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SUSTAINABILITY PRACTICES FOR COMPETITIVE ADVANTAGE IN SRI LANKAN CONSTRUCTION INDUSTRY

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Abstract: Currently, the modern world faces the most complex in the economic, environmental and social issues; those issues have to be resolved for the future generations. This concept is called sustainability. Every industry focuses on sustainable practices. On the other hand, the construction industry is playing a major role in this dynamic world. Moreover, nowadays construction industry faces a lot of challenges, like a shortage of technical skills; quality, management and profitability are playing major roles in construction projects. The sustainable practices are important for maintaining and improving the quality of our environment and also it is important for the quality of life in the construction industry. However, sustainable practices are connected with key drivers and challenges, such as climate change, air pollution, water quality, soil quality, population, economic growth, wildlife and land quality. Also client's expectation is the biggest challenge which is entering to the sustainable practices; most improvements of challenges are applying information technology and improve the working environment issues. Sri Lanka is one of the most scenic places in the world. Thus it has different types of resources, such as landscape, water resources, and forests. Construction industries in Sri Lanka depend on different types of climate and environmental challenges and therefore the Sri Lankan Government consider the sustainable practices. The data analysis revealed four key drivers are mostly adapting sustainability practices. There are; clients' requirements and expectations, motivation from top management, government regulations and improving environmental performance. The paper concludes that key drivers are adapting sustainable practices.

Keywords: Sustainability, Construction, Challenges, Economic, Environment, Social, Key drivers

1. Introduction

Sustainable construction practices are essential for every industry. For an example it is essential for construction industries, so they (construction industries) focus more on the sustainable practices. Mainly three perspectives control the sustainable practices such as social, economic and environmental. Sustainable development connects with the public, also this practice requires and integration of triple bottom line goals [13]. World Commission on Environment and Development (WCED) define the definition for the sustainable practices contribute to present needs satisfaction and also available for the future generation needs [13].Corporate social responsibility defines the corporate with the society and resources [24].Sustainable practice is environmental orientated and environmental friendly material use in the construction works. Sustainable construction has some essential requirements such as; importance of resource management implements the quality of products and discusses the responsibility. Improvement of the quality construction process includes reduction of building material wastage, increasing the use of recycled waste as building materials, energy efficiency in buildings, water conservation, durability, maintenance, innovation in building materials and methods [29].

2. Sustainable Triple bottom lines and key drivers adopting the Sustainable practices

Sustainable development means "successfully satisfy the current needs without compromising the ability of future

generations to satisfy their own needs" [6]. But this do not analyse the scientific concept, because this concept only concerns the social responsibility, it does not consider the economic and environmental perspectives [15].

Triple bottom line (TBL) are connected sustainable equilibrium those three pillars are economic to profit, social responsibility to people and environmental to the planet [18]. It is mainly based on the stakeholders' current needs and compromises the people future needs. All three consider the different qualification concern, but the environment is the biggest value and the economy is the smallest, while the society is middle value [6]. This generally calls multi bottom line perspectives, but more practical definition of the "triple bottom line" (TBL) means, companies continuously consider their economic, social and environmental sustainability perspectives. Also TBL proves the company actionable measure; it should help investment confident and security [30].Construction companies' ultimate goal not only short-term economic value but also concerns the long term triple bottom line perspectives. Also defines the sustainability as "long-term commitment" or "reduce the social, environmental and economic risks" [17].

Firstly, should consider maintaining the quality and capacity of the ecosystem and to use and keep for future generation [4]. Secondly social responsibility considers the management and how to manage the peoples' needs and provide the opportunities equally for all society [14]. Also, social responsibility is keeping people's quality of life and equity. The lastly economic measure focuses the right wealth and properties. Currently all of the company sustainable programmes indirectly support the company economic statutes [27]. Also they said social responsibility create the good image for the company. Corporate social responsibility doesn't help economically but it helps the positive view about the company in the current market [35]. Basically economic benefit from reducing the material wastage is increased the socio efficiency in the company. Also this situation is help to make positive business in the company, so it will help to increase the social and environmental issues [36]. All three are connecting each of them ideally; it will save the sustainable Triple bottom line. Firstly "socio-economic includes the worker rights, positive business view and business ethics. Secondly "eco-environmental has been considered the resources important, energy conservation, pollution and environmental regulations. Finally "socio-environmental" maintaining the resources quality for give the social such as air quality, water quality, and bio-diversity maintain, environmental preservation, hazard management and reduce the Noise. Every organization follow different means of sustainability practices, because they consider possess of organizations and capabilities of organizations. Presently, most of the organizations are following the sustainability frame work or sustainability initiatives because it should implement the organization [16]. Generally people agreed the Triple bottom line treated the sustainability dimension, but some methods focus only one dimension. That means environmental or social or economic dimension, they do not tread the other two dimensions. These three dimensions have been connecting the impacts, each of them are impacts on other two perspectives [21].

Firstly economic sustainability perspective basically out focus of economic growth, also it is a link with the population growth, organizations actions, and resources use and maintain the environmental quality. The present generation should maintain the quality of the sustainability and ensuring they didn't provide the disadvantage for future generation. On the other hand economic perspective, it is included creation of the material resources, investment, income and assets of the company. These principles maintain the all of the operation stages. They include the consumption pattern, distribution of wealth, important product, analyse and development [37]. Secondly social responsibility is maintaining

stakeholders' expectation of economic, legal, ethical and discretionary [22]. All construction companies manage the corporate social responsibility (CSR) initiatives, CSR is explaining the way of the business that base on the social responsibility, also manage the economic and environmental concern about the business. It is always a positive impact for the stakeholders; however, they face the problem how to incorporate a business [31]. Social responsibility considers the community issues, society safety, and knowledge about the organization, workers' rights, place of work safety arrangements, human rights and opportunity equality [23]. Andriof (2001) said "one of the essential social responsibilities is a business can do it profitable" because profitable business can provide the sustainable issues in the society, view of environmental safety, returns the investment for shareholders and provide the positive relationship for the society. Finally environmental sustainability perspective considers the resources for the present needs and it does not affect the future uses [2]. According to the Lovins (1999) organizational operation consume the natural resources by considering only about the rate of the natural reproduction, however the organization should consume the under rate of the reproduction level. Otherwise organizations fail the environmental sustainability [26].

Also environmental connect other two dimensions such as, eco-environmental and socio-environmental. Every organization concerns the environmental sustainability, because all the business sustainable activities treat under the environmental sustainability [23]. Environmental sustainability relates the weather changes; it provides the different issues of impacts such as climate change, global warming, air quality/ fresh air, noise, carbon emission and biodiversity loss. Most of the construction works impact the environment positively or negatively, also these impacts are measured on the triple bottom line. Moreover triple bottom lines influence the multiple ways such as, economic analyse the materials wealth and financial income, environmental perspective concern the protection of nature and social perspective relate the quality of people's life [37]. Construction industry must be following the internationally recognized sustainable principles, also incorporate the green management principles. Economy growth is must be ensuring the environmental safety and social responsibilities. Sustainable construction was describing the sustainability issues regarding the construction industry; sustainable practices concern the key drivers, challenges and issues [25]. Some of the key drivers are embedding environment sustainability practices in Sri Lanka construction industry. Sustainability practices find some comprehensive list of key drivers such as, cost, ethical concern, stakeholders' pressure, top management commitment, economic growth and population growth [8]. Also find some more drivers such as, government regulations, environmental regulations, an international organization for standardization (ISO) and customer demands [3].

Firstly, considering the cost; Sri Lanka is developing the country, so cost is an essential driver in the financial sector. The cost drivers are covering the people, energy consumption about machinery works, operating cost/ maintenance. Secondly Government regulations always focus on the social and environmental sustainability, because Construction industry takes the most of the resources from the environment. Sri Lanka faces the major issue, so government considers the environmental impacts. Also Sri Lankan environmental ministry creates the policies for environmental management [28]. Thirdly top management's main responsibility is encouraging the working community; also maintain the environmental management and produce the internal strong environmentalism [8]. In the top management commitment implementation are related strategies with the stakeholders, because they have an argument with top management. And also it has been some

requirements such as, leadership, change management, culture, technologies and team work [32]. Fourthly concern the population growth; country population of Sri Lanka (2012 est.): 20.33 million (growth rate: 0.913%). Increased country population, and then increase the number of developments. Therefore numbers of buildings are increasing and thus it overuses environmental resources [19]. Fifthly Stakeholders' pressure are a group of people or individually affect the company action is called as stakeholders' pressure. It is included internal and external bodies such as, employees, suppliers, clients, investors, non-government organizations NGOs and government bodies. It is helping to produce the positive way of social responsibility. It maintains the investors' confidence about the company statics [12]. Finally Sri Lanka economy concern smooth growth; it is positive view for the construction industry. It provides more job opportunities for people. Sri Lanka country economic growth reached 7.2% in 2014. Sri Lanka grew performance in 2012 double size growth in the construction industry. It is very largest level than comparing other years [3]. This Section discussed the key drivers entering the sustainability; So all the drivers are creating a research question such as, government regulations, clients' requirements & expectations, improving stakeholder relationship, motivation from top management, and relations ship with the community, improving environmental performance, improving economic performance, company regulations. Moreover, following section describes research methodology depended for this study. Data is presented, analysed and discuss drivers and lastly conclude that paper.

3. Research Methodology

Major aim is to investigate Sustainability practices for competitive advantage in Sri Lankan construction industry. Essential data collection and advance methods of analyse the data are necessary to achieve a correct meaning full outcome through a research [9]. This section analyses the types of methodology and suitable methodology for the research objectives. In addition, previous section reviews the Sustainability practices for competitive advantage in Sri Lankan construction industry. Thus this section reviews the principles of the methodology, and also a questionnaire has been discussed to cover the key drivers adopting sustainable practices. Moreover a structured questionnaire with, designed questions were mailed to Sri Lanka construction industries. Further more collected details were stored in computer for the analysis.

"We need to classify between quantitative and qualitative research strategies, in which the emphasis is on quantitative and qualitative research respectively and quantitative and qualitative methods." Quantitative research method classified some types such as, questionnaire or survey technique, structured observation and content analysis. Also qualitative research method classified some types such as interview research, observation and documentary analysis [20]. Quantitative research method has some advantages such as, fixed, objective, survey, hypothesis testing and abstract. However it is hard to collect the details due to the ignorance of some respondents reflecting their views towards the questions either partly or totally. [10].

In this research data collection was made by questionnaire method. Firstly a 'literature review' has been carried out to investigate in sustainability practices for competitive advantage in Sri Lankan construction industry. The key terms looked into literature survey were sustainable, triple bottom line, key drivers, sustainable issues, challenges and sustainable impacts. But these details collect from the people statements, books, journal and ministry guide line. These details are currently unconfirmed practices in construction industry people Sri Lanka. Secondly, select the questionnaire method for data collection. Questionnaire is one of the most importantly use the social research techniques [6]. A self-completion

questionnaire was sent to selected construction firm, consultant and construction related authorities. Questionnaires are most effective method, when compare the interview method, because more people response the questionnaire. It has been an easy method than face to face interview. Also if we take the questionnaire has some problems, those are visual not clear, respondents misunderstand the questions, and a number of our respondents understand the question differently from each other's and also their answers difficult to compare with each other's [20]. This method is better than the interview method. Because unlike in a face to face interview, we can`t ignore the question. But in this method if people who not like to answer they would ignore the page[11].

Within the research, all of the questions depend on Sustainability practices for competitive advantage in Sri Lanka construction industry and the research objectives. We were prepared questions to identify the key drivers in entering in Sustainability practices Sri Lankan construction industry. Research questions are based on the three types of main issues such as 'What' question for describe answers, 'Why' question for understanding or explanation and 'how' question for interventions to bring about the changes. So this type is important to identify the research problems and develop questions [5]. Sampling theory calculates the proper way of equation, also this theory classified some types such as random sampling judgment, judgment sampling (systematic and stratified sampling), and Convenience sampling [1]. Random sampling method has been suitable for this online questionnaire research.

4. Data presentation and Analyses

This section was discussed the results and discussion of the questionnaire survey respectively. The aim of this study is to analyse "Investigate Sustainability practices for competitive advantage in Sri Lanka construction industry". The results are elaborated to give consequential outcomes as identify the key drivers and challenges in entering in Sustainability practices.

4.1. Analyse the questionnaire

In this research I send my questionnaire for more than hundred construction industries and related people in Sri Lanka. These calculations of the industries are including government industries and private. We only received 33 responses out of which three were incomplete. All respondents have good knowledge about the key drivers adapting the sustainable practices in Sri Lankan construction industry.

4.2. Demographic questions

Firstly in this part has been analysed the respondents details such as job title, job level, natures of organization, experience details and number of staff in their industry. Identify the characteristics of respondents' designation job details. Totally 33 people answered question number one, 10 of them were quantity surveyor, 6 were Assistant engineer, 4 were engineer, 3 were technical Officer and 2 were assistant quantity surveyors. Also other professional answer each one such as, project manager, surveyor, cost estimator, civil engineer, sales engineer, planning engineer and operation associative. So highest number of people were answers from quantity surveyors. Also next major response comes from the assistant engineers. In this survey most three response are a quantity surveyor, assistant engineer and engineer. Majority of the people answer from the quantity surveyors, as it was nearly 1/3 of the respondents.

Table 1: respondents' Job level (prepared under the Survey results)

Job level (position)	No. of respondents
Senior	3
Middle	20
Junior	4
Professional/specialist	6
	30

Most of the respondents were middle level position in the organizations (table 2), which was 60.61 % of recipients it was nearly 2/3 of the respondents. Identify the characteristics of respondents' organization nature. Totally 33 people answer the question three. In the question three, 11 were from Quantity surveyors, 8 were from consultant, 8 were from contractor and 6 were from Developer. Highest number of people answers from quantity surveyors' nature organization. Based on organization background, it is reasonable to infer that held adequate knowledge of the sustainable practices in Sri Lankan construction industry, and all were of a maturity and its relate with the research objectives. Identify the characteristics of respondents' experience. Totally 33 people answer the question four. In the question four, 21 were from 1-5 years' experience, 8 were from 6-10 years, 2 were from 11-20 years' experience and 2 were from less than 1year experience. Highest number of people answers from 1-5 years' experience. Based on experience background, it is suitable for this survey, because most of the experience level could identify the maturity results. But this survey base on the online, so people most response from the 1-10 years' experience. It is a percentage nearly 90% of the total response.

Lastly identify the characteristics of respondents' detail in the industry in a number of staff. Totally 33 people answer the question five, it is based on the size of staff in the company. In the question four, 9 were from more than 100 staff in their organization, 8 were from 41-60 staffs, 6 were from 1-20 staff and 6 were from 21-40 staff. Also 4 people answer from the size of 61-100. Highest number of people answers from more 100 staff. Based on company size and number staff background, it is suitable for this survey, because Varity of the staff size could be identifying the different results. Also different size of Staff Company could be identifying the different types of sustainable issues, drivers and challenges. Almost highest number of response work as large size (more than 100) staff companies such as 27.27%. Also another majority of people answer from 41-60 staff ranges was 24.24%. So highest percent of the people answer from large size of staff, it is appropriately suitable answer for this survey.

4.3 Research questions: Key drivers adopting the sustainable construction

Identify the key drivers entering the sustainable practices, Sri Lankan construction industries have been some key drivers entering sustainable practices such as, stakeholders' pressure, top management commitment, economic performance, government regulations, environmental regulations performance, company regulations, Clients' issues, and relations ship with community. This is the multiple choice questions, so people can answer one or more than all answers. In this identify the most drivers adapting the construction industry; 20 respondents preferred clients' requirements & expectations, 18 respondents selected the motivation from top management, 17 respondents selected the government regulations, 15 respondents selected the improving environmental performance, 13 respondents selected the company regulations, 11 respondents selected the improving stakeholder relationship, 9 respondents selected the improving economic performance and 9 respondents selected the Relations ship with community. Figure 1 drawn follow respondents answering the percentage of key drivers and types of the drivers.

As shown figure 1, the drivers were entering the sustainable practices in the Sri Lankan construction industry. In this analyse show the highest number of response some drivers, those will be more adaptation in industry. As it could be appreciated, the total response was higher than 30; due to the fact the sustainable practices of construction industry can select more than one driver, being the most popular response to quite response such as, Clients' requirements and expectations (66.67%), Motivation from top management (60.00%) and government regulations (56.67%). Also reived response improving environmental performance (50.00%),

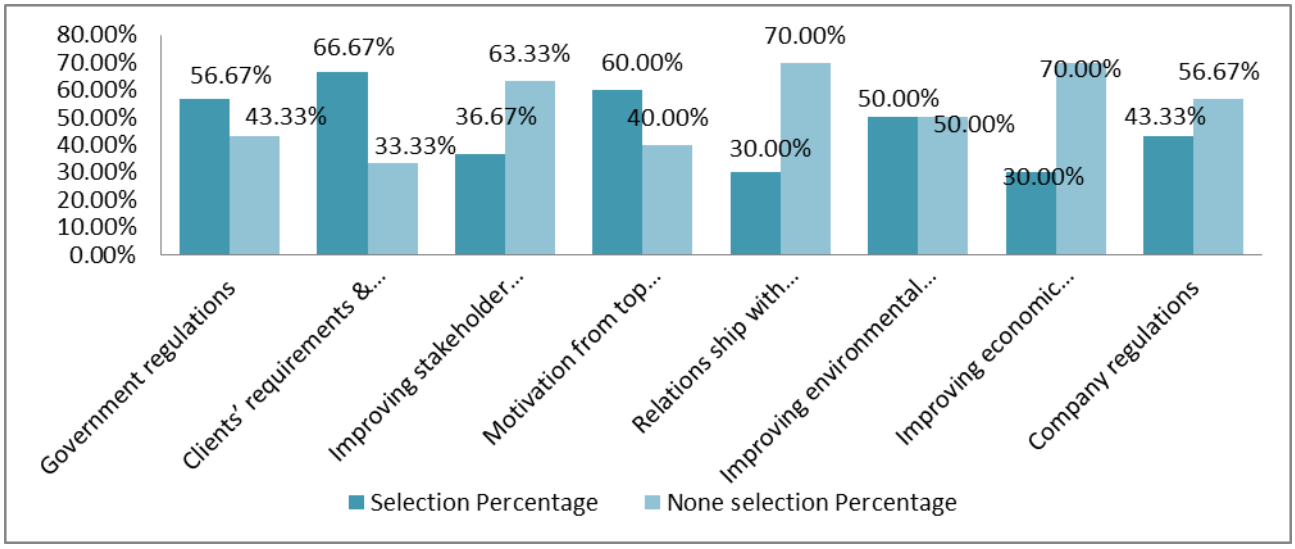

Figure 1- Key drivers (prepared under the Survey results)

company regulations (43.33%), improving stakeholder relationship (36.67%), relations ship with community (30.00%) and improving economic performance (30.00%). some responders answer all of eight.

This graphic takes into concern only the total number of response, which is actually correct, because as it was said eight drivers in the practices. Really popular response between the surveys, being the drivers is Clients' requirements & expectations. In this analyse identify the most respondents answers could entering the construction industry there following; Clients' requirements and expectations 66.67%, motivation from top management 60%, government regulations 56.67%, improving environmental performance 50.00%, and company regulations 43.33%. Those five drivers are most of the people sues for their answered, because these five are get the results of more than 40% of the respondents. Those drivers are mostly entering the sustainable practices in Sri Lankan construction industry.

5. Conclusions

This study identified Sustainability practices for competitive advantage in Sri Lanka construction industry. It is reviewing the Sri Lanka sustainable practices competitive advantages. Also analyse the sustainable definition, country population, geographical, sustainable practices; identify the significant issues, key drivers adapting the practices, challenges entering the practices. A questionnaire was designed and distributed to the construction organizations and construction industry people, who are participate the construction field current situation in Sri Lanka, also this technique was used to achieve the objective.

First objective was review on sustainability practices for competitive advantage in Sri Lanka construction industry, which were: Introduce the sustainable practices, define triple bottom line such as, economic sustainability perspective, social sustainability perspective and environmental sustainability perspective , Impacts of Triple bottom line , Ensuring sustainability practices for competitive advantage in Sri Lanka construction industry and key drivers entering the sustainable practices. Furthermore, suggestion of the sustainable practices some explanation is going to questionnaire. In this review purpose review on Sustainability practices for competitive advantage in Sri Lanka construction industry, refer to collect some books, e-books and journal from the library.

Second objective was identifying the key drivers and challenges in entering in Sustainability practices; question was key drivers entering the sustainable practices.

Which were: government regulations, clients' requirements & expectations, improving stakeholder relationship, motivation from top management, relations ship with community, improving environmental performance, improving economic performance and Company regulations. Each driver is important for the sustainable practices in the construction industry. So this question designs the multiple choice answer, in this purpose uploading my question in the e survey account and after sent the link in over the mail to construction industry people. After the respondents respond the question was analyse the question and draw some charts. In this questionnaire results after suggest some decision. Firstly identify the most significant key drivers in construction industry, which were: clients' requirements & expectations 17.86%, motivation from top management 16.07%, government regulations 15.18%, improving environmental performance 13.39%, and company regulations 11.61%. Those five drivers are most of the people sues for their answered, because these five are get the results of more than 10% of the respondents. So in this survey most answer of drivers is adapting the Sri Lankan construction industry sustainable practices. The scope of this study is limited to constructing organization and construction industry people. Therefore this study suggests some further scopes as follows; to investigate current sustainable practices issues, to carry out the challenges and implementation about sustainable construction practices in Sri Lanka, to analyse the data and use some calculation and prove sustainable practices and to identify, which issues change the challenges in the practices.

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