Chapter 8
Comparative Analysis of Ecological Footprint in Five Cities of India:
A Pandemic Analysis

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ABSTRACT

COVID-19, a new respiratory disease identified in December 2019, is one of the most recent risks to human health around the world. The purpose of this research is to examine the effects of COVID-19 on the ecological footprints of five cities across India: Delhi, Bhopal, Bareilly, Betul, and Razole, using the global footprint networks calculator tool. In this comparative analysis, six major factors were employed to examine EF which were examined through food, shelter, transportation, commodities, and services. Further, statistical test - T test and ANOVA analyse the difference ecological footprints in five cities. A total of 15 questions derived from six factors of land use type have been considered for the analysis using primary questionnaires collected via online google forms. The study presents a change in the ecological footprint through exploratory study of different cities with varying population sizes in the times of COVID-19. Results show significant difference in ecological footprint among the cities with maximum variation observed in class I cities like Delhi.

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INTRODUCTION

From the emergence of human civilization, there has been a need for food, shelter and home. Human beings with a span of time began to exploit nature for their own benefit. Technological advancements and emerging technologies are frequently used to help harmonize both urban and rural environments (Kudryavtseva et al., 2021). To fulfil the demand of rapid urbanization, the global climate is deteriorating and thus the quality of life in urban areas (Mehrotra et al., 2020). Globalization along with subsequent growth of economies has significantly led to the rise in carbon emissions (Shahbaz et al., 2018). Globally, the current pace of urbanisation in megacities leads to the evolvement of natural ecosystems as environment roles change (Sharma et al., 2020). Given the complex consequences of excessive human use of natural resources plus following land use changes, ecosystem services remain particularly vulnerable to a variety of influences (Nasiri et al., 2020). The present worldwide environmental issue has sparked interest in learning how individuals could become more conscious of the environmental effects of human actions (Villarroel et al., 2017). Infectious diseases have already altered the architecture, design, and urban planning of our cities (Megahed & Ghoneim, 2020). The ongoing coronavirus disease, known as COVID-19 2019, has been declared a pandemic that has resulted in mayhem on people, their behavior, lifestyle and society at large (Echegaray, 2021; Yang et al., 2020). To promote social distancing and prevent infection of coronavirus disease, national and local governments worldwide have announced emergencies, encouraged ed safer-at-home directives, and mandated business closures (Mofijur et al., 2021; Weill et al., 2020). This isolated billions of people around the world and less local and global traffic, influencing nature in a variety of ways (Corlett et al., 2020). During this period of crisis, limited human contact with nature has proven to be a protection for nature and the environment (Lokhandwala & Gautam, 2020). Lowered energy demand as well as corresponding greenhouse gas (GHG) and additional pollutants emissions result from fewer vehicles on the road and congestion (Khursheed et al., 2020). Following this, there was a substantial depletion in greenhouse gas emissions on account of decreased transportation, manufacturing, schooling, as well as several other activities; however, when represented that this was insufficient to minimize pollution in the air for all contaminants (Eroğlu, 2020a).

It is well established that the virus has no direct influences on the surroundings or the energy sector individually (Eroğlu, 2020). However, the pandemic has impacted humans and their interaction with the ecological processes in various ways. Human impact on ecology was first measured by the Ecological Footprint (EF) - a tool to calculate human demand for natural resources, showing, the aggregate of nature required to sustain humans or an economy (Bazan, 1997; M. Wackernagel et al., 1999). It helped to understand issues like resource use limits, and the international dealing out of the natural resources of the planet (Borucke et al., 2013). It included strategies for ensuring the sustainability in the long run of environmental resources utilised worldwide the spread of the virus has unquestionably affected the Ecological Footprint. Carbon Footprint (CF) - another tool that evaluates the number of greenhouses especially carbon dioxide that are released by human activities in the atmosphere of the area, locally and globally. The sector-wise studies of Food, Shelter, Mobility, Goods, and Services have been conducted but a holistic study of the Ecological Footprint and Carbon Footprint pertaining to COVID-19 still lacking.

The Global Footprint Network by Wackernagel has risen to prominence in carrying out this procedure via the enhancement of the National Footprint Accounts including the current Footprint Standards method because it keeps updating the data. The primary objectives of this research are to use a structured approach for calculating Ecological Footprint along with Carbon Footprint, to look at the effects of the pandemic on society. Secondly, the study aims to examine changes in the lifestyle and resource consump-