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Role of Local Government in Implementing Low Carbon City in Shah Alam

Farah Nadia Azhar, Zarina Mohd Zain*, Nor Azira Ayob
** Corresponding Author*

Faculty of Administrative Science and Policy Studies,
Universiti Teknologi Mara, Shah Alam, Malaysia

farahnadiaaa@gmail.com, zarina752@uitm.edu.my, norazira@uitm.edu.my
Tel: +60-18-360-8327

Abstract
Low Carbon City Framework (LCCF) provides a guideline for local government to plan new strategies in reducing the carbon footprint to achieve sustainable development goals in Shah Alam, Selangor. This paper aims to examine the local government's role in reducing carbon emission for the benefit of the community. This study prepares a qualitative approach through semi-structured interviews. The findings found that the success of converting Shah Alam into a low carbon city requires effective strategies which include raising awareness, developing action plans and implementation with continuous improvements. Through these, the success of local government can be identified in terms of economy, social and health..

Keywords: Local Government; Low Carbon City; Sustainable Development; Carbon Footprint

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1.0 Introduction

With the ongoing global climate crisis, the urgent need for a transition towards a sustainable and low-carbon city has become paramount. It is estimated that in 2022, the global average temperature will be about 1.15 °C which is above the average from the year 1850 to 1900. Moreover, from the period 2015 to 2022, it is recorded to be the eighth warmest year (World Meteorological Organization, 2023). This rise in temperature threatens human survival while bringing negative impacts on the ecosystem and economic development.

Malaysia, being one of the largest emitters of greenhouse gases among the ASEAN countries, contributes to 0.52% of the global carbon emission. As such, in 2016 Malaysia had put forward their goal in reducing the country's greenhouse gas emission by 45% by 2030 (Abdul Rahman, 2018). Malaysia came up with their own low carbon policy which is The Green Technology Master Plan 2017-2030 to achieve the national carbon emission target while progressing towards a low carbon city. The concept of a low carbon city is to improve a city's energy efficiency, while conserving energy, and reducing the carbon emission. However, to achieve a low carbon city, the local government has an important role to establish policies catering to the public interest while also developing appropriate

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monitoring systems to ensure that the programs are promptly implemented. But unfortunately, there are limited studies on the local government's role in implementing LCC programs.

Shah Alam, among the major cities in Malaysia that has established its own Low Carbon City 2030 Action Plan, recognized the importance of embracing environmentally friendly practices (Al George, 2020). The local government, Shah Alam City Council (MBSA) has implemented numerous programs under the action plan. However, IQair reported that in 2019, Shah Alam was ranked among the top cities in the country to have low air quality. One of the reasons is because the population is not ready to change their mode of transportation to active transport (N. Na'asah et al., 2019). Therefore, this study aims to highlight the significant role of the local government in implementing LCC policies in Shah Alam.

Moreover, the objective of this study is to determine the action taken by the local government and its benefits towards the LCC program. When the local government takes responsibility, it helps to improve the LCC program that has been run by them. The findings of this research will also establish a way for local governments to enhance their LCC policies as well as a stepping stone for future policy studies on LCC programs.

2.0 Literature Review

2.1 Level of Awareness towards LCC

According to Malaysian Green Technology and Climate Change Corporation (MGTC) (2019), the first phase of implementing LCC is to create awareness. Public awareness serves as the foundation for fostering a culture of sustainability and collective responsibility toward building a low-carbon city. When residents, businesses, and institutions understand the impact of their actions on the environment, they are more likely to adopt sustainable behaviors such as reducing energy consumption, using public transportation, recycling, and adopting sustainable habits in daily life. According to Wu et al. (2022), awareness is one of the problems that should be addressed when implementing the LCC program. He also suggested that it is not a national responsibility but also an individual responsibility as it depends on societal participation and acceptance. Hiromi (2022) also stated that local governments are seen to have an important role in undertaking measures for the localization of the global agenda.

According to SDGs Future City Plans (2018), one of the ways that the local government can take to raise awareness is by disseminating knowledge on low carbon practices and their benefits to the community. It includes providing various communication and education opportunities including outreach events, enabling a wide range of stakeholders to communicate and disseminate knowledge on SDG implementation. Local governments can also have partnerships with other authorities to lead the transition to sustainable development as it enables the sharing of knowledge in relation to cross-sectoral challenges (Hiromi, 2022; Biermann et al., 2017). As an information hub to the community, the local government can leverage various communication channels, such as websites, social media platforms, and community forums, to provide accurate and accessible information. By sharing facts, data, and success stories related to low carbon city programs, they help to educate residents and empower them to make informed choices.

2.2 The Action Plans to strategies the LCC

With the urgency in combating climate change continues to escalate, developing an action plan is an important phase in implementing the LCC strategies (MGTC, 2019). To develop an action plan, there must be a roadmap that takes the city's capacities and capabilities into consideration. It will provide guidance to ensure successful implementation of the identified goals (Ministry of Economic Affairs, 2019). With a clear action plan, it will clarify the objective as well as a clear way of measuring progress towards that objective. Therefore, local government has great responsibilities in implementing effective strategies and action plans to shift towards low carbon cities. For instance, Malacca City Council has introduced the Melaka State Climate Action Plan 2020-2030 which focuses on six areas which are public and stakeholder engagement, climate governance, energy, transport, waste as well as ecosystem and biodiversity (Zen et al., 2019). However, in Shah Alam, to achieve a low carbon future for the city, MBSA has developed the city's 2030 Action Plan which targets five main strategic cores; transportation, waste management system, built environment, energy efficiency, water resource management, and green technology (MGTC, 2020).

According to LCCF (2022), one of the most effective ways to conserve energy is through utilising public transportation. Nasrudin et al., (2020), also agreed that some of the strategies that the local government can take are through low-carbon transport such as increasing the public transport system and creating green initiative programs to encourage people to adopt healthy lifestyles and reduce private vehicle usage. Hence, to encourage the community to take up public transportation, the local government must develop an efficient, accessible, and sustainable transport system. Energy efficiency and water resource management are also crucial in mitigating carbon emissions. On top of its advantage of reducing carbon emissions, it also reduces the bill to operate a building. In Singapore, one-third of the nation's electricity consumption comes from buildings (Z. Lee, 2021). Therefore, Singapore's Building Construction Authority (BCA) has introduced the Super Low Energy (SLE) program in 2018 which aims to achieve 80% SLE buildings by 2030 (Goh, 2022).

According to Singapore's Public Utilities Board (PUB), the country's current water demand is about 430 million gallons per day whereby 45% of the overall consumption is from home usage. As such, PUB aims to install over 300,000 smart water meters in residential, industrial, and commercial premises for users to monitor to reduce the water consumption in buildings (A. Tan, 2022). While in China, they focus on green technology where the government targets to be more developed in terms of innovations, they aim to build a green technology innovation system from 2022 to 2030. To further encourage businesses to support green technology, the government introduced tax incentives. The government's policy and support enhance the innovation of green technology which would allow

businesses to progress towards a low carbon economy. Therefore, it can be concluded that transportation, energy efficiency and water resource management as well as green technology are very important areas that local government should consider in developing action plans to achieve the ultimate goals.

2.3 The Focus on Implementation and Continuous Improvement

Continuous improvement is also important in implementing low carbon city strategies (MGTC, 2019). With the continuous progression towards a sustainable future, local governments have an integral part in amending and updating the existing policies when necessary while constantly finding ways to improve a city's current state. Additionally, local government also need to set long-term goals and initiatives in curbing carbon emission. According to Gaspar et al. (2019), in order to continuously improve the initiatives in reducing global carbon emission, they suggested providing incentives for the community and organizations that take part in reducing the energy usage and clean energy sources. Another action plan is by providing continuous support to vulnerable communities by returning the community's money as dividend (Gaspar et al., 2019). This, together with continuous improvement on green energy and innovations would improve future technology and sustainability for future generations. When the local government focuses on their implementation and continuously improves on their strategies, it will attract more people to engage in the LCC program. Therefore, when the local government carries out their duties, it provides a positive outcome of the low carbon city program in the city. This contributes to the country's policy direction which is to adopt green innovations and technologies.

2.4 The Benefits of LCC Towards the Community

The role of local government and success of LCC implementation is related to the benefits towards the community which includes health, social, and economy. According to Bernama (2021a), as the LCC encourages a healthy lifestyle by promoting outdoor activities and active transport such as cycling and walking, the community will be in good shape and thus, resulting in a healthier environment while improving the quality of air. Maizlish et al. (2013) stated that active mode of transportation has the potential to lower the risk of exposure of fine particles, depression, cardiovascular diseases, dementia, and obesity. Additionally, increased active travel would eventually result in a 10-19% decrease in ischemic heart disease, a 10-18% decrease in cerebrovascular disease, a 7-18% decrease in dementia, and a 12-13% decrease in breast cancer.

It was discovered that local government does not only have a positive impact on the community's health but also its economy. There is a direct economic return associated with reduced energy expenditure, transport fares, user fees, and so on. The transformation of cities in Malaysia into low-carbon cities will help develop the local green economy, create jobs, and attract domestic and international investments (Bernama, 2021b). According to multiple studies, a decrease in air pollution-related diseases the amount of money being spent on medical treatments could be reduced. Therefore, with an improved environment at home and in the workplace, it results in the decrease of illness rates and subsequently saves on health-care costs. This therefore increases productivity at the workplace and companies would save a lot on labor cost.

Public transportation is another aspect considered in the low-carbon implementation and has proven to improve accessibility, thus benefiting the urban poor (A. Gouldson et al., 2018). This is because it enhances the social benefits where it facilitates social inclusions which connects the community together by interaction with others. The impact of public transportation has also shown to provide improvements towards social stress.

With regards to the behavior and attitude by the community, it has a significant impact on the overall outcome of low carbon city in Shah Alam. Young individuals are especially more receptive and positive towards changes than the older people (Hu et al., 2021). For instance, when it comes to changing their means of transportation to public transportation, younger generations are more realistic and conscious of the negative effects that private vehicles have on the environment (Clark et al., 2016). This awareness brings positive impacts to the city as it ensures the compliance with the policy set by the local government. Additionally, with a well-developed low carbon city policy, it brings positive outcome of green innovations specifically on the application for green patents (Pei & Wang, 2022). This is due to the increase in demand for smart equipment and technologies in which it promotes a green economy in the city.

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3.0 Methodology

This study utilized a qualitative technique through semi-structured interviews. A semi-structured interview is the most suitable method for this study as it offers flexibility to the researcher and also the informants as they are allowed to elaborate and clarify their answers in detail. Therefore, this method provides reliable data for the researcher to answer the research questions.

This study utilised a purposive sampling technique to choose the sample of participants. To get reliable answers and specific data points for this study, the researcher opted to interview three qualified personnel from MBSA who are relevant to this study as they are directly involved in the LCC programs in Shah Alam. The MBSA personnel include the town planner, engineer, and officer who oversees the transportation operation in the city.

The information gathered through the interview was transcribed and analysed using the thematic format. The themes were created based on factors that led to the successful implementation of LCC by the local government which benefited the community in Shah Alam.

4.0 Findings

The limited awareness among the community in Shah Alam on the LCC program has caused an increase in carbon emission levels in the city. Based on the response from the informants, it shows that the local government has an important role in raising public awareness. The informants agreed that the success of the programs implemented by MBSA is closely related to public awareness. They added that having the community aware of the programs would lead to the success of reducing carbon emissions in Shah Alam. This is because public awareness is a way to educate and highlight the importance of the LCC program to the community. Furthermore, according to the informants, having more of the community involved and educated, encourages others to be involved in the program. As a result, it would collectively increase the number of participants of the LCC program in the community. This would ultimately improve the community's way of life by adopting sustainable lifestyles and practices that reduce air pollution in the city.

According to them, numerous plans had been carried out to raise public awareness. This includes the Car Free Day which allows the community to enjoy their weekend activities with their family while also promoting environmental awareness. To further attract more people, they promoted their events on social media such as Facebook and Instagram. This shows that their role in raising public awareness is important in ensuring the success of their program.

Since the carbon emission from transportation contributes to the low air quality in the city, it hinders the full potential of achieving the goal of the program. The MBSA personnel also agreed that transportation is the biggest contributor to the carbon emission in the city. They further added that developing an action plan is another key aspect which defines the efficiency of the program. MBSA emphasises strategies to develop an action plan to attract the community to take up public transport. MBSA had planned out many future projects on transportation to improve their current LCC program. Since the number of public transport users is increasing, they have also increased the number of public transports in Shah Alam to promote and meet their needs. They further added that the waste management system in Shah Alam also needs improvement which they are trying to improve through their 'Reuse, Reduce and Recycle' campaigns.

Furthermore, this study found that continuous improvement from the local government is needed to have a successful LCC program. They should set a long-term goal and initiative to meet their main intention which is reducing carbon emission. As the country progresses and the population increases, more initiatives are needed to be improved to meet the needs. In summary, when the local government carries out their roles and responsibilities adeptly, it would lead to a successful outcome of the LCC program.

4.1 Summary of Findings

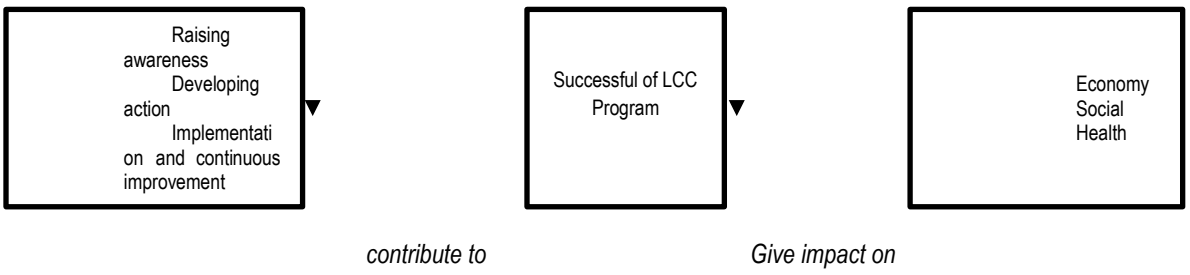

Figure 1: Summary of findings

Based on the findings, there are three parameters that are considered to be the role of the local government that contributes to the success of the LCC program in Shah Alam. Among the roles include raising awareness, developing action plans and implementation and continuous improvement. When the local government carries out all the three roles, it will make the LCC program to be more successful. Thus, it will also give benefits to the communities in terms of economy, social and health.

5.0 Discussion

Based on the findings, the MBSA personnel agreed that public awareness is important in ensuring a successful LCC program. When people are aware of the program, it allows them to change their attitude, behaviour and take part in the said program. However, this would not be made available if the financial support was not given to MBSA. Indeed, more projects and programmes can be held when more financial budget is allocated to MBSA. To educate and promote the community on the LCC program, MBSA has implemented a Car Free Day program, where people in Shah Alam are encouraged to do light exercises, jogging, and cycling during the event. According to them, the program provides positive outcomes as over the days, more people join the program. Furthermore, one of the action plans taken by the MBSA includes improving the Smart Selangor program by increasing the number of free buses and routes throughout the city. They also implemented a garbage segregation program where according to them; it is the MBSA's expenditure. They further added that when they enforce green building initiatives, it would attract more investments from external investors. Lastly, they mentioned that to have continuous improvement towards the program, they need more financial support to work on it. They also admitted that when they collaborate with other parties, it helps them in changing ideas and make the program more successful. Overall, the MBSA personnel agreed that the LCC program brings numerous benefits towards the health, economy and social of the community. These have an impact on future programs which enhances the goal of achieving net zero emissions by 2030.

6.0 Conclusion

This paper highlights the role of local government as a key factor in implementing the LCC program in Shah Alam. The policies established by MBSA in reference to the LCCF, are divided into three phases which includes awareness, action plan development, and implementation and continuous improvement. Each of these phases defines the successfulness of LCC implementation in Shah Alam which has further benefits in terms of health, economy and social. However, these positive outcomes can only be achieved with the cooperation of the community in playing their part in participating in the programs by MBSA. Additionally, based on the results it found that despite MBSA's low carbon initiatives, they are still lacking funding to support the programs. This hinders MBSA's full potential of maximizing the reduction of carbon emission in the city. This study leads to a conclusion that policies should be modelled in such a way that it attracts the community to come together which produces a sustainable positive outcome in the city. However, like all studies, there were limitations. The framework of this study was based on LCCF 2017 as the newer versions have yet to be published. This could result in outdated information on the policies used. For future study, this paper will be a useful reference for researchers working on the low carbon city and its relation to MBSA. This would allow the government body to review the flaws in policies and programs to focus on the awareness of the community. Furthermore, for future studies, this research paves the way for quantitative research methods which could further validate the study.

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Paper Contribution to Related Field of Study

The findings from this study will provide a guideline especially for local authorities and others in implementing and enhancing the low carbon city program which at the same time can also reduce the environmental pollution considering that the carbon emission in the city is still relatively high. With enhancement towards the policy, it paves the direction towards a sustainable future where it would benefit the community and government in terms of health, social and economy. Therefore, the result from this study could be a stepping stone for future researchers, in which they can further study the advances in technologies that local governments can incorporate in the LCCF policy through the 3M (measurement, management and mitigation) approach. With advanced low carbon technologies and approach, it would elevate the effectiveness of the LCC program.

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