

Title : Life Cycle Assessment (LCA) and Carbon Footprint for Organization (CFO) of Maetaeng Elephant Camp, Chiang Mai

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ABSTRACT

Tourism involves extensive use of natural resources, transportation systems, electricity, and other basic infrastructure, all of which contribute to greenhouse gas (GHG) emissions. In Thailand, this issue is especially important due to the rapid growth of nature-based tourism. Elephant camps represent a key example of this trend, serving as both cultural and economic tourism attractions. This study conducts a Life Cycle Assessment (LCA) and Carbon Footprint for Organization (CFO) of Maetaeng Elephant Camp, Chiang Mai, Thailand, to analyze its GHG emissions to identify major emission sources. The assessment uses the GHG Protocol with a cradle-to-operation boundary, covering Scope 1 (direct), Scope 2 (energy indirect), and Scope 3 (other indirect) emissions. Primary data were collected through on-site visits, interviews with management and operational staff, and internal administrative records (e.g., fuel consumption, electricity bills, and related operational data) for the period January–December 2025. The results from three scopes indicate that the camp emitted a total of approximately 353 tCO₂e in 2025. Scope 1 emissions, primarily from mobile combustion for physical operations and internal transportation, were the largest contributor at about 215 tCO₂e (60.8%), followed by Scope 2 emission from purchased electricity at 82.8 tCO₂e (23.4%), and Scope 3 emissions, mainly from waste transport and upstream

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fuel and material inputs at 55.6 tCO₂e (15.7%). The LCA hotspots analysis identified internal transport activities (37.1%), electricity consumption (23.4%) and cooking and boiler operation of the camp (19.3%) were the dominant emission sources, making up about 80% of total emissions. These findings provide a baseline for prioritizing emission reduction efforts and support evidence-based environmental management in tourism operations. However, effective mitigation strategies require further stakeholder study to ensure feasibility and practicality. This study offers integrated LCA and CFO assessments of an elephant camp in Thailand and demonstrates the importance of integrating environmental management and planning for wildlife-based tourism.

Keywords: Life Cycle Assessment, Carbon Footprint for Organization, Greenhouse Gas, Wildlife-based Tourism

Title name guide.

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