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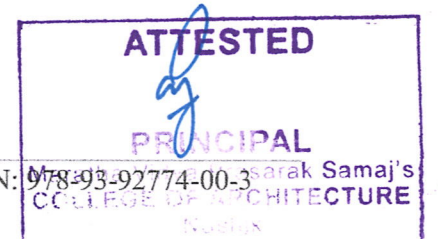
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Comparative analysis of various methods used for mapping carbon footprint of a region

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Abstract : The term 'carbon footprint' is now been widely used by organizations, companies, regions, cities and nations. With climate change high up on global, political and corporate agenda, carbon footprint calculations are gaining considerable importance and have become one of the important environmental aspects of regional planning. For estimating carbon footprint different tools are being used ranging from basic online calculators to more scientific methodologies such as life-cycle analysis and input-output based methods. However it has been observed from literature review, that while estimating carbon footprint the basic terminology is generically interpreted depending on various factors such as intent of estimation, data availability, scale of the entity etc. Large variations in the spectrum of the terminology interpretation ranges from direct carbon dioxide (CO₂) emissions to full life-cycle greenhouse gas (GHG) emissions. There is also variation in the unit in which carbon footprint is expressed for various entities. This paper comparatively analyses the methodologies used in carbon footprint mapping of three cities as case studies and critically reviews the variation in protocols regarding the mapping approach, type of emissions, unit of measurement, emission sources, potential gases and system boundaries under consideration. It finally concludes into suggestive approach for devising a methodology for mapping carbon footprint of an administrative ward level of a region in Indian context.

Keywords: carbon footprint, greenhouse gas emissions, life-cycle analysis, regional planning, administrative ward.

1. Introduction :

Recognizing the global reach of Green House Gas (GHG) pollutants, more than 160 countries have signed the Kyoto protocol , which pledges GHG emissions reductions of at least 5% relative to 1990 levels. (Ramaswami 2008). Green house gas emissions are result of day today human activities that are mainly influenced by lifestyles, choice of technologies, choice of products made and technologies chosen for their production. Polulation in any region is responsible for multidisciplinary activities at various sectoral levels. The activities are largely interlinked as well as linked with the activities taking place outside the geopolitical boundaries, but are responsible for GHG emissions for the needs of the region. Hence if GHG mitigation measures are to be implemented, measuring these emissions becomes important at regional level. It is observed from literature review, that there is a large variation in the definitions used for the term carbon footprint by various companies, organizations, NGO's, consultancies, businesses and city level inventories. The definition mainly is driven by the goal for which carbon footprint quantification is to be done. Data availability and scale of the entity are other governing factors. Accordingy the protocols for various studies are observed to be devised in terms of type of emissions, unit of measurement, emission sources, potential gases and system boundaries under consideration. There is no commonly accepted standard or protocol that is followed globally when it comes to carbon footprint mapping of a region. Decisions taken with respect to the

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