who directly contribute to the low levels of demand for sustainable building lack understanding of the need for sustainable design. This indicates that demand has not been unfulfilled by supply. In fact, more demand needs to be created. Private clients are not only developers, but the general public. If the public are well informed, they will demand environmentally-responsible buildings and spaces. Therefore, it is recommended that efforts be made by governments, local authorities, organizations and other groups to increase public knowledge of the problems regarding conventional buildings. The public should be educated on sustainable buildings and technologies can improve Malaysia's building stock as well as save money and cause less environmental damage in the long run.

Successful methods of educating the public on sustainable building could include advertisements, the creation of sustainable building resource and information centres, design competitions, sustainable programmes, demonstration projects, information sessions and workshops and green labeling programmes. A massive and long-term marketing effort to convince the industry of the long-term benefits of sustainable performance in general and of a SBRS as a means of identifying sustainable performance is also deemed necessary.

Building professionals also have significant influence over the decisions their clients make because they present clients with options. In order for building professionals to effectively present and defend the sustainable design options to their clients, it is recommended that the number of sustainable building training programmes be increased. Therefore, government agencies can work with universities and building organizations to provide various sustainable building training programmes to increase the number of professionals who are skilled in sustainable building processes.

6.2 Technological Factors

The core of any widespread system of labeling is the assessment system itself. Sustainable design is contextual in nature – environmental, climatic, socio-cultural, economic, and energy-use factors affect what is considered environmentally prudent. Consequently, Malaysia needs its own assessment system by adapting existing SBRS to suit local environmental issues and priorities, thus ensuring appropriateness. This exercise requires extensive research and is currently being addressed by the authors; the initial findings have been published elsewhere (Shari, Jaafar et al., 2007). On the other hand, since Malaysia has no experience with SBRS, it is argued that the system would be much more easily accepted for use by the community if it is reasonably simple to use.

6.3 Economic Factors

Economic incentives can also play a role to boost the interest of building stakeholders who will never be compelled by the environmental reasoning behind sustainable buildings. SBRS is currently being used around the world as metrics to evaluate design projects or buildings. They not only educate owners about environmental soundness of their homes and facilities but also provide an indirect economic incentive by providing a marketing edge for building professionals who build structures that merit the higher ratings; hence, their buildings will fetch better values. Therefore, it is suggested that a percentage of professional remuneration is linked to the outcome of an assessment. If the formula is successful, it will financially reward the design team for their extra efforts and skills in adding value to the building. The authorities can also begin to encourage banks and lenders to provide low-interest loans or loan guarantees for sustainable building projects.

Another incentive for developers to build sustainable buildings is to provide tax reliefs (e.g., property or sales tax exemptions, income tax credits, etc.) and development charges. The rationale for providing this relief is in the acknowledgement of the additional expense incurred by the developer for the public good. Tax credits or exemptions are also one of the steps to promote the uptake of SBRS and sustainable buildings in general. As sustainable buildings can have higher materials and design costs compared to conventional buildings, tax credits available to sustainable building designers and builders can offset these higher initial costs. These credits allow early adopters in the market to overcome the early price barriers to new technologies and practices while increasing the market share of sustainable buildings and technologies.

6.4 Social factors

This study discovers that there is no resistance among industry players in adopting SBRS. This implies their willingness to contribute their efforts towards achieving a sustainable building industry. With this concurrence, one incentive that helps to maintain this interest is to recognise outstanding projects and achievement. Hence, it is proposed that an award programme be implemented for some of the top green projects and to be part of a large annual conference, workshop or other educational event. This public recognition provides designers, developers, contractors and other companies with a marketing tool and competitive edge. Furthermore, showcasing award-winning sustainable buildings in local architectural and home magazines provides an additional benefit of generating broad public awareness.

6.5 Political factors

Among the political challenges highlighted earlier are slow legislation process, inadequate enforcement and poor coordination and integration among relevant government agencies. These problems lie largely within the Malaysian framework of federalism where the legislative powers are shared between the Federal and State governments. By constitutional design, the Federal government possesses more legislative and executive powers compare to the states. Within this framework of federalism, state governments have a limited financial and administrative capacity in maneuvering its policy towards sustainability. Consequently, for most issues, the state governments will only be involved in the implementation of programmes and projects decided by the Federal governments. Conversely, the Federal government has minimal control over exploitation of natural resources (e,g., minerals, water and timber) in the states.

Another contributing factor to the complication of coordination is the nature of the institutional set-up itself where the State Economic Planning and Development Unit is largely responsible for socio-economic development, where as the state Department of Environment (DoE)—a branch office of Federal DoE—is responsible for environmental protection. The decision to approve any physical development projects, including those that can be environmentally sensitive, is entirely within the jurisdiction of the state. It will not require informational inputs from the DoE unless the project invokes EIA to be undertaken. In this context of federalism, any development programme that does not take into account the limited powers of the State and Federal governments on matters relating to the environment will impede its effectiveness for moving towards sustainable development at the state level.

Bearing these issues in mind, it is thus suggested that an interagency sustainable building organization be formed in order to collaborate with DoE and other relevant government agencies to help coordinate sustainable building works. This organization should also play the important role of training and managing performance assessors, supervising the assessments and liaising with the industry. It is also vital for all assessors to be certified by this organization. Recalling the problem of poor EIA reports and improper registration of consultants as highlighted earlier, this step would certainly ensure the credibility of SBRS to be met.

Political will is also crucial in providing finance for research and implementing solutions. Since governments are usually the largest single owners of buildings in a nation and they set the policy and laws that must be adhered by their citisens, it is recommended that all state governments be very supportive of green buildings and encourage this type of development in any way they can. Implementing green practices in their own buildings is a great way for governments to demonstrate environmental (conscientiousness) leadership and responsibility.

7. CONCLUSIONS

The potential advantages of SBRS can be easily discerned, but implementing such an idea in a relatively conservative industry is a major challenge. Therefore, this paper has explored the potential success of introducing and implementing SBRS in Malaysia by using Trudgill's AKTESP (Agreement, Knowledge, Technology, Economic, Social and Political) framework. Based on existing literature, surveys and lessons learnt from government initiatives, a set of recommended measures is proposed to propel SBRS forward. The summary of the main recommendations is as follows:

- Educate the public on sustainable building via advertisements, sustainable programmes, demonstration projects, information sessions, workshops and green labeling programmes;
- Develop sustainable building training programmes to increase the number of professionals who are skilled in sustainable building processes;
- Conduct researches to adapt existing SBRS to suit local context and priorities;
- Offer economic incentives, e.g., relief of taxes and development charges, loans and financial rewards to key industry players who commit their projects to a given minimum sustainable rating;

- Implement award schemes for the top rated green projects;
- Establish an inter-agency sustainable building organization to help coordinate sustainable building works and provide the platform for the implementation of SBRS.

SBRS has the potential to become a standard practice in Malaysia if the building industry and related authorities collectively address the raised issues by incorporating some of the recommendations outlined in this paper.

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