UNIVERSITI TEKNOLOGI MARA

THE IMPLEMENTATION OF LOW CARBON CITY (LCC) IN SHAH ALAM AND ITS BENEFITS TO THE COMMUNITY

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ABSTRACT

Low Carbon City (LCC) is a city which comprise of societies that consume sustainable green technology, green practices, and emit relatively low carbon or greenhouse gases (GHG). The concept of LCC is closely related to the sustainable development of a city. With the adoption of sustainability principles, carbon emissions can be reduced significantly through the means and ways in which cities are designed and developed, and the ways resources are consumed. Using a mixed-method approach of quantitative and qualitative methodology, this paper aims to identify the factors that contribute to the implementation of LCC program, determine the benefits of LCC program to the community in Shah Alam, and study the initiatives taken by the local government. The data collection involves in collecting 384 samples within the vicinity of Shah Alam. While a total of five (5) informants were chosen for the semi-structured interview. The informants are the officials who are directly involved in the LCC programs. A descriptive analysis was used to describe and summarize the qualitative data. To model the relationship between the dependent and independent variables, multiple regression was used to analyse their relationship. Moreover, for the qualitative data, a thematic analysis was conducted to identify themes and sub-themes from the outcome of the semi-structured interview. This paper found that the implementation of LCC can be measured through four main areas: 1) environment; 2) transportation; 3) infrastructure and 4) buildings, while its benefits could be seen in terms of job creation, enhanced social integration, and improved public health. Furthermore, this study highlighted the key aspects that MBSA had focused on and the challenges faced in implementing the LCC program in Shah Alam, among which includes the awareness and resistance of older aged group for a change towards a sustainable living. The main research gap addressed by this study lies in the limited empirical evidence available on localized LCC implementation in Malaysian cities, especially in understanding the interplay between community perception, government initiatives, and demographic resistance. Existing literature has largely focused on policy frameworks or technological aspects of LCCs at a national or regional level, with minimal emphasis on community-level implementation and stakeholder engagement within urban municipalities like Shah Alam. By filling this gap, the study contributes new insights into how local governments can enhance LCC adoption by aligning strategies with public awareness, demographic responsiveness, and financial support mechanisms. Based on these findings, the study recommends that the government reassess budget allocations and enforce stricter guidelines to ensure the successful realization of the LCC program by 2030. Future research is encouraged to further explore the financial sustainability of LCC initiatives and examine the behavioral dynamics of older populations in relation to sustainable urban living.

Keywords: Success, Low Carbon City, Implementation, Benefits, Community

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CHAPTER 1
INTRODUCTION

1.1 Research Background

Over the past decades, the increase in demand for energy to meet the needs of the growing population has led to the exploration of natural resources which relied on non-renewable energy sources (Naz et al., 2019; Mensah et al., 2019). This approach aimed to strengthen the nation's economy, resulting in the depletion of natural resources and a corresponding increase in greenhouse gas emissions, primarily consisting of carbon dioxide from the combustion of fossil fuels (Rahman et al., 2017). In 2018, carbon dioxide accounted for the largest proportion of global greenhouse gas emissions, constituting approximately 72%, followed by methane at 19%, and nitrous oxide and fluorinated gases at 6% and 3%, respectively (Olivier & Peters, 2020). Carbon dioxide absorbed and emitted infrared radiation, thereby contributing to the warming of the Earth's surface. As a result, the accumulation of carbon emissions became a significant driver of global warming (Pata, 2021; Iqbal et al., 2021).

According to the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, there was a 95 to 100 percent probability that human activities since the 1950s had contributed to the warming of the global surface (Pachauri & Meyer, 2015; Hausfather, 2017). It was estimated that, by 2022, the global average temperature had increased by approximately 1.15°C above the average for the period from 1850 to 1900. Furthermore, the period from 2015 to 2022 was recorded as the eight warmest years on record (World Meteorological Organization, 2023). The ongoing rise in global temperatures led to global warming, which, in turn, caused significant climate change. This phenomenon was characterized by the change in climate patterns resulting from the carbon emissions released into the Earth's atmosphere. The imbalance between incoming and outgoing radiation in the atmosphere triggered a series of cascading effects on both the physical environment and living organisms (Heshmati, 2020). As a consequence of climate change, numerous catastrophic events, including droughts, heatwaves, wildfires, and severe floods, occurred (Hersher, 2023). These events increased in both frequency and intensity, adversely affecting water supply systems, drainage and sewerage infrastructure, and wastewater treatment plants, ultimately