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SUSTAINABLE URBANISATION TO ENHANCE CLIMATE RESILIENCE IN MALAYSIAN CITIES

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INTRODUCTION

Background

Around the world, climate change is increasingly recognised as one of the most pressing crises of our time. In 2019, the United Nations Secretary-General António Guterres called for all countries to declare a *climate emergency*, a public acknowledgement of climate change as a problem, which needs to be addressed with proactive, long term measures. The COVID-19 pandemic meanwhile has strengthened calls for broad-based resilience, including a focus on sustainability and green recovery.

It is no longer accurate to discuss the phenomenon of climate change solely in the future tense: many countries are already grappling with its effects today, including Malaysia. ASEAN's State of Climate Change Report 2021[1] projects that the region is set to face temperature, precipitation, and sea level rise; frequent dry spells; extreme rainfall events; as well as extreme floods, all of which are increasingly observed across our country in recent times.

Cities and urban life are prominent in the discussion of climate change, both as contributors to and more susceptible victims of the phenomenon. As it stands, the aforementioned effects are felt more acutely in urban areas. With Malaysia on a steady path of urbanisation, national climate change policy cannot afford to ignore the urban lens. Indeed, within the country, over 90% of national economic activity is conducted in cities while more than 74% of the population live in urban areas, a figure that is expected to grow to 82% by 2030 amid rural-urban migration and economic development.[2] Poor coordination in this regard also creates *urban sprawls* (development with minimal consideration towards proper urban planning), where poor utilisation of resources will exacerbate existing issues.

As the climate crisis continues to grow, so does the need to address it. In an urban setting, *resilient cities* are vital towards ensuring the longevity of cities against climate change, in turn securing the wellbeing of their inhabitants. The Organisation for Economic Cooperation and Development (OECD) defines a resilient city as one that can: (i) absorb, recover and prepare for future shocks (economic, environmental, social and institutional), and (ii) promote sustainable development, wellbeing and inclusive growth.[3] Going further, one of the key elements of a resilient city should encompass carbon, or more ideally, climate neutrality.[4] This goal would be in line with Malaysia's pledge of becoming a carbon neutral nation by 2050.[5]

1.ASEAN Secretariat (2021)
2. Global Platform for Sustainable Cities (n.d.)
3. OECD (n.d.)
4. Carbon neutrality is a state of net-zero carbon dioxide emissions, i.e. where there is a balance between carbon emissions into the atmosphere and the amount of carbon dioxide removed through carbon offsets. Climate neutrality goes a step further, implying a state of net-zero emissions of greenhouse gases as a whole.
5. Zakri Abdul Hamid (2017)

While urbanisation itself is a natural consequence of our country's development trajectory, there remains a delicate balance to be achieved in order to avoid creating more or exacerbating existing vulnerabilities within our cities. The road to resilient cities is paved with *sustainable urbanisation*, which this paper aims to explore as a direction for the future of our cities.

Sustainable urbanisation: what it is and why we should care

Sustainable urbanisation[6] focuses on the long term viability of cities, as well as enhancing the wellbeing of both the city and its inhabitants. Wellbeing in this case includes economic, social, equity, environmental factors and so on; factors that contribute to one's day-to-day livelihood conditions. As Figure 1 below suggests, the ideal sustainable city should, as a baseline, provide amenities such as accessible public resources, a comprehensive public transportation system, green infrastructure, and so forth, all of which integrate a positive environmental focus.

Figure 1: **Elements of sustainable cities as defined in the Low Carbon Cities Framework**

Source: Ministry of Natural Resources, Environment and Climate Change (NRECC, 2017)[7]

6. More information on sustainable urbanisation as a whole can be found in Appendix I.
7. The name of the Malaysian ministry responsible for environmental issues has changed several times in the last decade. At various times, the ministry has been referred to as the Ministry of Natural Resources, Environment and Climate Change (KeTSA); Ministry of Energy, Green Technology and Water (KeTTHA); or Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC), among others. For consistency, this paper uses the current iteration of the ministry's name as of December 2022, which is a merging of portfolios between the Ministry of Environment and Water (KASA) and KeTSA.

Therein a less considered aspect of urban planning in relation to climate resilience is also the need for social resilience, which arguably comes hand in hand. It is undeniable that climate change poses a viable threat towards people, and these effects are often amplified among underprivileged and marginalised communities.

Our cities have not only been vulnerable towards the effects of climate change, but also, in recent times, the ongoing COVID-19 pandemic. While the country has shifted towards an endemic phase two years into the pandemic, the fact remains that cities continue to face difficulty in allocating resources to cope with the health and socioeconomic impacts faced, naturally deprioritising other pressing agendas in the process. These are not newfound challenges but systemic issues that have been exposed and brought forth into the limelight due to current events. Hence, sustainable urbanisation can also be used as a means for the country to continue pushing for COVID-19 recovery efforts.

All in all, conducted through desk research, this paper provides an overview of sustainable urbanisation in line with building climate resilience; the current climate change-related challenges Malaysian cities face; current existing frameworks that contribute to sustainable urbanisation; as well as future policy recommendations.

CURRENT CHALLENGES

The United Nations' Intergovernmental Panel on Climate Change (IPCC) states that Southeast Asia is one of the regions most at-risk of facing the effects of climate change. Below are the challenges faced by Malaysia:

1. Temperature rise

Climate change is a direct result of global warming, which is the long-term warming of the planet's overall temperature, in turn causing numerous undesirable effects towards our general environment.

For cities, temperature rise presents itself in the form of the **urban heat island effect**, which occurs when city infrastructure, such as buildings and roads, absorbs and reflects more heat than its outlying landscapes, such as forests and bodies of water, thereby causing urban areas to be significantly warmer than their surrounding areas. Atmospheric pollutants from vehicles and other heat, ventilation and air conditioning (HVAC) systems also trap solar radiation and prevent heat from dissipating, compounding the phenomenon.

The urban heat island effect is not just an effect of climate change but also a symptom. As a consequence of warmer urban temperatures, residents may become more reliant on artificial cooling, which contributes to increased consumption of energy and release of pollutants, thereby further harming the climate. It can then pose various health hazards, such as heat strokes, exacerbating heat-related diseases for at-risk population groups. In light of rising urbanisation rates in the region, exposure to greater urban heat island intensification among urban populations is also expected to be observed, compounded by the general greater heat risks in tropical zones.[8]

Malaysian cities are no exception to the urban heat island effect. Think City's city land surface temperature mapping found the following temperature increases across the country from 1988-2020 (unless otherwise stated):[9]

8. Huang et al. (2019)
9. It should be noted that the data sourced from Think City's land surface temperature mapping is a snapshot from a particular day of the year, not an average for the whole year; however the information can still be indicative of the increase in temperature over the period.

Table 1: **Temperature changes in key urban areas in Peninsular Malaysia, 1988-2020 (unless otherwise stated)**

Urban area	Temperature change (°C)
Kuala Lumpur	+1.64
Bayan Lepas	+5.63
Georgetown	+6.37
Ipoh	+6.75[10]
Johor Bahru	+6.7[11]

Source: Think City (2021)

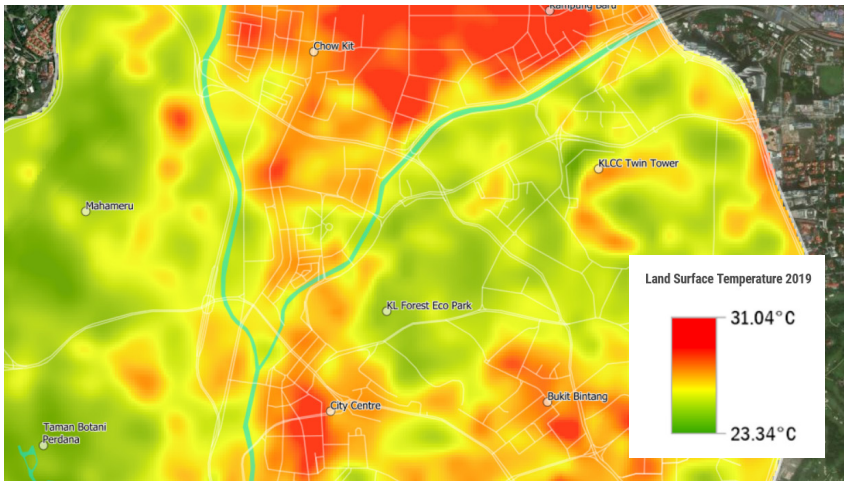
All of these cities can be seen as subject to increased gentrification and urbanisation, where satellite data revealed a significant increase in the city's built environment (i.e. man made constructions) over the years which led to the rise of surface temperature.[12]

The urban heat island effect has unique effects on tropical countries, even more so on our cities. Factors such as humidity and wind levels must be taken into account in planning mitigation strategies. The low wind speeds observed cause poor heat dispersion within our cities, not to mention the high levels of humidity and precipitation causing a larger amount of latent heat. Our cities also experience increased anthropogenic heat due to larger traffic loads and air conditioning use, causing a cycle which further exacerbates urban heat island intensity.[13]

However, Think City's study also showcased the effectiveness of green infrastructure and spaces in reducing the urban heat island effect, with park reserve areas such as KL Forest Eco Park, Taman Botani Perdana, and public spaces and gardens in Mahameru and KLCC recording decreased and/or steadying temperatures, strengthening the case for integrating nature into our urban planning (see Figure 2).

10. This increase was observed between 1998 and 2019.
11. This increase was observed between 2005 and 2018.
12. Think City (c. 2019)
13. Wang K. et al. (2019)

Figure 2: **Land surface temperature map of Kuala Lumpur city centre during the year 2019.**



Source: Think City (2019)

2. Extreme weather

Extreme weather conditions in Malaysia, exacerbated by climate change, consist of heat waves (leading to droughts) and extreme rainfall (leading to floods), both of which will be discussed. These experiences in Malaysia, setting aside native weather conditions, largely stem from the El-Niño-Southern Oscillation, also known as the El Niño and La Niña cycle. The phenomenon is an irregular climate pattern concerned with ocean temperature variations, where El Niño indicates warmer conditions and La Niña indicates colder ones. Following this, El Niño events cause heat waves and droughts to be observed by our country, while the La Niña cycle can cause an increase in rainfall and, by extension, flooding. Essentially, these circumstances cause precipitation extremes, which lead to the extreme weather conditions described. While these are natural climate phenomena, the frequency and intensity of El Niño and La Niña events have also been exacerbated by climate change, with often profound negative socioeconomic consequences.[14]

Having prefaced with this, the extreme weather conditions experienced in urban Malaysia will be further elaborated upon.

Heat waves and droughts

Heat waves and droughts are primarily brought forth by the El Niño phenomenon and further perpetuated by the urban heat island effect observed in our cities.

14. Wang B. et al. (2019)

Globally, in its Sixth Assessment Report, released February 2022 by the IPCC, it was stated that the nine years spanning 2013–2019 were all listed among the 10 hottest years ever recorded, and such a phenomenon showed no patterns of slowing down significantly. Naturally, these conditions pose numerous challenges towards public health, public infrastructure (should our facilities be inadequately prepared for extreme heat), and so on.

More worryingly, heat waves risk increasing food insecurity, which will disproportionately affect our country's marginalised communities. Left unabated, a 2°C increase in temperature could cause a decline of rice yields by one tonne per hectare. According to the ASEAN State of Climate Change Report 2021, this could result in a projected decline of Malaysian rice yields in the range of -5.9% to -30.9% by 2050 in the country.[15] Extended periods of heat have also affected poultry farming in our country, slowing down production and endangering the health of our labourers.[16]

Extreme rainfall and floods

Floods are the most prominent natural disaster faced by Malaysia, projecting to have caused RM5.82bil of damages within 1998-2018 and affecting over 770,000 people.[17] These numbers do not take into account the damages observed over the past year, where in December 2021 a year's worth of rainfall was observed within the span of a day,[18] with at least 37 people found dead and 68,000 people evacuated from their homes.[19]

While it is not necessarily an irregular occurrence for Malaysia to experience heavy rainfall during the monsoon seasons,[20] there has been an increase in recent years during the season, particularly during the 2021-22 floods as previously mentioned. Such a phenomenon should be properly acknowledged as a consequence of climate change and poor mitigation planning rather than the "once every 100 years" event touted by our authorities.[21]

Like heat waves, extreme rainfall affects Malaysia's capacity to ensure food security. As it stands, floodwaters have already destroyed more than 40,000ha of padi fields nationwide between 2017–2021.[22]

In this regard, it is important to remember once again that climate change is an all-encompassing crisis, and that where our infrastructures become affected by its negative effects, so will the wellbeing of our people.

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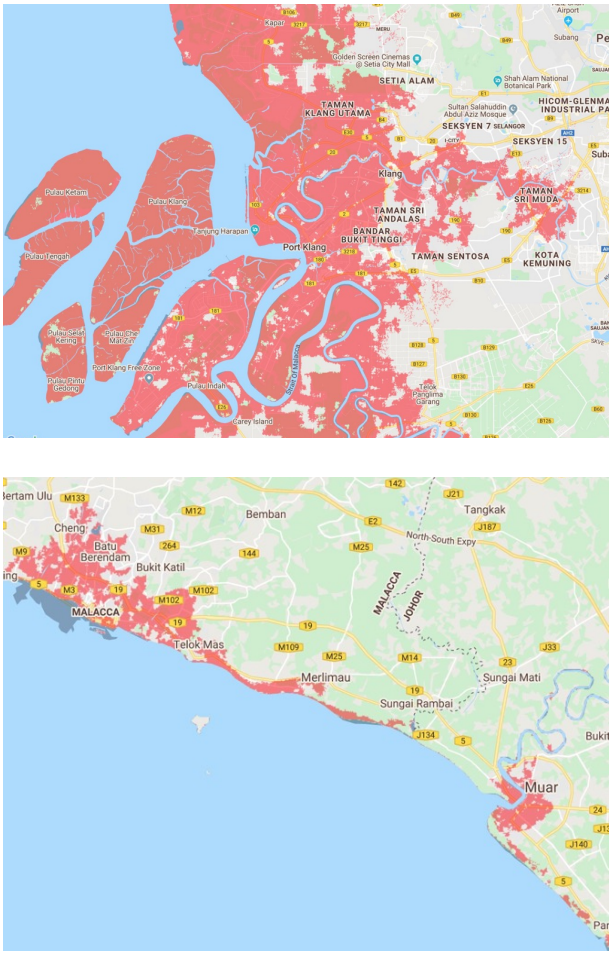
15. ASEAN (2021)
16. Fahmy A. Rosli (2022)
17. Zurairi AR (2018)
18. Amir Yusof (2021)
19. Alifah Zainuddin (2021)
20. Malaysia experiences two monsoon seasons per year: the Southwest Monsoon, which typically takes place from late May to September, and the Northeast Monsoon, which typically takes place from October to March.
21. The Star (2021)
22. Dina Murad (2022)

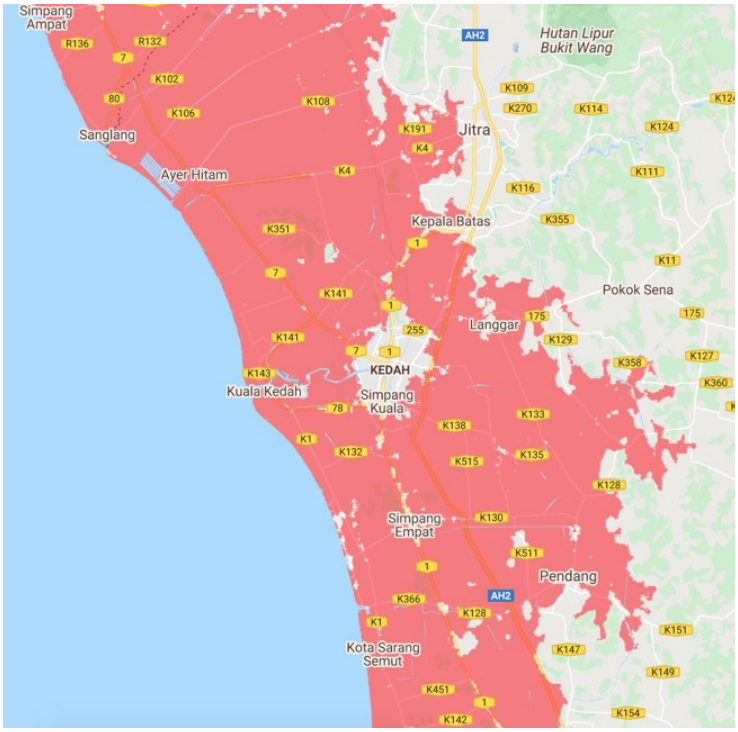
3. Sea level rise

Sea level rise is primarily caused by the effects of global warming, i.e. either the added water from melting ice sheets and glaciers, and/or the expansion of seawater as it warms. Generally, sea level rise in Malaysia can lead to tidal inundation, shoreline erosion, increased wave action and saline intrusion, which in turn will lead to the submergence of corals, loss of fisheries resources, plantation lands, mangrove forests, and a possible relocation of coastal infrastructure.[23] It has also been projected that by 2050, many of our coastal towns including Port Klang, Muar and Alor Setar will become submerged, with surrounding areas and roads partially submerged (see Figure 3).[24]

Figure 3: **Maps of Port Klang, Selangor; Muar, Johor; and Alor Setar, Kedah respectively, where red indicates regions that will become submerged by 2050.**



23. Norzaida Abas et al. (2017)
24. Centre for Governance and Political Studies (2019)



Source: Centre for Governance and Political Studies (2019)

From an economic standpoint, sea level rise poses similar threats to flood damage, the two conditions essentially being of the same nature. Economic damage from sea level rise is projected to primarily stem from the disruption of economic activities, in particular agricultural production, along vulnerable stretches of Malaysia's coastlines.[25] The World Bank Climate Risk Country Profile[26] for Malaysia suggests that Malaysia's mangrove zones could become submerged, and by 2060, it could impact our country's industrial zones. Furthermore, currently 6% of palm oil production and 4% of rubber production is at risk from sea level rise.

Social impacts should also be considered. The worsening of climate change has in recent times created climate refugees—people who are forcefully displaced from their homes as a result of climate change related impacts. In 2018, the World Bank estimated that three regions (Latin America, sub-Saharan Africa, and Southeast Asia) will generate 143 million more climate migrants by 2050.[27] Already, underprivileged people have lost their homes as a result of our frequent flooding; an increase in such a pattern can potentially lead to an internal climate migration crisis.

25. Sarkar et al. (2014)
26. World Bank (2021)
27. World Bank (2018)

4. Climate proofing and disaster preparedness

Climate proofing and disaster preparedness is an integral part of climate change mitigation and adaptation in cities. As the severity of the climate crisis continues to increase, climate proofing becomes an imperative in ensuring our response towards unnatural or unprecedented events is sufficient to avoid lasting damage to our infrastructure and communities. The SMART Tunnel, the motorway tunnel and stormwater drainage system built to tackle flash floods in Kuala Lumpur, is a prominent success story of disaster preparedness. However, as circumstances continue to evolve, more needs to be done.

In general, Malaysia's disaster management efforts follow a "loss reduction model",[28] which is primarily focused on preventing further damages, but fails to address problems at their root cause. While many factors play into the existing condition of our country's disaster preparedness, response in recent times has drawn much criticism due to poor governance. In the case of the past year's flash floods, for instance, emergency response was touted as slow and inadequate,[29] not to mention the general ill-preparedness of both emergency responders and victims due to the unprecedented severity.

5. Impact towards vulnerable communities

It is important to remember that climate change does not just create meteorological challenges — it has real economic and social implications, particularly for vulnerable communities. UNICEF's "Impact of Climate Change on Children: A Malaysian Perspective"[30] report published in October 2021 highlighted how children from indigenous backgrounds and the urban poor (i.e. marginalised communities) are more vulnerable to climate risks due to day-to-day factors such as poverty, illiteracy, poor access to basic services and information, poor housing and living conditions. These factors have also been inadequately considered and thus insufficiently supported in Malaysia's governance framework on climate and environment, which in turn perpetuates more harm towards these communities.

28. Noralfishah Sulaiman et al. (2019)
29. Taylor (2022)
30. UNICEF (2021)

ONGOING MEASURES

As mentioned above, faced with such widespread impact, successive governments at all levels (federal, state and local) have introduced measures to mitigate or improve the situation. However, many programmes suffer from lack of follow-up and coordination between different government departments and agencies, blunting their effectiveness.

1. Overview & existing policy frameworks

The following is a brief overview of Malaysia's ongoing policies on sustainable development applicable to the paper's subject matter (note that it is *not* a definitive list):

Table 2: **Nonexhaustive summary of the key sustainable development policies in Malaysia since 2005**

Year	Policy	Summary
2005	National Physical Plan (NPP)[31]	A spatial planning framework for land development and conservation. Succeeded by NPP2 in 2010, NPP3 in 2015, and NPP4 in 2021.
2006	National Urbanisation Policy (NUP)[32]	A policy document intended to serve as the framework for urban development in Peninsular Malaysia, covering infrastructure, transport, housing, public amenities and urban governance. Succeeded by NUP2 in 2019.
2009	National Policy on Climate Change[33]	A policy document with 43 action points, covering resource management, environmental conservation and governance, to mainstream climate change solutions.

31. PLAN Malaysia (2020)
32. Federal Department of Town and Country Planning (2006)
33. Ministry of Energy, Environment and Climate Change (2009)

Year	Policy	Summary
2011	Feed-in tariff Scheme (FiT)	Scheme that lets households generate their own electricity to sell to the grid.
	Low Carbon Cities Framework	Framework of what constitutes a "low carbon city" in Malaysia and the parameters required to achieve it.
	Green Building Index (GBI) Township	GBI as an assessment tool for an infrastructure's sustainability now applicable at the scale of small communities and neighbourhoods.
2015	11th Malaysia Plan	A broad 5-year plan with a chapter calling for sustainable and resilient green growth, with targets to enhance the green market, promote low carbon mobility and improve waste management.
2017	Malaysia Green Technology Masterplan (MGTM)	Strategic plans for green technology development to create a low-carbon and resource efficient economy.
2018	Establishment of Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC)	Commitments made: no single-use plastics, 20% clean energy generation by 2030, etc.
2021	12th Malaysia Plan	A broad 5-year plan with a chapter calling for the advancement of sustainable and resilient green growth, with targets such as net zero emissions by 2050, 120 towns to reach sustainable urban status by 2050, etc.
	Budget 2022[34]	Announcement of voluntary carbon market (VCM), low carbon transition facility.
	National Low Carbon Cities Masterplan (NLCCM)[35]	A guide for policymakers at all levels of government — federal, state and local authorities for the implementation of low carbon cities.
	Low Carbon Mobility Footprint 2021-2030[36]	Policy framework to mainstream the shift towards electrification in the transportation industry as a key strategy to reduce GHG emissions.

34. Ministry of Finance (2022)
35. Ministry of Energy, Environment and Climate Change (2021a)
36. Ministry of Energy, Environment and Climate Change (2021b)

Year	Policy	Summary
2022	National Low Carbon Aspiration 2040 Plan[37]	To assist with achieving net zero greenhouse gas emissions (GHG) in 2050, addressing energy transition and climate change among others.
	Budget 2023[38]	Year-end launch of VCM, flood mitigation plan until 2030.

Source: Adapted from Ram and Chacko (2019); various other sources described in footnotes 30-37

In terms of international frameworks, Malaysia is committed towards the major climate frameworks, the ones relevant in this context being the Kyoto Protocol, Hyogo Framework (to address disaster risk reduction), and the Paris Agreement.

It should be noted that despite Malaysia's proactiveness in rolling out numerous climate initiatives and plans, there is an overall lack of cohesion when brought together. Many of these initiatives seem to be announced off-the-cuff with no sense of urgency or accountability towards their implementation, even when most have stipulated time frames for execution. In addition, they are generally not widely disseminated in public spheres, making their supposed benefits much less observable. As a result, these initiatives end up as vague goalposts that fail to be accounted for.

From the above table alone, initiatives such as the "Low Carbon Cities Framework", "Low Carbon Mobility Footprint 2021-2030" and "National Low Carbon Aspiration 2040 Plan" at a glance appear repetitive; it is difficult to discern the differences between these initiatives and the separate impacts they are meant to achieve.

Further, the NLCCM[39] attempts to compare these frameworks, but even this comparison insufficiently discerns one framework from another in the substance of its policy recommendations as well as its aims (see Table 3 below).

37. Economic Planning Unit (2022)
38. Ministry of Finance (2022)
39. Ministry of Energy, Environment and Climate Change (2021)

Table 3: **Comparison of low carbon frameworks in Malaysia**

Low carbon cities policy tools/ GHG reporting standards	Description
National Low Carbon Cities Masterplan (NLCCM)	• Developed for Ministry of Environment and Water in 2019 by the Green Technology Application for the Development of Low Carbon Cities (GTALCC) Project with UNDP Malaysia/Global Environment Facility (GEF) fund. • The 3M Approach - Measurement, Management & Mitigation • Policy support for all levels of government • A hybrid document of bottom up and top down policy measures • Roll-out plan in tandem with the 5-years Malaysia Plan (Rancangan Malaysia) • Target: Carbon neutrality for the 33 biggest cities and regions of Malaysia by 2050 and beyond
Low Carbon Cities Framework and Assessment System (LCCF)	• Launched in 2011: Version 2 launched in 2017 • Implemented by Malaysia Green Technology and Climate Change Center (MGTC) • Consists of a framework and assessment system which allows for performance of carbon reduction measures in a city or a township • MGTC introduced the LCC Challenge 2030 a programme to accelerate the transformation towards low carbon cities. The goal of the program is to establish 200 low carbon zones in state capitals and major urban areas by 2030. The LCCF document will be used as a reference in this program. Participating cities annual GHG emission reduction in energy, water, mobility and waste is assessed.
Low Carbon Society (LCS)	• The Low Carbon Society (LCS) blueprints of Putrajaya, Iskandar Malaysia and Kuala Lumpur incorporates a methodology using the internationally recognised Asia-Pacific integrated Model (AIM) to project GHG emissions under various scenarios i.e. Business as Usual (BAU) and Counter Measure (CM) • The term “Low Carbon Society” in the LCS blueprints is created to project the blueprints as a people-centric plan. • All the LCS blueprints were developed by Universiti Teknologi Malaysia-Low Carbon Asia Research Centre (UTM-LCARC) based on a research collaboration between UTM-LCARC, Kyoto University, Okoyama University and the National Institute of Environmental Studies

Low carbon cities policy tools/ GHG reporting standards	Description
Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC)	• GHG Protocol standard developed by World Resources Institute (WRI), C40 Cities Climate Leadership Group and Local Governments for Sustainability (ICLEI) • Launched in 2014 • The GPC is a robust framework for accounting and reporting city-wide GHG emissions. • Local authorities and regional authority which have used GPC as a reporting standard: Majlis Bandaraya Petaling Jaya, Majlis Perbandaran Ampang Jaya, Majlis Perbandaran Hang Tuah Jaya, Dewan Bandaraya Kuala Lumpur and Iskandar Regional Development Authority (IRDA) • One of the key actions in the NLCCM is to align the existing GHG reporting format to GPC

Source: Ministry of Natural Resources, Environment and Climate Change (2021a, p. 126)

Taking another instance, the Green Building Index (GBI) is a recognised green rating system in Malaysia, acting as a measurement of sustainability for green design and construction as well as an assessment for a building's environmental design and performance.[40] An issue with GBI is that it is not a *standardised* green rating system; other green rating systems, such as the Real Estate and Housing Developers' Association of Malaysia (REDHA)'s rating system, Singapore's Green Mark, the Leadership in Energy and Environmental Design system from the United States, and the Building Research Establishment Environmental Assessment Method from the United Kingdom, are at times preferred by Malaysian developers, thus creating a hodgepodge of differing and often incompatible evaluation criteria and accreditations as to what constitutes a green project,[41] resulting in greenwashing through a failure of accountability in maintaining "sustainable architecture".[42] These measures are also, once again, not under governmental regulation or legislation, making any form of accountability even more difficult to achieve.

40. Sustainable Infrastructure Tool Navigator (n.d.)
41. In this case, a developer may opt for an evaluation criterion that more conveniently suits their agenda, thus tokenising the measure rather than implementing it as an ethical and wholehearted contribution towards sustainable development.
42. Yeang, K (2013, p. 367)

2. Disaster risk management

As a general overview, the body in charge of Malaysia's disaster risk management is the National Disaster Management Agency (NADMA). Many of the challenges caused by climate change fall under NADMA's purview. Meanwhile the National Security Council (NSC) Directive No. 20 under the National Security Division in the Prime Minister's Department provides guidelines on the management of disasters, including the responsibilities and functions of the various agencies under an integrated emergency management system.

It is impractical to mention every existing disaster management mechanism here, but one that is particularly relevant to highlight is the Environmental Impact Assessment (EIA),[43,44] an important study mandated under the Environmental Quality Act. It aims to identify, predict, evaluate and communicate information about the impacts on the environment from a proposed project, and to detail out mitigation measures prior to project approval and implementation.

A common thread faced by these organisations, despite being able to carry out the work within their purview, is the lack of legal enforcement. While NRECC's Drainage and Irrigation Department, for instance, is able to create guidelines and provide inputs within EIAs for development projects, there are ultimately no punitive measures to be taken should development projects fail to fulfil or disregard these suggestions.[45]

3. COVID-19 recovery initiatives

Malaysia's COVID-19 recovery initiatives have primarily centred on short-term solutions meant to provide immediate relief, such as stimulus packages.

While the green economy and its initiatives have been acknowledged as a potential avenue for COVID-19 recovery, there generally have been insufficient initiatives taken to back this up. Green spending has been comparatively small, whilst providing unconditional support towards environmentally harmful industries. Existing plans as highlighted in the next point provide little detail or commitment as well. As Malaysia continues its COVID-19 transition into the endemic phase, it is all the more important to integrate green initiatives during this period not just as a means of economic and social development recovery, but also to ensure climate resilience and recovery.

43. Department of Environment (2016)
44. For a simplified rundown, see here: https://bit.ly/ocwutmeia
45. Hana Naz Harun (2022)

4. 12th Malaysia Plan[46] and Budget 2022-2023

The climate agenda has gained further pertinence in the most recent iteration of the Five-Year Malaysia Plans (*Rancangan Malaysia Lima Tahun*; RMLT), the 12th Malaysia Plan (12MP), which specifically highlighted the goal of reaching net zero emissions by 2050,[47] as well as projecting a total of 120 towns to achieve "sustainable urban" status by 2025.

That said, some key highlights towards climate action in 12MP include the following:

- Introduction of the Voluntary Carbon Market (VCM) by Bursa Malaysia,
- Low Carbon Transition Facility (LCTF)[48] by Bank Negara Malaysia, a grant to support SMEs interested to transition into low carbon practices,
- Tax exemptions and other financial incentives for electric and less carbon-intensive vehicles.

Meanwhile, Budget 2022 has a key focus strategy on the sustainability agenda, in relation to fostering a sustainable economy.[49] Its key initiatives include low carbon initiatives, environmental and biodiversity preservation, community empowerment, as well as further enhancing BNM's sustainability *sukuk*.[50] Budget 2023, beyond enhancing the aforementioned points, emphasises the 2050 carbon neutrality commitment and VCM rollout, and bears points on buffing up disaster preparedness mechanisms.[51]

5. A "whole-of-society" approach

Even if the governance and implementation of the various government initiatives were flawless, they most likely still wouldn't be enough to ensure sustainable and resilient urban development. The challenge and ramifications are at such a scale that the response necessarily involves everyone, from individuals to large corporations over small businesses and civil society.

One example of such a whole-of-society approach are Think City's initiatives and collaborations. Think City is Malaysia's leading impact organisation focused on urban policy. Among its main pillars of focus is creating environmental and social resilience.

Not only do they partner with government bodies and international organisations such as UN-affiliated bodies, but also most if not all of their initiatives are driven by community engagement and collaboration, both with civil society organisations and people on the ground to promote

46. Economic Planning Unit (2021)
47. Amir Yusof (2021)
48. Bank Negara Malaysia (2022)
49. Ministry of Finance (2021)
50. *Sukuk*: financial bonds that comply with *Sharia* law.
51. Ministry of Finance (2022)

sustainable citymaking with emphasis on culture, capacity building, climate action and more. Per their website, Think City developed a climate adaptation plan in collaboration with the Penang City Council in Malaysia, the Department of Irrigation and Drainage and UN-Habitat to deal with the impacts of climate change on Penang.

On World Cities Day 2020, Think City hosted and sponsored the launch of the "World Cities Report 2020: The Value of Sustainable Urbanization in Malaysia". The key points of the report that are important to this research include:[52]

- The economic growth and consumption of potential cities must support sustainable development and build resilience to climate change.
- The environmental value of sustainable urbanisation cannot be realised without prioritising the needs of the most disadvantaged.

52. Think City (2020)

POLICY RECOMMENDATIONS

Despite the large number of initiatives already in progress, the increasing frequency and gravity of climate change-related impact will require even more attention from policy makers. This paper puts forward recommendations based upon the existing three-pronged approach towards climate change established by the Paris Agreement — *climate mitigation*, *climate adaptation*, and *climate finance*. Overall, all strategies should be implemented in a balanced manner, as well as with consideration towards a whole-of-society approach, taking into account the overall needs of the public sector in relation to efforts by governmental and civil society organisations, providing agency to each party in carrying out solutions. Following a back-to-basics approach around the three categories mentioned above would help in seeing the wood for the trees, and ultimately facilitate coordination and effectiveness between all parties.

Ultimately the focus of policy recommendations in this area should be as follows:

- Building climate resilience as a preventative method for both short- and long-term,
- Reducing ongoing climate risks and effects, such as the urban heat island effect, flood risks, and so on,
- Ensuring there are avenues for urban areas and their inhabitants to adapt to and address future climate risks.

1. Climate mitigation

The purpose of climate mitigation is to prevent global warming from progressing further by minimising greenhouse gas emissions. This can be achieved through the following two key elements:

(i) Resilience planning

Resilience planning is an integral aspect of climate mitigation, taking into consideration a development project's vulnerabilities in relation to its environment and potential risk factors, and preemptively creating mitigation strategies. In any necessary future development project, harm reduction should be prioritised if it is found that such a project may cause damage towards its surrounding environment and populace. Whenever the cons significantly outweigh the pros, such projects should not move forward. Here, strict enforcement from relevant authorities is also required in order to ensure the effectiveness of mitigation through resilience planning.

Before commencing development planning, **risk assessment personnel or tools** should be utilised to find out the impact of future urban projects. An accessible example of this is ThinkHazard![53] Developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) as administered by the World Bank, the open source tool offers the following features:

- assesses the risks a development project should take into account based on its area of development,
- provides recommendations on how to reduce the risk impact,
- provides general resources for risk evaluation within the area, and
- provides a projection for how climate change may impact the development area in the future.

For instance, ThinkHazard! identifies urban flood hazards and extreme heat as high risks in Kuala Lumpur, and provides a breakdown of what new development projects should take into account to mitigate these issues, such as the kinds of vulnerability assessments to be conducted and how to avoid increasing existing hazards. Taking these points into consideration for the project's adaptive capacity would assist with ensuring future development projects minimise their detriment towards the environment, as well as ensure the project has a baseline towards being sustainable.

Another tool is the aforementioned **green rating system/green certification** to ensure new development projects strive towards a set of criteria for sustainability. For instance, the GBI assesses this with six criteria — energy efficiency, indoor environmental quality, sustainable site planning and management, materials and resources, water efficiency, and innovation — and issues four types of classifications — certified, silver, gold, and platinum — based on its scoring.[54]

In using the aforementioned tools, there is also the need to address existing issues in order to ensure proper implementation as follows:

- Standardise the usage of existing green rating systems to ensure that all projects deemed sustainable meet the same set of criteria consistently.

- Strive towards mandating future architecture to undergo green assessments and require them to meet a certain level of sustainability criteria before moving forward with these projects. This would be a step-up from the current situation where green assessments for development projects are still voluntary. Alternatively, at the bare minimum, developers should be further incentivised to obtain green certification.

53. ThinkHazard! (c. 2020)
54. Green Building Index (n.d.). While GBI has different guidelines for different types of development projects (such as for non-residential new constructions, townships, etc.) the general assessment criteria and categorisations remain similar.

- Re-evaluate development projects every few years like the GBI, which re-evaluates its certified projects every three years. By allowing room for an increase or decrease in rating where applicable, we can ensure the maintenance and consistency of sustainability measures. This reduces the likelihood of installing infrastructure with poor upkeep.

- Adequately train personnel in charge of developing future projects and those involved in the assessment process to ensure proper implementation of sustainable infrastructure. Developers should be made aware of the avenues and options available to make their projects green ones; while personnel involved in the assessment process must be able to (i) identify sustainable infrastructure that is reliable and (ii) provide suitable recommendations for improvement with the best intentions.

From there, we can further the implementation of **Urban Growth Boundaries**. Introduced in the Malaysian National Physical Plan 3, Urban Growth Boundaries essentially partition areas to be used for urban development, while ensuring there remains surrounding green areas to be preserved in their original state;[55] in line with that is the open space policy, where two hectares of open space is allocated per 1000 persons per population for urban areas. City planning authorities must ensure the enforcement of these policies in line with creating people-centric urban development. However, such actions are inadequate on their own. Existing measures also need to be re-evaluated for their effectiveness and contribution towards the trajectory our government purports to strive towards (such as Malaysia's pledged preservation of forested areas up to 50% being inclusive of palm oil plantations due to loopholes in legal classifications[56] rather than solely protected as forest reserves).

(ii) Renewable energy

Where new projects should be developed with a focus on fostering sustainability, a key element they should seek to integrate is renewable energy. Malaysia's existing environment is ripe with opportunities to further implement and integrate renewable energy — as it stands resources such as solar power remain underutilised, and cost-wise integrating more renewables would not necessarily drive up the cost of living in Malaysia[57] (though safety nets should still be and have been considered).

At this time, most responsibility of integrating renewables into one's residence lies upon homeowners to do so at their own accord. While costs for homeowners to implement renewables have become more affordable (such as with the revamping of the Net Energy Metering system), and there exist incentives (such as rent-to-own financial schemes for solar panels) for integrating renewables, green development standards should push further for developers to integrate solar and other renewable infrastructure into their projects.

55. Ram and Chacko (2019)
56. Sahabat Alam Malaysia (2020)
57. Yeo (2022)

2. Climate adaptation

As it stands, Malaysia's climate action is largely focused on mitigation rather than adaptation, as well as actions at the federal government level.[58] Climate adaptation is the adjustment of systems and behaviours that are already in place to prepare for current and anticipated impacts of climate change. For an optimal response against climate change, a balance of both climate mitigation and climate adaptation strategies must be administered hand-in-hand. This can be achieved through the following three concepts:

(i) Retrofitting existing infrastructures

Existing city infrastructures must be adapted to address the landscape changes caused by climate change for many reasons, namely to reduce the urban heat island effect (and other effects of extreme weather events in our cities), to reduce the frequency and impact of natural disasters in cities, and so on. There are multiple avenues to do so.

First, as a *nature-based solution*, **increasing green and blue infrastructure**. As mentioned in the prior Think City study, a prevalence of green surfaces within a region provides a cooling effect, tackling the urban heat island effect, and also helps improve the wellbeing of people.[59]

Second, *sponge cities* as a concept has gained traction in our public discourse as a solution for Malaysian cities' increasingly observed flash flooding, although the notion has been floated as early as 2018.[60] In essence, sponge cities are an ecologically friendly alternative to traditional flood defences and drainage. They work by not only increasing suitable foliage within the stipulated areas but also implementing infrastructure such as permeable pavements to prevent the accumulation of stormwater in streets. Sponge cities can also rechannel and repurpose accumulated water for daily usage, thereby benefiting households. Such an arrangement enables the implementation of rooftop farming and related initiatives, thereby increasing food security, and by extension, building social resilience. With proper planning, they also serve as recreational areas.

It is generally estimated that existing sponge cities serve well to reduce carbon emissions, even functioning as a carbon sink.[61] A carbon sink is a natural or manmade system which absorbs and thereby removes carbon dioxide from the atmosphere. Carbon sinks are important climate mitigation mechanisms, particularly natural carbon sinks such as existing bodies of nature, as addressed with points such as the urban growth boundaries. Outside of preserving

58. Tan and Pereira (2013)
59. Brown and Mijic (2019)
60. Khor (2018)
61. Shao et el. (2018)

natural environments, it is also vital to *create* natural systems that can serve as carbon offset[62] mechanisms. As a combination of both natural and manmade structures, sponge cities are generally a direction that future city development should strive towards.

Some useful case studies for sponge cities are as follows:

- China's Sponge City Initiative is a model example of sponge cities, and its framework is worth localising. It focuses on three aspects: promoting urban ecosystem protection; ecological restoration and repair; as well as low-impact development.[63] The initiative, adaptively covering 30 cities, has greatly assisted China in mitigating its own extreme flooding problem, plus supports sustainable development.

- For local examples, Putrajaya has been held up as an example of a sponge city by the Drainage and Irrigation Department's deputy director-general (specialist sector) Bibi Zarina Che Omar, bearing an environmentally-friendly drainage system through its wetlands.[64] Here, she also emphasises the importance of taking into account Malaysia's own climate and urban conditions (such as foliage suitable for cultivation in Malaysia's urban areas, as well as climate/weather stipulations) in localising or developing sponge city frameworks in order to maximise the effectiveness of such initiatives.

Next, improving infrastructure to support **sustainable mobility**. This should be done to phase out our reliance on carbon-intensive fossil fuels in transportation and thereby reducing vehicular emissions (to which, as stated prior, exacerbates urban heat island intensity); reduce dependence on individual vehicles and encourage public transport/active transportation/ shared-use mobility services as well as improving its accessibility; as well as the further implementation of renewables to improve energy efficiency. In this regard, there are four key strategies as follows:

62. Carbon offsets are the reduction of carbon dioxide or other greenhouse gas emissions, typically as a means to counterbalance emissions created.
63. Ram and Chacko (2019)
64. Hana Naz Harun (2022)

Table 4: **Four strategies to promote sustainable mobility in Malaysia with a description of the current problems and measures to address them**

Strategy	Current problems	Measures to address problems
Prioritising pedestrian- and bike-friendly roads in urban planning	• Current city layouts are overly reliant on individual vehicle transportation (in addition to low uptake of public transport), causing congestion • Even for walkable distances, people often end up opting for vehicular transport due to walkways being poorly maintained, if existent at all	• People-centric city development, including considerations for disabled people and being public transport-oriented • Ensuring pavements are well-maintained and retro-fitted with shading as much as possible. • Instating elevated walkways in vehicle-heavy areas (such as the KLCC elevated walkway) with the bonus of ensuring connectivity with existing public transportation facilities
Further incentivising the use of public transport and shared-use mobility services	• Low uptake of public transport • Inconsistent reliability of services and inadequate levels of connectivity (including poor first- and last-mile connectivity) • Poor availability and consistency in areas outside of the city centre	• Increasing the frequency of buses, especially outside the city centre, and ensuring they adhere to their specific schedules • Increasing partnerships with shared-use mobility services and e-hailing services such as Kumpool and Grab as a stopgap measure towards lack of first- and last-mile connectivity
Further incentivising the use of electric vehicles and lower emission vehicles	• Limited accessibility of electric vehicles and electric vehicle infrastructure (such as charging ports)	• Expanding the usage of electric vehicles in public transportation to eventually serve as a nationwide replacement for carbon-emitting vehicles (such as the GoKL buses), targeting services such as taxis and e-hailing services through subsidies

Strategy	Current problems	Measures to address problems
Establishing low-emission zones (LEZs)[65]	• High GHG emissions and low air quality in urban areas • Over-reliance on (high polluting) vehicular transportation • Pronounced urban heat island effect in urban areas	• Implementing LEZs in a transitionary method, targeting higher emission vehicles in the greater Kuala Lumpur area first • Alternatively, the LEZ can be implemented in shifts • Pair LEZs with the incentivisation of low-emission and electric vehicles, as well as the streamlining of public transportation • As a long-term goal, aim to operate LEZs on a 24-7 basis or even as Zero Emission Zones (ZEZ)

(ii) Resilience infrastructure

From there, there is a need to improve, maintain and protect the infrastructure instated to manage climate risk. Risk factors must not only be identified, but also immediately addressed in the following three ways.

First, to address flooding, the **removal of existing bottlenecks** (such as clogged drainage systems and other impediments towards existing resilience infrastructure) is a short-term solution that can yield immediate results. New development projects should also take care not to aggravate or weaken existing resilience infrastructure. In recent times, some projects have been observed to have contributed to climate change-related disasters through careless practices. Examples include the East Klang Valley Expressway, which is said to have disrupted the area's drainage systems which then aggravated the floods in 2021[66] as well as the construction of the Pan Borneo Highway construction project.[67]

Second, it is important to **improve disaster mitigation mechanisms**, including disaster warning systems for extreme weather, natural disasters, and so forth. The Sendai Framework[68] has defined numerous priority areas and global targets for disaster risk reduction which countries should model their responses after. Additionally, the 2022 iteration of the Global Assessment Report on Disaster Risk Reduction emphasises the need to accelerate risk reduction by "reconfigur[ing] governance and financial systems to work across silos and design in consultation with affected people".[69]

65. LEZs are defined areas or periods where access for polluting vehicles is restricted. Where barring certain vehicles entirely is unrealistic, these zones instead penalise vehicles that do not meet the zone's requirements of carbon emissions per vehicle.
66. Mohamad Fadli (2021)
67. Binisol (2022)
68. United Nations (2015)
69. United Nations (2022)

Third, **disaster financing** at this point is a crucial element in mitigation measures, both for the people and for government bodies to engage in. For laypeople, the awareness of financial measures such as *disaster risk insurance* is a necessity; in 2021, it was noted that despite 4.8 million citizens living in flood-prone areas, nearly 74% of homeowners in Malaysia were not insured against flood risk.[70] While rebuilding resilience infrastructure will reduce the severity of damages, it is a long-term initiative, and financial management is a necessary supplementary measure for both the short term and for emergencies. People currently at risk need to be more aware of disaster risk insurance while underprivileged communities need to be prioritised and given targeted assistance.

For government bodies meanwhile, a balanced approach towards disaster financing must be taken for both disaster preparation (with measures such as emergency repositories) and response (such as targeted financial assistance). Collaborative efforts should also be made with providers of disaster risk insurance to ensure such coverage is further streamlined to the people. While its timing is overdue, Budget 2023 has pledged RM15 billion to a flood mitigation plan running up to 2030 (including "upgrading the weather forecast system to strengthen flood forecasts and warnings at the national level"), as well as further funding to NADMA and the National Disaster Relief Fund.

(iii) Capacity building and community resilience

As part of a whole-of-society approach, building resilience from the ground up is an important factor in climate action. People are often unwittingly subjected to the effects of climate change, and while it is imperative for our institutions to create mechanisms to cope with climate change, the layperson not only needs to be actively involved in consultation processes to ensure these mechanisms are well-rounded, but they also need to be adequately prepared to handle these situations (which more often than not are categorised as emergencies) if and when they arise.

First, for climate emergencies and tackling natural disasters such as flash floods, **emergency action plans** need to be created for **community action**. This process includes:

- organising training drills for the community,
- identifying organisations to be engaged and task forces to be created as response systems,
- determining existing bodies' engagement capacities.

In the formation of emergency action plans, existing vulnerabilities, both systemic (e.g. how effectively can emergency systems respond to disasters and accommodate people in need) and on-the-ground (such as inaccessible exit routes) can also be identified, and then tied back to resilience planning processes in the climate mitigation section. As an example, Budget 2023 is provisioning RM20 million under the Caring Community Organisations Grant for up to 2,000

70. Wan Najwa Wan Sulaiman (2021)

residents' associations to carry out voluntary activities such as holding fire-fighting courses and rendering assistance during disasters such as floods,[71] which is a step in the right direction.

Following this, **empowering local governments** and strengthening decentralisation is also important. Local governments would be able to better pinpoint structural shortcomings within their area and engage with the environment and people on the ground with local initiatives more effectively. Allowing for more focus via a bottom-up approach would also allow for more accountability enforcement-wise, as well as offload responsibilities from governmental authorities, which then allow them to focus on more major, widespread problems.

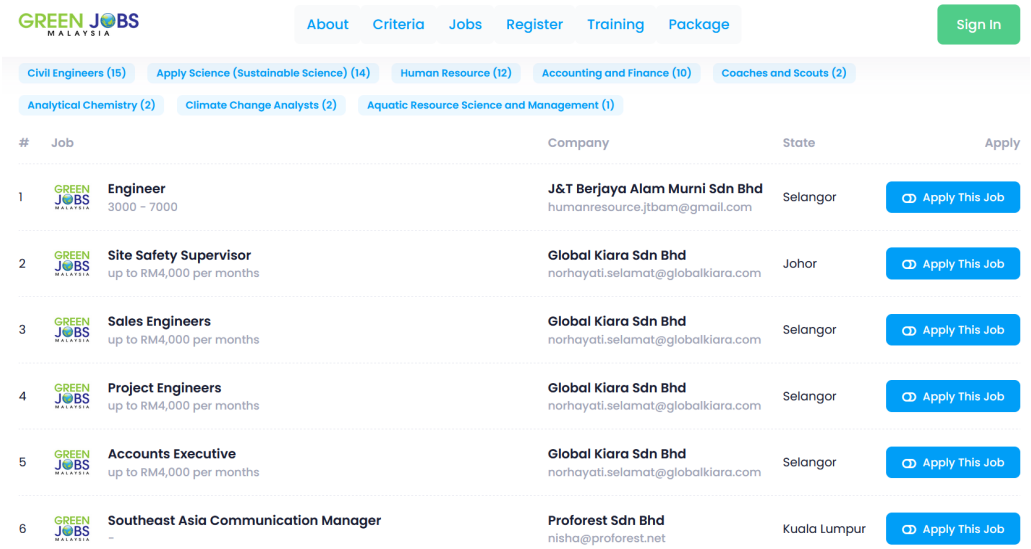
Further, the organisation of **roundtable discussions and engagement sessions** should primarily target those who are directly affected by climate disasters, whilst aiming to be as inclusive as possible (involving marginalised demographics and identities) in order to consider all aspects of human impacts. Organisations such as MERCY Malaysia and Think City regularly organise roundtables with emphasis on community involvement. With this in mind, more collaborative opportunities should be explored, not only in terms of community involvement, but also resource sharing.

Rounding out all of the previous points mentioned under the umbrellas of climate mitigation and adaptation, their implementation will also tie back to the **creation of green jobs**[72] and **reskilling**[73]. Malaysia is already taking steps to facilitate this, such as by relaunching the Green Jobs Portal developed by the Malaysian Green Technology And Climate Change Corporation (MGTC) in June 2022 (see Figure 4). This would also assist our country's social resilience by creating more jobs for fresh graduates that suit their qualifications and mitigate the existing job-skills mismatch in the demographic.

In this regard, employment creation should be guided by the concept of a **just transition**. In other words, green jobs, which focus on phasing out fossil fuels and transitioning into renewables, should wherever possible absorb reskilling personnel who would be at risk of losing their jobs. In addition, green jobs should not be limited to those of a technical nature, particularly given the increasing prevalence of environmental social governance (ESG) and the sustainability agenda opening up new avenues among both new and existing corporations. For instance, there is a need for more sustainability and corporate social responsibility (CSR) consultants. At the end of the day, both employers and job seekers should be made aware of sustainability as a field growing both in scope and necessity.

71. BERNAMA (2022)
72. A green job is defined as "employment that contributes towards environmental protection and conservation in the traditional sectors such as manufacturing and construction or in the green sector that includes renewable energy and energy efficiency" (International Labour Organization, 2016)
73. Reskilling is the cultivation of new talent, and utilisation of existing talent that could not find career paths within their specialisations.

Figure 4: **A screenshot of MGTC's Green Jobs Portal as of December 2022, which has a listing of vacancies for green jobs in Malaysia**



Source: Malaysian Green Technology And Climate Change Corporation (2022)

3. Financing Malaysia's green initiatives

A vital component of implementation for any plan is its funding, which is why it is crucial to keep tabs on budget allocations towards sustainable development and the green agenda. Malaysia has pledged a commitment towards green financing in recent years, dedicating an arm of the budget to sustainable development (for instance, Budget 2023's "Strategy 3: Enhancing Sustainability Agenda"), and Bank Negara Malaysia (BNM) is also actively involved in formulating green financing schemes.

Aside from the pledges made within the 12MP and recent national budgets, climate finance is an arm of climate action to consider. It is a less emphasised, and often overlooked, aspect in addressing climate change, despite the cruciality of financial mechanisms in supporting climate mitigation and adaptation initiatives as highlighted the Brundtland Report[74] and in Article 11 of the Paris Agreement.[75] Climate finance can stem from both public and private, local and international forms of funding. Initiatives such as green bonds and investments, tax and subsidies, all fall under the climate finance umbrella.

74. World Commission on Environment and Development (1987)
75. United Nations Framework Convention on Climate Change (2015)

Preliminary suggestions for financing our country's climate mitigation and adaptation initiatives are as follows:[76]

(i) Carbon taxes

Carbon taxes are widely discussed in green finance discourse, but such an instrument has not been implemented within Malaysia despite the country's commitment to carbon neutrality by 2050 and various framework rollouts. Tax experts have continued to insist that our country is "not ready" for carbon taxation initiatives,[77] but it is important to remember that it is not a novel idea in the region: neighbouring Singapore began implementing a carbon tax scheme back in 2019.[78]

Budget 2023 continues to reiterate the need to conduct a feasibility study on a carbon price mechanism, even though this call to action was introduced back in 12MP, and similar feasibility studies[79] have been conducted in the past by third parties. In other words, there is potential to create far more progress than we have so far. The newly appointed government should seize the momentum and aim for decisive progress in this area.

(ii) Voluntary carbon market and internal carbon pricing

The **voluntary carbon market (VCM) exchange** initiative is in a similar predicament. Introduced in the 12MP along with other green finance initiatives by BNM, VCM was launched on 9th December 2022.[80] Time will tell on the effectiveness of its execution, but the long term end goal should generally aim to transition the VCM into a compliance market or cap-and-trade scheme.

Some companies such as Sunway Group Bhd, CIMB Bank Bhd and Malayan Banking Bhd (Maybank) have already introduced an **internal carbon pricing (ICP)** mechanism within its own jurisdictions.[81] While nationwide actions may not be immediately achievable or adoptable by everyone, companies with the capacity should be encouraged to take up their own internal carbon pricing mechanisms.

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76. The specific machinations of climate finance are beyond the scope of this paper. However, some key potential instruments are discussed briefly in this section.
77. The Edge (2022)
78. National Climate Change Secretariat Singapore (2022)
79. To address criticisms surrounding the potential effect of the carbon tax on low-income households, some studies highlight the importance of implementing safety nets for vulnerable groups that will be affected by any price changes as a result of the carbon tax. See, for example, Joshi (2019).
80. Bursa Malaysia (2022)
81. Tan (2022)

(iii) Other financial methods and incentives

Financial methods and incentives should be further explored, particularly so in order to finance the projects and suggestions put forward in the previous sections. Some examples include:

- **Green bonds**. Budget 2022 and 2023's commitment towards improving and further issuing its sustainability *sukuk* is a step in the right direction, especially seeing that it acts as ASEAN's prime issuer of sustainability *sukuk*.[82]

- Some other financial incentives derived from Budget 2023 include numerous green tax schemes and reductions, funding for green projects such as the Sustainable and Green Biz Financing, Sustainability Incentive Scheme and Juara Lestari Scheme under SME Bank, and so on.

- Assistance from **international climate finance instruments**. Malaysia does seek out green financing from available mediums, such as the Green Climate Fund in order to formulate adaptation and mitigation plans to tackle adverse impacts of climate change faced by the country.[83]

Beyond these, **ecological fiscal transfers (EFT)** provide incentives to increase land and marine conservation, empowering states by allowing them to be reimbursed by the federal government for projects that achieve a set of criteria on said conservation. Budget 2022 and 2023 have both respectively allocated RM100 million to EFTs, though activists have previously noted this as an insufficient amount.[84]

(iv) Consultation sessions

Beyond this, active **consultation sessions** should be held involving financial sector stakeholders; municipal authorities; and, bearing in mind the whole-of-society approach, small business owners, NGOs, and so forth (essentially, parties that can be engaged as green financiers).

Corporations that have yet to devote attention to sustainability initiatives are often hesitant to sink resources into the area or simply commit to the bare minimum impacts which are then inflated for the public eye, essentially amounting to greenwashing. It is important to dispel any notions of misunderstandings corporations may have towards green/sustainability initiatives, and be encouraged to aim for long-term impacts. In this regard, green solutions have often proved to be more economical and effective.[85] For the banking sector, they must be convinced that such initiatives are ventures worth financing. With the aforementioned increased awareness

82. EY (2022)
83. Rozanna Latiff (2021)
84. Nambiar (2022)
85. European Forum on Eco-innovation (2015)

and prevalence of CSR and ESG, such initiatives are also often directly within the interest of corporations to participate in, and when proven to be advantageous and important, will often further attract their investment. This will also ensure effective implementation when initiatives such as carbon taxation and VCM are officially launched.

For small business owners, NGOs and other laypersons, this will bring more of an awareness towards the concept and implementation of climate finance, ensure that marginalised communities do not get overshadowed in development plans, as well as survey the effectiveness of existing green financial schemes (such as BNM's Low Carbon Transition Facility assistance for SMEs).

CONCLUSION

To reiterate Malaysia's current climate targets, our country aims to achieve carbon neutrality by 2050, which Budget 2023 measures strive to affirm. In tandem with this, as Malaysia continues to grow and urbanisation is set to increase over time, creating sustainable cities is an important aspect in achieving this goal, as seen through Malaysia's aim for a total of 120 towns to achieve sustainable urban status by 2025. Given that we can expect increasingly frequent and disruptive climate change-related events, there is significant urgency to implement ambitious and effective plans. Malaysia's climate action plan needs to bring together an ecosystem of actors carrying out a mission-oriented response strategy. While the aforementioned goals can seem overly ambitious on paper, if both top-down and bottom-up approaches are implemented with a balanced and collaborative effort between all actors — public, private, and those on the ground — these targets are most certainly achievable.

REFERENCES

Alifah Zainuddin (2021). Frustration grows in Malaysia over government's slow flood response. *The Diplomat*, [online] 24 December. Available at: https://thediplomat.com/2021/12/frustration-grows-in-malaysia-over-governments-slow-flood-response/

Amir Yusof (2021). Malaysia's 'once in 100 years' flood exposes reality of climate change, better disaster planning needed: Experts. *Channel News Asia*, [online] 21 December. Available at: https://www.channelnewsasia.com/asia/malaysia-once-100-years-flooding-climate-change-disaster-planning-2391316

ASEAN Secretariat (2021). *ASEAN State of Climate Change Report*. [pdf] Available at: https://asean.org/wp-content/uploads/2021/10/ASCCR-e-publication-Correction_8-June.pdf

Bank Negara Malaysia (2022). *BNM's Fund for SMEs: Low Carbon Transition Facility (LCTF)*. [pdf] Available at: https://www.bnm.gov.my/documents/20124/2294076/lctf2022_en_broc.pdf

BERNAMA (2022). Budget 2023: RM15b flood mitigation plan until 2030 in facing climate change. *BERNAMA*, [online] 7 October. Available at: https://www.mof.gov.my/portal/en/news/press-citations/budget-2023-rm15-bln-flood-mitigation-plan-until-2030-in-facing-climate-change

Binisol, L. (2022). 'Monitor mega projects to prevent floods'. *Daily Express*, [online] 11 October. Available at: https://www.dailyexpress.com.my/news/200688/monitor-mega-projects-to-prevent-floods-/

Brown, K. and Mijic, A. (2019). Integrating green and blue spaces into our cities: Making it happen. *Imperial College London* [pdf]. Available at: https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Integrating-green-and-blue-spaces-into-our-cities---Making-it-happen-.pdf

Bursa Malaysia (2022). *Bursa Malaysia launches a voluntary carbon market exchange* [online]. Available at: https://www.bursamalaysia.com/about_bursa/media_centre/bursa-malaysia-launches-a-voluntary-carbon-market-exchange

Centre for Governance and Political Studies (2019) [Twitter] 6 November. Available at: https://twitter.com/CentGPS/status/1191913321391247360

Channel News Asia (2021). 12th Malaysia Plan: What you need to know about the 2050 carbon neutral goal and other green measures. *Channel News Asia*, [online] 28 September. Available at: https://www.channelnewsasia.com/asia/malaysia-12th-plan-carbon-neutrality-2050-green-growth-ismail-sabri-2206756

Department of Environment (2016). *Environmental Impact Assessment Guidelines in Malaysia*. [pdf] Available at: https://enviro2.doe.gov.my/ekmc/wp-content/uploads/2017/02/FA-EIA-GUIDELINE-IN-MALAYSIA-1.pdf

Dina Murad (2022). The climate crisis turns up the heat on Malaysia's food security. *The Star*, [online] 17 April. Available at: https://www.thestar.com.my/news/focus/2022/04/17/the-climate-crisis-turns-up-the-heat-on-malaysias-food-security

Economic Planning Unit (2021). *Twelfth Malaysia Plan*. [pdf] Available at: https://rmke12.epu.gov.my/file/download/2021092722_twelfth_malaysia_plan.pdf?path=fileUpload/2021/09/2021092722_twelfth_malaysia_plan.pdf&name=Twelfth%20Plan%20Document.pdf

Economic Planning Unit (2022). *National Energy Policy 2022-2040*. [pdf] Available at: https://www.epu.gov.my/sites/default/files/2022-09/National%20Energy%20Policy_2022_2040.pdf

European Commission (2018). *Indicators for sustainable cities. Publications Office*. Available at: https://data.europa.eu/doi/10.2779/121865

European Forum on Eco-innovation (2015). Eco-innovation for better business. *BusinessGreen*, [blog] 20 May. Available at: https://www.businessgreen.com/sponsored/2409410/eco-innovation-for-better-business

EY (2022). *Malaysia is prime issuer of sustainability sukuk in ASEAN, with US$3.9 billion of total issuance*. [online] Available at: https://www.ey.com/en_my/news/2022-press-releases/01/malaysia-is-prime-issuer-of-sustainability-sukuk-in-asean-with-uss3-9-billion-of-total-issuance

Fahmy A. Rosli (2022). Hot weather, labour issues, the bane of chicken farmers. *New Straits Times*, [online] 20 May. Available at: https://www.nst.com.my/news/nation/2022/05/797835/hot-weather-labour-issues-bane-chicken-farmers

Federal Department of Town and Country Planning (2006). *National Urbanisation Policy* [pdf]. Available at: https://www.planmalaysia.gov.my/index.php/agensi/penerbitan-planmalaysia/agensi-dokumen-dasar/1944-dasar-perbandaran-negara-bi/file

Global Platform for Sustainable Cities (c. 2015). *Sustainable-city development in Malaysia*. [online] Available at: https://www.thegpsc.org/country/malaysia

Green Building Index (n.d.). *GBI Tools and Reference Guides*. [online] Available at: https://www.greenbuildingindex.org/gbi-tools-and-reference-guides/

Hana Naz Harun (2022). Putrajaya good example of 'sponge city' to avoid flooding. *New Straits Times*, [online] 2 June. Available at: https://www.nst.com.my/news/nation/2022/06/801681/putrajaya-good-example-sponge-city-avoid-flooding

Huang, K., Li, X., Liu, X. and Seto, K. C. (2019). Projecting global urban land expansion and heat island intensification through 2050. *Environmental Research Letters*, 14. Available at: https://iopscience.iop.org/article/10.1088/1748-9326/ab4b71/pdf

International Labour Organization (2016). *What is a green job?* [online] Available at: https://www.ilo.org/global/topics/green-jobs/news/WCMS_220248/lang--en/index.htm

Joshi, D. (2019). A Proposal for Carbon Price-and-Rebate (CPR) in Malaysia. *Penang Institute* [online] Available at: https://penanginstitute.org/publications/issues/a-proposal-for-carbon-price-and-rebate-cpr-in-malaysia/

Khor, M. (2018). Create "Sponge Cities" to Tackle Worsening Floods. *Third World Network*, [online] 5 February. Available at: https://www.twn.my/title2/climate/info.service/2018/cc180201.htm

Malaysian Green Technology And Climate Change Corporation (2022). *Green Jobs Malaysia*. [online] Available at: https://greenjobsmalaysia.my/

Ministry of Finance (2021). *Touchpoints Budget 2022 Measures* [pdf]. Available at: https://budget.mof.gov.my/pdf/2022/ucapan/touchpoints-en.pdf

Ministry of Finance (2022). *Appendix I: Touchpoints Budget 2023 Measures* [pdf]. Available at: https://budget.mof.gov.my/pdf/2023/ucapan/2023-touchpoint-en.pdf

Ministry of Natural Resources, Environment and Climate Change (2009). *National Policy on Climate Change* [pdf]. Available at: https://www.pmo.gov.my/wp-content/uploads/2019/07/Dasar-Perubahan-Iklim-Negara-dwi-bahasa.pdf

Ministry of Natural Resources, Environment and Climate Change (2017). *Low Carbon Cities Framework* [pdf]. Available at: https://www.lccf.my/wp-content/uploads/2018/10/LCCF_Book-Version-2-2017.pdf

Ministry of Natural Resources, Environment and Climate Change (2021a). *Low Carbon Mobility Footprint 2021-2030* [pdf]. Available at: https://www.kasa.gov.my/resources/alam-sekitar/Low-Carbon-Mobility-Blueprint-2021-2030/files/assets/common/downloads/Low%20Carbon%20Mobility%20Blueprint%202021-2030.pdf?uni=f3a4cf55470026182d4336649acc4c01

Ministry of Natural Resources, Environment and Climate Change (2021b). *National Low Carbon Cities Masterplan* [pdf]. Available at: https://www.kasa.gov.my/resources/alam-sekitar/NLCCM.pdf

Mohamad Fadli (2021). PM points finger at EKVE project as a cause of floods. *Free Malaysia Today*, [online] 26 December. Available at: https://www.freemalaysiatoday.com/category/nation/2021/12/26/pm-points-finger-at-ekve-project-as-a-cause-of-floods/

Nambiar, P. (2022). RM100mil not enough to gazette more forests, marine areas, say activists. *Free Malaysia Today*, [online] 28 April. Available at: https://www.freemalaysiatoday.com/category/nation/2022/04/28/rm100mil-not-enough-to-gazette-more-forests-marine-areas-say-activists/

National Climate Change Secretariat Singapore (2022). *Carbon Tax* [online]. Available at: https://www.nccs.gov.sg/singapores-climate-action/carbon-tax/

Noralfishah Sulaiman, Teo, W. S. and Fernando, T. (2019). Community Resilience Frameworks for Building Disaster Resilient Community in Malaysia. *Journal of the Malaysian Institute of Planners*, 17(1), pp. 94–103

Norzaida Abas., Zalina Mohd Daud, Norazizi Mohamed and Syafrina Abdul Halim. (2017). Climate change impact on coastal communities in Malaysia. *Journal of Advanced Research Design*, 33, pp. 1–7

OECD (n.d.). *Resilient Cities*. [online] Available at: https://www.oecd.org/cfe/regionaldevelopment/resilient-cities.htm

PLAN Malaysia (2020). *Senarai Penerbitan*. [online] Available at: https://myplan.planmalaysia.gov.my/www/

Ram, M. and Chacko, R. P. (2019). *Creating Future-Proof Cities: How to Navigate the Climate Crisis. Penang: Areca Books*.

Rasiah, R., Al-Amin, A. Q., Habib-Mintz, N., Chowdhury, A. H., Ramu, S. C., Ahmed, F. and Leal Filho, W. (2017). Assessing Climate Change Mitigation Proposals for Malaysia: Implications for Emissions and Abatement Costs. *Journal of Cleaner Production*, 167.

Rayyan, F., Culas, F. A. and Theseira, J. (2021). *COVID-19 Stimulus and Energy Transition in Malaysia: Analysis and Recommendations*. [pdf] Available at: https://th.boell.org/sites/default/files/2022-01/COVID-19%20Stimulus%20and%20Energy%20Transition%20in%20Malaysia-hires-new.pdf

Rozanna Latiff (2021). Malaysia seeks U.N. climate adaptation funds amid deadly floods. *Reuters*, [online] 27 December. Available at: https://www.reuters.com/markets/commodities/malaysia-seeks-un-climate-adaptation-funds-amid-deadly-floods-2021-12-27/

Sahabat Alam Malaysia. (2020) *Legal classes of forests and conservation areas in Malaysia*. [online] Available at: https://foe-malaysia.org/articles/legal-classes-of-forests-and-conservation-areas-in-malaysia/

Sarkar, S. K., Begum, R. A., Pereira, J. J., Abdul Hamid Jaafar and Mohd Yusof Saari. (2014) Impacts of and Adaptations to Sea Level Rise in Malaysia. *Asian Journal of Water, Environment and Pollution*, 11(2), pp. 29–36

Shao, W., Liu, J., Yang, Z., Yang, Z., Yua, Y., and Lia, W. (2018) Carbon Reduction Effects of Sponge City Construction: A Case Study of the City of Xiamen. *Energy Procedia*, 152, pp. 1145–1151

Sustainable Infrastructure Tool Navigator (n.d.). *Green Building Index for Buildings* [online]. Available at: https://sustainable-infrastructure-tools.org/tools/green-building-index-for-buildings/

Tan, C. T. and Pereira, J. J. (2013). Management of Climate Change and Disaster Risk: The Malaysian Perspective. In: W. Leal Filho, ed. (2012). *Climate Change and Disaster Risk Management*. Heidelberg: Springer. pp. 193–204.

Tan, Z. Y. (2022). Cover story: Getting ready for carbon pricing. *The Edge*, [online] 20 October. Available at: https://www.theedgemarkets.com/article/cover-story-getting-ready-carbon-pricing

Taylor, M. (2022). FEATURE - 'Surprise' urban Malaysia floods drive pleas for climate action. *Reuters*, [online] 2 May. Available at: https://www.reuters.com/article/malaysia-climate-change-floods-idUKL3N2VP0WC

The Star (2021). Once in 100 years: One month's average rainfall poured down in one day. *The Star*, [online] 19 December. Available at: https://www.thestar.com.my/news/nation/2021/12/19/floods-heavy-rain-lasting-over-24-hours-equals-to-average-monthly-rainfall-occurring-once-in-100-years-says-environs-ministry

Think City (c. 2019). *Land Surface Temperature for Kuala Lumpur City Centre*. [online] Available at: https://maps.thinkcity.com.my/think-city/maps/106291/land-surface-temperature-of-kuala-lumpur-city-center

Think City (2020). *Think City Hosts UN-Habitat as part of Global Observance of World Cities Day and Launch of World Cities Report 2020*. [online] Available at: https://thinkcity.com.my/wp1/wp-content/uploads/2021/04/World-Cities-Day-2020.pdf

Think City (2021). *Think City Land Surface Temperature Mapping Shows Malaysian Cities are Getting Hotter*. [online] Available at: https://thinkcity.com.my/wp1/wp-content/uploads/2021/04/THINK-CITY-NEWS-RELEASE-Land-Temperature-Shows-Malaysian-Cities-Getting-Hotter-Final.pdf

ThinkHazard! (c. 2020) *ThinkHazard!* [online] Available at: https://thinkhazard.org/en/

UNICEF (2021). *Impact of Climate Change on Children: a Malaysian Perspective*. [pdf] Available at: https://www.unicef.org/malaysia/media/2211/file/UNICEF%20-%20UKM%20Synthesis%20report%202021.pdf

United Nations (2022). *Global Assessment Report for Disaster Risk Reduction 2022*. [pdf] Available at: https://www.undrr.org/media/79595/download

United Nations (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*. [pdf] Available at: https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

United Nations Framework Convention on Climate Change (2015). *Paris Agreement*. [online] Available at: https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

United Nations Framework Convention on Climate Change (2019). *Climate Finance and Sustainable Cities*. [online] Available at: https://unfccc.int/sites/default/files/resource/SCF%20Forum%202019%20report_final.pdf

Wang, B., Luo, X., Yang, Y-M., Sun, W., Cane, M. A., Cai, W., Yeh, S-W and Liu, J. (2019). Historical change of El Niño properties sheds light on future changes of extreme El Niño. *Proceedings of the National Academy of Sciences*, 116(45). Available at: https://www.pnas.org/doi/full/10.1073/pnas.1911130116

Wang, K., Aktas, Y. D., Stocker, J., Carruthers, D., Hunt, J. and Malki-Epshtein, L.(2019). Urban heat island modelling of a tropical city: case of Kuala Lumpur. *Geoscience Letters*, 6(4). Available at: https://geoscienceletters.springeropen.com/articles/10.1186/s40562-019-0134-2

Wan Najwa Wan Sulaiman (2021). Underinsurance of flood risk. *The Edge*, [online] 27 December. Available at: https://www.theedgemarkets.com/article/underinsurance-flood-risk

Wilson, B. D. (2022). Futureproof City: *Tten Immediate Paths to Urban Resilience*. Routledge.

World Bank (2018). Groundswell: Preparing for Internal Climate Migration. [online] Available at: https://openknowledge.worldbank.org/handle/10986/29461

World Bank and Asian Development Bank (2021). *Climate Risk Country Profile: Malaysia*. [pdf] Available at: https://www.adb.org/sites/default/files/publication/723571/climate-risk-country-profile-malaysia.pdf

World Commission on Environment and Development (1987). *Report of the World Commission on Environment and Development: Our Common Future*. [pdf] Available at: https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

Yeang, K (2013). Environmental Sustainability Through Green Design. In: *Housing the Nation: Policies, Issues and Prospects*. Kuala Lumpur: Cagamas. pp. 367–375. Available at: https://www.cagamas.com.my/sites/default/files/content/publication/pdf/2020-09/Housing%20the%20Nation%20-%20Policies%2C%20Issues%20and%20Prospects.pdf=

Yeo, B. Y. (2022). *The Unfinished Business: Climate Change • Energy • Environment • Science, Technology and Innovation*. Kuala Lumpur: REFSA.

Zakri Abdul Hamid (2017). Towards a carbon-neutral Malaysia by 2050. *New Straits Times*, [online] 13 November. Available at: https://www.ketsa.gov.my/ms-my/pustakamedia/Keratan%20Akhbar/TOWARDS%20A%20CARBON-NEUTRAL%20MALAYSIA%20BY%202050.pdf

Zurairi AR (2018). Climate-related natural disasters cost Malaysia RM8b in last 20 years. *Malay Mail*, [online] 12 October. Available at: https://www.malaymail.com/news/malaysia/2018/10/12/climate-related-natural-disasters-cost-malaysia-rm8b-in-last-20-years/1681977

APPENDIX I: SUSTAINABLE URBANISATION

Sustainable urbanisation focuses on the long term viability of cities, as well as enhancing the wellbeing of both the city and its inhabitants. Wellbeing, in this case, includes economic, social, equity, environmental factors and so on; factors that contribute to one's day-to-day livelihood conditions. Here, we aim to explore how sustainable urbanisation leads to the formation of a sustainable city; where a sustainable city is also a resilient one, thereby creating climate resilience. The ideal sustainable city should, as a baseline, provide amenities such as accessible public resources, a comprehensive public transportation system, green infrastructures, and so forth, all of which integrate a positive environmental focus.

A key aspect of sustainable cities as a driver for climate action, per a UNFCCC report on climate finance and sustainable cities, is that they should be "complementary at all levels and across all sectors, and cities must be supported in their efforts to mainstream climate change and sustainable development in their development plans and strategies".[86] Impacts observed in urban areas and sectors are often interrelated, where negative impacts on one sector are viable to impact many other sectors (for example, floods observed in our urban areas have damaged public infrastructures, threatened food security by damaging crops, and caused public health concerns in the city due to environmental damages), hence the cruciality of balanced strategy planning.

Sustainable development as a framework comprises and should be visualised through the dimensions illustrated in Figure 3.

Figure 3: **Venn diagram representing the standard dimensions of sustainable development**

Source: European Commission (2018)

86. United Nations Framework Convention on Climate Change (2019)

Based on these dimensions, sustainable urbanisation addresses:

- **Economic development** through identifying and integrating green sectors in urban life and development;

- **Social progress** through building social resilience; the creation of green jobs; disaster prevention and preparedness at a community level; encouraging a lower carbon footprint through the incentivisation or provision of more sustainable resources as options;

- **Environmental responsibility** through protecting and cultivating green environments; minimising environmental damages.

All of which are interrelated.

Sustainable urbanisation is also a viable option for facilitating our country's COVID-19 recovery. A "green recovery" has been a suggested direction for Malaysia to further our engagement with sustainable development initiatives; having observed a reduction of carbon emissions during the pandemic, utilising this opportunity moving forward to prime our economy for pandemic recovery is a key entry point to creating more new jobs and sustainable growth opportunities in our country, such as low carbon economy and clean energy transitions, all the while doing its part to slow down climate change.[87] Initiatives such as Melaka's Green City Action Plan 2020, Johor's Green New Deal as well as its recently introduced Smart City Blueprint 2030 are examples of sustainable urbanisation efforts in Malaysia, where they are focused on environmentally-sustainable development that concurrently aims to improve the livelihoods and wellbeing of the people.

Therein a less considered aspect of urban planning in relation to climate resilience is also the need for social resilience, which arguably comes hand in hand. It is undeniable that climate change poses a viable threat towards people, and these effects are often expounded upon underprivileged and marginalised communities. Sustainable urbanisation for social resilience should take into account the purpose of public urban facilities for marginalised communities, take into account differentiated vulnerabilities during its planning, as well as take a whole of society approach into account. The case for building climate resilience alongside and for social resilience is intertwined throughout this paper.

A big obstacle to sustainable urbanisation, and efforts towards addressing climate change in general, is the aversion to long term solutions; particularly in the wake of the COVID-19 pandemic, where many governments and institutions felt the need to focus on short-term solutions, where execution can be carried out quickly to alleviate the immediate impact the pandemic had towards the economy. While the importance of short term solutions should not be overlooked for problems that need to or can be immediately addressed, long term solutions are vital not just in tackling climate change, but also in all aspects of development, setting up preventative measures which payoffs build up for the foreseeable future. In addressing a

87. Rayyan et al. (2021)

problem with the scale that the climate crisis has, short term and long term solutions need to be formulated concurrently and in a complimentary manner in order for them to be effective. It is projected that a failure to commit to long term solutions would reach a cumulative cost of RM40.1 trillion over a 100-year period (from 2010 to 2110).[88] Meanwhile, under an optimal policy scenario (where policies exist to tackle climate change), the cumulative cost drops while economic output increases. Therefore, there exists a concrete imperative for the government to apply a sustainable approach towards our urban planning and climate change mitigation.

An important aspect of sustainable development solutions, particularly long-term ones, is also its adaptive capacity;[89] particularly so in tackling the effects of climate change, as it is an ongoing phenomenon that will have evolving impacts over time and development. In formulating sustainable urbanisation solutions in line with developing climate and social resilience, they should be intuitive above all else. As circumstances change, our solutions should also be flexible in accommodating this change, otherwise the purpose of its sustainability would be defeated. If its long-term viability cannot be guaranteed, relevant authoritative bodies should be ready and willing to allow room for the reconsideration of long-term development projects; should they become redundant based on the circumstances it is meant to address, these projects should be revised or, if necessary, scrapped entirely, rather than persisting for the sake of sunk-cost fallacies.

88. Rasiah et al. (2017)
89. Wilson (2022)

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