

# **A Pilot Framework of Corporate Real Estate Sustainable Performance Measurement (CRESPM)**

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## **Abstract**

Sustainability is now recognised as an emerging important area and is a subject of discussion in recent studies. Sustainability is a current issue discussed in various platforms not only in Malaysia but throughout the world. Despite that, there is lack of scholarly discussion on sustainability relating to corporate real estate sustainable performance measurement (CRESPM). Corporate Real Estate Sustainable Performance Measurement (CRESPM) merits serious discussion as it contributes greatly towards the direction and decision-making of the organization in attaining maximum added value for the business; and contributing to the overall performance of the corporation. Thus, this research aimed at exploring, and then summarizing the best performance measurement indicator related to sustainable real estate by referring to the sustainability parent theory. The objectives of this study include to identify the existing CRE sustainable performance measurement indicator available from previous research; and to design a pilot model and framework for CRE sustainable performance measurement. The research uses content analysis method to analyse data gathered from literature and previous studies. The findings will be demonstrated in the form of a pilot framework model on CRESPM that will include 102 indicators of performance measurement derived from analysis. The framework is hoped to be available in the near future as an evolution for the future exploration on CRESPM.

**Keywords:** Corporate Real Estate, Corporate Real Estate Performance Measurement, Performance Measurement

## **1.0 Introduction**

The embracing of sustainable real estate can be seen through a growing number of sustainable and green building developments. Furthermore, the divest of real estate investment towards green and sustainable buildings, and also towards REITs have demonstrated public awareness on the contribution of sustainable development especially towards property or real estate to the benefit of not only the environment, but also towards the successful operation of businesses and investments. Business corporations are now jumping on the sustainable premise bandwagon in hopes of sustaining the business as it has been proven to be not only more profitable, but also requires less expenditure. More CRE strategies have been found in

previous research but not many consider sustainable performance measurement aspects. In addition, sustainability in CREM strategies has been perceived only as a part of performance measurement. Thus, this research aims to explore and then summarize the best performance measurement indicator related to sustainable real estate by referring to the sustainable parent theory that integrates all the sustainable environmental, economic and social aspects. The findings will be demonstrated in the form of a pilot framework model on CRESM that is hoped to be utilizable as reinforcement for future exploration on CRESM.

## **2.0 Problems and Issues**

In recent times, most corporations or business organizations were concerned with their corporate real estate strategies just as much as their business strategies in ensuring their businesses were sustainable, competitive, and yield good returns while simultaneously incurring reduced operational costs. A case in point is where Nourse and Roulac developed a CRE strategic framework which encompassed 8 strategies in 1993 (Nourse & Roulac, 1993). Later, De Jonge (1996) also discovered and developed 7 components of CRE (Krumm & de Vries, 2003). A few years later Lindholm & Gibler (2005) developed a set of CRE strategies incorporating 7 strategies, and updated them by adding a new potential real estate strategy related to the environment (Gibler & Lindholm, 2012). Meanwhile in Malaysia, Zaiton Ali, McGreal, Adair, Webb, & Roulac (2008) discovered a new strategy adopted by Malaysian companies that is Corporate Social Responsibilities (CSR) through adaptation of Nourse and Roulac's strategies. In short, the buzz on sustainable issues relating to CRE strategies only began in 2012; yet until now no organization has been found to adopt CRE strategies that fully consider the sustainability aspects. This was even apparent in strategies developed by Gibler & Lindholm (2012) where the sustainability aspect was only taken as a part of the strategies and not as a whole. Due to that, no framework concerning sustainability element in CREM has been found to date.

Masalskyte *et al.* (2014) discussed on the CRE sustainable practice elements taken into consideration when managing and maintaining a sustainable CREM practice. The elements involved include water management, waste management, energy management, monitoring and controlling, building certification, organizational sustainability, sustainable facility management, green supply chain, communication with stakeholders, communication with employees, green office, sustainable workplace, sustainability unit, sustainability finance, environmental policy, strategy and sustainability benchmarking. However, the relationships provided between CREM strategies with the elements identified were rather complicated to be understood.

It was thus, referring to the most frequently discussed issues within current certification system by super buildings (2010) that Yuce (2012) categorized those issues into three elements of sustainability namely: environmental issues encompassing issues on energy, materials, climate change, land use and ecology, and water and waste management. The next category is economic issues related to management and maintenance, lifecycle cost, building adaptability, process quality, and innovation. The last category is social issues that focus on comfort and health, accessibility of the building and access to transport, and safety and security. Therefore it is necessary to base sustainable performance measurement on these three criteria or elements.

In addressing the difficulties, inherent issues and lack of discussion on sustainable performance measurement in order to measure CRE, this research aimed to further delve into this matter. However, considering this is a first attempt, the researcher only focused on the criteria for sustainable performance measurement in order to develop a framework model based on CRE sustainable management performance measurement directly related to sustainable theory.

### **3.0 Methodology**

The research was conducted by reviewing all available literature from previous research to identify sustainable performance measurement indicators applied in CRE practice. All the reviewed data is then analysed through content analysis to design a pilot model and framework based on the sustainable theory that balances environmental, economic, and social impacts.

### **4.0 Corporate Real Estate Sustainable Performance Measurement**

Performance measurement indicators for sustainable real estate research have been steadily gaining popularity among researchers thanks to the existing and increasing awareness of sustainability issues and green building evolution. Research on environmental performance measurement, for example, provides insight into the measurement system development processes, indicator selection criteria, the use of data in measurement systems, the development of composite indices, and the role of measurement systems (Searcy, 2012).

These issues were also found discussed in several articles. One such article found in the “Environmental Building News, April 2005” outlines the range of potential benefits that could be the subject of performance measurement studies that include cost savings, reduced operating costs, other economic benefits, health and productivity benefits, community benefits, environmental benefits, and social benefits.

It has been established that sustainable revolution in CRE area begun in 2012 when a number of researchers such as Gibler & Lindholm (2012), and Masalskyte *et al.* (2014) adopted sustainability as a part of areas linked to CREM. Similarly in Malaysia, awareness on sustainability issues has also taken root in 2009 after the establishment of the Green Building Index (GBI) and the implementation of the National Green Technology Policy 2009. Nevertheless, it was noted that there was still no credible research on corporate real estate sustainable performance measurement in Malaysia.

Hence, the researcher have started to explore sustainable performance measurement to overcome the existing gap and have found that of late, sustainability performance measurement indicator studies were developed by referring to the theory of sustainability that integrates the three sustainability pillars of economic, environmental and social.

These three pillars are usually added to present the elements of sustainability in organizational management. Musil (2011), proved that corporate real estate executives should be well-prepared to demonstrate the economic impact as well as other social contributions like job creation, personal earnings, and an array of other community economic benefits that the

corporation can contribute to augment encouragement and support from the team. He reiterated that negative social impact caused by the organization may lead to decreased employee performance and reduced financial results (Musil, 2011).

This was corroborated by Muhammad Zahid Zulkipli Ghazali (2015) that integrating environmental sustainability, social sustainability, and economic sustainability into the corporate sustainable practice induces major benefits to stakeholders. The environmental sustainability criteria include environmental management system (EMS), ISO certification, emissions and effluents including greenhouse gases (GHG), energy consumption and saving, eco-efficiency and cleaner production, waste reductions, transportation, recycling, water and waste water treatment, green products and certifications, biodiversity and supplier assessments. Under social sustainability criteria 19 indicators have been listed namely decent labor practices, employee development, training and education, employees' human rights, employment opportunities, occupational health and safety, volunteering and philanthropy, diversity and equal opportunities, communities, prevention of child labor, human rights, labor union and bargaining power, shelters for workers and others, customer satisfaction and customer safety, product responsibility, eco labelling, ethics, drinking water at the workplace, and anti-corruption. Lastly economic sustainability comprises market presence (minimum wages), indirect economic impact, direct economic impact, corporate governance, earnings, value creation, and shareholders, acquisitions, locals in management, internal control, and R&D. Even though the criteria listed are more focused on corporate sustainability in general, some of the criteria can be considered and matched to the CREM objectives.

Evidently, Taylor (2013) also presented criteria of performance measurement that can be combined with the sustainable theory comprised of the three pillars. Evidence supports reduced operating cost, expanded markets for green product and services, improved occupant productivity, and optimized life cycle economic performance as indicators under economic criteria. Environmental criteria consist of enhanced and protected biodiversity, improved air and water quality, reduced waste stream, and conservation of natural resources. Social criterion than includes advanced occupant comfort and health, heightened aesthetic qualities, minimized strain on local structure, and improved overall quality of life.

In concurrence, Christensen et al. (2012) also listed several attributes to measure the performance that have been found to be also divided into three pillars of sustainability. The economic criteria includes current value of real estate asset, financial implications, and other risks and opportunities related to sustainability issues, operating costs, increased post adaptation value for existing building, construction and development costs, convertibility into other use(s), impact on infrastructure investment, and services developed for public use and benefits, total value of financial and in-kind contributions to community, and perceived value of positive (PR) / branding associated with the sustainability-related activities. Meanwhile the environmental criteria comprises energy efficiency, renewal energy and carbon offset, internal environmental quality, total direct and indirect GHG emissions, existence of hazardous materials, water use, waste management, refrigerant management, pollution/contamination, biodiversity value and impact to real estate activities, natural resources use, material use and site improvement, and management strategies. Lastly, social criteria covered aspects of

community benefits, transportation related noise, employee training opportunities, urban regeneration, percentage of operations with implemented local community engagement, operations with potential or actual negative and positive impacts on local community, number of persons in volunteering, aesthetic impact on community, provision of additional facilities and amenities, proximity to hostile factors, occupant and user satisfaction and comfort, health, safety and well-being, green cleaning policy, access to transportation, perceived positive impacts on PR, accessibility in the site, and facility layout design.

In conjunction with the finding above, Christensen et al. (2012) has ranked the criteria identified according to most important starting with occupant satisfaction, facility/building management team expertise, image/branding/PR, reduction in energy usage, monitoring of energy usage, indoor lighting and visual comfort of occupants, economic impacts, indoor thermal comfort for occupants, energy efficiency, risk reduction, maintenance consideration, indoor air quality, accessible to public transport, recycling of waste production, community impacts consultation and assessment, environmental management on site, alternative transportation programmes, whole life cycle value of property, building adaptability, use of alternative or renewable primary energy, water efficiency, neighbourhood community impacts, reuse of previously developed site, reduction in water consumption, reduction in material consumption, building user education programmes, use of local materials, social cost or benefit analysis and reuse of materials.

The increase in sustainability indicators to measure performance revealed that all three pillars of sustainability are crucial to maintain the sustainability of business corporations and also to ensure their success. This is due to the fact that all three pillars are related to, and supportive of each other in being the push factors towards the success of the business. The Green Building Index (GBI) Malaysia has required that buildings awarded with GBI ratings must fulfil six (6) criteria of GBI that covers energy efficiency, indoor environmental quality, sustainable site planning and management, material and resources, water efficiency, and innovation (Mona Isa et al. 2013). Even though the criteria did not explicitly demonstrate the link to the three pillars of sustainability, but indirectly can be seen. In short, sustainable performance measurements have discovered that from three pillars of sustainability parent theory.

#### **4.1 Economic Criteria**

The main area of concern is the environmental criteria or also known as ecological dimension that is mostly illustrated as global warming prevention through the reduction of CO<sup>2</sup> emissions, waste minimization, water conservation, and minimization of wastewater generation, ecosystem conservation, re-useable materials or recycling, environmental management promotion, reduction of office energy use and greenhouse gas emission generated, promotion of biodiversity, and indoor comfort environment quality. These are similar to findings from Yuce (2012) that identified 8 criteria to measure environmental performance that is site selection (site location, site characteristics, infrastructure, neighboring buildings, heat island effect, landscape inputs, risk at the site), biodiversity (site ecology, eutrophication, habitat management plan, biodiversity), land use (green field / brown field, land regeneration & development), resource depletion (total energy consumption, use of non-renewable primary energy, use of renewable primary energy, use of further energy resources, energy efficiency of building equipment, embodied energy), water use (potable water, grey water / waste water,

storm water runoff, planting, water efficiency of facility & appliances, embodied water, water pollution), materials & components, (recycled, re-used materials and components, modular and standardized materials and components, certified materials and components, service life, risks from materials, local / regional material), emissions (greenhouse gas - carbon dioxide, greenhouse gas – methane, greenhouse gas - nitrous oxide, greenhouse gas - fluorinated gases, acidification, ozone depletion, pollution), and waste (hazardous waste, non-hazardous waste, organic waste, inorganic waste, construction waste and radioactive waste).

On the other hand, Isa et.al. (2013) found that environmental sustainability from the perspectives of the productivity and well-being of occupants are most related to social criteria. She also determined environmental sustainability with the advantages and benefits of green features to the environment, such as energy efficiency, recycling and reduction of greenhouse gases. Supported by Collins & Junghans (2015) that found several other indicators of performance measurement such as improved efficiency of water consumption and less life cycle.

#### **4.2 Social Criteria**

The next area of concern in sustainability performance measurement is the social criteria. It is more concerned with the impact on the organization including labor practices, human rights, and society (Ghazali, 2015). (Lawrence, 2004) iterated in her research where she discovered that the lack of office space with appropriate environmental and social credentials was considered as significant problems and may create risks for the company . Lawrence (2004) reiterated that the environmental guide includes biodiversity, real estate guidelines including acquisition and disposal processes, design and construction, and facility management. Yuce (2012) further listed 6 elements namely: indoor environmental quality (CO<sup>2</sup>, formaldehyde and nitrogen oxide concentrations, indoor air pollutants concentrations, ventilation conditions, electromagnetic emissions, mold growth risk, indoor construction air quality, indoor air quality in car parks, thermal comfort, air temperature and relative humidity, summer / winter conditions, thermal zoning); visual comfort (day lighting, illumination, lighting zones and control: lighting for suitable tasks in lux, natural lighting & glare); acoustic comfort (noise from building and site, background noise level, reverberation time); architectural and cultural considerations (cultural heritage integration, aesthetic aspects, design and urban development, monument, branding and external expression); externalities (local employment opportunities / use of local services, community impact consultation, responsible and ethical procurement, available services, social cost benefit analysis, considerate constructors, neighborhood) and occupants' satisfaction (access to view, privacy, feelings and sensations, recreation, human interactions / relationships, interior qualities).

Some of the research revealed that social sustainability perspectives include sustainability criteria related to occupant satisfaction, flexible working environment, health and safety education, training and education of employees, employee retention, participation in local community programs, percentage comparison of male and female employees, percentage of staff who participate in basic environmental training, employee years of continuous service, total CSR spending and absentee rate (Lamprinidi & Ringland, 2006). Furthermore, Mona Isa et

al. (2013) disclosed that social elements include improved environment for office workers and building users, while de Francesco & Levy (2008) identified social criterion as changing the behavior to become more aware of day-to-day sustainability activities.

#### **4.3 Economic Criteria**

The last criterion is economic sustainability. According to Glatte (2012), by looking from pure economics view, economics is defined as a target concept related to performance targets (procurement, inventory, production, sales), financial targets (liquidity, investment, financing), and success targets (turnover, earnings, profitability).

However, sustainable performance measurement has been found to be less discussed in the economics arena because it is actually directly related to the performance contributable from the environmental criteria and social criteria. This is compounded by Christensen, Baldwin, & Ellis (2012) in their research findings which include the indicator for increased productivity directly results in the revenue of the corporation. A careful look at the productivity factors and revenue factors revealed that they actually came about or produced by employee satisfaction and comfort towards the company facilities, work space, work environment, and many other factors covered by environmental criteria and social criteria. According to Taylor (2013), sustainable design can support human performance and workplace flexibility, and increase productivity.

It is similar to reduced cost factors suggested by Mansfield (2009) whereby cost reduction towards building life can improve performance of the real estate as well as performance of the company. Previous research by Lamprinidi & Ringland (2006) also used reduced cost to measure the economic aspect of performance. Contrary with Yuce (2012)'s findings that only determine life cycle cost factors that include initial costs, operational costs, maintenance and repair, replacement costs, risk & value management, function analysis, and payback time. It can thus be summarized that even though economic criteria is the last area of concern in sustainable performance measurement, the focus on environmental criteria and social criteria acts as a driver to achieve a target concept related to the overall performance measurement represented by economic criteria. This is concurred by Taylor (2013) who have found some studies indicating that a firm's environmental and social performances are significant determinants for improving the overall performance of the firm.

#### **4.4 Additional Criteria**

Yuce (2012) added two additional new criteria that also need to be taken into consideration in measuring corporate real estate performance which are: functional and technical criteria, and process criteria. These two criteria have been released by the International Organization for Standardization (ISO) where the ISO goal is to consider the indicators for sustainability performance are not only focused on the environmental impact and economic, social and cultural improvement; but also technical performance that includes the technical process. Functional and technical criteria consists of 4 factors including safety (safety assessment, safety management); security (site and building, combustion sources, resistance - storm, high water, hail, earthquake); service (public & public transport accessibility, barrier-free accessibility,

bicycle comfort, pedestrian comfort, car parking capacity) and the last factors is usability (demand of space, area efficiency, capacity, occupancy, maintainability and operation comfort, longevity, intelligence and controllability, adaptability and versatility, demolition / reuse or recycling, and communications and mobility). Process criteria include those focused on planning and implementation. The factors involved are integral planning, integrated design, optimization and complexity of the planning approach, quality of the project’s preparation, establishing preconditions for an optimized use and operation, choice of construction process, quality of the executing contractors / prequalification, quality assurance of construction execution, controlled commissioning, innovations, innovative strategies & technologies, exemplary performance and building user guide, awareness & education.

Evidently, the two additional criteria found have been observed and considered by other researcher but the factors were categorized under a different category commonly parked under a related category of the three pillars and theory of sustainability.

### 5.0 Analysis of Sustainable Performance Measurement

Table 1: Frequency Analysis of Sustainable Performance Measurement Criteria

Performance Measurement Criteria	Elements	Freq u-ency %
<b>Environment Sustainable Criteria</b>		
Environmental management system		2%
Emission	Greenhouse Gas	9%
	Electromagnetic	2%
	Hazardous material	2%
Energy use	Energy Saving	12%
	Energy renewal	4%
	Sources	2%
Ecosystem/ Biodiversity	Site ecology	2%
	Eco friendly equipment	2%
	Eco production and service	4%
	Natural ecosystem protected /value	5%

	Management plan	2%
	Indoor comfort environment	4%
	Supplier assessment	2%
Waste	Waste reduction	5%
	Waste management	2%
	Hazardous	2%
	Organic	2%
	Radioactive	2%
Transportation	Conservation	2%
	Noise	2%
Water	Access	4%
	Reduce	14%
	Water quality	4%
	Waste water	7%
<b>Social Sustainable Criteria</b>	Conservation	2%
Employees concern	Development/ training and education	7%
	% participate in training	1%



	Human rights	4%
	retaining	4%
	Proportion of staff	4%
	Years of continuous service	4%
	Changing behaviour to sustainable activities	1%
	Absent rate	1%
	Volunteering and philanthropy	4%
Occupant Satisfaction	Health and safety and security	5%
	Comfort	4%
	Feelings and sensation	4%
	Health education	1%
	Access to view	1%
	Privacy	1%
	Recreation	1%
Performance Measurement Criteria	Elements	Frequency %
	Human interaction	1%
	interior qualities	1%
Customer Satisfaction	Comfort	1%
	Safety	3%
Office space	Design and layout	3%
	Flexible working environment	1%
Indoor environmental quality	Air temperature	3%

	Humidity	1%
	Air quality	5%
	Car park area	1%
	Ventilation	1%
	Material use	1%
Facilities and amenities	Provision	4%
	Layout design	1%
	Time delays for maintenance	1%
Community	Engagement	1%
	Aesthetic	1%
	Impact consultation	1%
	Programmes	1%
	CSR spending	1%
Visual comfort	Day lighting	1%
	Illumination	1%
	Lighting zones and control	1%
	Natural lighting and glare	1%
Acoustic comfort	Noise from building	1%
	Noise from transport outside	4%
	Noise from internal occupant	1%
	Reverberation	1%
Architectural and culture consideration	Cultural heritage integration	1%
	Aesthetic aspects	1%
	Design and urban development	1%
	Monument	1%
	Branding and external expression	1%

Externalities	Green cleaning policy	1%
	Transportation access	1%
<b>Economic Sustainable Criteria</b>		
Value creation	Real estate asset	8%
	Post adoption value for existing building	3%
Acquisition	Real estate acquisition decision	3%
Internal control		3%
R&D		3%
Profitability	Earnings /revenue	15%
Reduce cost	Operating cost	12%
	Renovation cost	3%
	Life cycle cost	3%
	Maintenance and repair	3%
Performance Measurement Criteria	Elements	Freq u-ency %
	Replacement cost	3%
Productivity	Employees productivity	3%
	Increase occupants productivity	3%
	Life cycle economic performance	3%
Green implementation	Service	3%
	Product	3%
	Opportunities to sustainable issue	3%

Risk	Real Estate	3%
Financial	Implication	3%
Convertibility	Function	8%
	Space	3%
	Impact on infrastructure provide	3%
Turnover	Staff	3%

## 6.0 Pilot Model and Framework of CRE Sustainable Performance Measurement

From the analysis done, sustainable performance measurement can be seen as integrating three pillars of sustainable theory which includes economic, environmental and social aspects. Hence, an onion model of sustainable performance measurement was developed to illustrate a clear view of the integration between all the elements presenting a sustainable relationship in the determination of sustainable performance measurement.

The onion model of sustainable performance measurement shows that the outer onion layer represents the environmental elements of sustainability criteria. The environmental sustainability criterion is located at the outer layer due to its contribution as a main indicator in sustainable performance measurement. Evidence revealed that, the environmental criteria has also been identified to act as a contributor to the successful implementation of social criteria which is placed at the second outermost layer.

From the figure, economic sustainability has been placed at the innermost layer to present a view that it is a result of, and affected by the relationship between environmental and social criteria as per discussed in the literature. The economic sustainability criteria objective can be successfully achieved if both the environmental criteria and social sustainability criteria have been fully achieved.

The integration of elements or factors involved to measure performance is illustrated in Figure 2 on pilot indicators of sustainable performance measurement. The variable in the framework are distributed to three pillars of sustainability.

Figure 1: Onion Model of Sustainable Performance Measurement

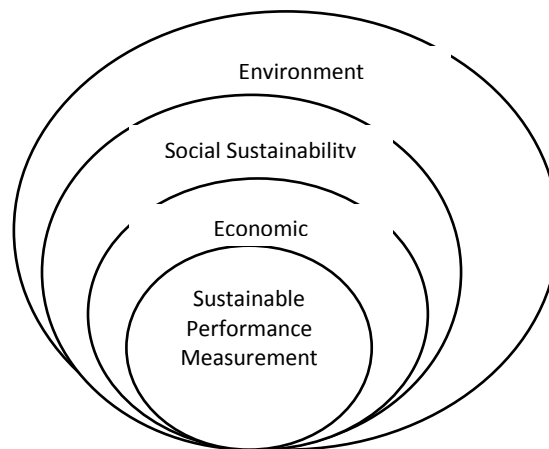
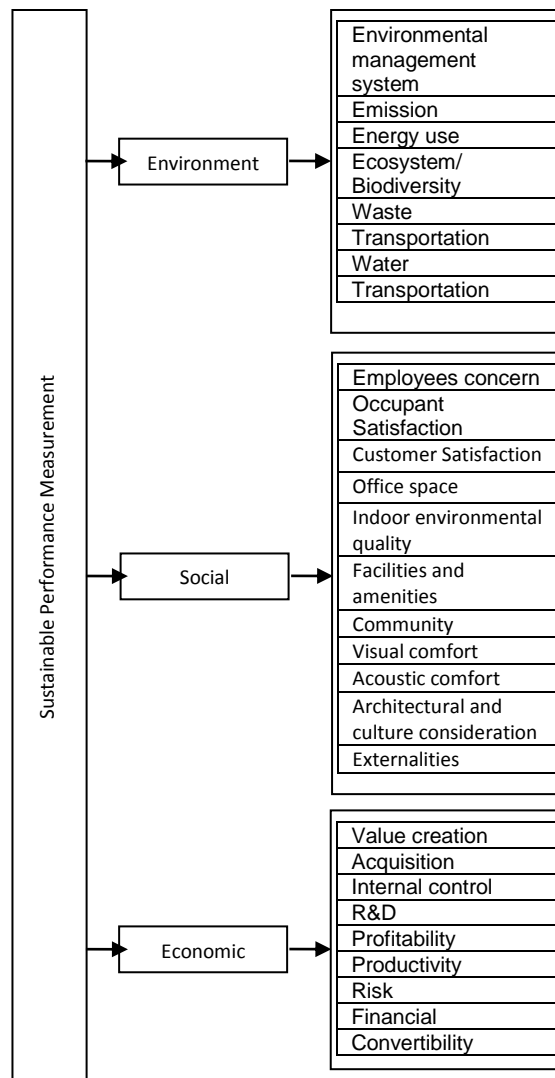


Figure 2: Pilot Indicators of Sustainable Performance Measurement



## 7.0 Conclusion

The research revealed 28 pilot indicators and 102 sun indicators or factors involved in measuring sustainable performance. All the indicators found were categorized into three important criteria of sustainability pillars of environmental, social and economic. Nevertheless, there are some redundancies in the variables or indicators identified. Therefore, in order to verify the best indicators to be used, further research will be supported with interview sessions conducted with sustainable property managers or related entities. Additional best indicators selected will be discussed in the next research.

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