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Research paper



A framework of leadership sustainability rating system (LSRS) for future construction project managers

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Abstract

The construction industry continues to be viewed as inevitable in encouraging societal, economic, and environmental improvements for development of sustainability in a world-wide context. The research on project management for green construction are mostly focused on project level. So far, there has been no framework for rating project leader's competencies in the context of sustainable construction. The aim of this paper is to propose a framework for rating leaders' competencies in integrating and promoting the sustainability practices when managing green construction projects. Based on a review on Sustainable Building Development, this study relates the dimensions of leadership with the Seen, Lean and Green sustainability concepts. As a result, an organizational-level Leadership Sustainability Rating System has been developed for the future of the industry. The approach revealed ten leadership competencies for sustainable leaders, and thirteen fundamental practices to be followed for sustainable development. The value of the framework lies in its ability to be used in parallel with the Sustainable Building Rating Systems offering thus a holistic method to examine the performance of the building from its early stages when leaders take technical and managerial decisions that require to be put in place and communicated to all project stakeholders.

Keywords: *Project management; Sustainability; Leadership; Construction Industry; Malaysia*.

1. Introduction

During the past decades the construction industry, in particular the building sector, continues to be viewed as inevitable in encouraging societal, economic, and environmental improvements for development of sustainability in a world-wide context (Maliene and Malys, 2009; Ofori, 2008; Tsai, and Chang, 2012; Tabassi et al., 2016). Chapter 7 of the United Nations Earth Summit Agenda 21 (2009) also provided the guidelines for "promoting sustainable human settlement development", which promotes sustainable procedures in the construction industry. The agenda also boosts transformation of "capacity-building" for human settlement by sustainable human resource management. From this point of view, project managers/leaders who are mostly responsible for managing human resources in projects (PMI, 2017), this includes sustainable projects, should encourage subordinates and influence them to achieve sustainable objectives (Tabassi et al., 2012; Northouse, 2007; Purvanova and Bono, 2009; Tabassi et al. 2017), which could help in significantly better fulfillment of sustainable performance. In the environment of sustainable construction growth, a project manager or a leader by her leadership behavior, the method of managing human resources as well as the project activities, will strengthen the project towards sustainability and pulling off productivity.

In line with the above statements, the United Nation's leadership summit placed 17 sustainable development goals that all of which centered on human capacity development (UNDP, 2015), and some of them also lend themselves to the need for achieving sustainable management in infrastructure construction sectors. With this general view it is evident that leadership plays a crucial role in setting the agenda for human capacity development. Furthermore and specifically to develop the construction sector, a leader or project manager must ensure she is going to develop new talents among her subordinates.

As defined by PMBOK 6th edition (PMI, 2017) a project manager is "the person assigned by the performing organization to lead the team that is responsible for achieving the project objectives". The focus word here is 'leading', which as defined by Northouse (2007) "is a process whereby an individual influences a group of individuals to achieve a common goal". In essence, to achieve the desired triple bottom line (TBL) objectives in sustainable development, the leader must ensure the vision is set, aligns the people to the vision, inspires, and motivates people along the way.

In the construction industry, sustainable development will call for leaders to ensure internal enablers such as training on specific knowledge area is provided, and availability of toolkits and processes for executing the work and an enabling environment for open and consistent communication is created (Walker & Jones, 2012). This is not to say, human capacity development will be only limited to the internal players. The leader is also responsible for ensuring external players are also developed such as suppliers, contractors, government, and NGOs partnership, when recommended. It is therefore understood, that leaders in the industry tend to be even more in charge for planning, controlling, coordinating, and decision making with respect to project sustainability (Junna et al 2015). To

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this end, a new term should be included in the leadership and sustainability literature, which we would like to name it as "Sustainable Leadership". The aim of sustainable leadership (SL) is to balance the three Ps, People, Profits and the Planet, in order to enhance durability of an organization by means of evidence-based management methods, in the process of adopting a comprehensive strategy in the direction of building organizational sustainability rather than green projects only.

This paper aims to rethink the long lasting sustainable development for construction organizations at a holistic perspective. Since sustainability has been considered as generative paradigm (Plessis, 2012), which is emerging out from a 'mechanistic' approach to an 'ecological' global view. In this work, we will propose ways to transform the construction industry away from exclusively serving up green projects to becoming sustainable corporations that straighten up with management and business sustainability whilst still serving various stakeholders. The main research objective is to develop an organizational-level Leadership Sustainability Rating System as an assessment framework for the future of the industry.

2. An overall review on sustainable building development

By early 1970s a raised awareness of the need for sustainable development was pointed out in national along with international arguments (Passmore, 1974). In the ensuing years, the sustainable development thinking was progressively developed to promote its three dimensions: economic, social and environmental. Applying these principles received a world-wide acceptance which in turn formed the vision and mission of many market sectors incorporating the construction industry with regards to its green projects. Along with the Brundtland Commission report, which was released in 1987, several guidelines and frameworks for developing sustainable built environment have been came forth internationally, nationally and locally by agencies and institutions in many areas in that individuals influence the environment. Since the building industry has significant role with regard to the human influence on the habitat together with on the quality of life (Anink et al., 1996; Tabassi et al., 2016; Zhao et al. 2018), many practitioners have regarded the building industry as an area with potential to fulfil high ranges of human demands together with sustainable development needs (Anink et al., 1996; Maliene and Malys, 2009; Roufechaei et al., 2014; Lu and Zhang, 2016; Zhao et al. 2018). For instance, Lu and Zhang (2016) pointed out that the building industry is liable for a substantial amount of environmental waste products in the world, while buildings alone ingest 17% of annual fresh water withdrawals, 40% of extracted materials and energy flows and 25% of total wood harvest(World Energy Outlook, 2011). Adding to this, building projects come with massive harms to the environment by generating large measures of Green House Gas (GHG) emissions along with ozone-depleting gases throughout the wheel of life (Melchert, 2007; World Energy Outlook, 2011).

Sustainable building emerged as a new concept to include all different measures taken to mitigate these effects. As a result, the building industry, embracing the eco-friendly development, has made up its own "environmental", "economic", and "social" setting, whereby a broad variety of building styles can be placed by using various engineering design and architectural patterns. Innovative business today aims at sustainable solutions to acquire buildings that are consistent with the triple bottom line (TBL) of sustainability. In addition to that and in order to develop sustainability, Nelms et al. (2005) came to the conclusion that the alternative solutions to the conventional construction technologies will be those that minimize the harms to the ecology, health, and the environment. This will direct the construction industry to trigger the process of taking advantage of sustainable development concepts within design and planning, construction, operation and maintenance phases of buildings.

The leverage of sustainable strategies in building industry has directed the development of several earth-friendly approaches predominantly in the interests of boosting green performance in the building construction (Zhang et al., 2011). In line with this, the Building Research Establishment Environmental Assessment Method (BREEAM) as the pioneer of green accreditation system was established in the United Kingdom in 1990s. Soon after, the U.S. Green Building Council (USGBC) in 1998 was launched the sustainable rating system in the United States, which has been known as "Leadership in Energy and Environmental Design (LEED) green building rating system". The LEED has set up relatively on the green rating system that developed by BREEAM. Likewise, the "Green Globes" standard could be seen as conformity of the Canadian version of BREEAM, which was introduced by the US Green Building Initiative in 2005. One can find several other rating systems appointed in countries worldwide, such as BEAM in Hong Kong, GBI in Malaysia, CASBEE in Japan, GRIHA in India, EmiratesGBC in United Arab Emirates, etc. just to name a few, with their particular advantages and disadvantages based on the strategy of assessments that planned for specified building/construction classes (Kubba, 2010).

The promotion of all these assessment and rating systems triggered new business concept on how the various building project stakeholders can facilitate successful implementation of sustainable building. It has been implied that those invested in sustainable building projects are capable of accomplishing substantial requirements of environmental project efficiency along with social performance, which will be resulted in making advantage to entice clients (Deb et al., 200). On the other hand, sustainability in the framework of building growth deemed as controversial, complex, and challenging trends (Pakir et al., 2012). This is evident in a number of interpretations presented by different industry experts on definitions that made available to the sustainable building construction solution (Maliene and Malys, 2009; Melchert, 2007; Zhang et al., 2011; Zhao et al. 2018; Zavadskas et al., 2018). Having said that, current interpretations point out that sustainable building projects need to be cozy, comply with the natural and bio-cultural elements of the environment, cost-efficient, and also reasonably priced to operate and maintain by users (Tabassi et al., 2016).

Consistent with above discussion, Table 1 shows the values for rating sustainable building constructions in the latest version of LEED (Kubba, 2010):

Table 1: LEED Criteria in Rating System for Sustainable Building Measurement

Measuring criteria	Maximum points
Sustainable sites	26
Water efficiency	10
Energy & Atmosphere	35
Materials & Resources	14
Indoor environmental quality	15
Innovations in design	6
Regional priority	4
	Total=110 pts

Agenda 21 of the "UN Conference on Environment and Development (UNCED)" urged nations around the world by using the assistance of global agencies to build, employ and trigger the necessary approaches for sustainable development. This process consists of promoting quality-of-life indicators that help in social wellbeing, wellness, environment, and the financial system (UN 1993). Following these green concepts, a system for sustainable development had been well articulated in the 7th Malaysian Plan. The Plan laid out innovative strategies in order to enhance the nation ability towards developing sustainability. In the building sector, the Malaysian government as a result of the Tenth Malaysian Plan (2011-2015) put pressure on the development of "affordable housing delivery system", to strengthen the appearance of prime quality and eco-friendly sustainable buildings. As a result, the Government with the assistance of the Construction Industry Development Board (CIDB) of the country motivated building/construction companies to come to be green certified by recruiting qualified and skilled workforces

and establish construction procedures for sustainable growth. The Malaysian government was indeed inspiring sustainable building progress since 2006 by means of the "Ninth Malaysian Plan" and by launching the National Green Technology Policy in 2009. The strategic objective was to steer the nation on the way to realize energy efficiency and sustainable development with a focus on the building market. The Government also offered a number of bonuses for developers to reinforce green building strategies in the Malaysian context (Alias et al., 2010).

Aside from that, in August 2008 the Malaysian Institute of Architects developed a "Sustainability Committee" to form the Green Building Index (GBI) for qualification and certification of green-rated buildings. The GBI Building Rating system evaluate the sustainable capabilities of buildings according to six key set of guidelines as revealed in Table 2. Consequently, these specific criteria are employed as success tools to assess projects' level of sustainability achievements.

Table 2: The Current Key Factors for Assessing Sustainable Building Constructions in Malaysia

Success Criteria
Energy Efficiency (EE)
Indoor Environment Quality (EQ)
Sustainable Site Planning & Management (SM)
Materials and Resources (MR)
Water Efficiency (WE)
Innovation (IN)

In line with the above, different sustainable building evaluation standards have been made available and applied in several countries. However, the authors discovered that these standards are mostly centered on project level, and there is deficiencies in relative sustainability rating evaluation between different platforms at the construction organization level. Soft and hard measures for green construction projects call for skillful and innovative professionals who can integrate green technology elements and turn them into architectural art (Stauskis, 2013). This industry, therefore, needs a system to rate its leaders and their competencies in the context of sustainable development at organization level.

The review of different research as well as code of practices showed that the sustainability thinking in the building industry is exceptionally concentrated on green projects and related attributes such as the quantities, size, scales and values of delivered sustainable projects. The vast majority of the rating systems in sustainability are dedicated to the delivered green buildings and/or construction services missing, however, to assess projects at earlier stages of their life cycle (e.g design). Nearly after a decade of formation, the GBI has shown improvements in different aspects in order to be applied to almost large range of building construction projects, which have also been broadly acknowledged by stakeholders. However, less attention was given to other important assessment criteria covering the entire life cycle of a construction project. This papers will fill this gap by introducing a framework for Leadership Sustainability Rating System (LSRS) focusing on construction project leaders. The recommended framework can be integrated with the current rating systems, not only in Malaysia but in other countries as well. Accordingly, the future leaders in the industry can obtain a certificate from the authorities in regard with green leadership behaviour. Figure 1 presents this framework for leaders aiming at sustainability values in the construction industry:

The factors from 1 to n that stem from the sustainability dimensions may not be fixed and each organization can develop them based on different projects that embrace, however, the triple bottom lines of sustainability.

2.1. Project structure

Berns et al. (2009) stated that sustainability is turn out to be steadily necessary for business strategy. It has been further stressed that sustainability will assist a firm’s achievements by contributing to its long-term values to the organization, and hence the launch of sustainable development in the organization's strategy is fundamental. Incorporating sustainability principals into an organization’s core values entails training of the personnel so that they can implement the organization’s sustainability agenda (Hargett and William, 2009). Incorporating sustainability concepts into leadership practices will encourage employees to go beyond their limit in their performance, which in turn, will result in improved productivity, growth and customer satisfaction. Since an organization's strategies put into action their projects, the human resources involved in these projects will productively analyse, concur and follow the opportunities to carry out the sustainable strategies (Lacy et al., 2009). Accordingly, incorporating the Seen, Lean and Green practices (SLG) in project structure seems vital for future leaders. There are seven components needed to ensure that a sustainable project structure will be realized. These are highlighted in Figure 2.

2.1.1. Project identity

The three aspects of Seen, Lean and Green (SLG) should be incorporated with the project vision, mission, values, branding, messaging, and leadership.

2.1.2. Financial administration

In this context the leader should show place more emphasis on the lean or economic aspects of sustainability when developing the budget, cash flow analysis, audit, and reporting (Qian, Chan and Khalid, 2015).

2.1.3. Long-range strategic plan

All three components of SLG should be incorporated with Goals; Objectives; Benchmarks of the project organization structure development.

2.1.4. Long-range fund-raising plan

All three components of SLG are also required to be involved in needs and resource assessment.

2.1.5. Annual operational plan

The three aspects of Seen, Lean and Green should be evaluated when developing the objectives and scope of project, project activities, and schedule. In addition, SLG need to be integrated when planning for human resources (HRs), procurement, and stakeholder management in an annual operation basis.

2.1.6. Project board development plan

SLG should be incorporated with evaluation, recruitment, orientation, maintenance, team building and alike in the process of project board development.

2.1.7. Staff development and organizational culture

The three aspects of seen, lean and green should be integrated with needs assessment; project monitoring and controlling, human resource development, and team building.

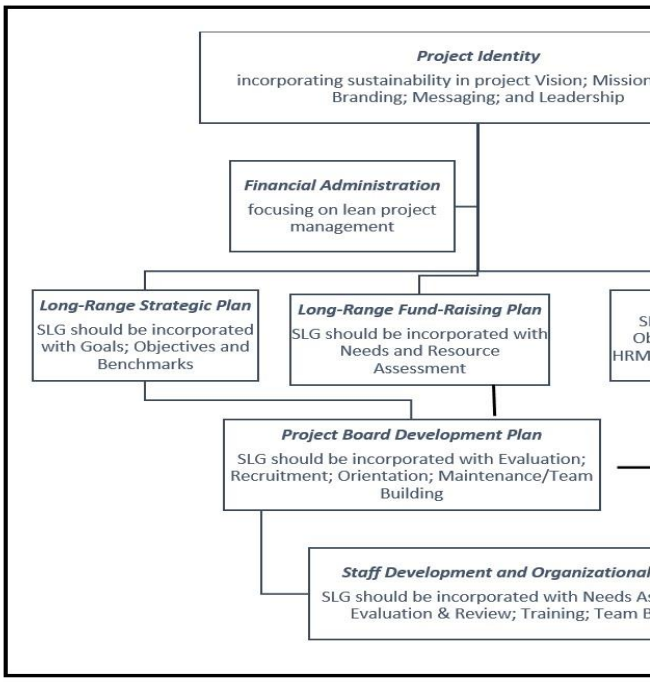


Fig 2. Sustainable project/organization structure

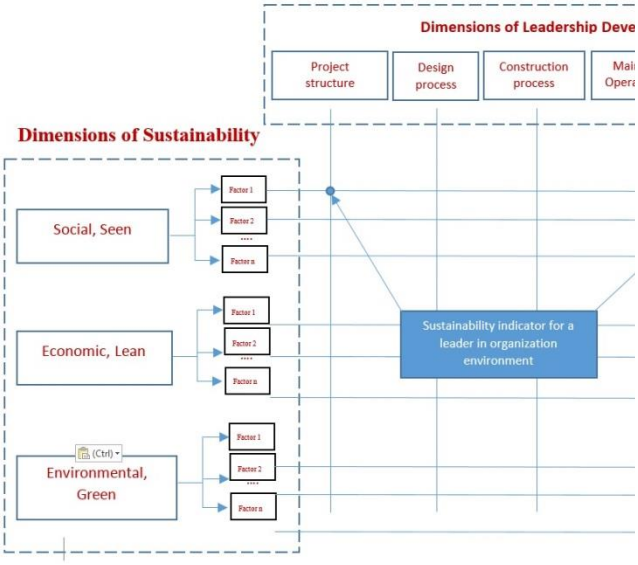


Fig. 1: Framework for Leadership Sustainability Rating System (LSRS) for construction project managers

2.2. Design process

Fostering sustainability from an enigmatic idea to the real world, necessitates that the right decisions are being made at the initial steps of planning and designing of a building project (Stipo, 2015). With the increase of infrastructure activation financing, environmental challenges and economic crisis around the globe, especially in some developing countries such as Malaysia, authorities, corporations, communities, academia and the public have an inimitable ability and commitment, at least on paper, to work together and work toward the aim of setting up our buildings and infrastructures environmentally, socially and financially sustainable. In order to achieve a better design and planning for sustainability it is necessary to make advantage from information technology. In this regard, a workflow approach that called Building Information Modelling (BIM) is empowering today's sustainable planners to be able to enhance their understanding, assessing, simulating and solving complex issues related to sustainable infrastructure and building projects (Sakikhales and Stravoravdis, 2017). BIM is transforming and developing administration policy and procurement, reframing the manner project managers, engineers and architects are planning, designing, constructing and operating the cities, and finally improving infrastructure lifestyle. Consequently, future sustainable project managers or leaders should possess solid knowledge of BIM. To reach that level, it seems necessary to feature the subject of BIM to the architectural, civil engineering, mechanics and construction management programs at different universities and colleges in the world.

There are many studies in the literature exploring sustainable design practices for building industry. These studies have mostly focused on issues such as "orientation and natural ventilation", "heating", "insulation", "lighting", "passive solar homes", "cooling" and "water heaters". In an early study Roufechaei et al. (2014), the author and her colleagues summarized some of the principles that should be considered by project managers in dealing with energy efficient design for sustainable housing development, which are presented in Table 3 and classified based on designer responsibility. However, a project manager or leader of a project may not require to have knowledge on all aspects of design for sustainable building project, but at least they should make themselves familiar with the general concepts. Accordingly, consulting with the following table may assist them to develop a general perception of critical items in the design process of a sustainable building project.

In addition to the energy efficient design, the design of buildings for sustainability normally takes other considerations such as issues associated with materials, compatibility for foreseeable future functions and flexibility to future climate change in practice. Accordingly, other aspects including but not limited to the following, need to be taken into consideration by the leaders for sustainable design of future buildings:

- Wind turbines,
- Solar Water Heating,
- Solar Photovoltaics,
- Biomass heating,
- Heat pumps - ground, water or air source,
- Hydro
- Health & Wellbeing
- Design for Waste management
- Pollution
- Innovation in new technologies and building processes
- Make advantage from Engineering, Procurement and Construction (EPC) form of contracts

Furthermore, project managers or leaders will be needing to work together with their suppliers and other stakeholders, including those fringe players frequently overlooked, to work collaboratively on new solutions and means of sustainable design buildings (Robichaud & Anantatmula, 2011; Bal et al, 2013). Keeping that in mind, the concept of Early Supplier/contractor Involvement (ESI) should be taken into practice by sustainable leaders. To find more on benefits of ESI please consult with the work of Sollish et al. (2011) and Johnson & Flynn (2015: Chapter Six).

Table 3: Energy Efficiency Parameters in the Design Stage of Housing Projects

Design Base	Energy Efficiency Parameters	Key References
Architectural	Use of passive solar energy	Zimmermann et al., 2005
	Use energy efficiency and integration of renewable energy sources in buildings	Hashim et al. (2011)
	Use of wooden materials for thermal insulation	Li et al. (2016)
	Optimization building orientation and shape	Fallahtafti and Mahdavinejad (2015)
	Application of green roof technology	Clark (2008)

	Optimization of building envelope design for energy efficiency	Seghier et al. (2017)
	Insulation (external walls, roofs, etc)	Sheweka and Magdy (2011)
	Well-oriented windows for day lighting and natural ventilation	Menzies and Wherrett (2005)
	Ample ventilation for pollutant and thermal control	Gill et al. (2010)
	Cooling and heating system (environmental friendly materials for HVAC system)	Monahan and Powell (2010)
	Application of geothermal energy and ground source heat pump	Omer (2008)
Mechanical	Efficient water heating	Knudstrup et al. (2009)
	Application of solar panels for water heating	Milton and Kaufman (2005)
	Insulation – isolation of tanks and pipes	Masood et al. (2017)
	Demand tank less water heater	Bilgen et al. (2008)
	Application of thermostats, ducts and meters	Whittington (2002)
	Application of photovoltaics to reduce energy consumption	Bahaj and James (2007)
	Selection and application of energy efficient lighting products	Monahan and Powell (2010)
Electrical	Application of artificial lighting	Harvey (2006)
	Use of efficient type of lighting (lighting output and colour)	Tenorio (2007)
	Use of daylighting techniques and systems to improve energy performance	Fontoynont (1999)

2.3. Construction process

Pre-fabricated buildings, Just in Time Management (JTM) and lean construction process are some of the critical concepts that should be integrated in the project management practices of a leader in construction phase. Compliance with human rights and Health, Safety and Environment (HSE) are also other aspects that need to be planned by future leaders. SLG should be incorporated with Needs Assessment of people who are doing the construction activities including but not limited to project staff and labour. SLG concepts should be also integrated with all evaluation and reviews through the construction process.

In addition to the above matter, the concept of sustainability ought to be incorporated to all purchasing and procurements in the process of construction. For instance, Kalubanga (2012) summarized the main benefits that return to the organization from adopting the policy of Sustainable Procurement, which are including:

- Control the costs via applying a wide approach to the whole costing of the life cycle.
- Optimize the external and internal criteria by means of the assessments of performance.
- Compliance with the social and environmental regulations.
- Manage Corporate Social Responsibility and risks.
- Build a sustainable chain of supply for current and future projects.
- Incorporate the local business and supplier communities.

The CSR practices below are also essential for a sustainable leader to monitor, control and evaluate during the construction process:

- Assign some of the construction works to minorities.
- Eliminate child labour
- Protect the women construction workers
- Corporate Social Responsibility
- Community engagement and development
- Fair trade policies and ethics
- Providing Equitable Safety and Health Protection

2.4. Maintenance & operation process

Building assets requires maintenance and carefulness to achieve their full life-spans. Well designed and constructed buildings are expected to fulfil their predicted service life provided that timely maintenance is implemented to rectify any created defects. A variety of environmental conditions such as weather (rain, wind, ice, etc) and pollution as well as the daily use of the occupants, deteriorate buildings over time. In the absence of adequate maintenance, deterioration defects will be developed faster, and buildings' service life may decline.

As illustrated below, over 30 years of a Computer Science Building's life at Stanford University maintenance, operations, and utility expenses are almost as great as the initial project costs.

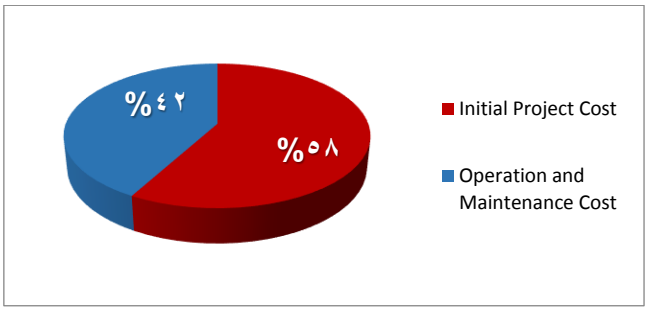


Fig. 3: Gates Computer Science Building-30-Year Life Cycle Cost.

Source: "Guidelines For Life Cycle Cost Analysis", Stanford University Land and Buildings, October 2005

In the same stream of research, Figure 4 showed the results of other studies (Ochoa et al. 2002; The American Institute of Architects, 2010) that have been conducted in the United States. The graph shows the regular costs expenses across the life cycle of a residential building, from preliminary phases to the disposal of the building at the end of its service life.

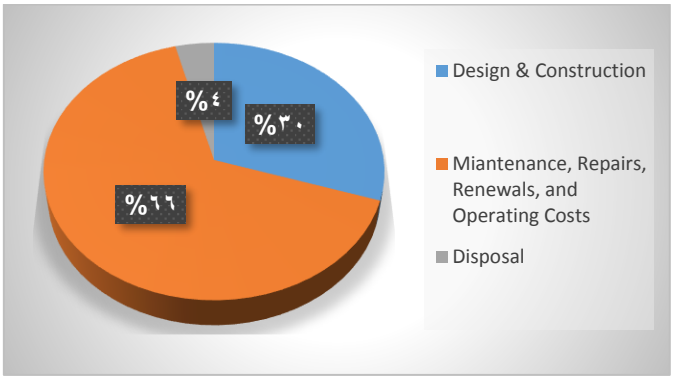


Fig. 4: Typical Distribution of Costs over the Life Cycle of A Residential Building.

The statistics in regard with total commercial floor space existed and going to be developed by 2020 in Kuala Lumpur, Malaysia summarized in Figure 5. According to the figure, the majority of the space in five different categorizes is assigned to existing buildings.

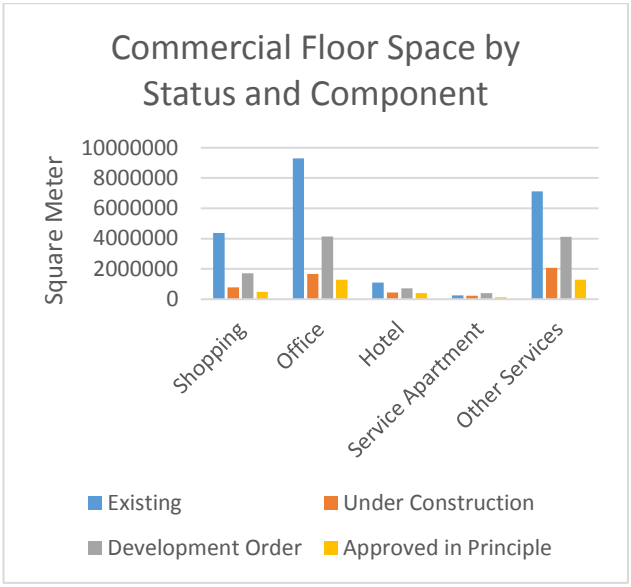


Fig. 5: Distribution of Commercial Floor Areas in KL (In Sq. M).

Source: Kuala Lumpur Structure Plan 2020 Available from: http://www.dbkl.gov.my/pskl2020/english/index.htm

Looking at the above figures, it can be concluded that the majority of costs associated with a building is assigned to its operation and maintenance stage, when the green building assessment systems target on the earlier stages of design and construction. This misalignment rendered the green rating systems unable to contemplate effectively durability, lifecycle cost, and the issues of premature building envelope (McCay, 2008). If urban buildings continue to be planned, designed, built and operated without a transformational change, the energy consumption of buildings is forecasted to be triple by 2050 (Zhang et al., 2015).
Accordingly, the following principles are also vital for a sustainable leader in order to inquire the project team to assess and take them into account in the process of building operation and maintenance:

- Energy audits and retro-commissioning
- Installation of active solar and wind energy systems
- Building automation systems
- Preventative maintenance program should be in placed
- Rain sensors on landscape irrigation
- Low-water landscaping strategies
- Green purchasing strategies
- Use environmental friendly Cleaning Products and provide safer Maintenance Services
- Use automate systems to monitor and control Energy, Water, Waste, Temperature, Moisture, and Ventilation
- Source Reduction and Recycling practices to reduce waste.
- Solid waste management
- Site and exterior maintenance
- Green & non-toxic cleaning
- Encourage Sustainable Transportation and Minimize Travel

2.5. Stakeholder management

Sustainable leaders are also encouraged to take into account the interests as well as the requirements of all key stakeholders throughout their decision-making processes. Successful sustainable leaders are outstanding at setting up and taking care of relationships with different parties engaged in the project including internal stakeholders, shareholders, bondholders, suppliers, customers, communities, and policy makers (Bal et al., 2013). Special care should also be granted to project staff, their benefits, opportunities, and health , and also to the company customers' health, safety, and satisfaction (Jabbour et al., 2013).
Researchers have argued that conflict is a ubiquitous characteristic of projects and inherent to interaction among stakeholders (Jehn and Bendersky, 2003; Jehn and Mannix, 2001; Jehn, 1995), and also noted that how a leader/PM deal with conflict greatly affects the project performance (De Dreu, 2007; Jehn and Bendersky, 2003; Tjosvold, 2008). "Conflict is a process in which one party perceives that its interests [e.g. concerns, goods, aims, values, aspirations, activities, etc.] are being opposed or negatively affected by another party" (Wall and Callister, 1995).
Conflicts may be unavoidable in projects; however, project leaders' competencies and leadership style can promote open communications and constructive debate to resolve conflicts among stakeholders. The study of Bal et al. (2013) suggested six steps to a stakeholder engagement process for sustainable construction development that a leader or project manager need to consider them: (i) identification of stakeholders; (ii) relating different stakeholders' skills, knowledge and interests to different sustainability-related targets; (iii) prioritization according to stakeholders' power, knowledge, contribution, etc.; (iv) managing; (v) measuring stakeholders' performance; and (vi) setting targets and putting them into action. Accordingly, LSRS model also put a great emphasis on stakeholder management as a key areas that should be considered by leaders of future.

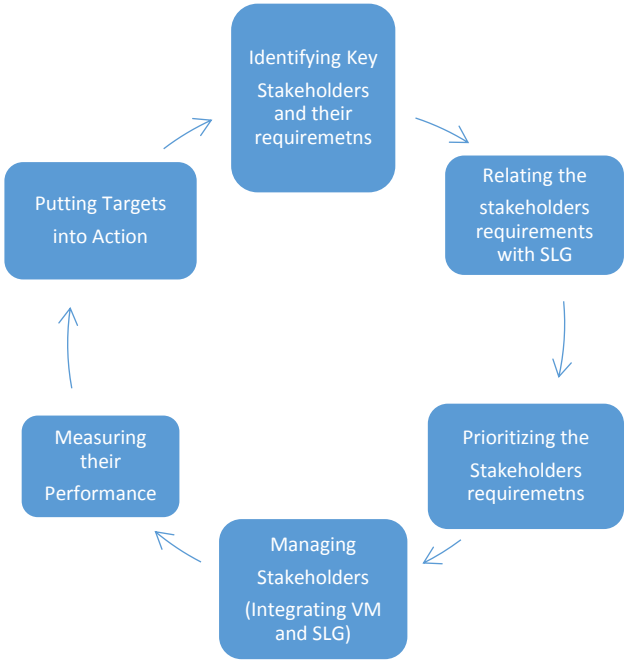


Fig. 6: Project Stakeholder Engagement Process for Sustainability.

Adopted from Bal et al. (2013)

2.6. Competencies

Last but not least, the "competencies" dimension covers the mechanisms, processes, knowledge and relations by which leaders are managing and directing the subordinates. Based on the model of Transformational leadership, Dulewicz and Higgs (2005) carried out a thorough review of the pertinent literature and developed a leadership dimensions questionnaire (LDQ) containing fifteen leadership dimensions bundled under three key competences these being; intellectual (IQ) emotional (EQ) and managerial (MQ).
Adding to the above, findings from a similar stream of research support that the competence to promote cooperative objectives and inspire the team and /or followers can have a significant impact on a project's performance (Müller and Turner, 2010; Yukl, 2002; Bass 1985). From another viewpoint, Hersey and Blanchard's research (1974) emphasized on different leadership competency profiles related to project type and complexity. Similarly, Northouse (2007) expressed that "successful leaders have the skill to adjust their attitude, approach and style accommodating the changing task requirements and team needs, at any stage of a project's life cycle". As a result, different internal and external conditions should change an

effective leader's style. This is expected to be observed when sustainable projects as shown in Table 4. Accordingly, we would like to suggest these competencies for future sustainable leaders as well.

Table 4: Ten Leadership Competencies for Sustainable Leaders

Group	Attributes	Reference
Intellectual Competence	-Critical analysis and judgement - Vision and imagination - Strategic perspective	Dulewicz and Higgs (2005)
Managerial Competence	- Resource management - Engaging communication - Empowering - Developing - Achieving	Dulewicz and Higgs (2005)
Transformational Leadership Qualities	- Develops followers into leaders - Inspire followers to go beyond their own interest	Daft and Pirola-Merlo (2009)

Source: Tabassi et al. (2016).

3. Summary and conclusions

The research interest in sustainability frameworks is being steadily increasing as a response to the growing concerns related to the need of addressing simultaneously the three dimensions of sustainability namely: economy, society and environment (Mancini et al. 2015). The inherent trade-offs in any green construction project can become even more challenging in an international environment. Leaders and leadership can interpret [76] how an organization's sustainability links to its wider complex systems. Assessing sustainable leaders, therefore, is even more important than developing them. In line with the literature on sustainable development in the construction industry, the objective of this study was to propose a framework for Leadership Sustainability Rating System (LSRS) for construction project managers. The framework targets at transforming the construction industry from serving up only green projects to developing green/sustainable corporations that believe in and promote management and business sustainability values. The various dimensions of leadership development in construction projects, as discussed in literature, were summarized, and the necessary hard and soft managerial skills for each dimension were listed. Accordingly, the Leadership Sustainability Rating System as an assessment framework for the future of the industry has been proposed. Based on the framework, there are some practices that future leaders should embrace as these are vital for sustainable development and include:

- Involving consent, especially mutual consent among the people
- Enforcing ethical behavior
- Developing financial niche categories
- Managing external interruptions in the interests of the organization
- Developing powerful system of green innovation in the organization
- Encouraging an environment of knowledge-sharing
- Building and developing a green solid organizational culture
- Setting a major priority of the organization on its individuals since high quality in products and services is directly aiming at maintaining and developing the workforces
- Promoting robust social and environmental responsibility among the employees
- Adopting a comprehensive stakeholder management plan
- Building and pleasing self-governing teams
- Taking into consideration any uncertainty and changes as process
- Fostering trust among the employees
- Encouraging self-management practices among the staff

Hence the sustainable project manager/leader framework will play a key role in the sustainable delivery of projects, particularly in situations where the country would decide to develop the aspects of seen, lean and green in the construction industry.

The recommended framework is expected to contribute to the formulation of an agile rating system for the assessment of construction project leaders' competencies in the context of sustainable development. The value of the framework lies in its ability to be incorporated in the existing Sustainable Building Rating Systems for a more holistic approach to sustainable construction projects. In addition, the framework can be a first step for the formulation of a certification process for green project managers.

4. Limitations and future research directions

With regard to the limitations of this study, observational studies are necessary to evaluate the degree of its effectiveness. The study was carried out based on a previous research conducted by the authors in the area of sustainable construction project management in Malaysia. For that reason, additional research on the proposed LSRS framework will be necessary to test whether the findings are generalizable to the same industry, or even other environments and/or industries. At the same time, effective parameters that might assist the predictive strength of the model need to be further explored. Future case study research can explore the factors under each dimension of sustainability testing their usefulness in specific projects. Therefore, the recommended dimensions should be tested for validity and reliability purposes.

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