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Carbon Footprint of the Divisional Secretariat Office, Galewela, Sri Lanka**Kulasekara, K.M.S.T.*, Awanthi, M.G.G., Rupasinghe, C.P.***Department of Agricultural Engineering and Environmental Technology, University of Ruhuna,
Matara, Sri Lanka***tharushi96k@gmail.com***Abstract**

Global warming (GW) poses a significant concern in the world today. Most of this warming is found to be caused by human-generated greenhouse gas (GHG) emissions. To address this issue, it is essential to calculate Carbon Footprint (CFP), as a valuable first step towards quantifying emissions and implementing measures to reduce them. The CFP provides insight into how individuals, organizations, countries, and the world are responding to the challenge of GW. Many different types of organizations, including universities, fire brigades, rescue services, food manufacturers, hotels, and hospitals, are now estimating their CFP. Among these, divisional secretariat offices play a significant role in serving the general public and are actively involved in addressing the impact of GW on local level. Therefore, the main objective of this study is to quantify the CFP of the organization with special reference to the divisional secretariat office, Galewela, and subsequently develop an emission reduction plan while estimating the impact of COVID-19 pandemic on organizational CFP. First, organisational, and operational boundaries were estimated based on GHG protocol. Activity data were collected across three distinct scopes: scope 1 encompassed office-owned vehicle transportation, disposal of food and paper waste, and the use of liquid petroleum gas; scope 2 involved purchased electricity; and scope 3 covered employee commuting and water usage. Information was gathered from 2018 to 2022 time period using bills, data sheets, personal communication, and questionnaires. The CFP of each emission source and activity was calculated in t CO₂e/year by multiplying activity data with emission factors developed according to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Results showed that the Galewela Divisional Secretariat has a total CFP of 49.6 t CO₂e/year including 11.4, 7.2, and 31.0 t CO₂e/year under scopes 1, 2, and 3 respectively. Employee commuting contributes to the highest CFP, accounting for 60% of the total. Transportation of office-owned vehicles (21%) and electricity consumption (15%) show the second and third highest, while all other sources represented less than 5% of total CFP in this office. The emission reduction plan revealed that 44.5% of CFP can be reduced by switching all employees to public transportation (29.5%) and installing solar panels (15%) in this office. Furthermore, during the COVID-19 pandemic, the CFP of electricity consumption decreased, while the CFP of transportation by office vehicles increased compared to the previous period, indicating a significant influence of the pandemic on the total CFP of this organization.

Keywords: Carbon footprint, Global Warming, Greenhouse gases