

COMMUNITY ADOPTION OF A LOW-CARBON LIFESTYLE PROGRAMME IN KUALA LUMPUR

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Abstract: *Urban climate change poses growing challenges, prompting communities to adopt low-carbon lifestyle practices to reduce greenhouse gas (GHG) emissions. Sustainable urban development relies not only on government policies and technological infrastructure, but also on proactive behavioural change at the community level. This study explores how communities adopt low-carbon practices, the role of local leadership in promoting behavioural shifts, and how these efforts contribute to national sustainability goals. Framed within four Sustainable Development Goals (SDGs): SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 17 (Partnerships for the Goals), this research aims to understand how everyday sustainable actions influence collective behaviour and long-term community engagement. Using a qualitative phenomenological approach, semi-structured interviews were conducted with eleven participants, including the chairman and committee members of Local Action 21 Kuala Lumpur (LA21KL). Thematic analysis using NVivo R1.7 software revealed five core themes: Developing Leaders through Mentoring which promotes environmental leadership and collective ownership; Striving for Inclusive Sustainable Development Goals which encourages broader public participation; Enhancing Urban Farming contributes to food resilience and sustainability awareness; Expanding Recycling Initiatives which improves waste management efficiency; and Strengthening Economic Sustainability which offers scalable models for sustaining participation through local green economy strategies. These findings are consolidated in a proposed Framework for Leadership and Mentoring in Sustainable Community Development, representing a novel contribution to community-based sustainability research. The study provides policymakers and urban sustainability advocates with practical insights and community-driven strategies that strengthen Kuala Lumpur's ambition to become a low-carbon city by 2030 and achieve carbon*

neutrality by 2050. Unlike previous research that focuses on limited aspects, this comprehensive approach examining five interrelated themes with eleven community informants provides deeper qualitative insights into the adoption of sustainable lifestyles at the community level.

Keywords: *Community Awareness, Developing Leaders Through Mentoring, Low-Carbon Lifestyle, Sustainable Development Goals, Public Participation*

Introduction

Malaysia's urban growth over recent decades has significantly increased carbon dioxide emissions from transport, industrial, and power generation sectors (Azlan et al., 2023; Weber et al., 2024; Zawawi et al., 2024). As climate-related hazards become more frequent, Malaysia's position among Southeast Asia's top emitters heightens the urgency for local solutions. Although national commitments to reduce greenhouse gas intensity by 40 per cent by 2020 and 45 per cent by 2030 demonstrate strong political determination, reaching these goals requires more than top-down regulations. Success relies on collaboration among government agencies, businesses, community organisations, and individual households (Azhari et al., 2025; Ibrahim et al., 2023).

To turn ambition into action, Kuala Lumpur City Hall (KLCH) launched the Low Carbon Society Blueprint 2030, aiming to cut citywide emissions by 70 per cent by 2030 and achieve carbon neutrality by 2050 (Kuala Lumpur City Hall 2018, 2021). At its core is the Low-Carbon Lifestyle (LCL) programme, conducted in partnership with Local Action 21 Kuala Lumpur (LA21KL; formerly Local Agenda 21 Kuala Lumpur). This initiative transforms daily routines through community workshops, targeted outreach, and small-scale infrastructure upgrades in public housing estates. It encourages household energy efficiency, waste separation and composting, community gardens, and a shift towards public transport and cycling. By piloting interventions in low-income areas, the programme tests scalable models for larger implementation across the Klang Valley.

However, policy incentives alone rarely change deeply rooted habits. Research indicates that individuals consider social norms, cultural expectations, and practical constraints when deciding whether to alter their behaviour (Stegeman et al. 2020; Whitmarsh et al., 2011). For instance, a family might recognise the long-term savings from using LED lighting but hesitate because of the initial cost or concerns about product reliability. International comparisons support this pattern. Japan's low-carbon transition combined subsidies for energy-efficient appliances with peer mentoring and neighbourhood monitoring boards, increasing both adoption and social cohesion (Wu et al., 2022). In Malaysia and China, involving trusted local figures in programme design helped build public trust and sustain participation (Castán Broto & Westman, 2020).

Barriers are most prominent in lower-income neighbourhoods, where limited budgets compel residents to focus on immediate needs over environmental concerns (Chau et al. 2021; Leknoi et al., 2022). Community groups in these areas often rely on short-term grants and lack technical expertise, so initial enthusiasm for urban farming or recycling initiatives frequently diminishes once seed funding ends (Celata et al., 2019). These realities highlight the importance of ongoing support and resources rather than one-off events.

Although the LCL programme offers modest subsidies and support, little is known about how residents interpret and incorporate these options into their daily lives. Most evaluations focus on participation figures or infrastructure upgrades, leaving a gap in understanding the lived experiences behind those numbers. There is limited insight into how informal mentoring networks and community frameworks either support or hinder long-term behavioural change.

This study addresses that gap by examining how residents of Kuala Lumpur adopt low-carbon practices and the role of local leadership sustains momentum. Through semi-structured interviews with eleven members of LA21KL, this research explores how mentoring relationships shape daily habits and align with national sustainability goals. The analysis identifies five key patterns of change, providing a practical framework for policymakers. By integrating policy context and community narratives, this research offers grounded guidance for strengthening the reach, resilience, and equity of urban sustainability initiatives.

Literature Review

Cities consume most of the world's energy and produce most carbon emissions, making household behaviour pivotal to mitigation efforts (Boswell et al., 2019; Koide et al., 2021; Negrón et al., 2025). Malaysia reflects this global pattern. In 2019, per capita emissions reached 10.158 tonnes of CO₂ equivalent, exceeding the global average (Ministry of Natural Resources, 2022). Growth in private car ownership, air-conditioned floor space, and food imports has further intensified demand for energy and transport (ASEAN 2021; Solaymani 2022). To moderate these trends, the government introduced Low-Carbon Lifestyle (LCL) programme to promote energy conservation, waste reduction, and cleaner mobility (Watabe & Yamabe-Ledoux, 2023).

Behavioural change is central to the LCL's vision, yet it remains difficult to secure. Previous research shows that people interpret “carbon” through technical facts, moral duties, and social norms, which shape their responses to appeals for action (Whitmarsh et al., 2011). Awareness alone rarely sustains behavioural change without accompanying social support or incentives (Stegeman et al., 2020). Higher-income households may resist low-carbon options if these appear inconvenient or costly. However, once they adopt new practices, they can influence their peers through example (Moorcroft et al., 2025). These insights imply that effective programmes must pair information with feasible options, visible benefits, and supportive social contexts.

Translating national policy into neighbourhood action is challenging in fast-growing Asian cities. Municipal departments face tight budgets, overlapping mandates, and accelerating development cycles, limiting their capacity to operationalise well-designed plans (Gouldson et al., 2016). Studies show that combining community participation with appropriate technology enhances both efficiency and trust (Castán Broto & Westman, 2020; Wu et al., 2022). Kuala Lumpur's blueprints acknowledge that infrastructure upgrades must be aligned with behavioural change to achieve carbon neutrality by mid-century (Al-Boridi & Saif Mohammed Ali, 2025; Wu et al., 2024). Achieving this goal requires accessible infrastructure, appropriate incentives, and sustained institutional support.

Lower-income communities illustrate stakes of a just transition. Public housing residents often weigh electricity savings against considerations such as comfort, safety, or school fees (Chau et al., 2021; Leknoi et al., 2022). Community groups often rely on short-term grants and limited technical expertise, so enthusiasm for recycling, composting, or urban farming often fades once initial funding ends (Celata et al., 2019). Addressing these constraints requires ongoing

facilitation, capacity building, and incentives that reflect local realities rather than one-off campaigns.

Leadership is a crucial lever in this context. In Malaysian neighbourhoods and universities, proactive and trusted leaders have driven initiatives such as recycling, community gardening, and energy conservation (Ghaus et al., 2017; Azalia et al., 2016). Learning spaces, ranging from WhatsApp forums to shared tool sheds, provide room for experimentation and peer support, helping residents adapt practices to their circumstances (Catana, 2020; Airaj, 2022). Scholars caution that one-size-fits-all designs rarely succeed; programmes must be tailored to local capacities and cultural contexts (Castán Broto & Westman, 2020).

Sustainable Development Goals (SDGs) offer a framework that links community projects to national and global agendas. SDG 4 emphasises environmental literacy, SDG 11 focuses on inclusive and sustainable cities, SDG 13 advocates for climate action, and SDG 17 highlights partnerships as a driver of progress (Bonsu et al., 2020; Cappellaro et al., 2022; Sengupta et al., 2020). Framing LCL within these goals helps clarify its co-benefits and attract broader support. Participants with environmental knowledge, good practices, and a willingness to volunteer show higher engagement, although economic disparities can overshadow the long-term benefits.

Research in Kuala Lumpur has documented community efforts, but often with narrow scopes. Basri et al. (2022) interviewed five participants and focused on three SDGs, identifying themes of engagement, leadership, and communication. Building on that foundation, the present study examines five interconnected domains: mentoring, SDG engagement, urban farming, recycling, and economic sustainability through interviews with eleven informants. Anchoring the work in LA21KL situates the findings within the city's participatory governance framework, where KLCH oversees the planning, engagement, and monitoring of LCL initiatives (Kamaruddin et al., 2016; Zanudin et al., 2022).

Overall, the literature converges on several points. Policy frameworks alone are insufficient without attention to everyday practices. Technology incentives work best with mentoring and community ownership. Long-term change depends on trusted local leadership, supportive learning environments, and resources beyond pilot phases. Despite promising initiatives, important gaps remain in understanding how residents interpret programme offerings, negotiate daily constraints, and use informal networks to sustain behavioural change. This study aims to inform the design of interventions that resonate with community realities and help deliver Malaysia's climate commitments.

The preceding review establishes that urban carbon mitigation depends on complex interactions among policy frameworks, institutional capacities, household behaviours, and community dynamics. However, significant gaps remain in understanding implementation mechanisms, informal support systems, and equity considerations within rapidly developing Asian cities. Table 1 synthesises key literature across thematic domains, identifies critical knowledge gaps, and articulates how this study's qualitative investigation of five interconnected domains through semi-structured interviews with eleven LA21KL members directly addresses these deficits.

Table 1: Integrated Literature Synthesis Matrix

Thematic Domain	Key Evidence & Gap Identified	How This Study Addresses the Gap
Urban Carbon Emissions & Household Behaviour	Cities generate the majority of global emissions; Malaysia's per capita emissions (10.158 tCO ₂ e in 2019) exceed the global average. Growth in vehicles, air-conditioning use, and imported goods continues to intensify demand (Boswell et al., 2019; Negrón et al., 2025; Ministry of Natural Resources, 2022). <i>Gap: Limited understanding of how residents translate awareness into sustained practices.</i>	Explores how residents interpret programme offerings and identifies factors that enable sustained engagement beyond initial awareness through qualitative investigation of lived experiences across five interconnected domains.
Behavioural Change Mechanisms	Carbon mitigation is interpreted through technical knowledge, moral imperatives, and social norms. Awareness campaigns alone rarely succeed without social support or incentives. Higher-income households often resist inconvenient practices but can influence peers once adopted (Whitmarsh et al., 2011; Moorcroft et al., 2025). <i>Gap: Insufficient evidence on peer influence and informal support mechanisms.</i>	Investigates how residents use informal networks and peer support systems to adapt practices to their circumstances, examining social learning channels and mentoring relationships that enable behaviour change.
Implementation Challenges & Institutional Capacity	Municipal departments face budgetary constraints, jurisdictional overlaps, rapid urbanisation, which limit their ability to implement city plans. City blueprints require infrastructure-behaviour alignment for mid-century neutrality (Gouldson et al., 2016; Wu et al., 2024). <i>Gap: Unclear mechanisms for translating policy into neighbourhood action.</i>	Examines implementation processes through LA21KL governance framework, investigating how KLCH coordinates planning, engagement, and monitoring in practice.
Community Participation & Leadership	Proactive, trusted leaders have driven initiatives in Malaysian contexts. One-size-fits-all designs often fail; contextual tailoring is essential. Combining participation with technology boosts trust (Ghaus et al., 2017; Castán Broto & Westman, 2020). <i>Gap: Limited evidence on specific leadership facilitation</i>	Investigates mentoring and leadership as a distinct domain, examining how local champions facilitate adoption and how programmes can be tailored to local capacities and cultural contexts.

	<i>mechanisms and contextual adaptation processes.</i>	
Equity & Just Transition	Lower-income households prioritise immediate needs over carbon reduction. Community initiatives often lose momentum when short-term funding ends. Public housing residents weigh potential savings against comfort and school fees (Chau et al., 2021; Celata et al., 2019). <i>Gap: Insufficient attention to economic constraints and need for equitable transition strategies.</i>	Examines economic sustainability as a core domain, investigating how residents navigate daily constraints and what support structures enable equitable low-carbon transitions.
Informal Learning Networks	Digital platforms, shared resources, and peer learning opportunities enable experimentation and practice adaptation, yet these mechanisms remain empirically underexplored (Catana, 2020; Airaj, 2022). <i>Gap: Limited systematic investigation of how informal learning sustains change.</i>	Investigates peer support networks, informal knowledge exchange mechanisms, and social learning processes enabling practice adaptation to local contexts.
SDGs as Integrative Framework	SDG 4 (quality education), SDG 11 (sustainable cities), SDG 13 (climate action), and SDG 17 (partnerships) link local to global agendas. Prior knowledge correlates with engagement, but economic disparities moderate outcomes (Bonsu et al., 2020; Sengupta et al., 2020). <i>Gap: Unclear pathways connecting resident engagement with sustainability goals.</i>	Examines SDG engagement as an analytical domain to understand how residents connect daily actions to broader goals and what structural barriers limit inclusive participation.
Prior Kuala Lumpur Research	Community-based research were limited in scope (five participants; three SDGs) identifying engagement, leadership, and communication themes (Basri et al., 2022). <i>Gap: Narrow empirical scope limits comprehensive understanding.</i>	Expands investigation to eleven purposively selected informants across five interconnected domains, enabling comprehensive analysis of community adoption dynamics.
Context-Specific Intervention Design	Technology and incentives work optimally with mentoring and a sense of community ownership. Long-term change requires resources beyond pilots and attention to local realities (Wu et al., 2022). <i>Gap: Insufficient contextually-grounded insights for intervention design.</i>	Generates contextually-grounded insights from Kuala Lumpur communities, producing actionable knowledge for intervention design addressing local realities and supporting climate commitments.

Note: This integrated matrix synthesises literature themes, identifies eight critical gaps, demonstrates how the study's qualitative methodology addresses these deficits, and explicitly links findings to evidence gaps. The five study domains (mentoring, SDG engagement, urban farming, recycling, economic sustainability) directly respond to identified knowledge deficits in implementation mechanisms, informal support systems, leadership facilitation, equity considerations, and context-specific intervention design.

As Table 1 demonstrates, while substantial research exists on urban sustainability and behaviour change, critical gaps remain in understanding how residents in rapidly developing cities like Kuala Lumpur interpret, adopt, and sustain low-carbon practices within specific institutional contexts. While the literature provides important theoretical frameworks, it offers limited insight into how these variables interact in practice or how informal networks function alongside formal programmes.

The eight gaps synthesised in Table 1, particularly regarding implementation mechanisms, peer support systems, equity constraints, and leadership facilitation, require qualitative investigation that captures residents' lived experiences. This study therefore employs semi-structured interviews with LA21KL participants to examine how community members engage with the LCL programme and the factors that enable or constrain sustained adoption. The phenomenological approach, detailed in the following methodology section, was specifically designed to generate contextually grounded insights that can inform more effective, equitable, and sustainable urban climate action in Kuala Lumpur and similar Southeast Asian cities.

Methodology

This study explores how communities adopt low-carbon lifestyles, the role of leadership in supporting behavioural change, and how these practices contribute to national sustainability goals. A phenomenological approach was adopted to gain deep insights into how individuals perceive and make sense of their everyday behaviours and decisions (Creswell & Creswell, 2003). As emphasised by Othman Leber (2017), phenomenology examines how daily experiences shape and influence human behaviour. This approach captured participants' perspectives and lived experiences related to low-carbon adoption (Husserl, 2017; Moerer-Urdahl & Creswell, 2004; Moustakas, 1994).

Research Site Selection

Kuala Lumpur was selected due to its unique urban characteristics, including rapid urbanisation, high population density, and significant greenhouse gas (GHG) emissions, alongside its status as Malaysia's economic and administrative hub. These factors make the city an ideal context for exploring community engagement in sustainability initiatives. Kuala Lumpur's strong commitment to sustainability, outlined in the KL LCSBP 2030 and LA21KL programme, further reinforced its relevance.

Sampling Strategy and Participant Selection

Eleven participants were recruited, with the sample size determined by the principle of data saturation to capture a broad range of perspectives (Saunders et al. 2018). Data saturation was achieved when no new themes emerged from additional interviews. The criteria for participant selection included:

- (1) active involvement in low-carbon activities through LA21KL programmes;
- (2) individual experience with LCL activities; and
- (3) willingness to share personal experiences and their adoption of the LCL programme.

Maximum variation sampling was employed to capture diversity in participants' backgrounds and experiences (Patton, 2015). This ensured diverse and representative viewpoints from key community leaders, such as LA21KL chairs and committee members.

Data Collection Methods

Data collection employed a triangulated approach, combining semi-structured interviews, field observations, and document analysis to ensure a comprehensive understanding of community adoption processes (Denzin, 2017). Semi-structured interviews allowed participants to share their experiences, addressing the programme's influence on daily life, economic benefits, efficiency improvements, challenges they faced, and community support in achieving the SDGs. The interview protocol was designed to elicit detailed narratives regarding personal transformation, community dynamics, and programme implementation experiences (Kallio et al., 2016). Field observations captured real-time community interactions, including participation in meetings, sustainability activities, and informal peer-to-peer learning exchanges (Kawulich 2005). Document analysis reviewed policy documents, community reports, meeting minutes, and official communications related to LA21KL and the LCL programme (Bowen, 2009).

Data Analysis Process

Data were analysed using qualitative content analysis, facilitated by NVivo R1.7 software to ensure transparent and rigorous analytical processes (Setiawan et al., 2024). The analysis involved multiple readings of interview transcripts and documents, followed by systematic coding to identify key themes and recurring patterns based on participants' lived experiences with the LCL programme. A constant comparative method was applied to ensure consistency and depth in theme development (Glaser & Strauss, 1967). The iterative process enhanced credibility through continuous cross-referencing and refinement. The final thematic structure was developed using NVivo R1.7 as visualised in Figure 1, presented in the results section to illustrate the output of the coding process. The approach aligns with best practices in urban sustainability research (Eskandari et al., 2024). This structured methodology enhances the reliability and relevance of the findings for sustainability studies. Table 2 provides an overview of the informants' demographics.

Table 2: Demographic profile of informants

Informant	Age (year)	Duration of Community Involvement	Position	Notes
Informant 1	51	5 - 10 years	Secretary	Community
Informant 2	52	More than 10 years	Former Chairman	Community
Informant 3	55	5 - 10 years	Former Chairman	Community
Informant 4	32	Less than 5 years	Town Planning Officer	Coordinator
Informant 5	47	11 - 20 years	Founder and President	NGO
Informant 6	58	5 - 10 years	Teacher Advisor	Community
Informant 7	59	5 - 10 years	Chairman	Community
Informant 8	48	5 - 10 years	Senior Deputy Director	Government Officer
Informant 9	50	More than 10 years	Director	Government Officer
Informant 10	60	More than 10 years	NGO Member and Advisor	LA21KL Advisor
Informant 11	42	Less than 5 years	Town Planning Officer	Government Officer

Source: Researcher's data (2021)

Results and Findings

Data were analysed using the constant comparative method, as outlined by Merriam (1998). This approach was employed throughout the data collection process to facilitate ongoing analysis of the interview data. The process began with the first interview, where initial coding was conducted to establish categories and identify emerging themes. Insights from each subsequent interview were compared against existing categories, allowing for the continuous refinement of themes and identification of recurring patterns and key issues. This process addressed the research question and achieved the research objective:

Research question: How does the community adopt a low-carbon lifestyle?

Research objective: To analyse the phenomenological method in adopting a low-carbon lifestyle.

Five themes and eighteen categories emerged from interviews and document analysis. The themes are: Developing Leaders Through Mentoring, Striving for Inclusive Sustainable Development Goals, Enhancing Urban Farming, Enhancing Recycling Programmes, and Economic Sustainability Development (see Figure 1).

These five themes systematically address the critical gaps identified in the literature. Mentoring responds to the lack of evidence on leadership facilitation, revealing how peer-to-peer knowledge transfer sustains engagement within PPR communities. SDG engagement clarifies pathways connecting residents' daily actions to sustainability goals through hands-on experiences. Urban farming and recycling illuminate informal support systems enabling sustained practice beyond formal programmes. Economic sustainability addresses equity concerns by documenting how B40 households balance environmental goals with immediate needs through income-generating activities. Together, these domains provide contextually-grounded insights for designing effective interventions in rapidly developing Asian cities.

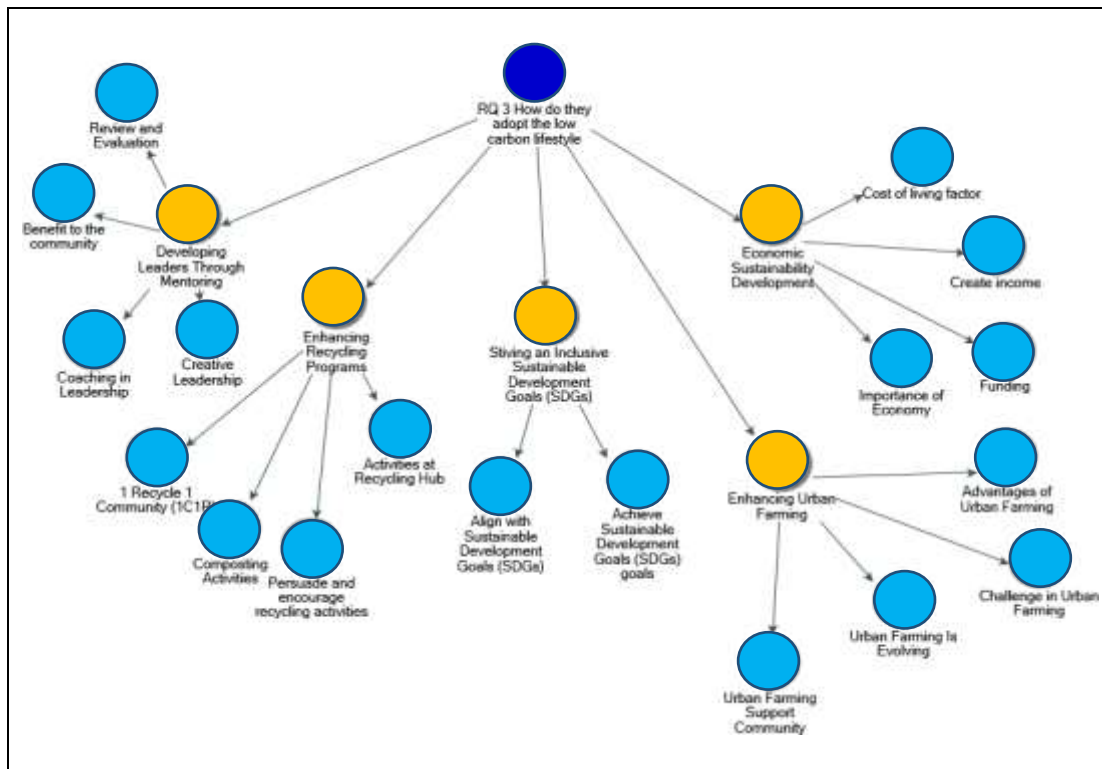


Figure 1: NVivo-generated thematic map based on the research question

Theme 1: Developing Leaders Through Mentoring

Mentoring ensures programmes meet present needs without compromising future generations (Brundtland Report, 1987). Creative leadership plays a crucial role in leveraging opportunities for community adoption of LCL initiatives (Ghaus et al., 2017). In urban farming, leaders focus on commercial viability so residents see tangible benefits and join in.

"We target each housing unit to participate in this initiative. Although implementation may not be perfect, we provide good advice so plants benefit residents in the housing area."

(Informant 5)

Leaders encourage participation, celebrate achievements, and help residents feel valued as they adopt behavioural changes (Azalia et al., 2016). PA Seri Perlis II pioneered urban farming, later mentoring Kebun Bandar Sungai Bunus, which won the 2022 Gold Award for Community-Led Initiatives from the Malaysia Institute of Planners. Former mentees became mentors, sharing knowledge with other communities.

"To keep participants engaged in gardening, we avoid promising monthly income. Instead, we motivate through publicity, organised visits, new technologies, and awards. We celebrate achievements together."

(Informant 2)

Leaders establish networks with NGOs and private companies, leveraging CSR initiatives to benefit communities. They introduce barter systems for exchanging goods, encouraging recycling and waste segregation in public housing areas, aligning with SDG 17's focus on

building partnerships for sustainable development. PPR Kepong exemplifies leadership by mentoring PPR Wangsa Sari, demonstrating effective sustainable practice promotion.

"I taught gardening concepts at Wangsa Sari. They were surprised by our recycling activities in limited space. We need proper concepts."

(Informant 3)

Challenges arise as leadership dynamics vary by location. Groups often work well under confident leaders, but shifts in leadership can disrupt collaboration. Therefore, approaches must be tailored to each group's demographic profile and lifestyle for successful teamwork. Leaders have expanded roles to mentor both local and neighbouring communities. The ongoing mentoring process trains and engages residents in low-carbon activities, including gardening, recycling, and waste separation. This provides exemplary community models that address challenges through creative problem-solving, utilising innovative strategies and human-centred approaches.

Theme 2: Striving for Inclusive Sustainable Development Goals

Informants identified four SDGs during interviews. While understanding deepened through LCL participation, many initially faced difficulties due to limited awareness and behavioural habits. Some needed more time to understand SDGs but benefited from community leaders' guidance and LA21KL support. This aligns with Kamaruddin et al. (2016), highlighting that community involvement and expert assistance are crucial for programme understanding and delivering benefits to members.

Various initiatives were implemented to ensure all members could understand and contribute to achieving SDGs, including hands-on community experiences, encouraging local resource use, promoting locally sourced food consumption, and reducing transport-related emissions. Subject matter experts from the Department of Agriculture and NGO representatives provided valuable advice to local farmers. Regarding SDG 11, LA21KL promotes collaboration and communal gardening to foster social cohesion and inclusion, enabling communities to progress towards multiple SDG goals.

"For gardening, we focus on SDGs 11, 13, and 17. Like 'zero hunger'. Most gardens under Local Action indirectly contribute to 'no poverty'. Our primary focus is climate action (SDG 13), utilising land for community 'good health and well-being' (SDG 3). Gardening is healthy and integral to our climate action efforts."

(Informant 4)

Most community leaders demonstrate strong networking skills, aligning with SDG 17: Partnership for the Goals. They plan programmes collaboratively with stakeholders, utilise locally sourced materials, reduce their carbon footprints, and develop self-sustainable projects related to the LCL programme.

"Collaborations with agencies or companies significantly impact the community. For example, Taman Tun Dr. Ismail garden works with Maxis to monitor soil acidity. Maxis installs real-time sensors to monitor acidity and make necessary adjustments. This exemplifies successful corporate-NGO collaborations."

(Informant 11)

Regarding SDG 4, communities benefit from various courses organised by LA21KL with academia, government agencies, corporations, and NGOs like Free Tree Society. These informal education sessions emphasise continuous and systematic environmental education, practical planting methods, and appropriate tool usage for planting and harvesting. Members learn fertiliser production and use for personal or communal purposes. A WhatsApp support group discusses fertiliser application problems, the benefits of chemical-free fertilisers, and updates on plant growth progress.

"This fertilizer absorbs quickly without damaging soil. Plants grow faster. To ensure fruit-bearing, we add sulphur and adjust the ratios accordingly, making this fertiliser ideal. For enzyme-based fertiliser, we use brown sugar."

(Informant 1)

Initially, communities had little knowledge of GHG reduction. Through participation in the LCL programme, they developed knowledge, built networks, and utilised communication platforms. The aim is for them to sustain engagement, become self-reliant, and mentor emerging communities with continued expert and government support.

Theme 3: Enhancing Urban Farming

Land constraints pose challenges for urban farming activities in Kuala Lumpur. Currently, urban farming is practised on small plots within housing schemes and schools, on building podiums like KLCH, and under transmission lines like at PPR Intan Baiduri. Although a long-term activity, urban farming offers tangible benefits by engaging community interest and fostering diligence. Many residents, particularly elderly individuals with gardening passion, utilise available empty land for plant cultivation. Increasing marketing efforts and collaborating with MARDI creates potential to expand market opportunities, as evidenced by the successful cultivation of eggplants at PPR Intan Baiduri, leveraging existing community farming knowledge.

"We may not be teaching experts, but we want to share knowledge with FAMA. One FAMA staff member mentioned there is no other place in Kuala Lumpur like ours. He received a headquarters referral saying, 'If you want to see a good example, go to PPR Intan Baiduri. You can learn there'."

(Informant 7)

Urban farming is promoted as both a productive activity and a source of collective pride. Many communities participate in PLANMalaysia's annual competition, *Anugerah Kejiranan Hijau* (AKH). Through this platform, participants learn new techniques from previous winners, including diverse plant cultivation, product uniqueness, and strengthening neighbourhood bonds. Urban farming has evolved within communities, providing valuable skills and enabling income generation through the sale of produce. These skills enable income generation through produce sales and align with SDG 13 by reducing emissions and enhancing climate resilience.

"We understand urban farming's purpose. There is not only a garden and gardening community, but tangible outcomes like neighbourhood bonding and community engagement."

(Informant 2)

During the COVID-19 pandemic, when people worked from home, they had ample time for urban farming activities. Community involvement significantly increased during this period, demonstrating the pandemic's positive impact on lifestyle and encouraging shifts toward sustainable practices.

"We never expected COVID-19. For AKH, our operations changed compared to before. We previously used site visits, but now the situation requires a change. Site inspections are now online. At the community level, people who have never held a hoe are gardening. Those who never met their neighbours now greet them frequently. There are pandemic blessings."

(Informant 11)

LA21KL organised the Kuala Lumpur Neighbourhood Garden Award 2023, featuring forums, product sales, and knowledge-sharing sessions by community leaders, academicians, and industry players. The highlight was the selection of winners from participating communities. Participants received star ratings as appreciation tokens. PPA Seri Perlis II earned a 5-star rating and the Special Jury Award in the Entrepreneurial Community category. This recognition reflects group efforts, community support, and exemplary leadership for other communities.

Theme 4: Enhancing the Recycling Program

Enhanced recycling activities successfully raised awareness among community members about the importance of recycling. They learned that collecting used boxes for paper recycling helps reduce deforestation and machinery use. To address Malaysia's littering problem, the Department of National Security (MKN) introduced the "1 Community 1 Recycling" (1C1R) programme on 23rd April 2022. In Kuala Lumpur, the Department of Health and Environment (JKAS) implemented the 1C1R initiative to address the increasing generation of solid waste. The 1C1R initiative incorporates a barter system concept, where individuals who bring recyclable goods receive incentive items in return. The programme primarily targets community members, especially B40 income groups, in residential areas such as PPRs and PAs. This approach is supported by Castán Broto and Westman (2020) who highlight implementation challenges, particularly in integrating local and community actors into governance, and stress the need for comprehensive strategies that consider local capacities and realities.

"We see many community initiatives, and they often do not realise their actions contribute to a low-carbon lifestyle. When we visited their locations, we explained that their actions contribute to reducing carbon emissions. For instance, food waste can be converted into compost instead of being thrown away. We engage in many activities contributing to low-carbon living, even small-scale ones from home, but should continue doing them."

(Informant 2)

The 1C1R programme includes mentorship components, with the Socio-Economic and Environmental Association (PERSEAS) serving as mentor while various PPR communities act as mentees. This mentorship initiative aims to engage youth in recycling activities, promote environmental preservation, and support government efforts in source separation, ultimately striving for a zero-carbon country status by 2050. PERSEAS, consisting of young members, successfully promotes the 1C1R programme. Their involvement is crucial for sparking youth interest in recycling activities. PERSEAS has become a key reference for other PPRs in

organising and managing 1C1R initiatives. Community leaders also addressed plastic waste through composting workshops with private firms, while NGOs partnered with government agencies and developers to strengthen recycling efforts. Activities involving children were organised through waste segregation programmes, featuring community events such as watching the Asian Cup Qualifiers together and advocacy efforts during the New Year celebrations at Dataran Merdeka. These efforts aimed to impart LCS concept knowledge to community members at every level.

“Through these activities, teenagers were exposed to the environmental impact of waste. That is why educating them first is important. Once they gain knowledge, we can guide them. We do not want to say, 'Do not throw trash simply.' They will ask, 'Why not?' We do not want arguments. Instead, we want them to process information, like children and teenagers in Pekan Kepong.”

(Informant 5)

Theme 5: Economic Sustainability Development

Economic resilience is a key pillar of sustainable development. Recently, the prices of most goods have increased, including those related to urban farming. Community leaders are collaborating to encourage more people to participate in these activities.

“Our gardening skills are not applied on a large scale due to limited land. It is just enough for ourselves. If there is a surplus, we can sell the produce, but the social entrepreneurship element is still present.” (Informant 7)

Urban farming participants record their sales in logbooks. Some participants earn approximately RM300 to RM400 per week, while others make over RM1,000 per month. The sale proceeds are deposited in the cooperative fund, which was established in 2009.

“We provide upskilling opportunities for the community. They can sell their products after gaining knowledge from the LA21KL programmes. Hence, it is one of the indirect returns on investments for us.”

(Informant 7)

Recycling also has an economic impact. While some individuals recycle primarily for cleanliness, others recycle their belongings to generate income, contributing to cost reduction and added value in line with the SDGs. For example, PPR Pekan Kepong keeps data on their recycling activities, which generates revenue and enables them to be independent, rather than relying on grants from LA21KL, as the project is self-sustaining and can progress autonomously. In August 2024, PPR Kepong received *Geran Masyarakat MADANI Rendah Karbon Kuala Lumpur 2024* from the Mayor of Kuala Lumpur. This initiative by KLCH recognises the efforts of community groups that have successfully implemented low-carbon projects in the city.

For community survival, members demonstrate creativity and innovation. They do not aim for fame, but instead engage in recycling activities to ensure survival and overcome financial constraints. They seek methods and ways to implement initiatives that provide benefits, particularly in addressing financial challenges and meeting survival needs following COVID-19 pandemic.

“Through recycling activities, they have sufficient funds to support their urban farming projects, including edible gardens. By recycling, they not only improve their lifestyle but also establish their edible farms, train other communities, and earn an income. This is the best part. When they start earning, it reflects their behavioural change. These youths become mentors, and we can help elevate them to the next level.”

(Informant 5)

Discussion

The findings reinforce that effective climate action requires aligning national policy goals with grassroots realities. While Malaysia's target for carbon neutrality by 2050 is commendable, its achievement hinges on daily behaviours and decisions of urban residents (Azlan et al., 2023; Kuala Lumpur City Hall, 2021). The themes identified (mentorship, inclusivity, urban farming, recycling, and green entrepreneurship) mirror behavioural, social, and economic layers necessary for successful low-carbon transitions.

These findings collectively address the eight critical gaps identified in the literature review. The mentoring theme provides empirical evidence on leadership facilitation mechanisms previously underexplored in Malaysian contexts, revealing how peer-to-peer knowledge transfer sustains community engagement. SDG engagement clarifies the pathways connecting residents' daily actions to broader sustainability goals, addressing the gap in understanding how global frameworks translate into local practice. Urban farming and recycling highlight the informal support systems that enable sustained behavioural change beyond formal programme structures, filling the deficit in understanding social enablers. Economic sustainability addresses equity concerns by documenting how B40 households balance environmental goals with immediate needs through income-generating activities. Together, these interconnected domains provide the contextually grounded insights necessary for designing interventions in rapidly developing Asian cities, directly responding to the call for context-specific intervention design.

Mentorship played a pivotal role in shaping local environmental leaders, supporting Ghaus et al.'s (2017) assertion that transformative leadership stems from sustained capacity building. This aligns with Catana (2020), who stressed importance of structured community learning. As participants shared, guidance from peer mentors empowered individuals to lead projects confidently, anchoring change in relationships and shared purpose. Inclusivity was another defining characteristic. The involvement of elderly, youths, and linguistically diverse groups addressed a significant barrier noted by Whitmarsh et al. (2011), which is climate action must feel relevant to different lived realities. This also echoed SDGs 11 and 17 by ensuring community ownership through collaboration.

Urban farming offers both environmental and social benefits. Participants experienced stronger neighbourhood bonds and better food security, supporting earlier research by Cheng et al. (2024) and Bonsu et al., (2020), which emphasised green infrastructure as both an adaptive and participatory strategy. Meanwhile, recycling functioned as a gateway to broader awareness (Stegeman et al., 2020). Once community members saw tangible benefits, they were more likely to explore composting, gardening, and energy conservation. Economic sustainability emerged as a long-term enabler. Green entrepreneurship, such as youth-led compost sales or cooperative savings, makes environmental actions economically viable, as emphasised by Celata et al. (2019) and Jamaluddin et al. (2023).

Regarding the importance of integrating livelihoods with environmental behaviour. These findings validate the value of community-led, multi-pronged strategies that blend education, engagement, and empowerment. However, implementation still faces barriers, including limited funding, inconsistent participation, and bureaucratic gaps. To overcome these, structured support, consistent leadership, and decentralised decision-making must remain core components of the LCL framework.

Limitation of Study

This study explores lived experiences of community members engaged in low-carbon lifestyle initiatives. However, it does not quantify carbon reduction impacts or compare the effectiveness of different interventions. The findings are drawn from a specific sample of participants in Kuala Lumpur, which may limit the generalisability of the results to other regions or demographic groups. The absence of a longitudinal component also restricts the ability to track long-term behavioural change. Future research should incorporate emission metrics, conduct comparative studies across urban areas, and include extended follow-up to assess the durability and scalability of these solutions.

Conclusion

Progress towards a low-carbon community begins with ordinary choices made by residents and their support systems. This study confirms that mentoring, inclusive participation, urban farming, recycling, and local green enterprise can translate broad climate goals into daily practice. Each theme gains momentum when guided by trusted community leaders who share skills and foster collaboration, addressing the study's three research questions on behaviour, leadership, and policy alignment.

Momentum, however, is fragile. Limited funding, uneven engagement, and weak enforcement can hinder the development of promising ideas. The Sustainable Community Leadership Model responds to these gaps by linking early awareness to long-term systems change. It relies on continuous mentoring, practical education, and partnerships that circulate knowledge and maintain high motivation. Applied thoughtfully, the model can help Kuala Lumpur move towards its 2030 emissions target and offer a transferable path for other Malaysian cities. Future work could pair these qualitative insights with emission metrics to more precisely gauge environmental impact. By placing local leadership at the centre of climate action, the study shows that sustainable living is not an add-on but a shared responsibility that enhances well-being and community pride.

Recommendations

The Sustainable Community Leadership Model, as illustrated in Figure 2, provides a clear roadmap for transitioning low-carbon ideas from discussion into daily practice. Its three-phase sequence, foundation, expansion, and consolidation, keeps the pace realistic while allowing communities to develop their skills and confidence.

Short Term (1 – 3 years): Laying Foundations

Local leaders, city officers, and youth volunteers should co-host workshops on composting, balcony gardening, and waste sorting. Attendance and post-session surveys will track reach and learning outcomes. Emerging champions can participate in a six-month mentorship cycle, which pairs them with experienced facilitators, thereby building a pool of peer educators (Ghaus et al., 2017).

Medium Term (3 – 5 years): Expanding Engagement and Resources

Resident associations, KLCH's Urban Community Unit, and partner NGOs can scale pilot projects to neighbouring flats, while micro-grants funded by corporate social-responsibility schemes cover tools and seedlings. Success will be counted through the number of active groups and self-generated funds from produce sales or recycling rebates. Peer exchanges between estates will deepen skills and solidarity, echoing the call for continuous community learning (Catana, 2020).

Long Term (5 – 10 years): Institutionalising Sustainable Practice

City planners should embed low-carbon criteria into local plans, ensuring that housing retrofits, waste services, and public space designs reflect lessons from earlier phases. Community mentors who complete two cycles can join a city-level advisory panel, renewing their leadership and giving residents a formal voice. Progress will be reflected in municipal key performance indicators, such as emissions per capita and recycling rates (Jamaluddin et al., 2023).

Annual Review

At the end of each year, KLCH, LA21KL, and community representatives will meet to review indicators, share barriers, and reset targets. This feedback loop ensures the plan remains responsive while maintaining clear accountability. By progressing through these stages with defined metrics and shared responsibility, Kuala Lumpur communities can transition from isolated activities to sustained, city-wide routines that advance national climate commitments.

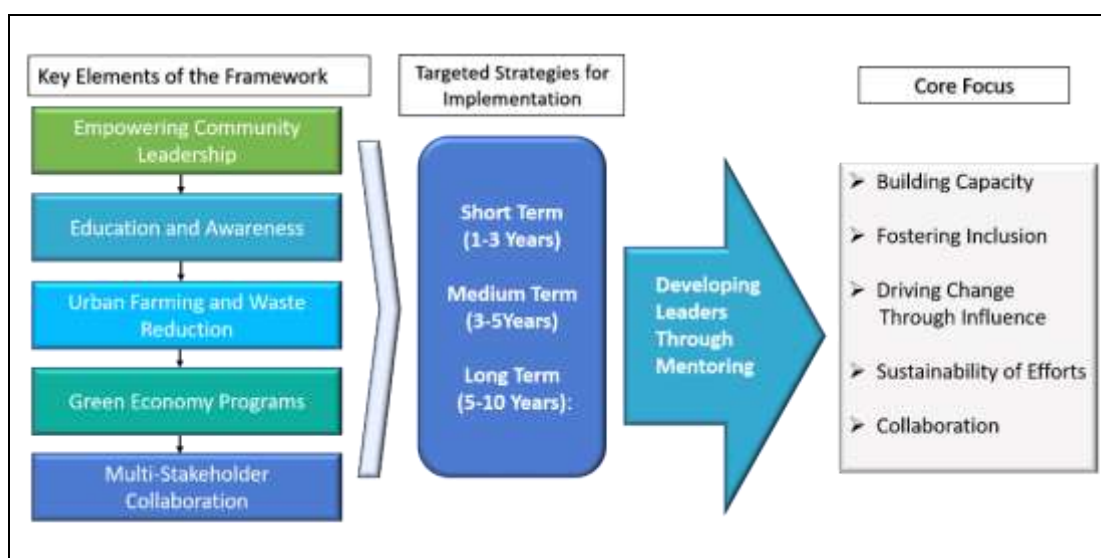


Figure 2: Sustainable Community Leadership Model

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