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Sustainability attitude and performance of construction enterprises in Kerala

Manu Sankar V¹, S. Hariharan²

¹Master of Engineering Student, Civil Engineering Department, EASA College of Engineering and Technology, Coimbatore

²Assistant Professor, Civil Engineering Department, EASA College of Engineering and Technology, Coimbatore

ABSTRACT

Development ventures impacts affect the economy, society and condition. To change development industry towards manageability, development ventures' discernments and execution on maintainability should be perceived and assessed, which has not be completely investigated by existing examinations. This undertaking is to inspect the Kerala development endeavours' demeanour towards and execution on different parts of maintainability so as to recognize those perspectives the organizations see to be the most and least significant and those viewpoints the organizations perform best and most exceedingly awful on. The associations among the sustainability attitude, sustainability performance, and firm size are to be explored. Economic feasibility of the sustainable construction is also analysed. Questionnaire method is planned to obtain the data from various stakeholders for this study. A five -point Likert scale is used to collect the necessary information. Statistical package for Social Science (SPSS) software is used to analyse the data. A building is modelled using sustainable concept with building information modelling and cost of the construction is compared with ordinary construction practice. The study is limited to building construction projects hence the data are collecting from this area in Kerala.

Keywords: Sustainable construction; Attitude and performance, Economic feasibility, Five -point Likert scale, Statistical package for Social Science (SPSS) software, Building.

INTRODUCTION

Development industry is one of the quick developing areas in India. Various development ventures are presently going through in different fields of structural building. Huge and complex ventures have been worked by contractual workers and development organizations from everywhere the nation. Feasible development plans to meet present day requirements for lodging, working conditions and framework without bargaining the capacity of people in the future to address their own issues in times to come. It consolidates components of monetary productivity, natural execution and social obligation and adds furthest

degree when engineering quality, specialized advancement and adaptability are incorporated [1-7].

Feasible development includes issues, for example, the plan and the board of structures; materials execution; development innovation and cycles; vitality and asset proficiency in building, activity and upkeep; strong items and advances; long haul observing; adherence to moral guidelines; socially-practical situations; partner support; word related wellbeing and security and working conditions; inventive financing models; improvement to existing logical conditions; interdependencies of scene, framework, metropolitan texture and engineering; adaptability

in building use, capacity and change; and the dispersal of information in related scholarly, specialized and social settings. The sustainability principles, continues to advance the industry's evolution toward the ultimate goal of achieving complete sustainability throughout all phases of the building life cycle.

AIMS AND OBJECTIVES

From the previous studies it is found that sustainability is the most important criteria in construction industry. But at present in India especially in Kerala in construction field it is not considered to the reasonable extent. So it is important to find how much sustainability factors are considering in construction industry and to compare the economic aspect of ordinary building construction with sustainable building construction

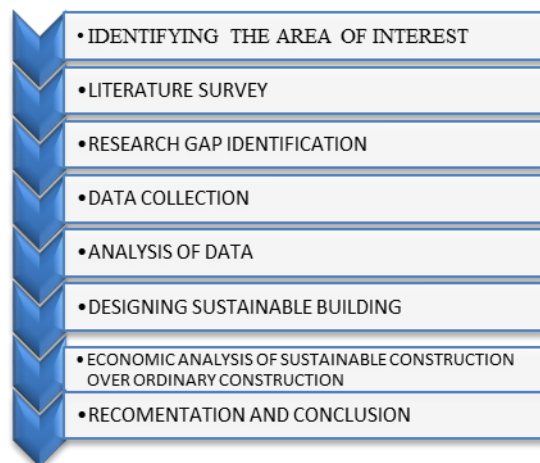
- To find the factors influencing sustainable construction practice
- To provide recommendations for overcoming the current barriers to the successful integration of environmental, economic and social issues
- To implement sustainability aspects in building

design

- To analyses sustainable aspects construction over ordinary construction practice

METHODOLOGY

- Various literatures based on sustainability were studied and reviewed.
- After reviewing various literatures it is identified that sustainable construction have a great influence in construction industry. Hence this study aims to find out the sustainability attitude and performance of construction enterprise in Kerala
- Questionnaire survey is used for the data collection since it's a tool for collecting and recording information about particular issue of interest. A 5 point Likert scale is used in this survey. Questionnaire is distributed among contractors and consultants.
- Cronbach's alpha reliability test is used for ensuring reliability of questionnaire response using SPSS (Statistical Package for Social Science) software package which is used for statistical analysis.



DATA COLLECTION

Questionnaire is distributed all over Kerala. Google form is used in order to distribute the questionnaire, with a cover letter attached to it which state purpose and need of the survey. Google form helps respondents to respond to the questionnaire with minimum time.

The questionnaire is divided into three sections. The first section contains general information about the respondents such as contact address, company size, type and the general industry characteristics such as size, experience, amount of change etc. Questions in the last two sections are posed in a multiple choice question format. The

second section ask extend of usage of sustainable factors in the construction projects. The respondent is asked to state the frequency of usage of sustainable factors in his projects. Most frequent using factor corresponds to “very often” whereas the least frequent correspond to “never”. The third section addresses the barriers of sustainability. The respondent is asked to state the influence of these barriers in implementing sustainability in his projects. Most influential barrier corresponds to “Extremely influential” whereas the least influential correspond to “not at all influential”.

ANALYSIS AND RESULT

Extent of usage of sustainability factors

Environmental Factor

- Providing health and wellbeing of those who live in the building
- Managing impact on bio diversity
- Water conservation and harvesting

- Usage of locally available Material and resources
- Energy efficient design consideration
- Adoption of pollution control measures
- Construction Waste management
- Land use efficiency
- Usage of Green innovation and products in the design construction stage

From figure 5.1.1 contractor and consultant mainly consider ‘health and wellbeing of those who living in building’ and ‘water conservation and harvesting. Usage of locally available material ranked’ third. As per contractor ‘usage of green innovation and product in the design construction stage’ is the main environmental factor that lack in construction project in Kerala. ‘Land use efficiency’ is the ranked seventh. As per consultant ‘construction waste management’ and ‘usage of green innovation and product in the design construction stage’ is the main environmental factor that lack in construction project.

ENVIRONMENTAL FACTORS

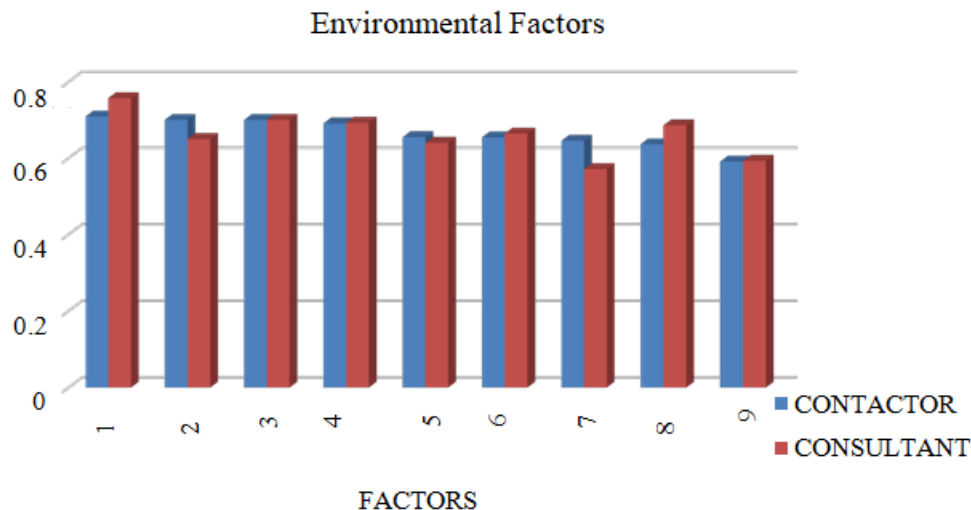
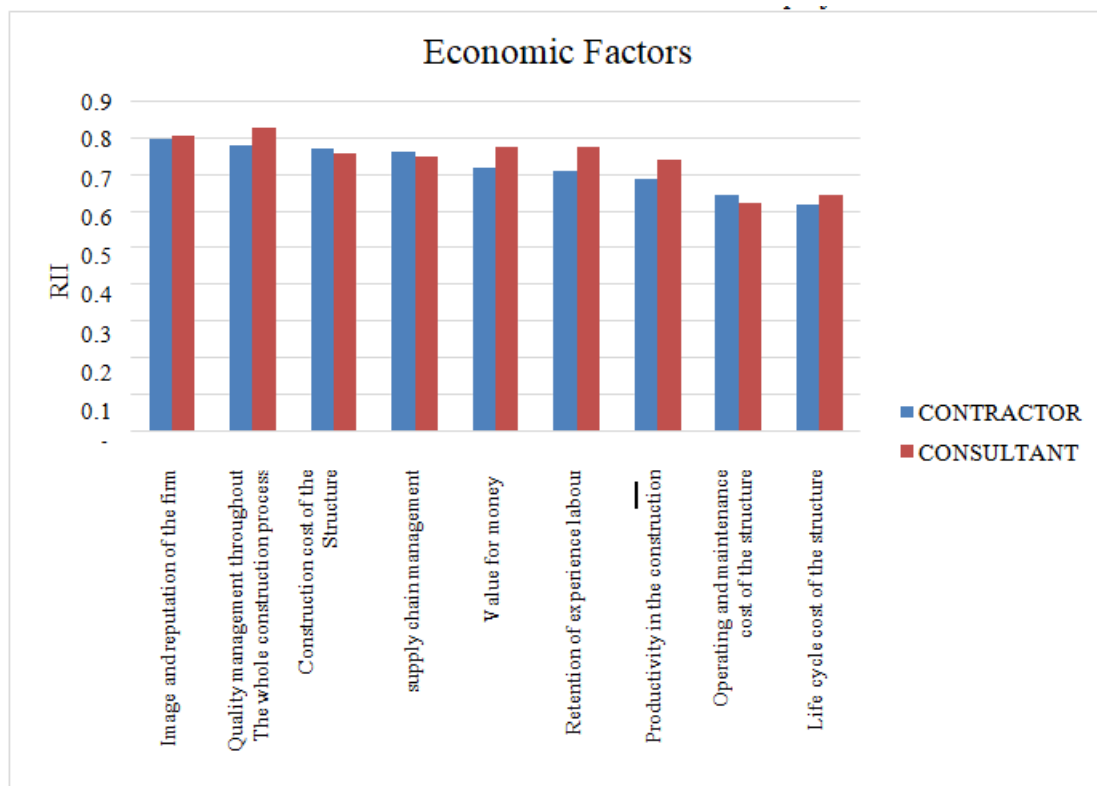


Figure 5.1.1 Environmental factors

Economic factor

- Image and reputation of the firm
- Quality management throughout the whole construction process
- Construction cost of the structure
- Supply chain management
- Value for money
- Retention of experience labor
- Productivity in the construction
- Operating and maintenance cost of the structure
- Life cycle cost of the structure



From figure 5.2, according to contractor 'image and reputation of the firm' ranked first 'quality management thought the whole construction project' ranked second that is these factors are mainly consider in the construction project. 'Life cycle cost, operation and maintenance cost are the major factors that lack in sustainable considerations. According to consultant 'quality management throughout the whole construction project' and 'image and reputation of the firm' are mainly considered economic factors. Like consultants 'Life cycle cost, operation and maintenance cost are the major economic factors that are not considered in construction projects.

Social factor

- Obeying laws and regulations

- Health and safety
- Human Well-being and right
- Anti-corruption and fair competition
- Culture/heritage
- Wage and welfare of Employee
- Supporting community development
- Education/training for employees

From figure 5.3, contractors and consultants give major important to 'Obeying rules and regulation', health and safety', in their construction projects. 'Education and training of employs' are the factors which is clearly lacking by both contractors and consultant. 'Wage and welfare of the employee' is the next main factor that lack by both contractors and consultants.

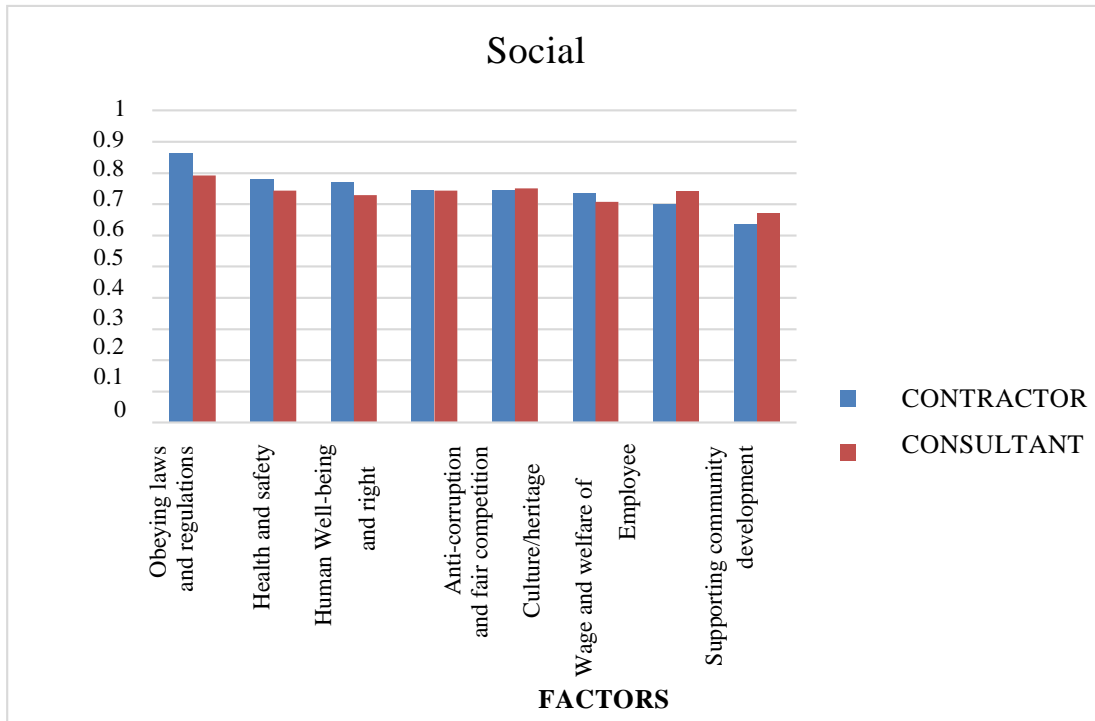


Figure 5.1.3 Social factors

BARRIERS TO SUSTAINABILITY-CONSULTANT

- Lack of demand of sustainable products by the client

- Higher investment cost
- Lack of financial resources
- Lack of building codes on sustainability
- Lack of easily accessible guidance

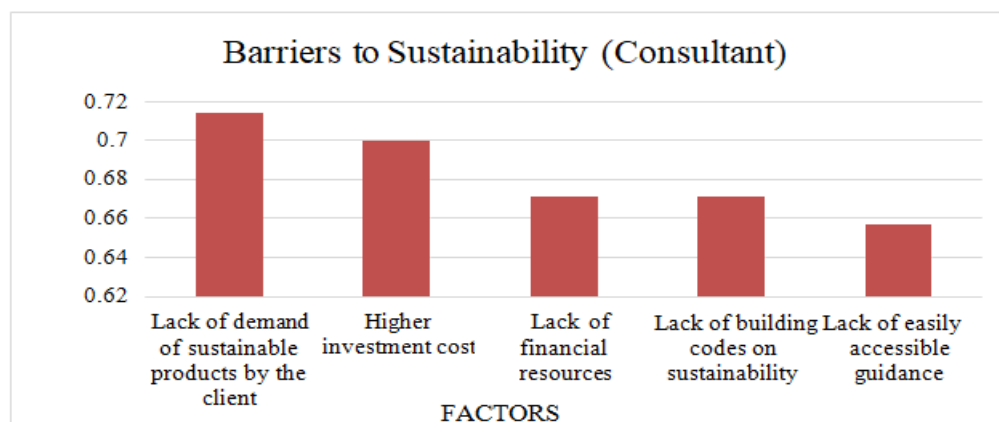


Figure 5.4.1 Barriers to sustainability (consultant)

From figure 5.4, according to consultant lack of demand of sustainable product by client is the major barrier of implementing sustainability in construction project in Kerala. Higher investment

cost is the next major factor. Lack of government policies and support ranked third. Lack of building codes on sustainability and lack of easily

accessible guide lines are the other important factors.

BARRIERS TO SUSTAINABILITY-CONTRACTOR

1. Lack of government policies/support

2. Lack of demand of sustainable products by the client
3. Higher investment cost
4. Lack of building codes on sustainability
5. Lack of easily accessible guidance.

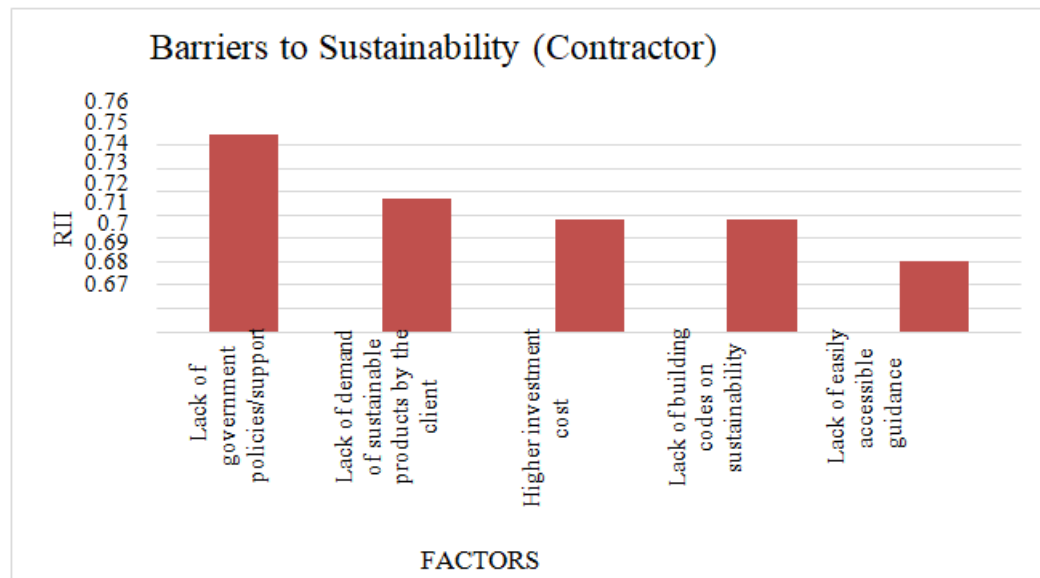


Figure 5.5.1. Barriers to sustainability (contractor)

From figure 5.5, according to contractor lack of government policies and support is the major barrier of sustainability. Lack of demand sustainable product by client ranked second and higher investment cost is the next major factor. . Lack of building codes on sustainability and lack of easily accessible guide lines are the other important factors.

CONCLUSION

Environmental, social and economic factors are the main three pillars of sustainability in Kerala, contractors and consultants lack in extent the usage of these sustainability factors.

In case of environmental sustainability the main factor lacking in project is 'usage of green innovation and products' which helps in creating low energy building, also construction waste management is not considered by the construction sector which may lead to adverse effect in environment.

In case of economic factors construction enterprises in Kerala is not considering the life cycle cost of the structure also the maintenance and operation cost, they only consider the construction cost of the structure, the quality of the structure which will lead to a good product and the image and reputation of their company, since it is competitive world. Since building rules and laws are strong in Kerala construction companies more concentrate on obeying laws and regulation by the government, health and safety of employee's also human wellbeing. While concerning social factors for sustainability up to an extend companies lack in providing training for the employees mainly concern to sustainability. There are certain factors which prevent the usage of sustainability in construction project. The main issue is lack of demand of sustainable product by the client. For example designing a green building as per Griha standards construction enterprises may not try to use sustainable factors because of the high investment cost, lack of financial resources or fear

of long payback period. Another main barrier for companies regarding the implementation of sustainable measure is the lack of building codes on sustainability and easily accessible guide line. Lack of skilled labors and lack in giving training to the employs about sustainability are also plays strong role in preventing the implementation of sustainable construction. Government policies and support can help in implementing sustainable factors in construction projects.

RECOMENTATIONS

- It will be effective if there is involvement of experts in the design, planning and process stages of the construction work to incorporate sustainable measures in all the phase
- It will be a better option to use energy

efficient design for construction. Better methods which considering the fuel energy will make the design more sustainable

- Modifications in government rules which ask or force every construction enterprise to implement sustainable measures in their project can be revolutionary change
- Social aspects of sustainability can be considered.
- Proper guide lines and training shall be given to employees about sustainable construction and implementation of sustainable factors in construction which will improve their confidence to work in that area.
- Awareness and education about the need of sustainable building shall be given to the society.

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