Optimization Of Materials Through Sustainability Approach –A Case Study

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Abstract- *The concept of sustainable development arose from a number of environmental movements in previous decades, but it wasn't actually defined until 1987 by the World Commission on Environment and Development. TheyDescribed sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' This definition highlighted the importance of environmental, social and economic factors when considering development. It also emphasized the need for the elevation of poverty and a drive towards greater equality around the world, all within the limits of the planet's finite resources.*

Keywords- Citation, Construction and Demolition Waste, Waste Management

I. INTRODUCTION

In recent years, sustainability concept has become the common interest of numerous disciplines. The reason for this popularity is to perform the sustainable development. The concept of Green Architecture, also known as sustainable architecture or green building, is the theory, science and style buildings designed and constructed accordance with environment friendly principles. Green Architecture stripes to minimize the number of resources consumed in buildings construction use an operation as well as curtailing the harm done to the environment through the emission, pollution and waste of its components.

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II. LITERATURE REVIEWS

Mr. Abhinandan R. Gupta, Sustainable Construction Management Practice - Site Waste Management Volume 2, Issue 7, and July2012.
Author explained about the concept of "Sustainability" which simply means the proper use of resources or to sustain resources for further generation to come. Using scarily and Eco- friendly material even though is a great compatible approach for achieving it but what about the construction already existing? Brings a great question to one's mind. Million tons of resources are utilized per year for construction purpose and million tons get waste both at construction and demolition time. This C & D waste needs to be given special attention.

S.K. Sharma, Sanghi, Rashmi, Wastewater Reuse and Management, 2012 .
In this paper author explain that wastewater is a resource that can be adequately treated to successfully satisfy most water demands as well as decreasing wastewater discharges and preventing pollution and discussed about the recent wastewater treatment technologies.

Colin Jeffrey, construction and demolition waste, September 2011.
In this paper, the author explained that demolished materials of construction can also be reuse in new construction with other construction materials by applying different methods.

Sustainable-Construction Planning System (SCPS) in order to mitigate the negative impacts of the construction industry on the environment. This study could be a platform for developing sustainable planning systems that can be used broadly in construction projects.

III. RESEARCH METHODOLOGY

3.1 To Determine Resource

As due to rapid development of construction industry, first of all findings for various types of resources

3.1.1 ABC Analysis on The Basis of Cost and Quantity

In this ABC analysis, classification of different types of material,

Machine is categorized on basis of cost, quantity, and man resources is categorized on basis of efficiency.

3.1.2 Search for Alternative on Basis of Priority

On the basis of cost & quantity, finding various alternative materials to add as substitute in building.

3.1.3 Testing Capability of Materials and Methods

In this project testing's of concrete cubes, wood specimens &grey water is done which are compared with the standard results from I.S Codes and WHO standards. And conclusions were commented over the testing results.

Legislation and Governmental authorities alone cannot solve this issue. It is the change of our behavior and approach which is required. We have to improve our "vision" for construction rather than making green buildings only as per standards.

WHAT ARE THE SUSTAINABLE MATERIALS

Sustainable products are those products that provide environmental, social and economic benefits while protecting public health and environment over their whole life cycle, from the extraction of raw materials until the final disposal.

Sustainable construction materials are building materials made from recycled products and resources that can be replenished in a relatively short amount of time. There are many types of sustainable construction materials, often referred to as green building products. Lumber, stone, metal and paper are materials that can be recycled and re-used as building products. Bamboo, cork, straw and even coconut are examples of construction products that can be renewed quickly.

SUBSTITUTE SUSTAINABLE MATERIALS

The substitute materials are those materials which are added to reduce the quantity of construction materials. As well as they give the same strength as construction materials. There are some materials in nature which can be used as substitute materials. Some of them are given below as –

1. Wood
2. Tiles
3. Hemp
4. Clay
5. Jute
6. Surkhi
7. Bells
8. Recycled Plastic
9. Straw
10. Glass
11. Rubber

IV. PROJECT LIFE CYCLE

A project is conceived to meet market demands or needs in a timely fashion. Various possibilities may be considered in the conceptual planning stage, and the technological and economic feasibility of each alternative will be assessed and compared in order to select the best possible project.

The project life cycle may be viewed as a process through which a project is implemented from cradle to grave. This process is often very complex; however, it can be decomposed into several stages as indicated by the general outline in Figure. The owner may choose to decompose the entire process into more or less stages based on the size and nature of the project, and thus obtain the most efficient result in implementation. All stages from conceptual planning and feasibility studies to the acceptance of a facility for occupancy may be broadly lumped together and referred to as the Design/Construct process, while the procurement and construction alone are traditionally regarded as the province of the construction industry.

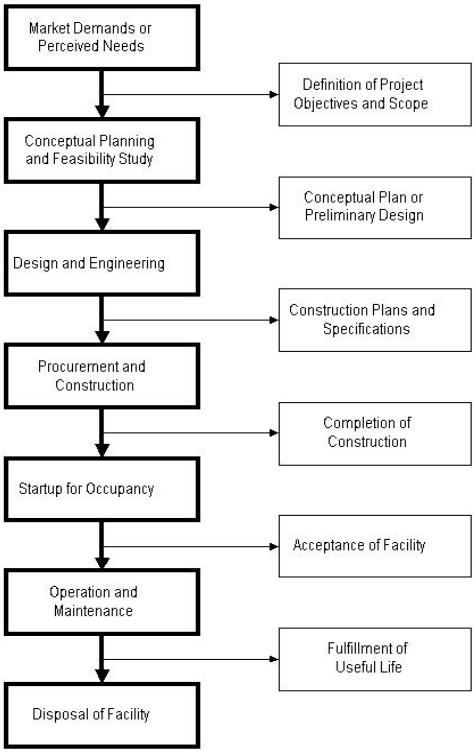

Fig. Flow chart of The Project Life Cycle of a Constructed Facility

It is important for the owner to be aware of the approach which is most appropriate and beneficial for a particular project. In making choices, owners should be concerned with the life cycle costs of constructed facilities rather than simply the initial construction costs. Saving small amounts of money during construction may not be worthwhile if the result is much larger operating costs or not meeting the functional requirements for the new facility satisfactorily. Thus, owners must be very concerned with the quality of the finished product as well as the cost of const Analyze and understand all the provided review comments thoroughly. Now make the required amendments in your paper. If you are not confident about any review comment, then don't forget to get clarity about that comment. And in some cases there could be chances where your paper receives number of critical remarks. In that cases don't get disheartened and try to improvise the maximum.

V. PRESENT CONDITION

These days, political leaders of every country in their discussion make it a point to address their concern for the environmental crisis and energy shortage, which is also an effort of world bodies to make all nations to build a mechanism for sustainable development. The definition of sustainable development signifies to meet the needs of the present at the same time with no compromise on the part of future generation as far as resources are concerned. It becomes important for all of us to understand the principles and values of the whole concept. With the ever increasing economic growth our biodiversity is facing tremendous challenge to meet the demands of rising population. Destruction of ecosystem with increasing economic growth can be seen all over the world with the extinction of thousands of species, degradation of agricultural land, extreme climatic changes that alarm shrinking of biodiversity of our planet.

Pollution

The construction business in many countries is responsible for nearly a third of all industry-related pollution incidents. There is no construction this does not have an environmental impact. The main aspect of construction is making buildings of varied uses be it for residential, commercial, industrial, recreation, healthcare or any other purposes. The estimate of global pollution that can be attributed to buildings is air pollution 23%, climate change gases 50%, drinking water pollution 40%, landfill waste 50% and ozone depletion 50.

VI. POSSIBLE WAYS TO OVERCOME

1.7.1 Changing Conception Construction Methodology

Considering the future population projections, utilization of resources, pollution and unstable climatic conditions, and in order to protect the environment and the wellbeing of the planet, something has to be undertaken that

would contribute to the change of the current patterns of social and economic activities, and we all have a leading role to play in that change process. We need to adopt a holistic approach and green oriented thinking when considering the construction sector/industry. Such an approach would Include the following stages:

i. Promotion of Awareness building on the "GREEN CONCEPT"
ii. Green Procurement
iii. Green Planning
iv. Constructing Green Buildings
v. Utilizing Green Construction techniques
vi. Green Operation & Management
vii. Green Maintenance & Repairs
viii. Green Dismantling

ABC ANALYSIS

The ABC analysis is a term used to define an inventory categorization technique often used in materials management. It is also known as Selective Inventory Control. Policies based on ABC analysis:

_ A ITEMS: very tight control and accurate records
_ B ITEMS: less tightly controlled and good records
_ C ITEMS: simplest controls possible and minimal records

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost, while also providing a mechanism for identifying different categories of stock that will require different management and controls.

The ABC analysis suggests that inventories of an organization are not of equal value, thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance.

'A' items are very important for an organization. Because of the high value of these 'A' items, frequent value analysis is required. In addition to that, an organization needs to choose an appropriate order pattern (e.g. 'Just- in- time') to avoid excess capacity. 'B' items are important, but of course less important, than 'A' items and more important than 'C' items. Therefore "B" item is intergroup items. 'C' items are marginally important.

4.2.1 ABC analysis categories

There is no fixed threshold for each class, different proportion can be applied based on objective and criteria. ABC Analysis is similar to the Pareto principle in that the 'A' items will typically account for a large proportion of the overall value but a small percentage of number.

VII. CONCLUSION

The study of this research work highlights many concepts about sustainable approach. It means better quality of life for everyone, now and for generations to come. It is a vision of progress that links economic development and protection of the environment. There are many aspects which are lacking for developing sustainable construction planning and such resource optimization may increase the potential to reduce, reuse and recycle construction waste generation. Along with this unavoidable population growth and development, ignored aspect and dimension of resource depletion environmental pollution should not be ignored. Resources should be sustained for generations to come so that they can survive. Hence sustainability is a complex concept which encompasses not just energy but all the resources needed to support human activity against the natural environment, we need to start respecting natural system and learning from ecological processes, creating a better balance between human need and the wider environment. Then resources will sustain for future development.

REFERENCES

[1] Mr. Abhinandan R. Gupta, Sustainable Construction: Remedy over Environmental Impact of Construction Industry 2013.
[2] Mr. Abhinandan R .Gupta, Sustainable Construction Management Practice-Site Waste Management Volume 2, Issue 7, July 2012.
[3] S.K. Sharma, Sanghi, Rashmi, Wastewater Reuse and Management, 2012 .
[4] Colin Jeffrey, construction and demolition waste, September 2011

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