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Analysis of Carbon Footprint (Comparison Study between R.C.C and Green Building)

Prof.Sainand Khot¹, Sidarth Bhatt², Raushan Kumar³, Pravin Ghotale⁴, Sanchari Paul⁵

^{1, 2, 3, 4, 5}Department Of Civil Engineering, Dr. D. Y. Patil Institute Of Engineering, Management & Research, Akurdi, Pune, India

Abstract: The term carbon footprint‘ has become tremendously popular over the last few years and is now in widespread use across the media. With climate change high up on the political and corporate agenda, carbon footprint calculations are in strong demand. Numerous approaches have been proposed to provide estimates, ranging from basic online calculators to sophisticated life-cycle analysis or input-output-based methods and tools. Despite its ubiquitous use however, there is an apparent lack of academic definitions of what exactly a ‘carbon footprint‘ is meant to be. Though in India this carbon footprint has not been adopted properly yet our group has taken effort and has taken this project —Carbon Footprint which will be very useful for future awareness in India mainly. Before going to calculative part we must know the various sources of carbon emission. So basically there are two sources of carbon emission : Direct source and Indirect source and by analyzing these sources properly and knowing the values of various materials one can easily do the calculative part in terms of CO2 equivalent. This project is mainly divided into two stages: Preliminary stage (in which we are going to prepare a checklist of green materials , reconnaissance survey will take place, methodology will be properly defined) and secondary stage (which mainly consists of calculation part by root method). Then we are gonna develop our own method with the help of other available methods and then comparative studies will take place between different methods.

Keywords: carbonfootprint, emissions , sources

I. INTRODUCTION

Carbon footprint‘ has become a widely used term and concept in the public debate on responsibility and abatement action against the threat of global climate change. It had a tremendous increase in public appearance over the last few months and years and is now a buzzword widely used across the media, the government and in the business world. But what exactly is a ‘carbon footprint‘? Despite its ubiquitous appearance there seems to be no clear definition of this term and there is still some confusion what it actually means and measures and what unit is to be used .So basically carbon footprint is the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community. While this term itself is rooted in the language of Ecological Foot printing (Wackernagel 1996), the common baseline is that the carbon footprint stands for a certain amount of gaseous emissions that are relevant to climate change and associated with human production or consumption activities. But this is almost where the commonality ends. There is no consensus on how to measure or quantify carbon footprint. This paper will clarify some of the doubts regarding on how to measure carbon footprint.

II. LITERATURE SURVEY

- 1) **Title:** Carbonfootprint: current methods of estimation Divya Pandey · Madhoolika Agrawal ,Jai Shanker Pandey
- a) **Abstract:** Increasing greenhouse gaseous concentration in the atmosphere is perturbing the environment to cause grievous global warming and associated consequences. Following the rule that only measurable is manageable, mensuration of greenhouse gas intensiveness of different products ,bodies, and processes is going on worldwide, expressed as their carbon footprints. The methodologies for carbon footprint calculations are still evolving and it is emerging as an important tool for greenhouse gas management. The concept of carbon footprinting has permeated and is being commercialized in all the areas of life and economy, but there is little coherence in definitions and calculations of carbon footprints among the studies.
- 2) **Title:** “Enabling Low Carbon Communities.
- a) **Author:** Christopher M Jones |UC Berkeley
- b) **Abstract:** This paper tells us how human activities results in the release of greenhouse gases to the atmosphere which includes transportation , food , goods and services. Everything we do results in the release of enormous percent of carbon into the atmosphere and why we should adopt low carbon technologies and practices. This paper also point out the climate crisis taking place around the world due to release of carbon into atmosphere. This paper has also laid emphasis on the local climate action planning

III. METHODOLOGY

A. Overview

Since we have to calculate the carbon footprint of a green building that means we have to consider all the carbon emission that will take place right from manufacturing upto disposal . Before starting off with methodology let's see an overview of this method. Suppose we have a concrete block which is composed of cement, fine aggregates, coarse aggregates (neglecting water). Let us assume that out of these, per kg cement has a carbon emission of X tonnes so that means if we have 50kgs of cement our carbon emission will be $(50 \times X)$ tonnes equivalent to (tCO_2e) . Similarly we will do this for aggregates as well . So, by adding up the carbon emitted by cement and aggregates we will get the total carbon emitted by that concrete block .So this example of calculating carbon footprint was on a small scale . Now let us see the steps that will brief on about how we are going to calculate carbon footprint of a green building.

B. Steps

1) Find source of emission at different stages (Transportation Stage , Construction Stage , Disposal Stage)

- a) *Source of Emission During Transportation Stage:* Truck , Load carriers , Material itself , person driving that truck Amount of carbon emitted also depends weather that vehicle is at rest or moving. That means moving vehicle can emit more carbon and vehicle in rest will emit less carbon .so we will also consider that how many times that vehicle had stop during travelling to be more precise.
- b) *Source of Emission During Construction Stage:* This stage will be crucial as more than 70% calculation part relies on this stage.
- c) *Sources At This Stage Will Be Green Materials Such As:* Wool brick , Lime , Mycelium , Recyclable or sustainable concrete , Bamboo , solar tiles , paper insulation , Triple glazed window , Grasscrete , Recycled Plastic , Wood , Timbercrete etc. 14 Though these materials are considered as green materials still there will be some carbon emission which will be less as compared to R.C.C. building materials .
- d) *Source Of Emission During Disposal Stage:* Incineration process , Filling Process
- i) Then analysis of CO_2 emission in transportation stage , construction stage and disposal stage will be done.
- ii) Combine all the data evolved in these stages and simply will be get the carbon footprint of that green building in terms of tonnes equivalent (tCO_2e)

C. Proposed work

Proposed system has been in different aspects of development in various projects. Calculation of carbon footprint of buildings in various cities in America has shown great results . The method mentioned in this paper has different approach in estimating and calculating the carbon emission. The small emission sources that has been neglected during the calculation has been considered in this paper .

1) Advantages

- a) Harm to environment will be reduced.
- b) Pollution near the surrounding environment will be in control.
- c) Widely applicable to activities

2) Disadvantages

- a) Long and tedious calculations are involved sometime.
- b) Accurate values are almost hard to get.
- c) Based on some hypothetical assumptions.

IV. CONCLUSION

In these two carbon footprints methods , calculation of carbon footprint by carbon footprint calculator no doubt is more fast and accurate but mathematical calculation is no doubt a tedious method as you have to consider every parameter for the calculation of carbon footprint . Based on my project there wasn't much difference in the answers but mathematical calculation helps to find out different concepts regarding carbon emission . Method is very simple and anyone can perform it by simple ways.



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