FINAL REPORT

Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda

20 APRIL 2018

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TABLE OF CONTENTS

LIST OF BOXES

LIST OF FIGURES

LIST OF TABLES

List of Acronyms

Acronym	Definition
AGR	Agriculture
BE	Built Environment
BIO	Bio Diversity
CAP	Consumer Association of Penang
DIS	Disaster
ES	Energy Security
EXCO	Executive Council
FGD	Focus Group Discussion
GBI	Green Building Index
IG	Institution & Governance
LAND	Land Matters
LRT	Light Rail Transit
MBPP	Majlis Bandaraya Pulau Pinang
MP	Member of Parliament
MPSP	Majlis Perbandaran Seberang Jaya
MRF	Material Recovery Facilities
NGO	Non Governmental Organization
PGA	Penang Green Agenda
PGC	Penang Green Council
QoL	Quality of Life
SD	Sustainable Development
SDG	Sustainable Development Goals
SE	Socio Economic Issues
TRANS	Transportation
WM	Waste Management
WS	Water Security

Preamble

The Services for Stage 1's Stakeholders Consultation for Developing the Penang Green Agenda is commissioned by the Penang Green Council. It is the first of three stages to develop the Penang Green Agenda. This study consists of three (3) key interlinked objectives. The first objective is to identify the current and future environmental issues that align with the United Nations' Sustainable Development Goals. To achieve this objective, the relevant stakeholders were consulted through interviews and focus group discussions. This process fulfils the second objective of this study. The third objective is to identify the public opinion of the Penang Green Agenda (PGA) via surveys and an open day as well as by consolidating the viewpoints of relevant stakeholders through interviews and focus group discussions.

This study adopted a mixed-method approach comprising of quantitative and qualitative data collection and analysis. For the quantitative aspect, data were collected using a standard questionnaire. The questions were formulated from the environmental themes derived from the interviews/focus group discussions. The quantitative data is limited to the questions listed in the questionnaire. Although the original research framework was designed to adopt stratified sampling based on district and ethnic group, due to the client's request to accommodate and incorporate online survey findings through PCG's green activities (Mampan) and the Open Days (i.e. Tesco e-Gate and Jusco Aeon Alma), the sample concentrated on certain districts in terms of representation. This slight anomaly was calibrated and normalised by conducting weighted analysis to view whether there are significant differences between the weighted and unweighted results. The comparative analysis between the two sets of weighted and unweighted results does not show any obvious difference and thus does not alter the conclusion of the analysis.

For the qualitative component, purposive sampling was used to select key informants for the interviews and focus group discussions. In purposive sampling, selected informants almost never represent the entire population (Neuman, 2011: 268).

This is predominantly a perception study where the viewpoints of key stakeholders were solicited. However, the list of stakeholders is not exhaustive and the viewpoints are not

reflective of all stakeholders. Despite many attempts to contact and follow-up with stakeholders, some who were unable to attend the interviews/focus group sessions and several did not respond to invitations to attend the interviews/focus group sessions.

In keeping with the study's objectives, this report is prepared to identify current and future environmental issues. It does not provide solutions or recommendations to address these issues. The compilation of current and future issues in this report is non-exhaustive as there might be pertinent or relevant issues that were not highlighted during the interviews or focus group sessions, and thus, were not captured in this report. The data are reported and presented as it is, especially the qualitative component without further interpretation. The outcome of this report is to establish the scope for Stage 2's Stakeholders Consultation as part of the process to develop the Penang Green Agenda.

Reference

Neuman, W.L. 2011. Social Research Methods: Qualitative and Quantitative Approaches (7th ed.) Boston: Pearson.

Executive Summary

Disclaimer: The findings of this study are based on the views and perspectives of stakeholders gathered from interviews, focus group discussions and public survey. It is important to note that while some issues, as opposed to others, received great concern from certain stakeholders, those issues need to be interpreted with caution due to limitations in the number of respondents, restrictions of content discussed and surveyed and limitations in participants' knowledge and awareness.

This study aims to fulfil the following three principal objectives: (i) to identify the current and future environmental issues that align with the United Nations Sustainable Development, (ii) to consult the relevant stakeholders via interviews and focus group discussions, and (iii) to identify the public opinion of the Penang Green Agenda (PGA) via surveys and open days.

1. The stakeholders involved in this research are government agencies (state and local), EXCO members, developers, NGOs, environmental agencies and the general public.

2. The research methodology involves a mixed-method approach comprising quantitative and qualitative data collection. Qualitative data is gathered from five (5) focus group discussions, 17 interview sessions and two (2) open days. Quantitative data is gathered from public surveys. A total of 2,498 survey forms were gathered for the public survey from face-to-face interviews and an online survey. Stratified sampling based on district and ethnicity is adopted in executing the public survey.

3. The number of public surveys by district is 438, 844, 392, 547 and 277 for Barat Daya (BD), Timur Laut, (TL) Seberang Perai Utara (SPU), Seberang Perai Tengah (SPT) and Seberang Perai Selatan (SPS), respectively. The analysis of data from this public survey uses weighted analysis to take into consideration the overrepresentation of the sample from the actual sample needed for the study.

4. Qualitative analysis from focus group discussions involves content and thematic analysis. The identified themes are socioeconomics (SE), agriculture (AGR), biodiversity (BIO), transportation (TRANS), built environment (BE), waste

management (WM), land matters (LAND), water security (WS), energy security (ES), leadership (LEADER), disaster (DIS) and institution and governance (IG).

5. Quantitative analysis from the public survey is based on a semi-structured questionnaire. The questionnaire is divided into five categories: (i) socio-demographic profile, (ii) individual and household behaviours on green practices, (iii) psychosocial behaviour, (iv) perception and awareness of current environmental and developmental issues and (v) perception and views of future issues and challenges.

6. Current issues as identified by stakeholders during the focus group discussions and interviews concentrate on many areas of Sustainable Development Goals (SDGs) with SDG 11 issues dominating the discussion. Among the pertinent subjects addressed in SDG 11 are limited open and green spaces, improper location of residential areas, limited number affordable housing and disappearance of urban village (BE), limited land development, uncontrolled hill development, land reclamation and unbalanced land development (LAND), increase in population (SE) and traffic congestion (TRANS). Other issues discussed include issues relevant to SDG 6 such as poor waste management practice (WM), improper sanitation at construction site (BE) and seawater pollution (WS), SDG 9 such as air and noise pollution at construction site, high cost of Penang Transport Master Plan and limited initiative of green technology (BE) and SDG 1 such as insufficient programs to assist with poverty eradication, attitude of urban poor, homeless and beggars (SE).

7. From the public survey, it is concluded that environmental issues in Penang are perceived as serious and fairly serious. Serious environmental issues are excessive land reclamation, flash flood, chronic traffic jam and deforestation. Fairly serious environmental issues are diminishing waterfront, noise pollution, inefficient solid waste management, water pollution, limited open and green spaces, air pollution and rising temperature. Nevertheless, with regard to the seriousness of environmental issues based on districts, results showed four main issues heavy traffic (except SPS), flash flood (except SPT and SPU), deforestation and land reclamation.

8. The public survey revealed that Penangites are dissatisfied with affordable housing, land development, littering, level of noise, and access to green and open space. All of the mentioned problems exist in all districts. SPU shows no issues of affordable housing and land development while also facing noise problems. Furthermore, SPS expressed dissatisfaction on solid waste management.

9. In the context of SDGs, Penangites are concerned with the SDGs issues mentioned. Also, the results show that residents in five (5) districts are very concerned about water pollution, deforestation, the efficiency of public transport and affordable housing. Other SDGs issues include job security (SPT and SPS) and food security (TL, SPU and SPS), while in TL, the issues are related to unbalanced development and lifestyle.

10. BE, WM, TRANS, BIO and AGR are documented as current green practices, with BE appearing as the most practised theme by the interviewed and surveyed stakeholders. Among the BE practices are solar panels, green office projects, green office certifications, green building index, eco-town, and LED street lights. Stakeholders are also keen on SE issues such as programs for the poor and vulnerable, health programs, equal gender employment opportunity and assistance for entrepreneurs. The current practices are confined within 15 SDGs, namely 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13,14,15 and 17.

11. From the survey, it could be concluded that green routine practices are uncommon among households. Nevertheless, households have been identified to be involved in at least some form of green practice. The most common green practice by households is waste management.

12. The discussion of current challenges is based on the focus group discussions and interview sessions only. Current challenges are defined in 15 SDGs, with the exception of SDGs 10 and 12. The themes commonly cited by stakeholders are BIO, BE, SE and WS. The current challenges referred to commonly are issues pertaining to land reclamation. Among them are challenges in minimising the impacts of land reclamation on food security, future development, life below water, mangrove forest

and chemical and toxic spills to sea. Other BIO challenges include the challenges to reduce pollution and animal migration.

13. With regard to psychosocial behaviour, the study finds that the public is not ready for immediate green lifestyle changes and not ready to embrace and adopt green initiatives fully.

14. Future issues discussed during the focus group discussions and interview sessions include SE, IG, TRANS, AGR, LAND, BE, BIO WS, ES and WM. The issues discussed fit SDGs 3, 4, 6, 7, 9, 10, 11, 12, 15 and 17 with SDG 11 mostly cited. In SDG 11, the issues concern efficient public transportation (TRANS), balanced development between Penang Island and Seberang Perai (LAND), green and open spaces (BE) and integrated solid waste management (WM).

15. The top future issues identified by the public from the public survey are more trees, better and efficient public transportation, accessibility of clean water and sanitation, more open and green spaces, more recycling facilities, empowering vulnerable groups, incorporating disaster management in urban planning and quality pedestrian pathways.

16. Future challenges gathered from an open-ended form of the public survey are traffic jam, flood, flash flood, landslide, air pollution, water pollution, littering and deforestation. The solutions forwarded by the public to overcome such challenges are improving the drainage system, improving public transport, control development, law enforcement, plant more tree and impose strict fines.

17. Future challenges as identified by stakeholders during focus group discussions and interviews mostly refer to the struggle in resolving the identified current issues. The issues discussed various themes such as SE, IG, AGR, TRANS, WS, WM, LAND and BE with issues on SE and POLICY being the most discussed. Among the SE issues raised is dependence on assistance that does not break the poverty cycle, behaviour and attitude of the general public, extending assistance to vulnerable groups for social equality and food wastage. Future challenges discussed on POLICY focus on the role

of government and their limitations to tackle funding issues, to solve public conflicts, to adhere to public interests and the needs of training programs, the constraints on implementation, enforcement and monitoring and to collaborate with relevant agencies in solving community problems.

18. Based on the qualitative and quantitative analysis, the study finds that all SDGs are discussed in at least one category of current issues, current practices, current challenges, future issues and future challenges. Hence, in shaping the Penang Green Agenda (PGA), a holistic approach that encompasses all SDGs needs to be embraced. It is through the realisation and accomplishment of all SDGs that quality of life of the people would be enhanced. Nevertheless, it could be concluded that SDG 11, sustainable cities and communities be treated as the most important SDG given that the many issues discussed fit many of the themes.

19. With regard to PGA focus area, the areas identified by stakeholders are BE, SE, TRANS, WM, BIO and IG.

20. In conclusion, the following could be deduced:
    (i)   Socioeconomic issues remain relevant and of great concern to many stakeholders.
    (ii)   With regard to current issues, the public expresses their concerns on issues that have a direct impact on their life, i.e. flash floods, solid waste management, limited green spaces and recreational areas as well as affordable housing.
    (iii) The public also expresses their concern on long-term environmental changes such as climate change, erosion, pollution and limited green spaces.
    (iv)   While awareness of green issues is considerably high, routine green practices are noticeably low.
    (v)   Limited budget, lack of regulation and enforcement are the main challenges towards strengthening education and increase awareness of the importance of sustainable practices.

Chapter 1
Overview of Sustainable Development

The year 1962 marked a turning point in the development of sustainability. It was the year where the modern environmental movement began with Rachel Carson. Her remarkable book, Silent Spring (1962), reported the catastrophic levels of agricultural pesticides in the environment causing harm to animal species as well as to human health.

After ten years, in 1971, Maurice Strong, Secretary-General of United Nations (UN) in a conference on Human Environment documented a report named 'Only One Earth'. This was the first report documented as an outcome of the first UN meeting in the year 1972 on the environment in Stockholm (UN Millennium Project, 2005), reporting on the critical findings by 152 leading experts from over 58 countries. The results stressed the anthropogenic or human-led impact on the biosphere. This was a wake-up call to all stakeholders to create a common future (International Institute for Sustainable Development, 2012).

The effort for sustainable development progressed to Earth Summit, 1992 in Rio de Janeiro with significant outcomes including Agenda 21, Convention on Biological Diversity, the Framework Convention on Climate Change, Rio Declaration, and non-binding Forest Principles (International Institute for Sustainable Development, 2012). A decade later, the world moved assertively to address challenges of development in an interdependent world (UN News Centre, 2002). The agenda was tabled at the World Summit on Sustainable Development (WSSD), 2002, Johannesburg, under the leadership of Kofi Annan. Separately, to mark the beginning of new millennium, UN General Assembly adopted about 60 new goals including eight Millennium Development Goals (MDGs) in September 2000 in New York.

Despite numerous commitments, we are still far from sustainable development. Data collected over two decades has demonstrated that the growth in global emissions is accelerating. The global emissions rose 10% from the year 1990 to 2000 and 33% from the year 2000 to 2010 and now, accumulatively, increases by more than 46% since the year 1990. The emissions amply global warming (MDG, 2013). Moreover, the impact of land degradation globally has resulted in poverty and hunger and has forced rural-urban migration

(UN Millennium Project, 2005). Consequently, an estimated 863 million people in the developing world reside in urban slums (Millennium Development Goals, 2013).

In 2007, about 28% of marine fish stocks were over-exploited, and many species on this planet are at risk of extinction despite the increased number of protected areas (UN, 2010). Forests also demonstrated an alarming rate of deforestation despite the establishment of sustainable forest policies. South Africa and America recorded the largest net deforestation with 3.4 million and 4.0 million hectares per annum, respectively in 2000-2010 (FAO, 2010). One of the underlying factors to deforestation is the land conversion (forests to agriculture), driven by the world's growing population (Millennium Development Goals, 2013). More people means more food. It is evidence that supply and demand in global business activities pose a tremendous impact on the earth's ecosystems, resulting in the degradation of environmental quality.

Despite the rapid economic growth, achieving equitable and sustained development remains elusive for many countries. It requires a shift from growth to development (Gladwin et al., 1995). Economic growth was usually attained at the cost of greater inequality, weakened democracy, loss of cultural identity and overconsumption of natural resources needed by future generations (Soubbotina, 2004). To some extent, economic growth was not followed by similar progress in human development. Consequently, slow human development can put an end to fast economic growth. This growth pattern was labelled as a 'dead end' (Soubbotina, 2004).

Sustainable development emphasises that growth must be environmentally sound and inclusive. It aims to reduce poverty and build shared prosperity for today's population and to continue to meet the needs of future generations (WCED, 1987). The concept of sustainable development is built upon three pillars: economic growth, environmental stewardship, and social inclusion. Another perspective views the modern concept of sustainability upon four principles: natural resources scarcity, ethics of conservation, limits to growth and international development experience (Hezri, 2016). Despite various concepts, the application of sustainable development carries across all sectors of development, including the built environment, energy, water, transportation, waste management and agriculture.

Due to its multifaceted meanings, the concept of sustainability is difficult to operationalise (Hezri, 2016). Nevertheless, a number of countries have defined sustainable development based on its different components. The most common framework used by countries in developing indicators of sustainable development starts from the idea of three pillars of sustainability (Haas et al., 2002). Another dimension of sustainable development that is often mentioned in the context of work on indicators covers institutional aspects. The institutional dimension was one of the four categories (economic, environmental, social and institutional) used by the United Nation's Commission on Sustainable Development (UNCSD) (Haas et al., 2002). Malaysia has developed similar indicators such as economic sustainability, environmental and resource sustainability, social sustainability and legal and institutional sustainability (Hezri, 2004).

1.1 Overview of Sustainable Development Goals (SDGs)

With the impending expiration of the Millennium Development Goals (MDGs), the UN coordinated global efforts to launch its successor. On 25 September 2015, the UN High-Level Panel of Eminent Persons, where political leaders from every part of the world agreed upon a bold approach that is expected to influence the shape of the post-2015 agenda, dubbed the Sustainable Development Goals (SDGs). It is a universal agenda for all countries driven by five big transformative shifts. These universal shifts are:

1. Leave no one behind, where the world should move from reducing to ending extreme poverty in all its forms. Also, goals should be designed to focus on reaching excluded groups.
2. Put sustainable development at the core by integrating the social, economic, and environmental dimensions of sustainability.
3. Transform economies for jobs and inclusive growth, while moving to sustainable patterns of work and life.
4. Build peace and effective, open, and accountable institutions for all, which encourage the rule of law, property rights, freedom of speech and the media, open political choice, access to justice, and accountable government and public institutions.
5. Forge a new global partnership so that each priority should involve governments and also others, including people living in poverty, civil society and indigenous and local communities, multilateral institutions, business, academia, and philanthropy" (Todaro & Smith, 2015: 27).

On January 1, 2016, the Sustainable Development Goals (SDGs) was accepted officially as a global agenda. Through SDGs, the UN sets 17 common goals, with 169 targets for all nations that need to be achieved by the year 2030. SDGs is not just an environmental agenda but also aims to elevate social well-being and economic growth. As shown in Figure 1.1, the targets of sustainable development goals cover multidimensional aspects which include poverty and hunger; health and well-being; quality education; gender equality; clean water; clean energy; work and economic growth; sustainable industrialisation and city; reduce inequality; responsible consumption; carbon reduction; life on land and oceans; fair governance and security; and partnership to achieve sustainability goals. Not all of these global targets would be a central focus of countries' development planning, but instead, they can opt to prioritise on critical areas (Komoo, 2017).

Figure 1.1 Sustainable Development Goals (SDGs)

Together with other world leaders, Malaysia adopted the 2030 Agenda for Sustainable Development (2030 Agenda) at the United Nations General Assembly in New York on 25 September 2015. Malaysia is implementing the SDGs in three phases, coinciding with the five-year Malaysia Plan period (EPU, 2017). The first phase (2016-2020) will prioritise SDGs according to 11th Malaysia Plan. The second phase (2021-2025) will focus on post-2020 goals and targets. The remaining goals and targets in line with Malaysia's capacity and

global role will be commenced under phase 3 (2026-2030). Hence, most of the SDGs programs and projects are funded through existing Government budget. It is envisioned that funding and resources from the Government will be supplemented through collaboration with the private sector, NGOs, civil society and international agencies (EPU, 2017).

Figure 1.2 shows the current Malaysian performance of SDGs. Malaysia is ranked 54 out of 157 countries. Regarding index score, Malaysia managed to obtain a score of 69.7%. The score is below the average score of OECD countries (77%) but above the score of East and South Asia (63.3%). The recorded lowest scores are SDG2, SDG5, SDG10, SDG14 and SDG15. Details of the priorities for the five goals outlined by EPU (2017) are given in Table 1.1.
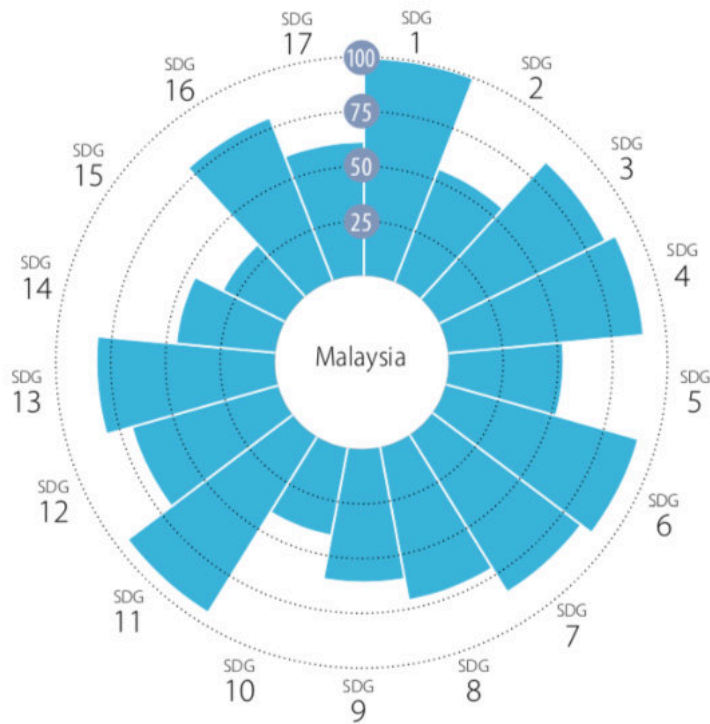
Figure 1.2 Malaysia SDGs Average Performance, 2017

Source: www.sdgindex.org

Table 1.1 Priorities on selected SDGs

SDGs	Priorities
2. Zero Hunger	• Reaching pockets of remote communities that have food and healthcare needs • Reducing the incidence of obesity, which is a rising issue • Ensuring food security in the face of climate change • Accelerating the adoption of sustainable agricultural practices
5. Gender Equality	• Ensuring gender empowerment • Reducing all forms of gender discrimination • Reducing gender-based violence
10. Reduced Inequalities	• No priorities have been outlined in the Sustainable Development Goals Voluntary National Review, 2017 (EPU, 2017).
14. Life Below Water	• Achieving holistic marine and coastal management at both federal and state levels • Strengthening monitoring, surveillance and enforcement capacities • Enhancing knowledge of marine resources • Minimising the impact of climate change on the marine and coastal ecosystem
15. Life on Land	• Strengthening institutional and regulatory framework for forest management • Increasing capacity of related agencies • Strengthening monitoring, surveillance and enforcement capacities • Intensifying reforestation e orts nationwide • Strengthening partnerships with indigenous and local communities

Source: EPU (2017)

Collaboration between government, the private sector, NGOs, civil society and international agencies is crucial in ensuring the success of SDGs targets and priorities. The success of this global agenda also requires a 'bottom-up' approach (UNDP, 2017), where elements such as political courage, strong leadership and good governance are seen as a major prerequisite in ensuring that the agenda can be achieved successfully (UN, 2016).

1.2   Public Awareness of Sustainable Development of Goals (SDGs)

The Sustainable Development Goals (SDGs) is established as an agenda for the global community. It is often associated with the people's goals. Mogens Lykketoft (President of the 70th Session of the UN General Assembly) in his video message for the event 'Communicating the Sustainable Development Goals - for Everyone' urged every nation committed to SDGs to ensure that its people understand the aspirations of this global

14

agenda. The result from our survey shows that only 31.34% of people in Penang have heard of the SDGs (Figure 1.3). The numbers are quite impressive compared to other countries. Statistics from the 2017 Eurobarometer indicate that only about 10% of Europeans know what the SDGs are (OECD Development Communication Network, 2017).

YES	NO
31.34%	68.66%

Figure 1.3 Public awareness of Sustainable Development Goals (SDGs)

Source: Survey (2018)

1.3   How to measure environmental impact of urban areas?

The growth of population is continuously increasing causing an increase in the consumption of food and extraction of natural resources. As a result, both the industrial economy and developing economy have increased humanity's ecological burden on the planet (GRDC, n.d.). Food, electricity, and other basic amenities for people to survive need to be produced and are extracted from natural resources. Some natural resources such as food from crops, aquatic resources, energy and others need to be sustained to meet population demand. Cities are growing inexorably. Inevitably their environmental impact will worsen (Newman, 2006). In 1995-2000, the world's urban population grew at a rate of 2.1% per year. For the 2000-2030 period, it will grow at an average annual rate of 1.8%. At that rate of growth, the world's urban population will double in 38 years (UN, 2000). Hence, the measurement of environmental impact on urban areas is needed. Locally, municipal decision-makers should be able to measure urban and regional ecological impacts for policy design. Prior to that, policymakers and all pivotal actors need to list indicators which define the criteria for ideal types (Chambers, 1992) and describe the steps for measuring the sustainability of city planning (Maclaren, 1996).

The Environmental Impact Assessment (EIA) and Ecological Footprint (EF) are the methods used commonly in measuring the environmental impact of urban areas. Environmental Impact Assessment (EIA) is a study of the effects of a proposed project, plan or program on

the environment (Ogola, 2007). EIA focuses on the impacts that are expected from a proposed decision (Field & Field, 2017).

The Environmental Impact Assessment (EIA) is a tool or procedure used to assist any new or existing environmental and development plans or projects. The United Nations Environment Program defines it as "an examination, analysis, and assessment of planned activities to ensuring environmentally sound and sustainable development" (UNEP, 1996). The requirement for EIA is mandatory by law and is institutionally embedded in many countries. It plays a significant role in protecting an environment to ensure sustainable development. The procedures and objectives of EIA also vary according to countries and their development projects and environmental management. According to Yussoff & Hashim (1996), the goals of EIA in Malaysia are:

1. To examine and select the best from the project options available.
2. To identify and incorporate into the project plan appropriate abatement and mitigating measures.
3. To predict the significant residual environmental impact.
4. To determine the significant residual environmental impacts.
5. To identify the environmental costs and benefits of the project to the community.

While the process can be multidimensional and technical, one of its important approaches is to involve the public as environmental impacts can have serious implications to people's life.

Another approach to measuring the environmental impacts of urban areas is by conducting an ecological footprint analysis. All natural resources such as water and energy use land for infrastructure and agriculture, forests, and all other forms of energy and material inputs that people require on their daily basis are counted. As consumption of food is increasing, waste generation is also increasing. Thus, ecological footprint analysis also accounts for the land area required for waste assimilation. An ideal solution for better policy formulation is an ecological analysis to identify the ecological footprint in Penang. This is supported by the New Urban Agenda Principle, which is "to ensure environmental sustainability by promoting clean energy and sustainable use of land and resources in urban development, by protecting ecosystems and biodiversity, including adopting healthy lifestyles in harmony with nature, by promoting sustainable consumption and production patterns…" (New Urban Agenda, 2016).

1.3   Ecological Footprint

According to WWF (2000), total global consumption of natural resources has risen by 50% since 1970, while the earth's natural wealth has decreased by over 30%. An ecological footprint is a measurement of the land area required to sustain a population of any size. One of the examples of an empirical study of ecological footprint calculations for Malaysia is shown in Box 1.1.

The case study shown in Box 1.1 covers the macro analysis of three sectors of Malaysia's economy, namely agriculture, forestry and development. Ecological footprint could also be narrowed down to regional levels and specific areas. A city's ecological footprint is a sophisticated analysis of the impact of cities on how a city extracts food, water, energy and land from a bioregion (and beyond) and requires ecosystem services to absorb its wastes (Newman, 2006; p. 280). Ecological footprint could be one of the methods to manage natural resources more effectively and systematically, increase global and national competitiveness by reducing the EF, assist in the sustainable development and environmental strategy formation, use within the community plan. For instance, Local Agenda 21 provides baseline data to perform future projects, provides useful information to undertake public awareness and education campaigns, identifies local and global possibilities for climate change mitigation and CO_2 reduction and is an effective indicator of sustainability (Begum & Pereira, 2012; p. 4784). However, the ecology footprint technique works best at the national level, particularly for comparative purposes. More work needs to be done to improve the application of ecological footprint at the urban level (McManus & Haughton, 2006). Ecological footprints help to raise general awareness as sustainable development requires collective action of the local and global environmental burdens and risks that arise from human behaviour (McManus & Haughton, 2006).

Box 1.1 An empirical assessment of ecological footprint calculations for Malaysia (Begum et al., 2009)

Ecological footprint (EF) can be defined as the total land and water area required to support a population with a specific lifestyle and given technology with all necessary natural resources and to absorb all wastes and emissions for an indefinite length of time. In Malaysia, studies on EF are very limited, which is partly due to the limited availability of suitable data. Begum et al. (2009) demonstrates an ecological footprint (EF) calculation for the Malaysian three sector economy based on the modified input–output (I–O) method and National Footprint Account (NFA). In this study, EF is expressed in land area units (global hectares) where each area unit corresponds to 1 hectare of biologically productive space with world-average productivity. The calculation of EF is based on the latest 2000 I–O table produced by the Department of Statistics, Malaysia. This study aggregates the Malaysian I–O table from 94 sectors to 3 sectors. For the purpose of calculating the EF of Malaysia, the following figures are used, i.e. built-up areas, forest area, agriculture area and population. The following two approaches are applied to calculate the EF: National Footprint Accounting Approach and Input Output Analysis. In this study, the Living Planet Report is the only source that has been used to calculate the Malaysian National EF. Some of the findings from this study are presented in Table 1, 2 and 3. Table 1 provides an indication of how much estimated land each Malaysian consumes from the agriculture, forestry and built up sectors. This figure is lower than the one calculated by the NFA (1.13 gha/cap, Table 2). The EF of agriculture and forestry in the NFA method is higher than the modified I–O calculations for final national consumption whereas the EF for built sectors shows the opposite (compare Table 1 and 2). While the EF of built sectors in the NFA method amounts to 0.04 gha/cap versus 0.162 ha/cap with the modified I–O method.

Malaysia's EF appears to be smaller than that of the developed countries (US, Canada or UK), but larger than that of other ASEAN countries (Table 3). Each Malaysian requires 3.0 global hectares to support their lifestyle, when the actual available capacity for each individual is 1.9 global hectares. The largest contributor to the EF for each Malaysian is energy consumption (1.6 gha/cap, see Table 2). However, a major difference between Malaysia and ASEAN countries appears to the use of energy land. This study is of the opinion that being a developing country, Malaysia should be an advocate of EF as a measure of sustainability. With an EF of about 3.0 gha/cap, Malaysia could use this low figure as leverage in international negotiations with developed countries on issues related to trade, environment and sustainability. In general, any effort to reduce energy consumption will serve to reduce the EF of the country. This study also suggest that it is time for Malaysia to seriously review the issue of energy subsidies, particularly in light of the country's aspiration for sustainability in development.

Table 1: Ecological footprint for Malaysian three-sector economy (2000)

Sectors	Domestic (ha)	Imports (ha)	Exports (ha)	Estimated EF (ha)
Agriculture	0.133	0.020	0.030	0.123
Forestry	0.028	0.010	0.019	0.019
Built-up	0.205	0.094	0.137	0.162
Total	0.366	0.124	0.186	0.304

Table 2: Summary of the 3 sector consumption footprints for the Malaysia in 2001 based on NFA (global hectares per capita).

Land Type	Domestic production (P)	Imports (I)	Stock changes (SC)	Exports (E)	Consumption (P+I+SC−E)
Agriculture	0.74	0.72	0.08	0.82	0.72
Forestry	0.75	0.22	-	0.59	0.37
Built-up	0.04	-	-	-	0.04
Total EF	1.53	0.94	0.08	1.41	1.13

Table 3: EF comparisons between Malaysia and other countries.

Country	Ecological footprint (gha/cap)
Developed countries	
United States of America	9.5
Australia	7.7
Sweden	7.0
Canada	6.4
United Kingdom	5.4
ASEAN countries	
Indonesia	1.2
Cambodia	1.1
Philippines	1.2
Thailand	1.6
Vietnam	0.8
Malaysia	3.0

In measuring sustainability for city planning or policy analysis, six components of ecological footprint should be considered. The ecological footprint of any individual or household has six separate components as follows:

i. Crop Land: The area of cropland required to produce the crops that are consumed.
ii. Pasture Land: The area of grazing land required to produce the necessary animal products.
iii. Forest Land: The area of forest required to produce the wood and paper.
iv. Built Area: The area of land required to accommodate housing and infrastructure.
v. Energy Land: The area of forest that would be required to absorb the CO_2 emissions resulting from individual's energy consumption.
vi. Sea Space: The area of sea required to produce the marine fish and seafood (Begum & Pereira, 2012; p. 4784).

Ecological footprint analysis requires comprehensive data to develop an ecological footprint matrix. The data includes the amount of bio-productive land, sequester of the associated waste, Penang international trade, natural gas consumption, yields of primary products from cropland, forest, grazing land and fisheries, biocapacity variables, carbon uptake land and the net ecological footprint. It is not possible to calculate the ecological footprint in Penang at this stage, as there is no regional input-output data by states including Penang for every five years of the survey. The survey needs to take into account every transaction involved in that particular industry to produce a specific product. The input-output data can only be obtained from a comprehensive survey. The sum of the land requirements for the six individual land categories representing the ecological footprint (as listed above) is the total area appropriated from nature for the provision, maintenance and disposal of every consumer.

1.4   Projection of Carbon Emission from Passenger Vehicles in Penang

At this stage, we could only cover a small component of one ecological footprint indicator namely energy land: the area of forest that would be required to absorb the CO_2 emissions resulting from an individual's energy consumption (Begum & Pereira, 2012). We do not estimate the forest area required to absorb the CO_2 emissions. Rationally, to estimate how much total land requires absorbing the CO_2 emissions resulting from an individual's energy

consumption, it is inevitable for us to know how much carbon emission emitted by individuals from various sources. In this study, we project the carbon emission produced by registered passenger vehicles in Penang and Malaysia for the next five years. Data were retrieved from the Penang Institute and Road Transport Department (JPJ) website. Data on population were retrieved from http://www.worldometers.info/world-population/malaysia-population/. In conducting the projection for carbon emission emitted by passenger vehicles in both Penang and Malaysia, several assumptions are made as depicted in Box 1.2

Box 1.2 Assumption for Carbon Emission Projection in the next Five (5) Years

1. The increase in population in Penang and Malaysia will lead to an increase in the number of registered transport vehicles in Penang.
2. Data for the population in Penang are projected for 2018-2022 and data for Malaysia are projected for 2019-2022.
3. Data for a number of registered passenger vehicles are projected for 2016-2022 for both Penang and Malaysia. Also, due to data unavailability, data for a number of registered private vehicles for Malaysia is also projected for 2012-2014 based on the available data of 2005-2011.
4. The number of passenger cars registered only include three type of vehicles namely private car, taxi and hired cars.
5. Each passenger car is assumed to travel 66 km per day. The assumption of 66 km is based on research done by Shabadin et al. (2014). The average kilometre car travelled in Malaysia for the year 2013 was found to be 24,129 km. Hence, 24,129 km/365 days equal to 66 km per day.
6. Carbon emission is projected based on the engine capacity for both petrol and diesel passenger cars.
7. There are four types of petrol cars: small petrol car (maximum 1.4-litre engine), medium petrol car (1.4 – 2.1 litres), large petrol car (above 2.1 litres) and average petrol car.
8. There are three types of diesel cars: small diesel car (2.0 litres and below), large diesel car (above 2.0 litres) and average diesel car.
   (The classification of the petrol car and diesel car is based on Calculating CO_2 Emissions from Mobile Sources (see http://www.ghgprotocol.org/calculation-tools)

In calculating the carbon emission, data on the population and number of registered passenger vehicles are estimated based on the linear trend model. Four (4) scenarios are taken into consideration in the projection of carbon emissions of petrol passenger cars as follow:

i.   Small petrol cars (maximum 1.4 litres) travel by 66 km per day in Penang and Malaysia.

ii.   Medium petrol cars (1.4 - 2.1 litre) travel by 66 km per day in Penang and Malaysia.

iii.   Large petrol cars (above 2.1 litres) travel by 66 km per day in Penang and Malaysia.

iv.   The average petrol car travels 66 km per day in Penang and Malaysia.

We also calculate the carbon emission emitted by diesel passenger cars with three (3) scenarios as follows:

i.   Small diesel cars (2.0 litre and below) travel 66 km per day,

ii.   Large diesel cars (above 2.0 litre) travel 66 km per day and

iii.   Average diesel cars travel 66 km per day in both Penang and Malaysia.

Figure 1.4 shows the projection of Penang's population and number of registered passenger vehicles. From the population and number of registered passenger vehicles, we then project the carbon emission emitted by the vehicles.
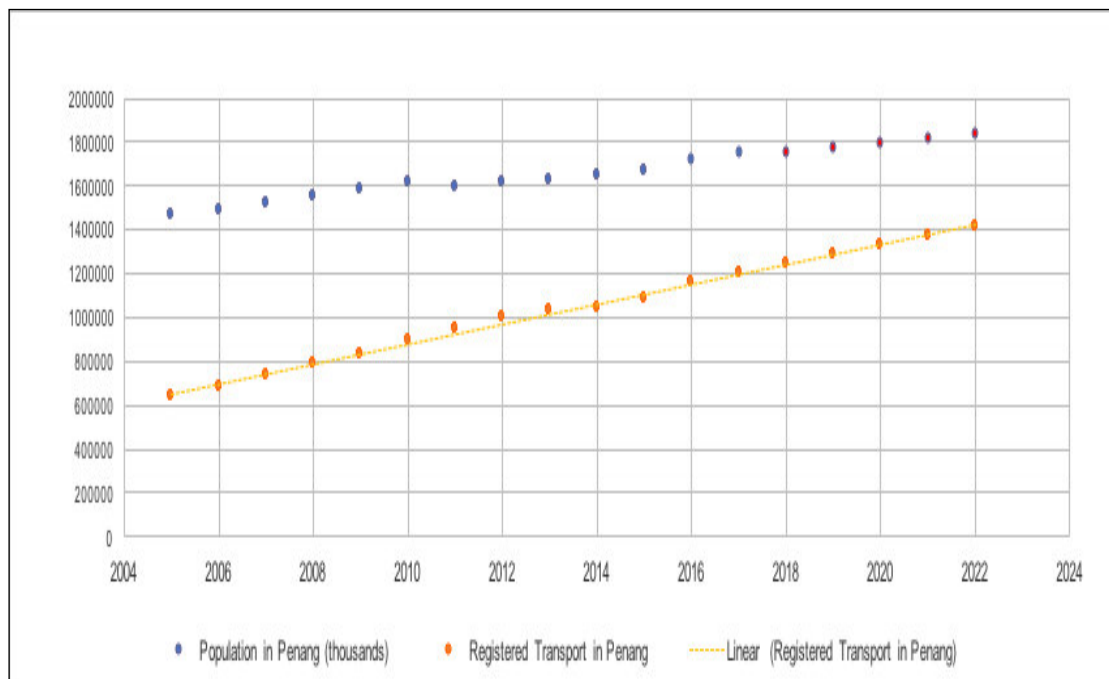
Figure 1.4 Projection of population and registered transport in Penang in the next five (5) years

Notes: Data for the population in Penang are projected for 2018- 2022; Data for a number of registered passenger vehicles are projected for 2016-2022.

Source: Own estimation (2018)

Estimated carbon emitted by the projected number of cars registered in Penang is depicted in Table 1.3 and Table 1.4. The assumptions listed in Box 1.2 are a small passenger petrol car with maximum 1.4-litre engine assuming travel up to 66 km per day will emit 15, 854,429.89 kg CO_2 (15, 854) metric tonnes. On the other hand, total kg CO_2 emission from passenger vehicles in Malaysia is estimated to be 179,147,619.42 kg CO_2 (179,148) metric tonnes. The larger the capacity of the passenger petrol car, the higher carbon emission emitted by the respective passenger vehicles.

Table 1.3 Estimated Carbon Emitted by Passenger Vehicles in Penang and Malaysia

Scenario	Capacity of vehicles	km/day	Penang		Malaysia	
			[a]No of passenger vehicles	[b]Total kg CO_2 (Metric tons)	[c]No of passenger vehicles	[d]Total kg CO_2 (Metric tons)
A	Small petrol car (max 1.4 litre engine)	66	1,413,051	15,854,429.89 (15,854)	15,966,811	179,147,619.42 (179,148)
B	Medium petrol car (1.4 – 2.1 litres)	66	1,413,051	20,517,497.50 (20,517)	15,966,811	231,838,095.72 (231,838)
C	Large petrol car (Above 2.1 litres)	66	1,413,051	25,180,565.11 (25,181)	15,966,811	284,528,572.02 (284,529)
D	Average Petrol car	66	1,413,051	18,652,270.46 (18,652)	15,966,811	210,761,905.2 (210,762)

Source: [a,b,c,d] Own estimation, 2018; kg CO_2 per unit calculation is based on Calculating CO_2 Emissions from Mobile Sources. See http://www.ghgprotocol.org/calculation-tools; [b,d] Conversion factor, see https://www.epa.gov/

Table 1.4 Estimated Carbon Emitted by Passenger Vehicles in Penang

Scenario	Capacity of vehicles	km/day	Penang		Malaysia	
			[a]No of passenger vehicles	[b]Total kg CO_2 (Metric tons)	[c]No of passenger vehicles	[d]Total kg CO_2 (Metric tons)
A	Small diesel car 2.0 litre or below	66	1,413,051	11,191,362.27 (11,191)	15,966,811	126,457,143.12 (126,457)
B	Large diesel car over 2.0 litre	66	1,413,051	13,056,589.32 (13,057)	15,966,811	147,533,333.64 (147,533)
C	Average diesel car litres	66	1,413,051	11,191,362.27 (11,191)	15,966,811	126,457,143.12 (126,457)

Source: [a,b,c,d] Own estimation, 2018; [b,d] kg CO_2 per unit calculation is based on Calculating CO_2 Emissions from Mobile Sources. See http://www.ghgprotocol.org/calculation-tools. For conversion factor, see: https://www.epa.gov/

A small diesel car with maximum 2.0-litre engine travelling up to 66 km per day will emit 11,191,362.27 kg CO_2 (11,191) metric tonnes. On the other hand, total CO_2 emission from passenger vehicles in Malaysia is estimated to be 126,457,143.12 kg CO_2 (126,457) metric tonnes (see Table 1.4). From the findings of petrol and diesel passenger cars, we conclude that the higher the capacity of the car, the higher carbon emission emitted by the respective passenger cars.

Figure 1.5 shows the number of passenger cars registered and carbon emission emitted in Penang and Malaysia. Even though the number of registered passenger vehicles and carbon emission emitted by these vehicles in Penang are lower than other areas of Malaysia, the trend shows that the number of registered passenger vehicles and carbon emission are gradually increasing.
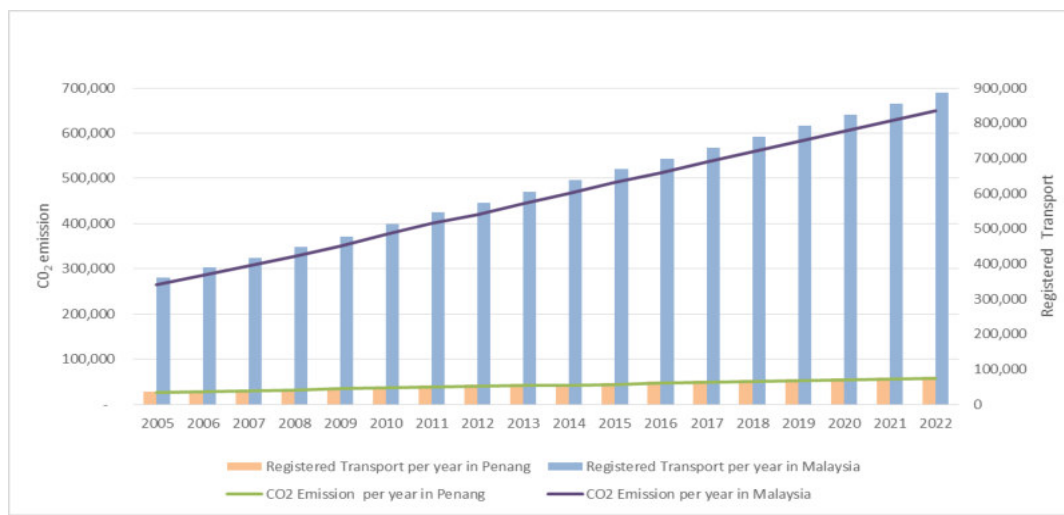
Figure 1.5 Projection of Penang and Malaysia CO_2 emission from passenger vehicles in Penang and Malaysia per day.

Based on the projection of carbon emission in Penang and Malaysia per day per year, the carbon emission will continuously increase. Policies related to sustainable transportation may be needed for both Penang and Malaysia. Environmental conservation is needed, and policy implication on how to conserve the environment will be discussed in the policy implication chapter of this report.

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Chapter 2
Study Objectives & Methodology

2.1   Study Objectives and Scope

The study aims to fulfil the following objectives:

1.   To identify the current and future environmental issues that align with the United Nations Sustainable Development Goals.

2.   To consult the relevant stakeholders via interviews and focus group discussions.

3.   To identify the scopes of Penang Green Agenda (PGA) Public Opinion via survey and open day.

The scope of the study is to:

1.   Recommend and prepare appropriate methodologies and strategies for stakeholder consultation, which can best meet the project objectives. The proposed methodologies can be either quantitative or qualitative, or a mixed methodology.

2.   Design, plan and conduct the stakeholder consultation activities based on the agreed methodologies as well as developing materials and research instruments for the stakeholder consultation activities.

3.   Identify and recommend an appropriate study sample size and sample selection that will adequately represent stakeholders from all sectors that will be covered in the scope of PGA.

4.   Compile and submit the results and data of the stakeholder consultation activities to the PGC.

5.   Prepare interim reports for stage 1 and a final report for stage 1 that combine the findings of both interim reports to the PGC.

2.2   Study Methodology

This study involves five major phases. Figure 2.1 shows the summary of the phases involved in this study. The study begins by providing basic and adequate knowledge on Sustainable Development (SD) and Sustainable Development Goals (SDGs) to all consultants in Phase 1. In addition to researching for related materials, the research team organised a half-day workshop on SDGs. An expert in SDGs chaired the SDGs half-day workshop. The document

reviews and understanding on SDGs helped the study team in identifying SDGs key issues and framed the scope of questions for a focus group discussion (FGD) and in-depth interview. The questions for FGD and in-depth interview were discussed with the Penang Green Council (PGC) Advisory Committees prior to finalising the list of stakeholders to be invited to the FGD and interviewed for the in-depth interview session. FGD sessions preceded qualitative data collection. Invitations were sent to potential stakeholders with clear intent on the objectives of the session, together with sample questions to be asked during the session.

Once the invitations were out, it was time to proceed with Phase 2 that was the collection of qualitative data. FGDs were conducted in USM, and in-depth interviews were conducted at the stakeholders' premises. It was at this stage that the preliminary findings of qualitative data were gathered and included in the Interim Report. As preparation for quantitative data collection in phase 3, the framing of survey questions was done in this phase. Phase 3 focuses on acquiring and collecting quantitative data based on the findings collated from Phase 1 and 2. Phase 4 followed immediately after consultants were satisfied with the reliability tests of the pilot study and after the survey questions were amended for better understanding. Phase 5 was the final phase of the study that included findings validation, identifying PGA scope and report writing.
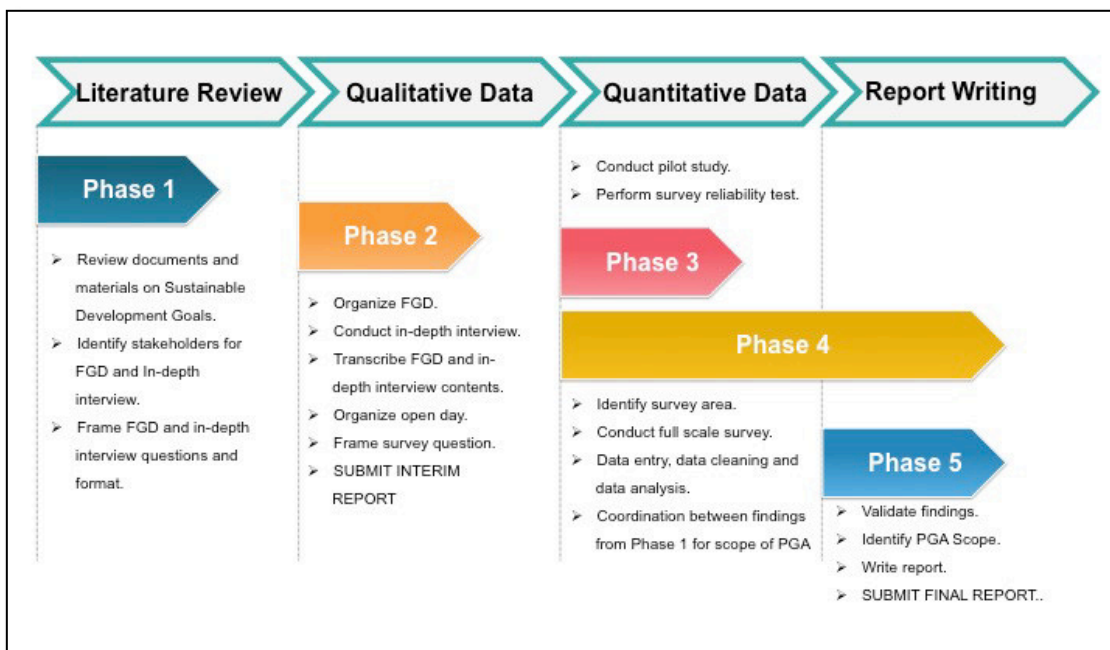
Figure 2.1 Phases of Study

2.2.1 Literature Review

Prior to conducting our study, consultants engaged in a review of the literature. Details of the tasks carried out are shown in Table 2.1

Table 2.1 Tasks Carried Out for the Literature

Step	Task	Description
1.	Understand the concept of Sustainable Development and Sustainable Development Goals	The concept of Sustainable Development was referred and analysed from various sources. The development and shift from Sustainable Development to Sustainable Development Goals (SDGs) were reviewed through several articles and documents. The background of SDGs was reviewed from official government documents. Indicators of sustainable development from developed countries were reviewed to give a holistic background.
2.	Ecological footprint and carbon emission	The literature on ecological footprint calculations was reviewed as a reference to calculate Penang ecological footprint.
3.	To understand the various green concepts, projects, initiatives and practices undertaken by stakeholders	Comprehension of green concepts, projects, initiatives and practices was undertaken through the following channels and avenues: - Academic literature such as books and latest journals - Websites from institutions and government agencies (i.e., Majlis Bandaraya Pulau Pinang (MBPP), Majlis Perbandaran Seberang Perai (MPSP), Penang Green Council (PGC); Green Building Index; World Green Building Council; Gamuda Berhad; Construction Industry Development Board. - Printed brochures from relevant institutions (i.e. Consumers Association of Penang, Construction Industry Development Board) - Newspapers (i.e. The Star).
4.	Review and adopt a best model for Penang Green Agenda	Review the different applicable models to best describe the Penang Green Agenda. Among the different models reviewed were the Quintuple Helix Model, Quintuple Helix Model and Triple Helix Model.

2.2.2 Focus Group Discussion and In-Depth Interview

a. *Stakeholders Identification*

We categorised our stakeholders into five groups (Figure 2.2), namely were NGOs, public sector, business / private sector, youth and professionals. For the public sector, we further segregated them into three subcategories that were state agencies, federal agencies and EXCO members and Member of Parliament (MP). For business / private sector, their subcategories were Small Medium Enterprises (SMEs) and developers. We compiled our list of stakeholders based on preliminary discussion with the PGC Advisory Committee in addition to receiving additional lists of stakeholders from PGC. Invitations were sent to all stakeholders for FGDs at least two weeks before the date of the session. Similar strategies were adopted to secure in-depth interview sessions with stakeholders. We were assisted by PGC a number of times in securing in-depth interview sessions with EXCO members and MPs. Nevertheless, we did not manage to get the cooperation from all stakeholders. This could skew the discussion and interviews to certain parties and certain groups. This limitation was unintended and uncontrolled. Hence, we only reported the findings and the views of those stakeholders who attended the FGD and agreed to be interviewed. Due to research ethics, we were unable to publish the details of the stakeholders who have not agreed or denied our requests to attend the FGD and in-depth interview.
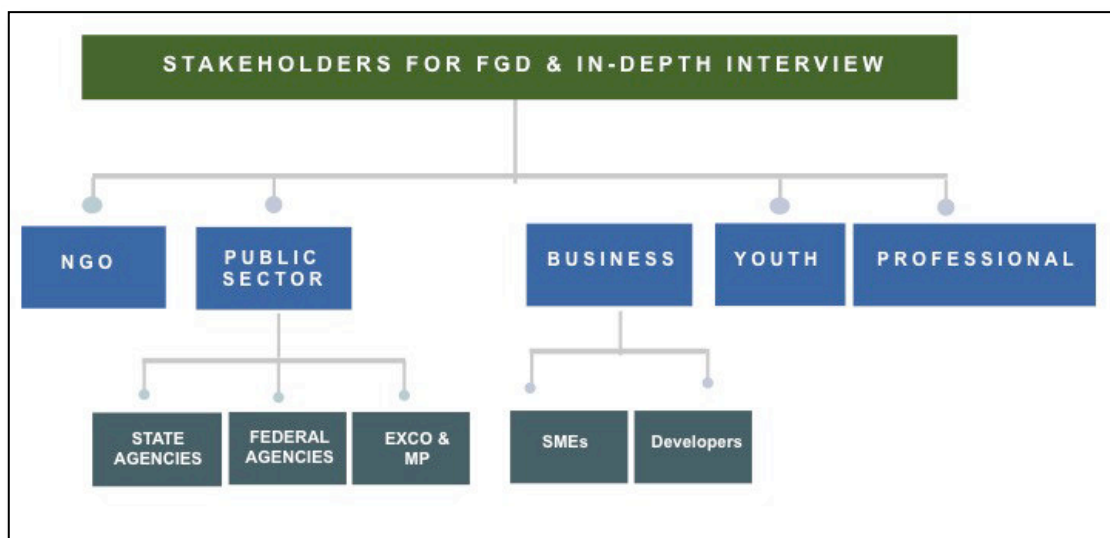
Figure 2.2 Group of stakeholders for FGD and in-depth interview

Five Focus Group Discussions had been conducted at the School of Social Sciences, USM. The details are shown in Table 2.1

Table 2.2 List of FGD sessions.

No	Group	Date	Number of participants
1	NGO	26.07.2017	7
2	Youth	26.07.2017	14
3	Public Sector	01.08.2017	11
4	Business	02.08.2017	5
5	Professional	02.08.2017	7

b.   Format

The format of the FGD and the in-depth interview was similar. The following steps were taken.

Table 2.3 Format of FGD and in-depth interview

Step	Task	Description
1	Sign consent form	Consultant started the FGD and in-depth interview session by informing stakeholders of the purpose of the session and the confidentiality of the information collected. Stakeholders were also informed that their participation was voluntary and that they could withdraw their participation at any time. As proof that stakeholders were aware of their participation, they had to sign a consent form as an indicator that they voluntarily participate in the FGD and in-depth interview.
2	Fill in the demographic profile	Stakeholders were then asked to fill in the demographic profile form so that the study could collate information on the type of stakeholders being interviewed.
3	Kahoot game	The Kahoot game was not conducted for a face-to-face interview. The purpose of the Kahoot game was to gather initial stakeholders' responses on basic environmental issues and green practices. There were 25 questions altogether.
4	Discussion	The discussion of FGD and in-depth interview followed the prepared questions provided to stakeholders in the invitation letter.
5	Mapping	Before ending the session, stakeholders were asked to map the locations of the environmental issue of their areas in the maps provided.

Note: A sample of demographic form, Kahoot, FGD and In-depth interview questions are shown in Appendix A

c. *Transcription*

To ensure that consultants focus on the discussion during the FGD and in-depth interview, the discussions were tape recorded for review and transcription. It is vital that the discussions and interviews were recorded and transcribed later rather than relying on notes to ensure that accurate information is gathered and collected. Table 2.4 explains the steps involved in the transcription process that led to the identification of 12 themes for the PGA. Details of the themes are explained in Table 2.5

Table 2.4 Transcription process

Step	Task	Description
1	Record discussion	All discussions during FGD and In-depth interview were recorded.
2	Transcribe recording	Research assistants and students who have experienced in transcribing recorded conversations and discussions. Transcriptions were vetted and read by consultants. Consultants refer to the recording to trace ambiguity in words, phrases or information.
3	Group consultants	Consultants were divided into five groups. The groups are current issues, current practices, current challenges, future issues and challenges and policy implication. Each group reads the 16 transcriptions and performs content analysis based on theme identified.
4	Identify themes	12 themes were identified that serve as the basis for the scope of PGA. The themes are Socioeconomic Issues (SE), Agriculture (AGR), Biodiversity (BIO), Transportation (TRANS), Built Environment (BE), Waste Management (WM), Land Matters (LAND), Water Security (WS), Energy Security (ES), Leadership (LEADER), Disaster (DIS), Institution & Governance (IG).

Table 2.5 Explanation of the identified themes

Theme	Acronym	Description
Socioeconomic Issues	SE	Any issues related to socioeconomic are grouped under this theme. Among the issues discussed were related to poverty, income inequality, culture and values, individuals' attitudes, social programs, welfare programs, population, housing issues, health issues, cost of living, prices, lifestyle, education, awareness, gender issues and employment.
Agriculture	AGR	Issues classified under agriculture refer to food security and urban farming.
Biodiversity	BIO	The discussions that were grouped in biodiversity was deforestation.
Transportation	TRANS	Any issues related to public transportation, private vehicles, traffic congestion and parking spaces were categorised under this theme.
Built Environment	BE	The built environment looks at issues related to infrastructure and facilities for the public, in addition to issues related to cities and development such as sustainable cities, construction sites, development area and building green practices.
Waste Management	WM	Waste management issues include waste segregation, solid waste management, landfill, waste disposal and waste disposal location.
Land Matters	LAND	Land matters cover development issues related to land such as land reclamation, uneven development, rapid development, limited land, land conversion, land acquisition and land competition.
Water Security	WS	Water security issues refer to the discussion on clean water and sanitation, sustainable water resources and water catchment area.
Energy Security	ES	Alternative energy sources, energy demand and initiatives for green energy were all categorised under energy security.
Disaster	DIS	Disaster refers to a natural disaster that happens. Disaster includes flood, climate change and coastal erosion.
Institution & Governance	IG	Any issue not clearly identified in any of the mentioned themes that deal specifically with budget, rules and regulations and policy implementation are grouped under this theme. The issue of leadership was also included in this category.

2.2.3   Survey

A public survey was conducted to solicit public views on current and future environment issues and to understand the public attitude and behaviour on green practices. The steps involved in conducting the survey are shown in Figure 2.3.
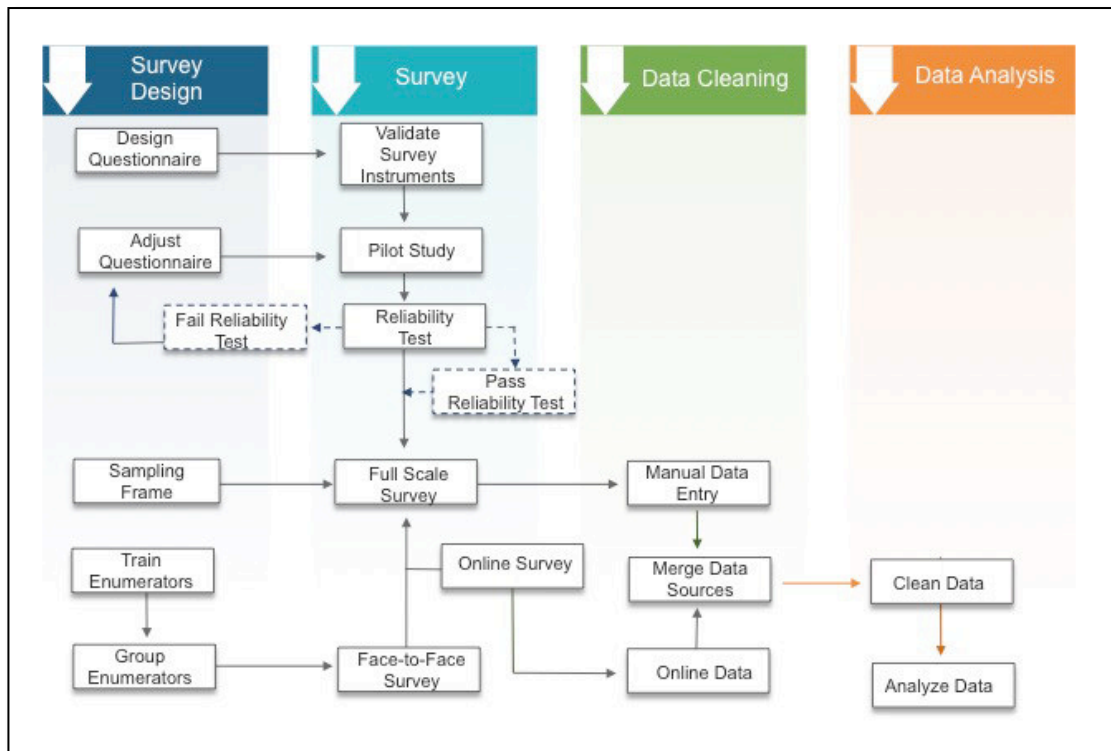
Figure 2.3 Steps involved in conducting survey

a.   Design Questionnaire

Based on the literature review, the findings from FGDs and in-depth interviews, a questionnaire was designed with 11 parts.

Table 2.6 Survey Instruments

Survey Instruments	Questions	Measurement
Part A – Attitudinal characteristics on development and environment	A1. Seriousness of environmental issues in Penang	5 Likert scale (not serious, slightly serious, fairly serious, serious, extremely serious)
	A2. Willingness to compromise and change	2 possible answers (yes, no)

Survey Instruments	Questions	Measurement
	now to save the environment for the future	
	A3. Willingness to make changes to environment and way of life	4 Likert scale (not applicable, no, maybe yes)
	A4. Readiness to embrace and adopt green initiatives organized by state government	4 Likert scale (not applicable, no, maybe yes)
	A5. Agreeing to statements on environmental issues.	5 Likert scale (no opinion, strongly disagree, disagree, agree, strongly agree)
	A6. Effect of Penang development on social, economy and environment.	4 Likert scale (not applicable, poor, good, excellent)
	A7. Satisfaction on aspects of local development and environment in own area.	5 Likert scale (no opinion, very dissatisfied, dissatisfied, satisfied, very satisfied)
	A8. Knowledge on Sustainable Development Goals	2 possible answers (yes, no)
	A9. Concern over Sustainable Development Goals issues	5 Likert scale (barely concern, slightly concern, fairly concern, concern, extremely concern)
	A10. Type of sustainable initiatives taken and practiced by individual.	Tick applicable initiatives.
Part B: Household waste generation, recycling and waste management	B1. Quantity of mix waste generated by household.	Two-step answer. Step 1 – choose size of bag Step 2 – indicate approximate number of bag
	B2. Information on household recycling behavior.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)
Part C: Household behavior and transport choice	C1. Main mode of transportation.	Tick applicable transportation
	C2. Time taken to get to work.	Tick applicable time.
	C3. Distance travelled if mode of transport changes.	Tick applicable time.
	C4. Information on involvement on green transport initiatives.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)
Part D: Household behavior and water use	D1. Household activity with regard to water consumption.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)

Survey Instruments	Questions	Measurement
Part E: Household behavior and energy	E1. Household activity with regard to energy consumption.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)
Part F: Household behavior and food consumption	F1. Household behavior with regard to food consumption.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)
	F2. Proportion of food bought that is thrown away.	Open-ended question.
Part G: Household attitudes across developmental and environmental domain	G1. Action taken with regard to environment and green practices.	6 Likert scale (not applicable, never, seldom, sometimes, often, routine)
	G2. Opinion on immigrant's influx in Penang.	5 Likert scale (no effect, poor, average, good, excellent)
Part H: Future expectations of Penang development	H1. Expectations of future Penang.	4 Likert scale (not applicable, no, maybe, yes)
Part I: Future Challenges and their solutions	Open ended question	3 examples of challenges. 3 examples of solutions to mentioned challenges.
Part R: Residential information	R1. District	5 categories (Barat Daya, Seberang Perai Utara, Seberang Perai Tengah, Seberang Perai Selatan, Timur Laut)
	R2. Residential address	
	R3. Strata	2 categories (urban, tural)
	R4. GPS location	
Part S: Socio demographic information	S1. Age	
	S2. Gender	2 categories (female, male)
	S3. Ethnicity	4 categories (Chinese, Indian, Bumiputera, Others)
	S4. Education level	4 categories (informal education, primary education, secondary education, tertiary education)
	S5. Current employment	5 categories (unemployed, private sector, public sector, self-employed, others)
	S6. Individual income	
	S7. Household income	9 categories (below RM999, RM1,000-RM1,999, RM2,000-RM2,999, RM3,000-RM3,999, RM4,000-RM4,999, RM5,000-RM5,999, RM6,000-RM6,999,

Survey Instruments	Questions	Measurement
		RM7,000-RM7,999, RM8,000 and above)
	S8. Household size	6 categories (live alone, live with spouse only, live with young children, live with parents / in laws, live with relatives, live with others (non family members)
	S9. Living arrangement	
	S10. Vehicle information and number of vehicle	8 categories (no private transportation, bicycle, motorcycle, car, MPV/SUV, van, bus/truck/lorry, others

b.   Training of Enumerators

Two training sessions for enumerators were conducted at the School of Social Sciences C23 Conference Room, Universiti Sains Malaysia on 21 September 2017 and 13 October 2017. The first training session was primarily done for the pilot study and the second training session was done for the full-scale survey. All enumerators who attended the first training session were required to attend the second training session as the questions for the full-scale survey had been altered. Students who did not o attend the training session were not allowed to participate in the full-scale survey. For every session, the Principal Consultant, assisted by two other consultants conducted the training session. The training session lasted five hours from 2:00 pm to 7:00 pm, for both sessions. 42 and 64 students attended the first and second training sessions, respectively.

Table 2.7 Detailed description of the Enumerators Training Session

Step	Task	Description
1	Understanding survey questions.	Consultants went through the survey form question by question and explained the questions to enumerators. Consultants also explained to enumerators on the best ways to describe the questions to respondents and to make sure that correct answers are recorded in the survey form.
2	Asking survey questions.	Consultants taught enumerators in the best possible way to ask the questions.
3	Approaching respondents and proceeding in asking respondents to complete the survey form.	Consultants provided the rules and regulations and the do's and don'ts in approaching respondents. A short mock interview session was done for the whole group to explain to enumerators the proper

Step	Task	Description
		ways to ask respondents in completing the survey form. Then the students worked in pairs, taking turns in becoming respondents and enumerators for the mock interview, supervised by consultants.
4	Data entry.	Enumerators were informed that their tasks for the survey included data entry. For the pilot study, data entry was done in an Excel template, prepared by the consultants. For the full-scale survey, data entry is done online via Survey Monkey platform. Enumerators were taught on how to key in the data and constantly reminded to be meticulous in data entry and immediately inform the Principal Consultant, should any mistake was done, particularly when data was entered via the Survey Monkey platform.
5	Grouping of enumerators.	Enumerators were divided into several groups. For the pilot study, enumerators were divided into three groups. Each group must have all the different ethnic groups to ensure that each group would be able to interview all ethnic groups as prescribed by the study. For the full-scale survey, enumerators were divided into five groups. Three consultants were assigned to each of the three groups for the pilot study, and six consultants were assigned to monitor the progress of full-scale survey based on districts. For easy communication between enumerators and consultant, a WhatsApp group of group leaders and consultants involved was set up.
6	Location of survey and respondents to survey.	This task was only applicable to the pilot study. It was during the training session that enumerators were informed of the location of a survey that they were supposed to go and the number of respondents they were supposed to achieve. For the full-scale survey, a separate discussion between principal consultant and group leaders were done to discuss the survey location and number of respondents.

c.   *Pilot Study*

A pilot study was done on 100 respondents (40 Chinese, 40 Bumiputera 15 Indians and five Others) in five areas in Taman Pekaka, Perak Road and Gelugor. A pilot study was done from 25 September 2017 and completed on 2 September 2017. During the pilot survey, one

research officer (RO) and one consultant followed one group per day to ensure that enumerators conducted the survey ethically and adequately.

After the pilot study, a discussion session between all group leaders and the principal consultant was done. It was during this discussion session that group leaders shared their experiences in conducting the survey and informed of the difficult questions that were not understood by respondents. A meeting with all consultants was then conducted to discuss the findings.

All the questions measured by Likert Scale passed the reliability test with a Cronbach Alpha more than 0.70. Nevertheless, based on the feedback received from PGC as well as from the enumerators, confused questions were replaced, reframed or deleted. Table 2.8 shows a summary of questions that were replaced, reframed or deleted. A sample of the questionnaire used for the full-scale survey is shown in Appendix B. The survey form was prepared in four languages – Bahasa Melayu, English, Mandarin and Tamil.

Table 2.8 Amendments Made to the Original Questionnaire

Original survey instruments and questions	Problem associated with the original survey instruments and questions	Decision made	New instrument / questions
Part A A2. Willingness to compromise and change now to save the environment for the future - 2 possible answers (yes, no)	Question is redundant with A3	A2 was dropped from the survey instruments	
A3. Willingness to make changes to environment and way of life - 4 Likert scale (not applicable, no, maybe yes)	The Likert scale category does not show time frame.	Time frame was included in the Likert scale.	A3 – becomes A2 and change the category of the 4 Likert Scale from Not Applicable, No, Maybe and Yes to No, Yes within the next 5 years, Yes within the next 3 years and Yes immediately.

Original survey instruments and questions	Problem associated with the original survey instruments and questions	Decision made	New instrument / questions
A5. Agreeing to statements on environmental issues - 5 Likert scale (no opinion, strongly disagree, disagree, agree, strongly agree)	This instrument and questions were similar to a previous study conducted by PGC.	A5 was dropped from the survey instruments.	
A7. Satisfaction on aspects of local development and environment in own area - 5 Likert scale (no opinion, very dissatisfied, dissatisfied, satisfied, very satisfied)	The instruction for this question was confusing. 'How satisfied are you with the following aspects of your local development and environment (in you area)?'	Instruction for this question was changed.	The new instruction for this question is 'How satisfied are you with the following aspects in you area?'
A9. Concern over Sustainable Development Goals issues - 5 Likert scale (barely concern, slightly concern, fairly concern, concern, extremely concern)	The instruction for this question was confusing. The confusion was on the word 'take' in the question 'Please take the most appropriate response that best suit your concern with regard to the issues of SDGs.' The Likert scale categories was thought to be too many and confusing.	The instruction for this question was changed. Likert scale category has been amended.	The instruction for this question has been changed to 'Please tick the most appropriate response that best suit your concern with regard to the issues of SDGs.' The 5 Likert scale has been changed to a 3 Likert Scale (not very concerned, concerned, extremely concerned). One more issue that has been highlighted by respondents that is 'ecosystem protected areas (land base and marine)' has been included as one of the options for the question.

Original survey instruments and questions	Problem associated with the original survey instruments and questions	Decision made	New instrument / questions
Part G: Household attitudes across developmental and environmental domain G2. Opinion on immigrant's influx in Penang.	Question G2 does not fit into instrument G.	Move question G2 into different section.	A new section has been included that is Part H: Household opinions on immigrants

d.   Sampling Frame

This study adopted stratified sampling based on district and ethnic group. Figure 2.4 shows the sampling frame adopted for the study. First, the study identified the district followed by the identification of major cities before assigning the number of respondents based on ethnic group to be interviewed by each group of enumerators.
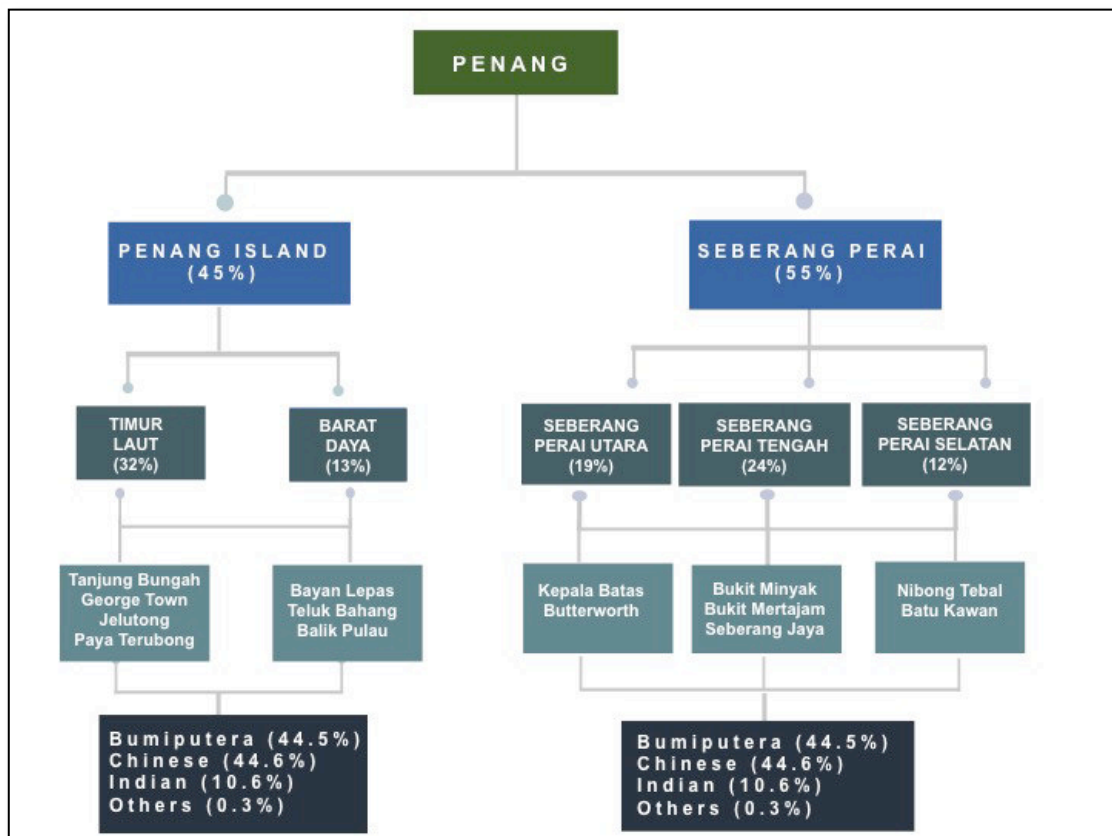
Figure 2.4 Sampling Frame

The study used Penang's population data by district for 2015 in framing the study sample. The following sample formula (Krejcie and Morgan, 1970) was adopted.

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

where

s = the sample size

X^2 = 3.841, the table value of chi-square for 1 degree of freedom at the desired confidence level

N = the population size

P = the population proportion (assumed to be 0.50)

d = the degree of accuracy expressed as a proportion (.05)

Based on the above formula, the sample size needed is calculated as shown in column 3 of Table 2.9. To meet the requirement of 2,000 surveys, as prescribed by PGC in the Term of Reference, the number of the sample has been increased proportionately based on the same district sample percentage (column 4 of Table 2.9). The total sample to be gathered for the study is as shown in column 5 of Table 2.9.

Table 2.9 Sample Size by District

District	2015 Population ('000)[a]	Percentage of district population to total population (%)	Sample size needed based on formula	Sample to be gathered
Barat Daya (BD)	217	13	139	261
Timur Laut (TL)	535	32	425	643
Seberang Perai Utara (SPU)	310	19	344	373
Seberang Perai Tengah (SPT)	395	24	390	475
Seberang Perai Selatan (SPS)	204	12	267	245
Total	1,663	100	1,565	2,000

[a] Source: Penang Statistics Quarter 3, 2017, Quarterly Penang Statistics, Penang Institute (Online database www.penanginstitute.org)

For the ethnic groups, we follow the ratio of 44.5: 44.6: 10.6: 0.3 for Bumiputera, Chinese, Indian and Others, respectively as shown in Table 2.10.

Table 2.10 Sample of ethnic group

District	2015 Population ('000)[a]	Percentage of ethnic population to total population (%)	Sample to be gathered				
			Barat Daya	Timur Laut	SPU	SPT	SPS
Bumiputera	680.4	44.5	116	286	166	211	109
Chinese	681.3	44.6	117	287	167	212	110
Indian	161.5	10.6	28	69	40	51	26
Others	4.9	0.3	0	1	0	1	0
Total	1,528.1	100.0	261	643	373	475	245

[a] Source: Population Quick Info, Department of Statistics Malaysia in Penang Statistics Quarter 3, 2017, Quarterly Penang Statistics, Penang Institute (Online database www.penanginstitute.org)

e.   *Survey Methods*

Two types of survey methods were conducted for the study, namely face-to-face interview and an online survey. For the face-to-face interview, the five group leaders were first informed of where to go to collect data and the number of respondents they need to gather for that place. Enumerators were informed to target residential areas of the major township in the assigned district. One research officer accompanied one group for a day when surveying until the group felt comfortable running the survey without supervision. The assigned consultant for each district also followed the group members in surveying to monitor their progress and procedure.

Group leaders were informed of the time frame in which the survey for every area was to be completed. The suggested dates for the surveys were:

23.10.17 – 31.10.17 – Timur Laut

01.11.17 – 03.11.17 – Barat Daya

04.11.17 – 07.11.17 – Seberang Perai Utara

08.11.17 – 11.11.17 – Seberang Perai Tengah

12.11.17 – 14.11.17 – Seberang Perai Selatan

The survey in Seberang Perai Utara started on 04.11.17 and had to be stopped for a few days due to the flash flood disaster that happened that weekend. The survey was stopped to take into consideration the safety of the enumerators, consultants and research officers, in addition to giving space to the flood victims. It was due to this reason that the targeted sample for the district was not met.

At the same time, three additional face-to-face interviews were conducted in conjunction with the PGC Roadshow at Dewan Millenium on 04.11.17 and the open days organised on 19.11.17 at Tesco e-Gate and on 25.11.17 at AEON Alma. During this session, enumerators targeted individuals attending the event. The screening questions asked were "Are you a Penangite?, Do you live in Penang? Do you work in Penang? Are you from Penang?" Enumerators only proceeded with the survey if the respondent answered YES to the questions asked. It was rather difficult to put a target on the number of respondents to be acquired on the data and to emphasise on a specific number of different ethnic groups. Hence, enumerators were advised to approach any respondents. This method was another reason for the imbalance in the ethnic proportion of respondents in addition to having an unbalanced number of respondents for each district. While the study targeted that respondents from Seberang Perai Utara would visit the event at Dewan Millenium, respondents from Timur Laut would visit Tesco e-Gate and respondents from Seberang Perai Tengah would visit AEON Alma, enumerators collected survey from respondents from various districts.

For the online method, the following medium was used
  i.   Email notification
  ii.   Social Media – Facebook
  iii.   PGC website

The online method was on an open platform for everyone. Hence, it was difficult to put a limit on the number of respondents and restrict the type of respondents based on ethnic group. It was based on this reason that the number of complete survey forms is more than the prescribed sample and that the complete survey forms were not in the intended proportions when segregated by ethnic group and district.

f.   *Data Cleaning*

Data cleaning were done for the survey data. The following table shows the steps involved in cleaning the data.

Table 2.11 Steps involved in data cleaning for survey data

Step	Task	Description
1	Merge data source	The surveys from a face-to-face interview in Timur Laut and Barat Daya were first keyed-into the Excel template. After the online portal of Survey Monkey was upgraded, the online survey data was automatically downloaded into Excel form. Hence, survey data from a face-to-face interview in other districts were directly keyed-into the online portal of Survey Monkey. Once the survey was completed, all the data were downloaded into various Excel files.
2	Translate Mandarin and Bahasa Melayu responses into English	Given that the survey forms were done in five languages, the next step prior to analysing the data was to translate all responses into English. The translation was done for Mandarin and Bahasa Melayu only because no respondents answered the Tamil version.
3	Merge completed data	All data were compiled into one file and exported to STATA Version.
4	Clean data type in STATA 12	All data that were stored in string variables were encoded and decoded to long / float variables for analysis.
5	Check accuracy of data	Consultants checked the data that was keyed in for districts and strata. After a thorough check, significant changes were done in districts and urban-rural location. Some respondents were unaware of the districts and location of their areas, and these were rectified during the cleaning process. When there was incomplete or missing information, the status of the data remained, and no changes were made.

The total collected samples from public survey amounted to 2,498, more than the intended sample. Certain districts have more respondents while others had fewer respondents. To account for this change, the weighted analysis was done by district. Weightage by ethnic group was not done because some respondents preferred that their ethnicity be left blank.

Nevertheless, it is worth noting that none of the districts were underrepresented in terms of sample and that the actual survey exceeded the intended sample.

Table 2.12 Actual survey data and weightage

District	Sample to be gathered	Percentage of district population to total population (%)	Actual survey	Percentage of sample district to total sample (%)	Average weight
Barat Daya	261	13	438	18	0.74
Timur Laut	643	32	844	34	0.97
Seberang Perai Utara	373	19	392	16	1.20
Seberang Perai Tengah	475	24	547	22	1.09
Seberang Perai Selatan	245	12	277	11	1.04
Total	2,000	100	2,498	100	

g.   Data analysis

As mentioned, data analysis was done based on average weight done for the entire sample. Six categories of variables were analysed based on district, income group, education attainment, location, the source of data and age. The six categories were

i.   Current issues – Seriousness of environment issues

ii.   Current issues – Satisfaction on certain aspects of development and environment

iii.   Current issues – Concern with regard to the issues of SDGs

iv.   Current practices – Sustainable initiatives taken and practised by individual

v.   Current practices – Household behaviour on waste management

vi.   Expectations with regard to future Penang development

For district, the category was BD, TL, SPU, SPT and SPS. For income group, the category was low-income (RM3,000 and below), middle-income (RM3,001 – RM6,999) and high-income (RM7,000 and above). For education attainment, the category was informal education / no education, primary education, secondary education and tertiary education. For location, the category was urban and rural. For the source of data, the category was online

and face-to-face. For age, the category was youth (35 years old and below), adult (36 – 59 years old) and elderly (60 years and above).

2.2.4 Mapping

The study aimed to identify environmental issues in Penang State. Public awareness and knowledge about environmental issues were captured by asking the respondents from the households' survey and focus group discussion to mark on the map locations that have environmental issues in Penang State. Table 2.13 shows the steps involved in mapping.

Table 2.13 Steps involved in mapping

Step	Task	Description
1	Gather information from Focus Group Discussion (FGD)	Each participant from the FGD was given a map of Penang State and asked to mark or pinpoint areas that have environmental issues. The points will be divided into 12 major categories; namely Socioeconomic (SE), Built Environment (BE), Land Matters (LAND), Water Security (WS), Energy Security (ES), Disaster (DIS), and Institution and Governance (IG).
2	Export points from maps into shapefile	All the points marked by the participants will be transferred into a shapefile format using ArcMap 10.3 software. Each point contains the number of participants who marked the identified area. For example, in the TRANS issue, seven participants marked Bayan Lepas.
3	Perform Point Density Analysis	The information regarding points and number of participants will undergo further analysis to determine which area requires extra attention so that PGA can put more effort in solving that particular environmental issue. We chose Point Density analysis to determine the highlighted area based on identified several major categories; TRANS, BE, SE, and DIS. The result will display which area contains highly concentrated points/number of participants marked on the map. The higher the concentration, the darker the colour.
4	Export shapefile map into jpeg format	Maps generated from Point Density analysis will be exported into jpeg format to display on the report.

2.2.5 Open Day

Penang Green Awareness Day (PGA Day) is an initiative by the consultation team to involve the public. The event was held on November 19, 2017, and November 25, 2017, at Tesco Shopping Mall, Lebuh Tengku Kudin one and Aeon Mall Alma, Bukit Mertajam, respectively. 64 students from the Environmental Economics and Natural Resources course and ten students from the School of Industrial Technology were involved as volunteers. The objective

of PGA Day is to educate and increase public awareness about the importance of ecosystem services to humanity. Posters on ideal ecosystem vs. disturbed ecosystem were presented to inform the public about the importance of ecosystem services as a key component in Sustainable Development Goals (SDGs). Besides awareness campaign, public concerns on Penang environmental issues were observed through casual activities across ages such as interactive games, online game, hands-on vertical gardening, colouring and drawing contest, and "issues mapping". Overall, active stakeholders' involvement in environmental and sustainability agenda was expected from the public where the environmental concerns were highlighted in the island region. The artwork from the kids' activities reflected their hope in a greener and happier Penang.

Reference

Krejcie, R. V. and Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*. 30, 607-610.

Population Quick Info, Department of Statistics Malaysia in Penang Statistics Quarter 3, 2017, Quarterly Penang Statistics, Penang Institute (Online database www.penanginstitute.org)

Chapter 3
Profile of Stakeholders

3.1 Profile of Stakeholders Involved in Focus Group Discussions and In-Depth Interviews

A total of 61 stakeholders attended the focus group discussion and in-depth interview. Only 50 profiles were reported. This was due to the fact that some stakeholders did not return the socio-demographic forms after the focus group discussion. Their profile is as shown in Table 3.1. The stakeholders invited to the focus group discussions and interviews were the top management of institutions and organisations or individuals who were involved in the decision-making process of the institutions and organisations.

As could be deduced from Table 3.1, we interviewed more men (70%) than women (30%) because more men were in the top management positions. The proportion of ethnic group for the Chinese and Bumiputera was almost the same with 40% and 44%, respectively. Given that the decision-makers with regard to Penang development were in the hands of the public sector, we involved more stakeholders from the public sector (42.86%) than any other sector. As such, more than half of the stakeholders involved in the focus group discussions and interviews were middle- and high-income groups with 35.48% from the RM4,000 – RM5,999 income category, 16.13% from the RM6,000 – RM6,999 income category and 25.81% from the above RM8,000 income category. Approximately 94% of the stakeholders had tertiary education. The majority of the stakeholders were youth (52.27%) and adults (38.64%). We also involved 9.09% of elderly in our focus group discussions and interviews.

Table 3.1 Profile of Stakeholders for Focus Group Discussions and Interviews (%)

	Number	Percentage
Gender	35	
Male	15	70.00
Female		30.00
Ethnic	20	
Chinese	4	40.00
Indian	22	8.00
Bumiputera	4	44.00

	Number	Percentage
Others		8.00
Employment	2	
Unemployed	7	4.08
Private Sector	21	14.29
Public Sector	11	42.86
Self-employed	8	22.45
Others		16.33
Individual Income	1	
RM1000-RM1999	6	3.23
RM2000-RM3999	11	19.35
RM4000-RM5999	5	35.48
RM6000-RM7999	8	16.13
RM8000 and above		25.81
Age Group	23	
Youth (35 years and below)	17	52.27
Adult (36 - 59 years old)	4	38.64
Elderly (60 years and above)		9.09
Education Level	1	
Primary Education	2	2.04
Secondary Education	46	4.08
Tertiary Education		93.88
Household Income	11	
RM1,000 - RM4,999	9	25.00
RM5,000 - RM6,499	10	20.45
RM6,500 - RM7,999	14	22.73
RM8,000 and over		31.82

3.2 Profile of Stakeholders Involved in Survey

The survey interviewed 2,498 individuals (692 from online survey and 1,896 from face-to-face interview) that covers both Penang Island and Mainland. The distribution of respondents is shown in Figure 3.1. The respondents were well-distributed between the Mainland and Penang Island.
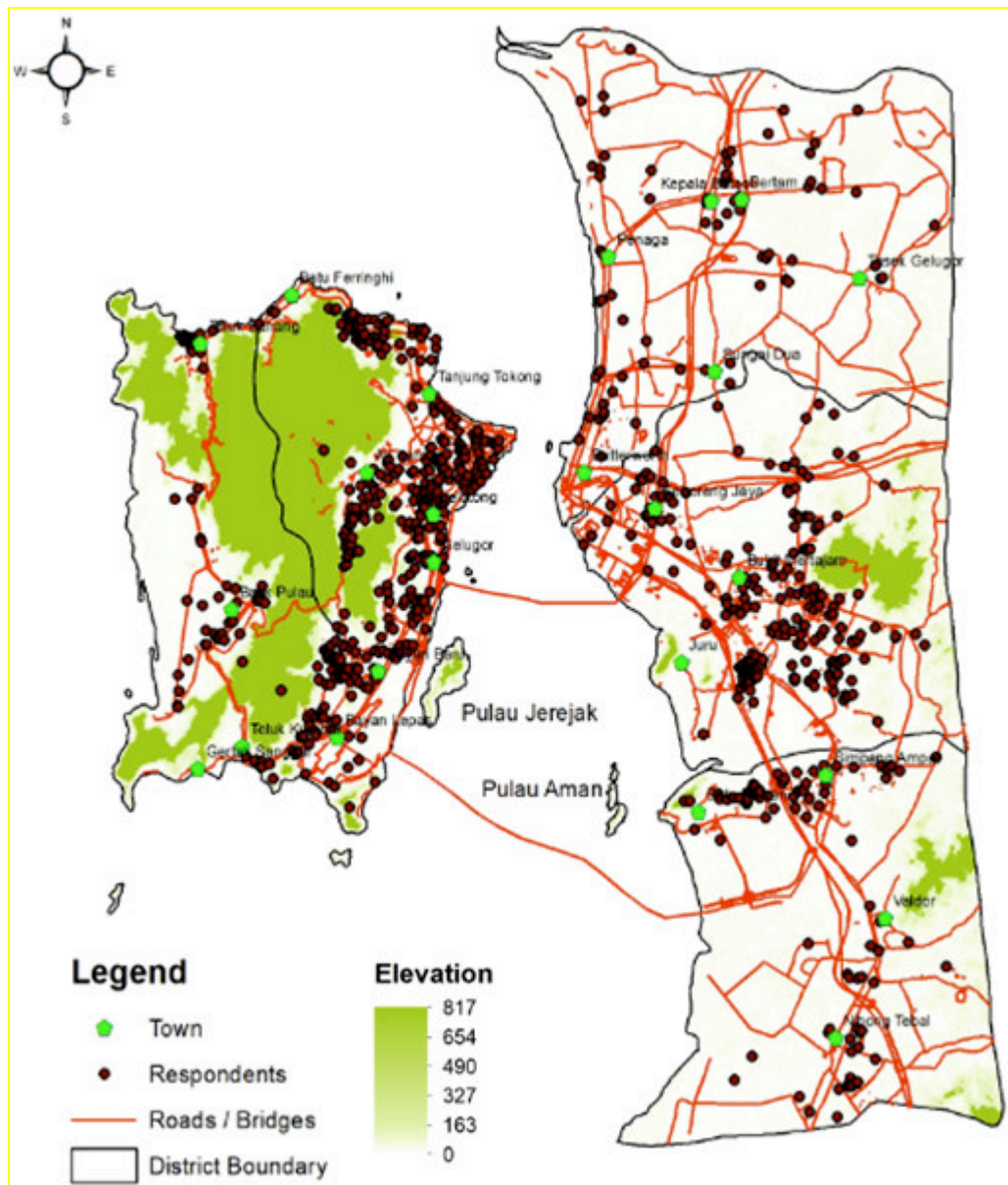
Figure 3.1 Distribution of Public Participation in the Public Survey

The profile of stakeholders is shown in Table 3.2. As mentioned in Chapter 2, we conducted both online and face-to-face surveys. The face-to-face survey involved interviewing respondents at their residential areas as well as at three venues where green open days were held. Our respondents covered all of Penang with 18% from Barat Daya, 34% from Timur Laut, 16% from Seberang Perai Utara, 22% from Seberang Perai Tengah and 11% from Seberang Perai Selatan. We covered 73% urban areas and 27% rural areas. Our distribution of respondents with regard to gender was balanced with 51% male and 49% female. With regard to ethnicity, we managed to interview 35% Chinese, 40% Bumiputera, 12% Indian and 4% other ethnic groups. 10% respondents of the online survey did not report

their ethnic group. Similar to stakeholders for focus group discussions and interview, the majority of the survey respondents had tertiary education (52%).

Our respondents were from different employment types with 37% from the private sector, 24% from the public sector, 22% self-employed and 14% unemployed. 50% of our respondents were youth, 36% were adult and 13% elderly. We also asked about living arrangements of respondents because living arrangements affect many aspects of the environment that include energy usage, water usage, food consumption and waste segregation. 30% of our respondents lived with spouse only,3 1% had young children in their households, 17% had in parents or in-laws in their households, 14% live alone, and the rest lived with their relatives and others.

Table 3.2 Profile of Stakeholders for Public Survey

	Total	Online	Face-to-Face
District			
Barat Daya	438 (18%)	66 (3%)	372 (15%)
Timur Laut	844 (34%)	155 (6%)	689 (28%)
Seberang Perai Utara	392 (16%)	268 (11%)	124 (5%)
Seberang Perai Tengah	277 (22%)	78 (3%)	469 (19%)
Seberang Perai Selatan	844 (11%)	35 (1%)	242 (10%)
Location			
Urban	1,827 (73%)	297 (12%)	1,530 (61%)
Rural	661 (27%)	304 (12%)	357 (14%)
Missing	10 (0.4%)	1 (0.04%)	9 (0.36%)
Gender			
Male	1,156 (51%)	191 (8%)	965 (43%)
Female	1,103 (49%)	191 (8%)	912 (40%)
Ethnicity			
Chinese	862 (35%)	161 (6%)	701 (28%)
Indian	293 (12%)	31 (1%)	262 (10%)
Bumiputera	1,008 (40%)	179 (7%)	829 (33%)
Others	96 (4%)	11 (0.4%)	85 (3%)
Missing data	239 (10%)	220 (9%)	19 (1%)
Education Level			
Informal Education / No Education	45 (2%)	2 (0.1%)	43 (2%)
Primary Education	120 (5%)	5 (0.2%)	115 (5%)
Secondary Education	915 (40%)	79 (3%)	836 (37%)
Tertiary Education	1,181 (52%)	297 (13%)	884 (39%)
Employment			
Unemployed	315 (14%)	30 (1%)	285 (13%)

	Total	Online	Face-to-Face
Private Sector	809 (37%)	132 (6%)	677 (31%)
Public Sector	524 (24%)	150 (7%)	374 (17%)
Self-employed	479 (22%)	34 (2%)	445 (20%)
Others.	78 (4%)	21 (1%)	57 (3%)
Age Group			
Youth (35 years and below)	1,250 (50%)	208 (8%)	1042 (42%)
Adult (36 - 59 years old)	911 (36%)	156 (6%)	755 (30%)
Elderly (60 years and above)	337 (13%)	238 (10%)	99 (4%)
Household Income			
Below RM999	130 (6%)	12 (1%)	118 (5%)
RM1,000 - RM1,999	275 (13%)	20 (1%)	255 (12%)
RM2,000 - RM2,999	448 (20%)	50 (2%)	398 (18%)
RM3,000 - RM3,999	425 (19%)	52 (2%)	373 (17%)
RM4,000 - RM4,999	313 (14%)	52 (2%)	261 (12%)
RM5,000 - RM5,999	223 (10%)	49 (2%)	174 (8%)
RM6,000 - RM6,999	105 (5%)	26 (1%)	79 (4%)
RM7,000 - RM7,999	68 (3%)	22 (1%)	46 (2%)
RM8,000 and over	203 (9%)	83 (4%)	120 (5%)
Living Arrangement			
Live alone	283 (14%)	40 (2%)	243 (12%)
Live with spouse only	608 (30%)	100 (5%)	508 (25%)
Live with young children	585 (29%)	126 (6%)	459 (23%)
Live with spouse and young children	48 (2%)	-	48 (2%)
Live with parents/in law	315 (16%)	50 (2%)	265 (13%)
Live with spouse, young children and parents	18 (1%)	-	18 (1%)
Live with spouse, young children, parent	4 (0.2%)	-	4 (0.2%)
Live with spouse and parents	20 (1%)	1 (0%)	19 (1%)
Live with spouse, parents and relative	4 (0.2%)	-	4 (0.2%)
Live with relatives	55 (3%)	11 (1%)	44 (2%)
Live with spouse, young children, and relative	5 (0.2%)	-	5 (0.2%)
Live with others	67 (3%)	6 (0.3%)	61 (3%)

Chapter 4
Current Scenario

The current scenario comprises issues, practices and contemporary challenges related to the environmental, economic and social aspects. The data are the results of the analysis pertaining to the survey instrument, focus group discussions as well as interviews with respondents.

4.1   Current Issues

Issues related to environment, economic and social aspects of the society in Penang State are the main elements that could assist in translating the scope of building the green agenda in Penang State. This section details the findings from the public survey, focus group discussions and in-depth interviews.

4.1.1   Summary Findings from Public Survey

The findings from public survey depict the views, level of satisfaction and concerns of the general public pertaining to environmental issues, current developments and issues related to the objectives of sustainable development. The results from the public survey were divided three section namely public views on environmental issues; public satisfaction on current development issues in their area; and public concern on issues of SDGs.

a.   Public View on Environmental Issues in Penang State

The public view of environmental issues in Penang consisted of 12 key environmental issues graded based on a 5-point Likert scale ranging from Not Serious, Slightly Serious, Fairly Serious, Serious and Extremely Serious. The result of the public view comprised five (5) selected indicators such as education, district, location, age group and income. Tables 4.1, 4.2, 4.3, 4.4 and 4.5 show the result.

Table 4.1 Public view of environmental issues in Penang based on the level of education (Mean score)

Environmental Issues	Education Level				Interpretation
	Informal / No Education	Primary	Secondary	Tertiary	
a. Chronic traffic jam	3.38	3.61	3.69	3.83	Fairly serious
b. Flash floods	3.30	3.30	3.42	3.70	Fairly serious
c. Rising temperature	2.83	3.52	3.34	3.46	Fairly serious
d. Limited open and green spaces	2.92	3.24	3.17	3.40	Fairly serious
e. Diminishing waterfront/shoreline	2.97	3.15	3.05	3.40	Fairly serious
f. Air pollution	2.83	3.28	3.18	3.36	Fairly serious
g. Water pollution	3.08	2.99	3.04	3.28	Fairly serious
h. Noise pollution	2.70	3.12	3.10	3.25	Fairly serious
i. Overfishing	2.49	2.68	2.52	2.77	**Slightly serious**
j. Excessive land reclamation	3.21	3.22	3.25	3.61	Fairly serious
k. Inefficient solid waste management	2.93	3.15	3.08	3.34	Fairly serious
l. Deforestation	2.93	3.50	3.39	3.64	Fairly serious
Total Mean Score	2.96	3.23	3.18	3.42	
Interpretation	Slightly Serious	Fairly serious	Fairly serious	Fairly serious	

The results in Table 4.1 show that the majority of respondents with different education backgrounds share the same view on environmental issues in Penang. They stated that all environmental issues in Penang are fairly serious except the issue of overfishing. Table 4.1 also shows that the respondents who have higher education are more concerned about the environmental issues in Penang. The respondents are fairly serious towards all environmental issues especially the chronic traffic jam. Those with no formal education and no education express their concern at the level of "slightly serious".

From Table 4.2, it could be deduced that all the environmental issues except overfishing were identified as fairly serious. Overfishing was identified as a slightly serious environmental issue. With regard to district, SPU and SPT were facing fairly serious chronic traffic jams and

flash floods. In BD and TL, the environmental issue regarded as fairly serious was chronic traffic jam. Flash flood was identified as a fairly serious issue in SPS.

Table 4.2 Public view of environmental issues in Penang based on district (Mean score)

Environmental Issues	District					Interpretation
	BD	SPU	SPT	SPS	TL	
a. Chronic traffic jam	3.75	3.80	3.73	3.62	3.84	Fairly serious
b. Flash floods	3.60	3.79	3.74	3.72	3.39	Fairly serious
c. Rising temperature	3.47	3.30	3.47	3.35	3.41	Fairly serious
d. Limited open and green spaces	3.38	3.31	3.24	3.30	3.31	Fairly serious
e. Diminishing waterfront/shoreline	3.27	3.42	3.15	3.23	3.29	Fairly serious
f. Air pollution	3.29	3.29	3.34	3.25	3.24	Fairly serious
g. Water pollution	3.26	3.29	3.22	3.12	3.10	Fairly serious
h. Noise pollution	3.20	3.15	3.18	3.22	3.15	Fairly serious
i. Overfishing	2.74	2.70	2.61	2.81	2.61	**Slightly serious**
j. Excessive land reclamation	3.42	3.62	3.42	3.37	3.48	Fairly serious
k. Inefficient solid waste management	3.31	3.31	3.20	3.28	3.16	Fairly serious
l. Deforestation	3.64	3.54	3.58	3.51	3.48	Fairly serious
Total Mean Score	**3.36**	**3.37**	**3.32**	**3.31**	**3.28**	
Interpretation	Fairly serious	Fairly serious	Fairly serious	Fairly serious	Fairly serious	

Table 4.3 shows that there are two (2) different environmental issues between urban and rural areas. Views from urban respondents showed that chronic traffic jam is a main issues, and respondents from rural areas stated that the flash flood is the major issue. Overfishing remains a slightly serious issue for both locations.

Table 4.3 Public View of environmental issues in Penang based on location (Mean score)

Environmental Issues	Location		Interpretation
	Urban	Rural	
a. Chronic traffic jam	3.79	3.71	Fairly serious
b. Flash floods	3.55	3.76	Fairly serious
c. Rising temperature	3.44	3.33	Fairly serious
d. Limited open and green spaces	3.30	3.30	Fairly serious
e. Diminishing waterfront/shoreline	3.24	3.33	Fairly serious
f. Air pollution	3.28	3.28	Fairly serious
g. Water pollution	3.17	3.22	Fairly serious
h. Noise pollution	3.17	3.18	Fairly serious
i. Overfishing	2.64	2.73	**Slightly serious**
j. Excessive land reclamation	3.45	3.51	Fairly serious
k. Inefficient solid waste management	3.21	3.28	Fairly serious
l. Deforestation	3.54	3.54	Fairly serious
Total Mean Score	**3.31**	**3.35**	
Interpretation	**Fairly serious**	**Fairly serious**	

Tables 4.4 and 4.5 show that views from respondents in different age and income groups agree regarding chronic traffic jam as an environmental issue in Penang. And the issues of overfishing remain slightly serious in Penang.

Table 4.4 Public view of environmental issues in Penang based on age group (Mean score)

Environmental Issues	Age Group			Interpretation
	General Public	Youth	Elderly	
a. Chronic traffic jam	3.81	3.69	3.64	Fairly serious
b. Flash floods	3.54	3.44	3.31	Fairly serious
c. Rising temperature	3.48	3.40	3.20	Fairly serious
d. Limited open and green spaces	3.35	3.24	2.94	Fairly serious
e. Diminishing waterfront/shoreline	3.26	3.16	2.90	Fairly serious
f. Air pollution	3.30	3.29	2.98	Fairly serious
g. Water pollution	3.21	3.12	2.77	Fairly serious
h. Noise pollution	3.26	3.18	2.73	Fairly serious
i. Overfishing	2.75	2.60	2.41	**Slightly serious**
j. Excessive land reclamation	3.40	3.36	3.08	Fairly serious
k. Inefficient solid waste management	3.20	3.18	2.95	Fairly serious
l. Deforestation	3.52	3.51	3.09	Fairly serious
Total Mean Score	**3.34**	**3.26**	**3.00**	
Interpretation	Fairly serious	Fairly serious	Fairly serious	

Table 4.5 Public view of environmental issues in Penang based on income (Mean score)

Environmental Issues	Income			Interpretation
	RM3000 and below	RM3001 to RM6999	RM7000 and above	
a. Chronic traffic jam	3.70	3.92	3.79	Fairly serious
b. Flash floods	3.44	3.72	3.66	Fairly serious
c. Rising temperature	3.37	3.42	3.32	Fairly serious
d. Limited open and green spaces	3.25	3.33	3.20	Fairly serious
e. Diminishing waterfront/shoreline	3.16	3.41	3.23	Fairly serious
f. Air pollution	3.25	3.37	3.00	Fairly serious
g. Water pollution	3.11	3.30	3.04	Fairly serious
h. Noise pollution	3.15	3.28	2.90	Fairly serious
i. Overfishing	2.55	2.78	2.67	**Slightly serious**
j. Excessive land reclamation	3.37	3.60	3.37	Fairly serious
k. Inefficient solid waste management	3.16	3.33	3.20	Fairly serious
l. Deforestation	3.51	3.57	3.53	Fairly serious
Total Mean Score	**3.25**	**3.42**	**3.24**	
Interpretation	Fairly serious	Fairly serious	Fairly serious	

Tables 4.1 to 4.5 show that chronic traffic jam was a fairly serious environmental issue in Penang. The mean score analysis by district indicated that flash flood was a fairly serious environmental issue in SPT and SPU.

b.   Public Satisfaction on Current Development Issues in Their Area

Keywords that describe satisfaction levels of the observed aspects ranged from No Opinion, Very Dissatisfied, Dissatisfied, Satisfied and Very Satisfied. Current development issues are presented in Tables 4.6 to 4.10 suggesting that the overall results are in agreement across education, districts, locations, age and income group indicators with respondents being dissatisfied. While for affordable housing, it appears as very dissatisfied with all variables except for education. None of the variables fall under satisfied and very satisfied observations.

Table 4.6 Public satisfaction on current development issues based on level of education

Current Development Issues	Education				Interpretation
	Informal / No Education	Primary	Secondary	Tertiary	
a. Air quality	3.67	3.58	3.55	3.46	Dissatisfied
b. Water quality	3.67	3.68	3.63	3.59	Dissatisfied
c. Access to green and open spaces	3.64	3.58	3.47	3.35	Dissatisfied
d. Level of noise	3.40	3.44	3.39	3.33	Dissatisfied
e. Litter and rubbish	3.48	3.52	3.35	3.21	Dissatisfied
f. Access to public transportation	3.64	3.64	3.59	3.37	Dissatisfied
g. Land development	3.28	3.43	3.25	3.14	Dissatisfied
h. Affordable housing	2.92	3.26	3.06	2.88	Dissatisfied
i. Health facilities and accessibilities	3.74	3.84	3.81	3.67	Dissatisfied
j. Education facilities and accessibilities	3.63	3.88	3.86	3.75	Dissatisfied
Total Mean Score	**3.51**	**3.69**	**3.50**	**3.38**	
Interpretation	Dissatisfied	Dissatisfied	Dissatisfied	Dissatisfied	

Table 4.7 Public satisfaction on current development issues based on district

Current Development Issues	District					Interpretation
	BD	SPU	SPT	SPS	TL	
a. Air quality	3.56	3.42	3.53	3.70	3.42	Dissatisfied
b. Water quality	3.64	3.54	3.63	3.76	3.54	Dissatisfied
c. Access to green and open spaces	3.51	3.29	3.52	3.59	3.28	Dissatisfied
d. Level of noise	3.47	3.28	3.43	3.58	3.19	Dissatisfied
e. Litter and rubbish	3.39	3.07	3.41	3.43	3.16	Dissatisfied
f. Access to public transportation	3.50	3.28	3.55	3.51	3.44	Dissatisfied
g. Land development	3.24	3.07	3.31	3.38	3.04	Dissatisfied
h. Affordable housing	2.97	2.85	3.05	3.24	2.83	**Very Dissatisfied**
i. Health facilities and accessibilities	3.74	3.56	3.81	3.86	3.66	Dissatisfied
j. Education facilities and accessibilities	3.79	3.66	3.89	3.92	3.71	Dissatisfied
Total Mean Score	**3.49**	**3.30**	**3.51**	**3.60**	**3.33**	
Interpretation	Dissatisfied	Dissatisfied	Dissatisfied	Dissatisfied	Dissatisfied	

Table 4.8 Public satisfaction on current development issues based on location

Current Development Issues	Location		Interpretation
	Urban	Rural	
a. Air quality	3.48	3.54	Dissatisfied
b. Water quality	3.59	3.64	Dissatisfied
c. Access to green and open spaces	3.40	3.42	Dissatisfied
d. Level of noise	3.32	3.42	Dissatisfied
e. Litter and rubbish	3.28	3.24	Dissatisfied
f. Access to public transportation	3.49	3.37	Dissatisfied
g. Land development	3.17	3.19	Dissatisfied
h. Affordable housing	2.93	3.01	**Very Dissatisfied**
i. Health facilities and accessibilities	3.73	3.67	Dissatisfied
j. Education facilities and accessibilities	3.79	3.76	Dissatisfied
Total Mean Score	**3.418**	**3.426**	
Interpretation	Dissatisfied	Dissatisfied	

Table 4.9 Public satisfaction on current development issues based on age group

Current Development Issues	Age Group			Interpretation
	General Public	Youth	Elderly	
a. Air quality	3.55	3.47	3.45	Dissatisfied
b. Water quality	3.61	3.60	3.59	Dissatisfied
c. Access to green and open spaces	3.44	3.39	3.35	Dissatisfied
d. Level of noise	3.42	3.31	3.30	Dissatisfied
e. Litter and rubbish	3.37	3.21	3.19	Dissatisfied
f. Access to public transportation	3.53	3.43	3.36	Dissatisfied
g. Land development	3.22	3.19	3.02	Dissatisfied
h. Affordable housing	2.99	2.96	2.85	**Very Dissatisfied**
i. Health facilities and accessibilities	3.77	3.70	3.59	Dissatisfied
j. Education facilities and accessibilities	3.82	3.78	3.68	Dissatisfied
Total Mean Score	**3.472**	**3.404**	**3.338**	
Interpretation	Dissatisfied	Dissatisfied	Dissatisfied	

Table 4.10 Public satisfaction on current development issues based on income

	Current Development Issues	Income			Interpretation
		RM3000 and below	RM3001 to RM6999	RM7000 and above	
a.	Air quality	3.52	3.52	3.77	Dissatisfied
b.	Water quality	3.62	3.58	3.86	Dissatisfied
c.	Access to green and open spaces	3.41	3.43	3.49	Dissatisfied
d.	Level of noise	3.35	3.34	3.60	Dissatisfied
e.	Litter and rubbish	3.31	3.25	3.39	Dissatisfied
f.	Access to public transportation	3.58	3.40	3.30	Dissatisfied
g.	Land development	3.23	3.14	3.19	Dissatisfied
h.	Affordable housing	2.99	2.90	3.01	**Very dissatisfied**
i.	Health facilities and accessibilities	3.82	3.70	3.77	Dissatisfied
j.	Education facilities and accessibilities	3.87	3.76	3.73	Dissatisfied
	Total Mean Score	**3.47**	**3.40**	**3.51**	
	Interpretation	Dissatisfied	Dissatisfied	Dissatisfied	

c. Public Concern on Issues of SDGs (Concern)

Keywords describing public concerns on related SDGs issues range from Not Very Concerned, Concerned and Extremely Concerned. There are 26 variables related to SDGs in the Public Survey as shown in Tables 4.11 to 4.17 based on education, district, locations, age and income indicators. Overall, results show that all variables fall under "concerned". However, regional and global partnership for sustainable development as well as trade related activities that lead to environmental problems (local consumption vs. imported goods) are "not very concerned" under the education indicator.

Table 4.11 Public concern on issues of SDGs based on education

Issues of SDGs	Education				Interpretation
	Informal / No Education	Primary	Secondary	Tertiary	
a. General environmental problems	2.00	2.16	2.18	2.28	Concerned
b. Climate change & global warming	2.09	2.23	2.16	2.30	Concerned
c. Air pollution	2.09	2.19	2.21	2.31	Concerned
d. Water pollution (river/ ocean/ lake/ stream/ pond)	2.02	2.20	2.23	2.33	Concerned
e. Water shortage	2.09	2.23	2.22	2.27	Concerned
f. Food security (piece, accessibility, availability)	2.08	2.27	2.22	2.31	Concerned
g. Deforestation (hill, forest, terrain, slope)	1.92	2.24	2.19	2.35	Concerned
h. Loss of biodiversity (on land, under water)	1.94	2.05	2.06	2.22	Concerned
i. People's lifestyles on waste related problems (waste management, recycle)	1.86	2.06	2.05	2.23	Concerned
j. Trade related activties that lead to environmental problems (local consumption vs. imported goods)	1.92	1.97	1.97	2.10	**Not very concerned**
k. Population growth	1.87	2.03	1.94	2.05	Concerned
l. Gender equality (woman and girls)	1.83	2.03	1.98	2.08	Concerned
m. Poverty	2.02	2.25	2.23	2.29	Concerned
n. Green space & recreational areas	2.00	2.21	2.18	2.28	Concerned
o. Accessibility to quality education	2.01	2.24	2.21	2.33	Concerned
p. Energy efficiency	2.02	2.10	2.12	2.25	Concerned
q. Accessibility to quality education	2.09	2.21	2.22	2.33	Concerned
r. Affordable housing	2.03	2.37	2.27	2.36	Concerned
s. Efficient public transportation	2.08	2.29	2.22	2.37	Concerned
t. Preservation and conservation of cultural and natural heritage	2.10	2.05	2.05	2.19	Concerned
u. Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)	1.95	2.12	2.09	2.16	Concerned
v. Rules, regulation, laws and policies for sustainable development	1.90	2.00	2.02	2.15	Concerned
w. Regional and global partnership for sustainable development	1.84	1.98	1.99	2.09	**Not very concerned**
x. Federal and State consensus on development issues	1.94	1.99	2.02	2.14	Concerned
y. Ecosystem Protected Areas (land base and marine)	2.03	1.98	2.06	2.19	Concerned
Total Mean Score	**2.00**	**2.14**	**2.12**	**2.24**	
Interpretation	Concerned	Concerned	Concerned	Concerned	

Table 4.12 Public concern on issues of SDGs based on district

Issues of SDGs	District					Interpretation
	BD	SPU	SPT	SPS	TL	
a. General environmental problems	2.23	2.22	2.22	2.23	2.24	Concerned
b. Climate change & global warming	2.23	2.27	2.24	2.21	2.24	Concerned
c. Air pollution	2.25	2.27	2.27	2.26	2.25	Concerned
d. Water pollution (river/ ocean/ lake/ stream/ pond)	2.27	2.34	2.29	2.30	2.26	Concerned
e. Water shortage	2.25	2.29	2.30	2.19	2.21	Concerned
f. Food security (piece, accessibility, availability)	2.26	2.34	2.31	2.22	2.24	Concerned
g. Deforestation (hill, forest, terrain, slope)	2.31	2.32	2.25	2.25	2.29	Concerned
h. Loss of biodiversity (on land, under water)	2.16	2.24	2.12	2.13	2.13	Concerned
i. People's lifestyles on waste related problems (waste management, recycle)	2.21	2.27	2.09	2.07	2.15	Concerned
j. Trade related activties that lead to environmental problems (local consumption vs. imported goods)	2.10	2.12	2.04	1.97	2.00	Concerned
k. Population growth	2.05	2.03	2.02	1.99	1.97	Concerned
l. Gender equality (woman and girls)	2.10	2.03	2.10	2.02	1.97	Concerned
m. Poverty	2.30	2.21	2.30	2.23	2.23	Concerned
n. Green space & recreational areas	2.24	2.28	2.24	2.19	2.23	Concerned
o. Accessibility to quality education	2.31	2.26	2.28	2.27	2.26	Concerned
p. Energy efficiency	2.23	2.23	2.21	2.13	2.17	Concerned
q. Accessibility to quality education	2.29	2.23	2.31	2.30	2.24	Concerned
r. Affordable housing	2.31	2.29	2.34	2.33	2.30	Concerned
s. Efficient public transportation	2.31	2.34	2.29	2.28	2.30	Concerned
t. Preservation and conservation of cultural and natural heritage	2.13	2.19	2.12	2.12	2.11	Concerned
u. Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)	2.11	2.17	2.15	2.16	2.11	Concerned
v. Rules, regulation, laws and policies for sustainable development	2.15	2.20	2.07	2.05	2.08	Concerned
w. Regional and global partnership for sustainable development	2.08	2.08	2.05	1.99	2.03	Concerned
x. Federal and State consensus on development issues	2.11	2.12	2.08	2.03	2.08	Concerned
y. Ecosystem Protected Areas (land base and marine)	2.16	2.18	2.11	2.10	2.12	Concerned
Total Mean Score	2.21	2.22	2.19	2.16	2.17	
Interpretation	Concern-ed	Concern-ed	Concern-ed	Concern-ed	Concern-ed	

Table 4.13 Public concern on issues of SDGs based on location

Issues of SDGs	Location		Interpretation
	Urban	Rural	
a. General environmental problems	2.23	2.23	Concerned
b. Climate change & global warming	2.24	2.24	Concerned
c. Air pollution	2.26	2.26	Concerned
d. Water pollution (river/ ocean/ lake/ stream/ pond)	2.27	2.32	Concerned
e. Water shortage	2.24	2.26	Concerned
f. Food security (piece, accessibility, availability)	2.26	2.29	Concerned
g. Deforestation (hill, forest, terrain, slope)	2.28	2.28	Concerned
h. Loss of biodiversity (on land, under water)	2.13	2.19	Concerned
i. People's lifestyles on waste related problems (waste management, recycle)	2.14	2.18	Concerned
j. Trade related activities that lead to environmental problems (local consumption vs. imported goods)	2.03	2.05	Concerned
k. Population growth	2.00	2.01	Concerned
l. Gender equality (woman and girls)	2.04	2.02	Concerned
m. Poverty	2.27	2.22	Concerned
n. Green space & recreational areas	2.23	2.23	Concerned
o. Accessibility to quality education	2.27	2.25	Concerned
p. Energy efficiency	2.19	2.18	Concerned
q. Accessibility to quality education	2.27	2.26	Concerned
r. Affordable housing	2.32	2.30	Concerned
s. Efficient public transportation	2.30	2.31	Concerned
t. Preservation and conservation of cultural and natural heritage	2.11	2.16	Concerned
u. Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)	2.12	2.16	Concerned
v. Rules, regulation, laws and policies for sustainable development	2.09	2.14	Concerned
w. Regional and global partnership for sustainable development	2.04	2.05	Concerned
x. Federal and State consensus on development issues	2.08	2.09	Concerned
y. Ecosystem Protected Areas (land base and marine)	2.12	2.14	Concerned
Total Mean Score	**2.18**	**2.19**	
Interpretation		Concerned	

Table 4.14 Public concern on issues of SDGs based on age group

Issues of SDGs	Age Group			Interpretation
	General Public	Youth	Elderly	
a. General environmental problems	2.29	2.18	2.24	Concerned
b. Climate change & global warming	2.26	2.21	2.29	Concerned
c. Air pollution	2.30	2.22	2.28	Concerned
d. Water pollution (river/ ocean/ lake/ stream/ pond)	2.31	2.25	2.36	Concerned
e. Water shortage	2.28	2.21	2.29	Concerned
f. Food security (piece, accessibility, availability)	2.30	2.24	2.33	Concerned
g. Deforestation (hill, forest, terrain, slope)	2.30	2.25	2.35	Concerned
h. Loss of biodiversity (on land, under water)	2.16	2.11	2.25	Concerned
i. People's lifestyles on waste related problems (waste management, recycle)	2.14	2.13	2.28	Concerned
j. Trade related activities that lead to environmental problems (local consumption vs. imported goods)	2.05	2.03	2.09	Concerned
k. Population growth	2.00	2.00	2.05	Concerned
l. Gender equality (woman and girls)	2.00	2.06	2.04	Concerned
m. Poverty	2.27	2.25	2.25	Concerned
n. Green space & recreational areas	2.26	2.21	2.29	Concerned
o. Accessibility to quality education	2.28	2.26	2.29	Concerned
p. Energy efficiency	2.22	2.16	2.24	Concerned
q. Accessibility to quality education	2.28	2.26	2.27	Concerned
r. Affordable housing	2.35	2.29	2.33	Concerned
s. Efficient public transportation	2.33	2.27	2.36	Concerned
t. Preservation and conservation of cultural and natural heritage	2.12	2.12	2.17	Concerned
u. Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)	2.15	2.11	2.17	Concerned
v. Rules, regulation, laws and policies for sustainable development	2.09	2.08	2.24	Concerned
w. Regional and global partnership for sustainable development	2.04	2.04	2.08	Concerned
x. Federal and State consensus on development issues	2.06	2.09	2.14	Concerned
y. Ecosystem Protected Areas (land base and marine)	2.11	2.12	2.22	Concerned
Total Mean Score	**2.198**	**2.166**	**2.236**	
Interpretation	Concerned	Concerned	Concerned	

Table 4.15 Public concern on issues of SDGs based on income

Issues of SDGs		Income			Interpretation
		RM3,000 and below	RM3,001 to RM6,999	RM7,000 and above	
a.	General environmental problems	2.18	2.31	2.39	Concerned
b.	Climate change & global warming	2.18	2.31	2.42	Concerned
c.	Air pollution	2.21	2.34	2.37	Concerned
d.	Water pollution (river/ ocean/ lake/ stream/ pond)	2.23	2.34	2.41	Concerned
e.	Water shortage	2.21	2.32	2.23	Concerned
f.	Food security (piece, accessibility, availability)	2.22	2.34	2.29	Concerned
g.	Deforestation (hill, forest, terrain, slope)	2.21	2.37	2.43	Concerned
h.	Loss of biodiversity (on land, under water)	2.05	2.28	2.29	Concerned
i.	People's lifestyles on waste related problems (waste management, recycle)	2.03	2.25	2.33	Concerned
j.	Trade related activities that lead to environmental problems (local consumption vs. imported goods)	1.97	2.14	2.16	Concerned
k.	Population growth	1.95	2.07	2.00	Concerned
l.	Gender equality (woman and girls)	2.00	2.09	2.01	Concerned
m.	Poverty	2.23	2.30	2.39	Concerned
n.	Green space & recreational areas	2.17	2.31	2.47	Concerned
o.	Accessibility to quality education	2.22	2.33	2.37	Concerned
p.	Energy efficiency	2.12	2.24	2.37	Concerned
q.	Accessibility to quality education	2.23	2.31	2.41	Concerned
r.	Affordable housing	2.29	2.40	2.46	Concerned
s.	Efficient public transportation	2.24	2.39	2.47	Concerned
t.	Preservation and conservation of cultural and natural heritage	2.06	2.20	2.28	Concerned
u.	Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)	2.09	2.15	2.24	Concerned
v.	Rules, regulation, laws and policies for sustainable development	2.01	2.15	2.44	Concerned
w.	Regional and global partnership for sustainable development	1.96	2.11	2.23	Concerned
x.	Federal and State consensus on development issues	2.01	2.12	2.35	Concerned
y.	Ecosystem Protected Areas (land base and marine)	2.04	2.20	2.41	Concerned
	Total Mean Score	**2.12**	**2.25**	**2.33**	

4.1.2   Summary Findings from Focus Group Discussion and In-depth Interview

Based on the FGD analysis and in-depth interviews, the main focus of the respondents were categorised into 12 themes comprising socioeconomic issues (SE), built environment (BE), waste management (WM), transportation (TRANS), biodiversity (BIO), agriculture (AGR), land matters (LAND), water security (WS), energy security (ES), leadership (LEADER), disaster (DIS), institutional and governance (IG). The majority of issues were based on experience as well as the work scope of the respondents.

a.   Socioeconomic Issues

A major part of current issues that involve the socio-economy falls under 10 focal points in SDG, namely SDG 1, 2, 3, 4, 5, 8, 10, 11, 12 and 17. The highlighted issues were determined based on stakeholders who were directly involved in this study. The majority of stakeholders agreed to these issues and expressed their apprehension about the socioeconomic issues faced by the residents of Penang. All the highlighted issues focused on consolidating the capabilities of the B40 and M40 groups.

The focus on issues under this category is sub-divided according to programs concerning the eradication of poverty that are less effective, challenges faced by the urban poor, infectious diseases and immigrants, environmental concerns of the people of Penang state, the monopoly by hypermarkets, food wastage and lack of financial resources.

The e-Yes Program is a good program to help the poor to escape the clutches of poverty. However, it is presumed that the program was not aimed at consolidating the capabilities of the poor. The program only gave financial aid to the poor to ensure they were above the poverty level.

> *"…program nak kurang orang miskin ni ada dijalankan oleh kerajaan negeri, cuma pada saya macam tak berkesan contoh macam program e-yes, program ni kerajaan akan top up untuk bagi orang yang berada di bawah garis kemiskinan dapat keluar daripada kelompok miskin." (Public Sector)*

"…state government has a program to reduce the poor, but for me it's ineffective, for example e-yes program. Through this program the government will add ringgit to those people who were under the poverty line to ensure they can move out from the poor group." (Public Sector)

Besides that, the gender inclusivity aspect should be given priority. The two gender groups, namely single mothers and women, are seldom given enough exposure by the relevant authorities. Living in the fourth industrial revolution era, women are forced to face gruelling challenges. For example, in most cases of assistance or training, women should not be left out or their participation limited.

The challenges faced by the urban poor were also highlighted. First, the inability to own houses by the low- and middle-income group in Penang state. Second, the problem of beggars who enter the business premises around Georgetown as well as the problem with the homeless. Third, the rising cost of living, such as the increasing prices of fish, prawns, squid and cockles, is among the challenges faced by the people of Penang state.

"…geng peminta sedekah kerap mengganggu pejabat saya, pejabat saya dekat George Town, saya tak suka." (Businesses)
"…beggars are always disturbing my office. My office is in George Town, I'm not happy with that." (Businesses)

"…harga ikan sekarang ni makin tinggi, mungkin stok ikan makan berkurangan, …..tangkapan nelayan juga kita tengok skang ni makin kurang." (NGOs)
"…the fish price is currently increasing, maybe the fish stocks are decreasing… The fish caught by fishermen is also decreasing." (NGOs)

The prosperous economic development in Penang state has attracted a sizeable number of immigrants to work in the state. This flood of immigrants could bring about the spread of infectious diseases such as Tuberculosis, Hepatitis (A and B) etc., as many of these immigrants have not been vaccinated. The flood of immigrants has created a conflict in

employment opportunities between these immigrants, the domestic immigrants and the locals. They now have to compete and eventually find employment outside the island. Besides that, the emergence of hypermarkets is a big threat to the small retail businesses in Penang state.

> *"…Pembangunan di Pulau Pinang ni pesat, ini telah menarik ramai pendatang asing bekerja di pelbagai sektor, tapi kena ingat mereka juga berpotensi turut menyumbang penyakit berjangkit."* (Public Sector)
>
> "... The rapid development in Penang has attracted many foreign migrants working in various sectors, but we have to remember that they also have the potential to contribute to infectious diseases." (Public Sector)

Other than the government's efforts to assimilate environmental awareness among the locals, the capability, preparedness and awareness of the people of Penang state towards the environment is questionable. For example, the problem of awareness among the residents, developers as well as businesses in Penang state is lacking, especially concerning matters involving environmental preservation. Another example is the issue of the foul smell and construction waste management, besides the developers' willingness to carry out recycling activities, which was low.

Financial constraints faced by the local council was another issue raised. This constraint limited the efforts to consolidate and enhance the capabilities of the community. It also hindered the optimal operations of the local council to enhance the well-being of the people.

b.   Built Environment

Current issues under the category of 'built environment' involved several SDGs such as SDG 6, 9, 11, 13 and 16. The highlighted issue mostly involved urban services system, imbalanced development, and conflict development in heritage areas, converting land from agriculture to residential, public infrastructure, physical facilities and safety aspects. The focus of the issue was that all levels of society in Penang state need access to these infrastructures, facilities and urban services as well as imbalance and conflict development in

particular areas. For example, facilities related to green, recreation and exercise, walk-ways, cycling and OKU areas; facilities for workers at construction sites; transportation and traffic; as well as conflicts in the development zone.

The majority of the respondents admitted that infrastructure and facilities such as open, green, exercise and recreational areas were limited. The recreation, exercise and green areas were concentrated in housing areas and condominium sites. Moreover, these facilities in public areas accessible by local residents severely lacked in most areas around Penang state.

> *"…green space in Penang very few, masyarakat Penang hari ini perlukan kawasan untuk beriadah dan bersantai." (MP and Exco Member)*
>
> "… green space in Penang is limited. Penangites today need the space for recreation." (MP and Exco Member)

Besides that, the facilities for the disabled around Penang state, especially in several areas such as hypermarkets around Georgetown, Bukit Mertajam as well as Seberang Jaya, were severely lacking and the accessibility was severely limited. The existing facilities did not include the disabled. Complaints were heard by those who liked cycling and walking as their daily routine. The existing facilities were limited and often used by motorcyclists. This issue raised the question about safety and conflict among consumers.

Penang state has numerous active construction sites that have warranted the opening of new development zones. This has created a long-standing conflict between residents around these business and industrial zones as well as heritage areas. This imbalance development has caused Penang Island to look more developed and complicated compared to the Mainland. Besides that, a major problem related to the sanitation system frequently occurs, and this system is almost non-existent in most active construction sites. All this could probably happen because the pertinent guidelines for use in construction sites are vague. Consequently, the foreign workers at these construction sites manage their sanitation system and if this situation continues it could invite the spread of various diseases.

The traffic and transportation infrastructures are frequently debated among policymakers. Penang state and the chaos of traffic congestion is inseparable. Hence, efforts by the state government to develop a more systematic transportation model via the Penang state Transportation Master Plan was presumed to be incapable of solving this problem because of the people of Penang state like to drive their cars compared to taking public transportation.

c.   Waste Management

Current issues under the category of 'Waste Management' involved several SDGs, such as SDG 6, 11, 12 and 14. Most of the issues were related to the solid waste management, industrial waste, building materials waste as well as the sanitation system. The focus of the issues was more on the problems faced by the people of Penang state as well as the trepidations concerning the pollution of marine resources.

Problems pertaining to waste management have frequently haunted the people of Penang state. A few residents could cause the problems, but stern action from the authorities is still not enough to curb the problem. Rivers, drains and ditches are frequently filled with rubbish such as plastics, boxes, paper and rope beside earth and sand sediments. The impact of deforestation activities contributed to flow the runoff water from hills becoming more problematic. These situations contribute to the flash flood problem in Penang. In addition, an increase in development and construction projects has become a problem for people living around these areas where construction waste materials are not managed well. This has disrupted the sight enjoyed by the residents living around these areas. These residents have become very uncomfortable with the construction waste management system that is not managed properly by most developers in Penang state.

The findings have shown that the respondents were worried about the industrial waste management system. Waste, if not monitored carefully, could pollute areas rich in fish, prawns, crabs and cockles and affect the health of residents.

d.   Transportation

Current issues under the category of 'transportation' involved several SDGs such as SDG 7, 11 and 13. The issues were related to the sudden increase in private-owned vehicles, traffic congestions and a less efficient transport system. The focus of the issues faced by the people of Penang state was on sound and air pollution.

The majority of the respondents agreed that traffic congestion problems that occurred in most areas in Penang state were very serious, especially during peak hours. Among the factors identified were the sudden increase in privately-owned vehicles. It would be difficult to overcome this issue if the public transportation system is not implemented in a systematic and efficient manner. The level of punctuality of the public transportation system is not comprehensive and still lacks consistency in many places in Penang state.

> *"… Penang kerap jem kereta banyak, tambah-tambah pada waktu pagi*
> *dari seberang ke pulau." (Public Sector)*
> "… Penang state always deals with congestion due to a lot of cars,
> especially in the morning from the mainland to the island" (Public Sector)

Thus, if the problem of increasing vehicles, as well as traffic congestions, continue, then, problems such as air and sound pollution could cause health problems and disrupt the harmonious living conditions of the people of Penang state by curtailing their quality of life.

e.   Biodiversity

Current issues under the category of 'biodiversity' were related SDG 13, 14 and 15. The issue that was highlighted was related to the conflict between wildlife and humans and destruction of mangrove areas due to the development process as well as the threat on marine life such as fish, prawns and crabs including caged-fish industries. The focus of the issue was on development problems in hill slopes, forests, sea-land reclamation, as well as domestic and industrial waste management.

The limited land around Penang state has forced the physical development of the housing and commercial sectors to encroach forests reserves, rivers and the sea. This situation has created a conflict between wildlife and humans as well as the destruction of mangrove areas. Currently, there are reports by Penangites about the appearance of pythons in their houses. Besides that, sea-land reclamation has jeopardised the marine habitat and disrupted fishing activities around the state. Discharge of domestic and industrial wastes have caused trepidations among the residents, and they could face pollution that endangers their health.

"...kawasan hutan di Pulau Pinang ni makin sikit.... tu yang kadang-kadang terdapat binatang liar masuk kekawasan penempatan." (Public Sector)

"... the forest area in Penang is decreasing .... that sometimes there are wild animals entering the residential areas." (Public Sector)

"...tambakan laut ni saya tengok menyebabkan ancaman kepada ikan dan lain-lain sumber laut, tapi ambil masa la untuk ok.... (NGOs)

"...this reclamation could be endangering the fish and other marine resources, but it takes time to be ok." (NGOs)

"...dan kawasan yang dekat dengan kilang, sisa buangan kilang bukan setakat cemarkan laut tapi ikan jugak." (Youth)

"...and near to the factory areas, industrial waste not only pollutes the sea but fish too." (Youth)

f.   Agriculture

Current issues under the category of 'Agriculture' were related to SDG 4, 10, 14. The issues were related to the food safety and farming awareness and involved the problem of decreasing resources of fish, prawns and crabs due to the development and land reclamation that is active in Penang state as well as vertical farming practice among Penangites. Also,

the focus of the issue was on problems faced by the people of Penang state as well as the trepidation about pollution affecting marine resources. Penangites raised the issues regarding the suitable model in aquaculture activities in Penang. There was no specific model as a standard reference in developing the aquaculture activities in term of choosing areas that are near to industrial zone which would affect the quality of fish.

Marine resources are among the resources that contribute to the people's economic development in Penang state. Hence, several development issues related to sea-land reclamation as well as housing, business and commercial project developments have had a direct effect on fishing activities and a decline in catches. Sea-land reclamation has disrupted fishery activities, and it would take a long time for it to recover. Besides that, active development projects around the state have affected the quality of marine life that has seen a decline. If this situation continues, it would have an adverse effect on marine food resources and force the people of Penang state to depend on imported foodstuff, which would be much more expensive.

g.   Land Matters

Current issues under the category of 'Land Matters' only covered SDGs 11 and 14. The highlighted issue was related to the limited land available in Penang state as well as reclamation activities. The focus was on the planning and management of land development aspects in Penang state as well as the prospect of property investment.

The prospect of land development planning in Penang state is frequently discussed with caution. Penang state, especially in the island, is facing the problem of limited land. Hence, rapid development is still focused in this part of the Penang state. This situation has had a direct effect on the drastic increase in property prices in Penang state. Lastly, sea-land reclamation has become an alternative for accelerating the development of Penang state. The problem in the planning and management of land development in Penang state could be solved by practising a uniform and balanced development policy in areas around Seberang Perai, Bukit Mertajam etc. Thus, other issues could emerge and pose problems to the people in their effort to enjoy a better quality of life.

"…di Pulau Pinang ni penduduk semakin bertambah, kenderaan pun makin banyak, kawasan makin sempit….emm fokus pembangunan dah tidak lagi sesuai jika terus tertumpu di kawasan Pulau,…. Boleh dah kalau nak pindah ke seberang pulak." (Professional)

"... in Penang the population is growing as well as number of vehicles are increase, the area is narrower ... the focus of development is no longer suitable if it continues to concentrate in this island, its time to move to the mainland." (Professional)

h.   Energy Security

Current issues under the category of 'Energy Security' focused only on SDG 7. The highlighted issue was related to the state government's initiative towards green technology. The focus is on technological facilities and utilities needed for realising the green technology approach from the development aspect. The issue related to technological capability was also raised and questioned by looking at the seriousness of the Penang state government to draft the green agenda. Without enough technology and investment in technology development, it would be impossible for government plans to achieve green development. Efforts to enhance the technology that is capable of realising the green agenda in Penang state need to be developed.

i.   Disaster

Current issues under the category of 'disaster' were focused on SDG 13 only. The highlighted issue was related to the direct effects of climate change on the lives of the people in Penang state. Climate change is not a new topic of discussion. Observations have shown that the climate in Penang state has become uncertain. Previously, from the end of November to the middle of March would see a dry season in the northern parts of the island due to the tropical weather. However, almost every day, states including Penang state have been receiving rain. The rainy weather is unpredictable, with some showers having caused heavy flooding. Besides that, climate change is also evident in the frequent cases of high

tides that have caused changes in tides and flows of sea water. This situation also contributes to serious beach erosions. The beach erosions have destroyed important mangrove swamps that sustain marine life and forms a gabion to prevent beach erosion.

j.   Institution and Governance

The current issues in the 'institution and governance' category constitute seven (7) SDGs, such as SDG 3, 4, 6, 9, 11, 14 and 16. The highlighted issues involve aspects such as enforcement of laws and regulations, policy formulation decisions, political interference and education system.

> *"…kerajaan banyak dah merancang, tapi keputusan yang kita buat tu sering tidak popular dikalangan masyarakat, kita nak bagi yang terbaik untuk dia orang, contoh macam kempen kita nak kenakan charge ke atas plastik bag, polistrin dan sebagainya… banyak orang tentang... susah jugak tu.. yang."* (MPs and EXCO Members)
>
> "…government has a lot of planning, but the decision is always unpopular among the society. We need to serve the best to them, for example like a campaign to plastic bag charge as well polystyrene… people object to this… too difficult." (MPs and EXCO Members)

The government's plan to develop the green agenda and instil awareness about environmental preservation should be included together with a firm system of regulations and legislation. Hence, enforcement should not be compromised by any environmental perpetrator. It is important to produce a specific SOP that should be made aware and adhered by everyone in Penang state. The enforcement of regulations and legislation aspect also causes a conflict related to overlapping power issues among enforcement agencies that would make enforcement efforts ineffective.

The greatest challenge for a government would be in policy decision-making. Most of the suggestions adduced by the government to realise the green agenda comprising saving measures, avoiding the use of plastic bags and polystyrene as well as recycling has received

objections and dissatisfaction from the community. The situation has become grave as every decision has faced some politically-based disruption or influence. This causes much difficulty as each agenda that is planned and developed is not done holistically, comprehensively nor is long-lasting.

Although the government has arduously implemented the green agenda leading towards a more sustainable environmental preservation effort, obstacles emerge when there are no leaders who can truly become an example leading to sustainable environmental preservation. In order to ensure that the green agenda is realised, the government needs to name a leader who is famous and has principles and character. The prospective leader should be known to the public as an environmental activist.

> *"…susah jugak nak buat, sebab kita tak da pemimpin yang ada telent untuk memperjuangkan perkara berkaitan alam sekitar… saya tak nampak setakat ni." (Public Sector)*
>
> "... it's hard to do it, because we do not have the talent leader to fight for the environment ... I do not see it." (Public Sector)

Instilling community awareness on the importance of environmental protection is not an easy task and cannot be solved in the short-term. It needs continuous and long-term efforts. Hence, a good education system that comprises various aspects of environmental protection is important and should be assimilated during the school-going stage. Although these efforts have been on-going, it still needs a long time for society to change and become aware. Moreover, the teaching and learning syllabus should be examined and improved periodically in order to form an environmentally loving society.

> *"…kita nak implement macam-macam tentang environment, tapi sistem pendidikan kita tidak pun menjurus ke arah itu,…dan masyarakat pun masih tak paham kenapa nak kena jaga alam sekitar ni…pada saya sistem pendidikan kena perkemas dahulu." (MPs and EXCO Members)*
>
> "…we want to implement various things about the environment, but our education system does not lead to that…and people still do not

understand why they have to take care of the environment.... for me our education system has to be improved first." (MPs and EXCO Members)

Regarding the housing, business and commercial zone development policy, the government needs to be transparent and consider the effects faced by the people of Penang state. Here, limited land resources have had an impact on the increase in property prices that has prevented the locals from owning property on the island. The capability of the people to own houses should be prioritised by the government to ensure the people of Penang state enjoy a better quality of life.

The case of obtaining limited financial resources by the local council is the main issue in the decision-making process. Limited resources have hindered the local council from operating efficiently and effectively. Besides that, the planning and management development aspect in Penang state involves the important involvement of the general public. Government policy should be more open by encouraging the involvement of the general public in the decision-making process, especially when introducing any agenda. Government planning should be in line with the needs and wants of the people.

4.1.3   Summary of Current Issues

The issues discussed in section 4.1.2 revealed the respondents' views during the in-depth interview and focus group discussion. All views are summarised in Table 4.16. Meanwhile, Table 4.17 shows the current issues raised by respondents.

Table 4.16 Summary of Current Issues based on Stakeholders

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG1: No Poverty	SE - e-yes program - urban poverty attitude - food waste - beggar - homeless				SE - homeless		
SDG2: Zero Hunger	SE Marine resources- Inflation					SE Fish prices hike	
SDG3: Good Health & Well Being	IG Enforcement Regulation SE Non communicable and communicable disease-Seberang Jaya; Batu Kawan	SE - Safety of the old building Immigrant workers potentially spread communicable disease - insufficient numbers of fire stations - Expose to chemical hazard - Pig and Chicken farm				SE Air pollution-Asthma	
SDG4: Quality Education	SE - Low environmental awareness among society, developer and poor community IG - Unpopular agenda - No specific courses on environmental education					SE - Low environmental awareness among developer - Green program is unpopular activity - Exposure to student on environmental education - Online business education AGR - Low awareness on farming/ vertical farming	IG - No specific courses in primary and secondary schools SE - Lifestyle-Smartphone leads individualism - Low attitude toward 3R practices
SDG5: Gender Equality	SE Assistance to single mother is not comprehensive		SE Awareness of woman and single mother to explore potential in business online				
SDG6: Clean Water & Sanitation	WM Solid waste management eg. Drainage and river Impact of deforestation on water catchment areas IG Regulation and enforcement are absent in integrated management system of watershed management; i.e., sanitation etc.			BE Poor facilities for workers at construction side No initiative from community- water quality watchdog group WM Solid waste in river- plastic bag			WM Marine pollution-i.e. Batu Ferringhi Water shortage Water pollution

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG7: Affordable & Clean Energy	ES Green energy- reality and practices- lack of initiative Green energy technology- not available	TRANS Continuous increase of private vehicles	TRANS Traffic congestion contribute to carbon emission				
SDG8: Decent Work & Growth				SE Competitive employment opportunity i.e. local vs foreign			
SDG9: Industry, Innovation & Infrastructure				BE Air and noise pollution during construction activities	IG Political interference in green technology initiative	BE -High cost of transport master plan -Safe lane for bicycle	BE Traffic congestion
SDG10: Reduced Inequalities	SE -Emerging hyper supermarket -Degrading of neighborhood values i.e. lack of sensitivity				SE Limited funding -State and Local activities	AGR Food security – fish price	SE Affordable housing
SDG11: Sustainable Cities & Communities	BE -Limited open spaces (green & recreational areas) -Small river and old drainage system-flood LAND -Conflict in land use development vs existing residence SE Influx of Immigrant TRANS Public transport system- not systematic WM Improper WM system	TRANS Increase private vehicle SE -Affordable housing -Extinction of small village IG -Limited capacity of local authorities to maintain enforcement	TRANS Public and private vehicle BE Sustainable cities No one stop center to help the tourist BE -Penang state is overdeveloped. Especially residential area -Drainage problem eg. Small and old - Uncomfortable with housing environment because of pig and chicken farms-SPS area - Few affordable housing in Penang island- expensive and small	LAND Limited land in Penang island	BE Maintenance and monitoring for implementing the green physical infrastructure BE -Imbalance development -Heritage areas under threat -Land reclamation for development BE Village in urban areas-off from the urban services system LAND - Penang island facing with high density population- focus development should be moving to main land	SE - Oversupply of expensive houses LAND -Conflict in land use planning BE -Public transportation is not systematic -Low number of safe areas for cycling and walking. - Development in high density area- Sg Ara, Relau -Slope cutting activities for development -Parking facilities – free and cheaper SE -High Population TRANS High usage of private vehicles	LAND Land reclamation BE Converting agricultural land to industrial and residential land e.g Batu Kawan, sg Dua SE - Acquisition of land issues -Massive development project in island

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG12: Responsible Consumption & Production	WM Food waste behavior	SE Public still prefer to use plastic bags					
SDG 13: Climate Action	DIS -Weather, monsoon, tidal effect -Coastal erosion -Sea level rising BIO Lost of mangrove areas BE Flash flood					TRANS Private transportation leads to high carbon dioxide emission DIS -Flooding BIO -Destruction of mangrove area	
SDG14: Life Below Water	BIO - Decline in fish resources - Sea pollution WM Effect of industrial waste	IG Regulation on marine life protection				LAND Land reclamation AGR No sustainable model in aquaculture in Penang	BIO Discharge of toxic and chemicals to fish farms in Balik Pulau
SDG15: Life on Land	BIO - Conflict between wild animal and human - Extinction (fauna) and destruction of forest habitat					BIO Deforestation	
SDG16: Peace, Justice & Strong Institutions	BE illegal factories at Bukit Minyak	IG No leader talent on environment	IG - No regulation on beggar - Political influences in decision making			IG Local authority enforcement	
SDG17: Partnerships for the Goals		SE NGOS frequently raising the issues on environment and development			SE - Cooperation with community leaders on sharing of community resources should not be top down decision - Less community involvement when the government plan the development-community should be part of the stakeholders		

Table 4.17 shows the summary of the highlighted current issues by stakeholders. The column on the elderly and general public is deduced from the public survey. The other columns were responses deduced from focus group discussion and in-depth interview. The column on youth is the combination of responses from focus group discussion, in-depth interview and public survey. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as important in the public survey. Most of the discussions of future issues concentrate on socioeconomic issues, built environment, transportation, energy security, water security and institution and governance.

Table 4.17 Summary of highlighted current issues

	MPs & EXCO Members	Public Sector	Busines-ses	Developers	Profession-als	NGOs	Elderly[a]	Youth[a]	General Public[a]
Socioeconomic Issues	◆	◆	◆	◆	◆	◆	◆	◆	◆
Built Environment	◆	◆	◆	◆	◆	◆	◆	◆	◆
Waste Management	◆	◆		◆	◆	◆	◆	◆	◆
Transportation	◆	◆	◆	◆	◆	◆	◆	◆	◆
Biodiversity	◆	◆	◆			◆	◆	◆	◆
Agriculture						◆			
Land Matters	◆	◆		◆	◆	◆	◆	◆	◆
Water Security									
Leadership		◆							
Disaster	◆	◆	◆			◆	◆	◆	◆
Institutions and Governance	◆	◆	◆		◆	◆		◆	

Note: [a] Partial findings from the public survey (Top six issues)

4.1.4 Location of Development and Environmental Issues in Penang

This section presents the location of the top four developmental and environmental issues as identified by stakeholders.
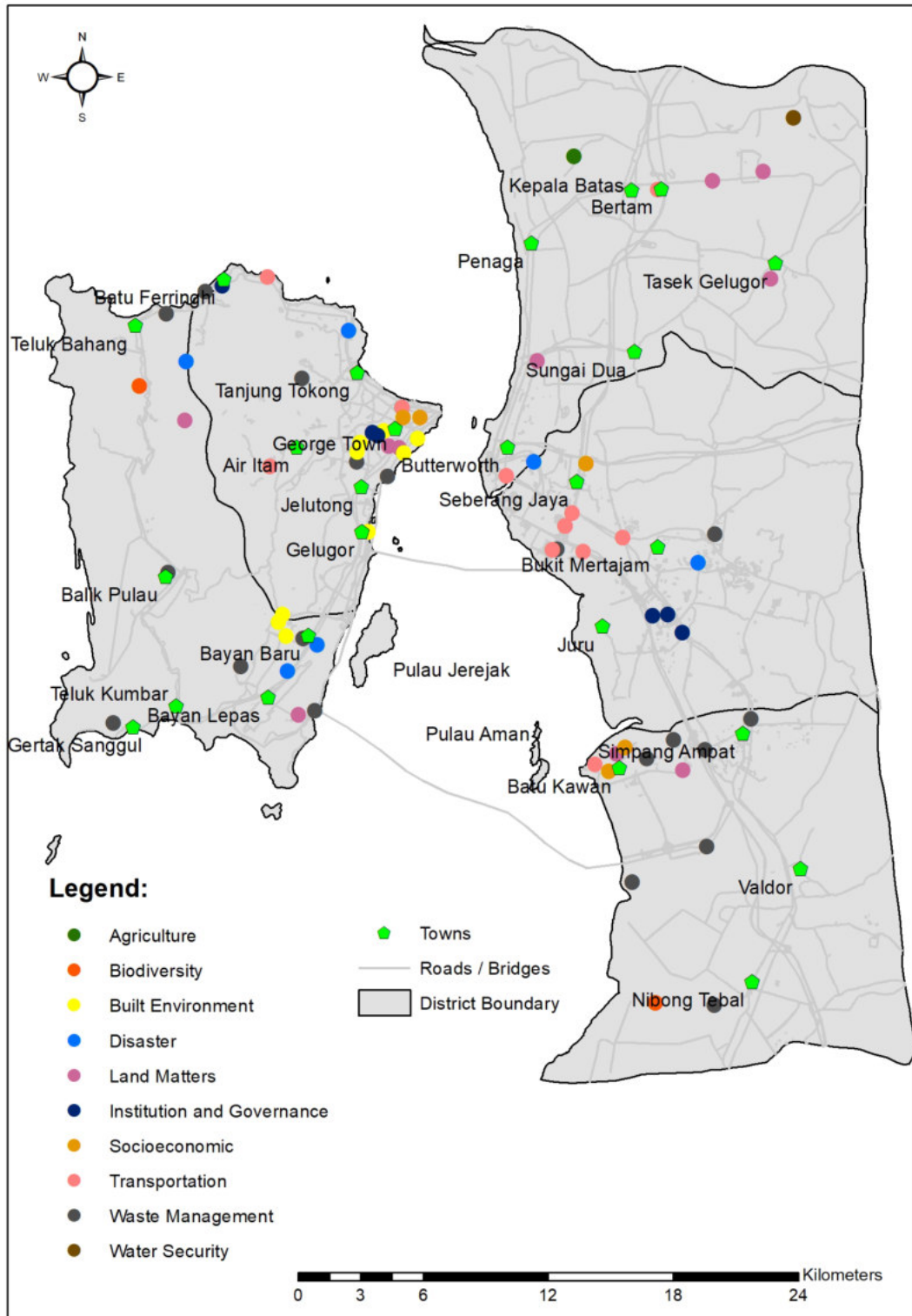
Figure 4.1 Location of Identified Developmental and Environmental Issues
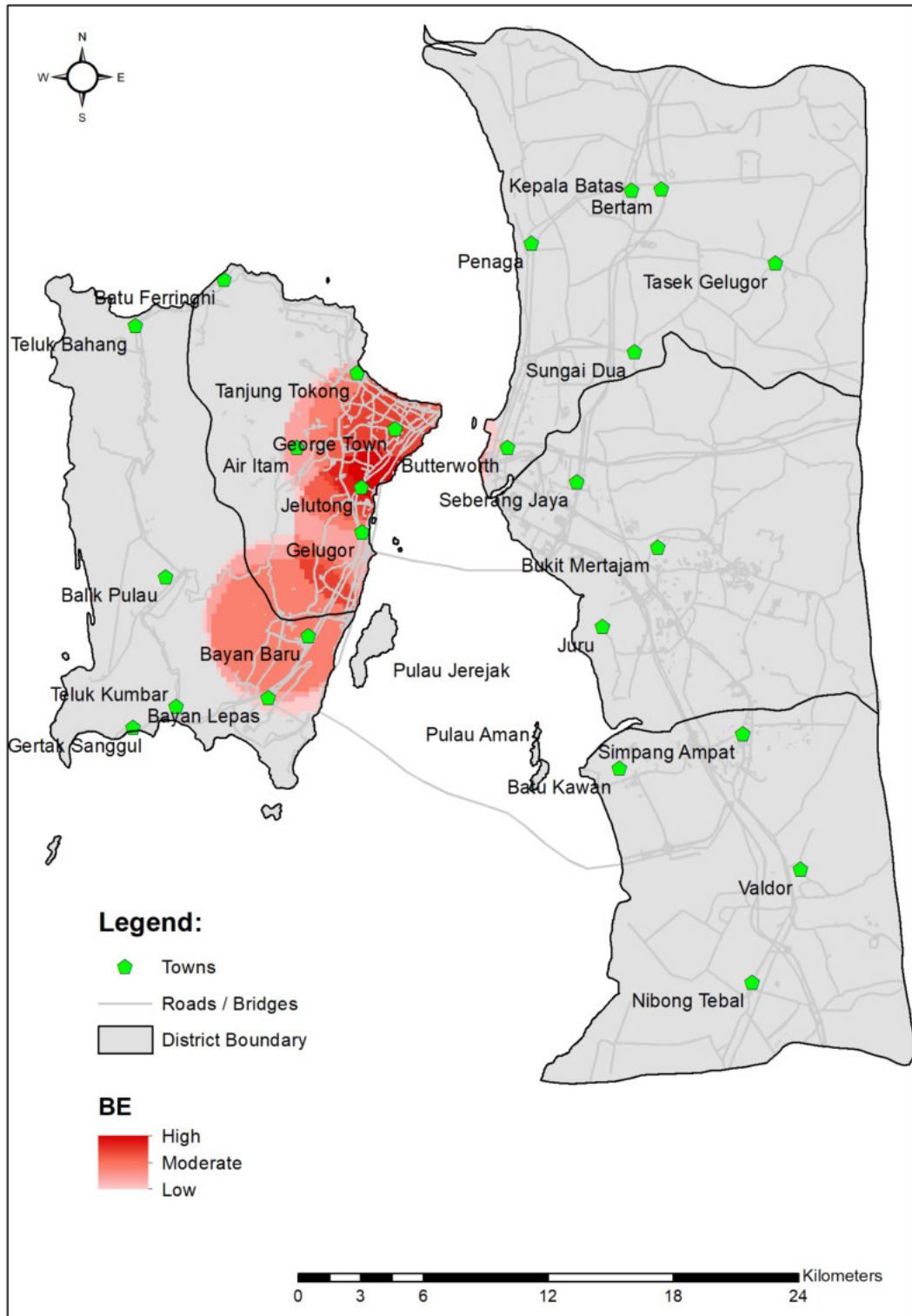
Figure 4.2 Location and Intensity of Built Environment Issues
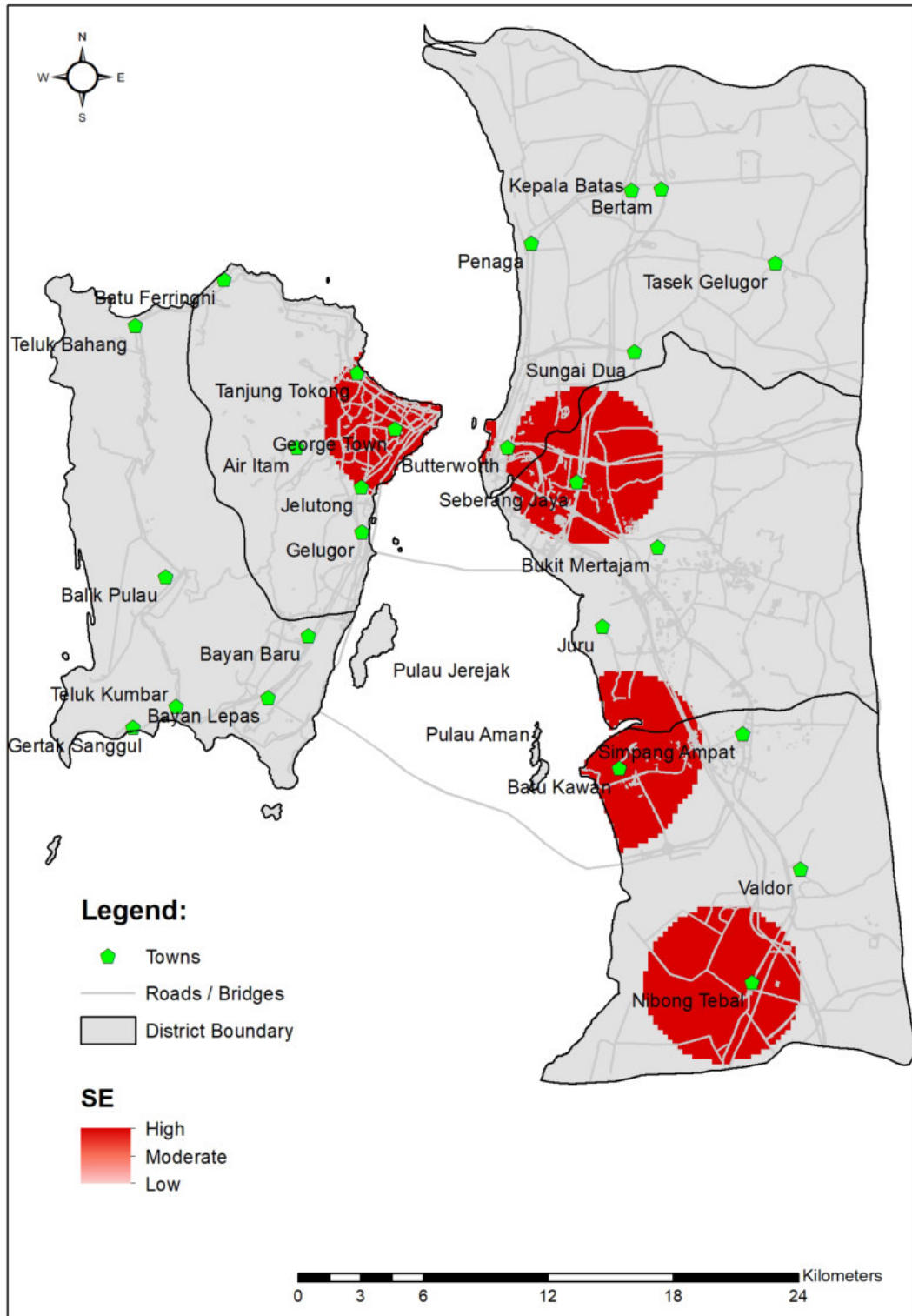
Figure 4.3 Location and Intensity of Socioeconomic Issues
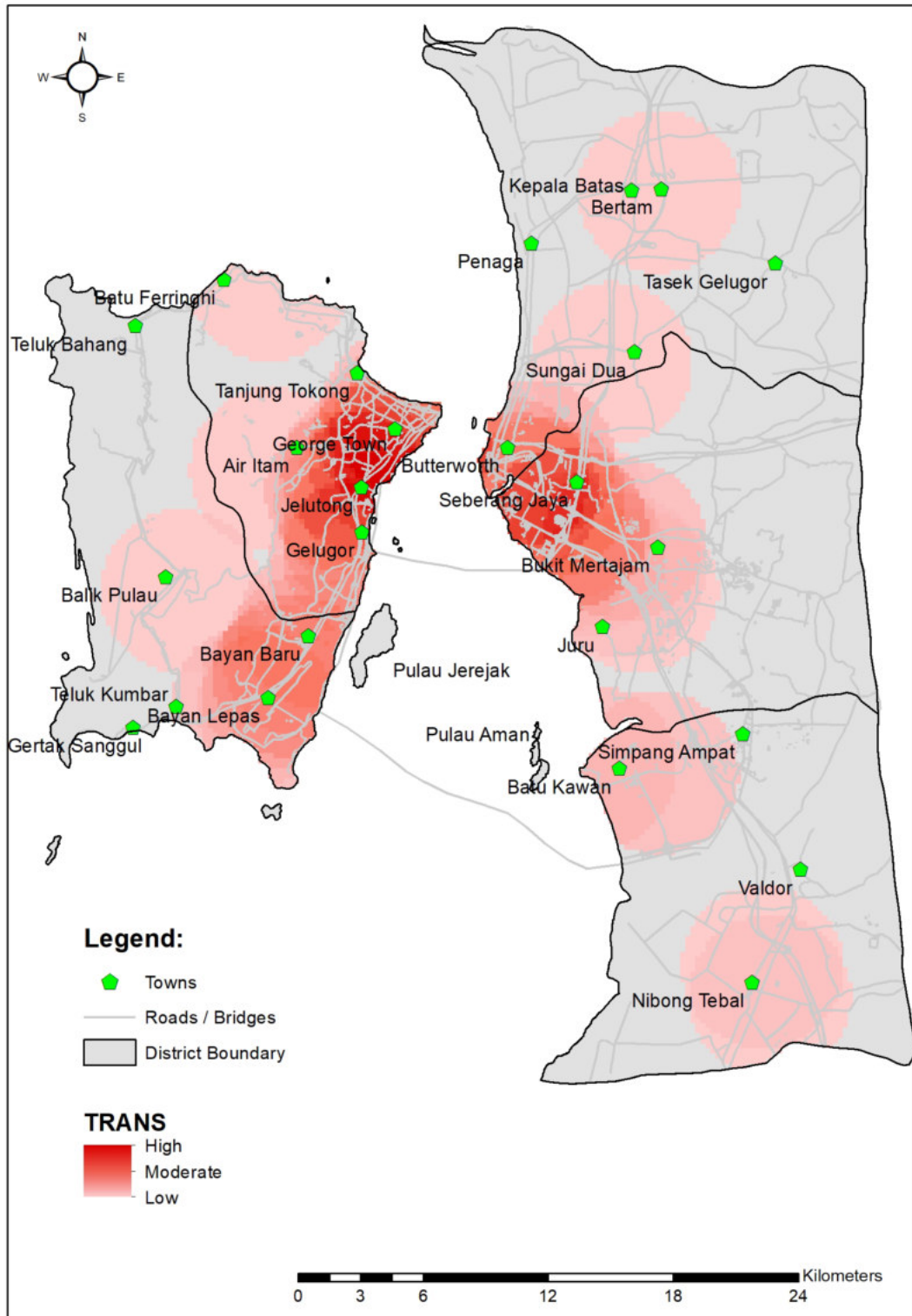
Figure 4.4 Location and Intensity of Transportation Issues
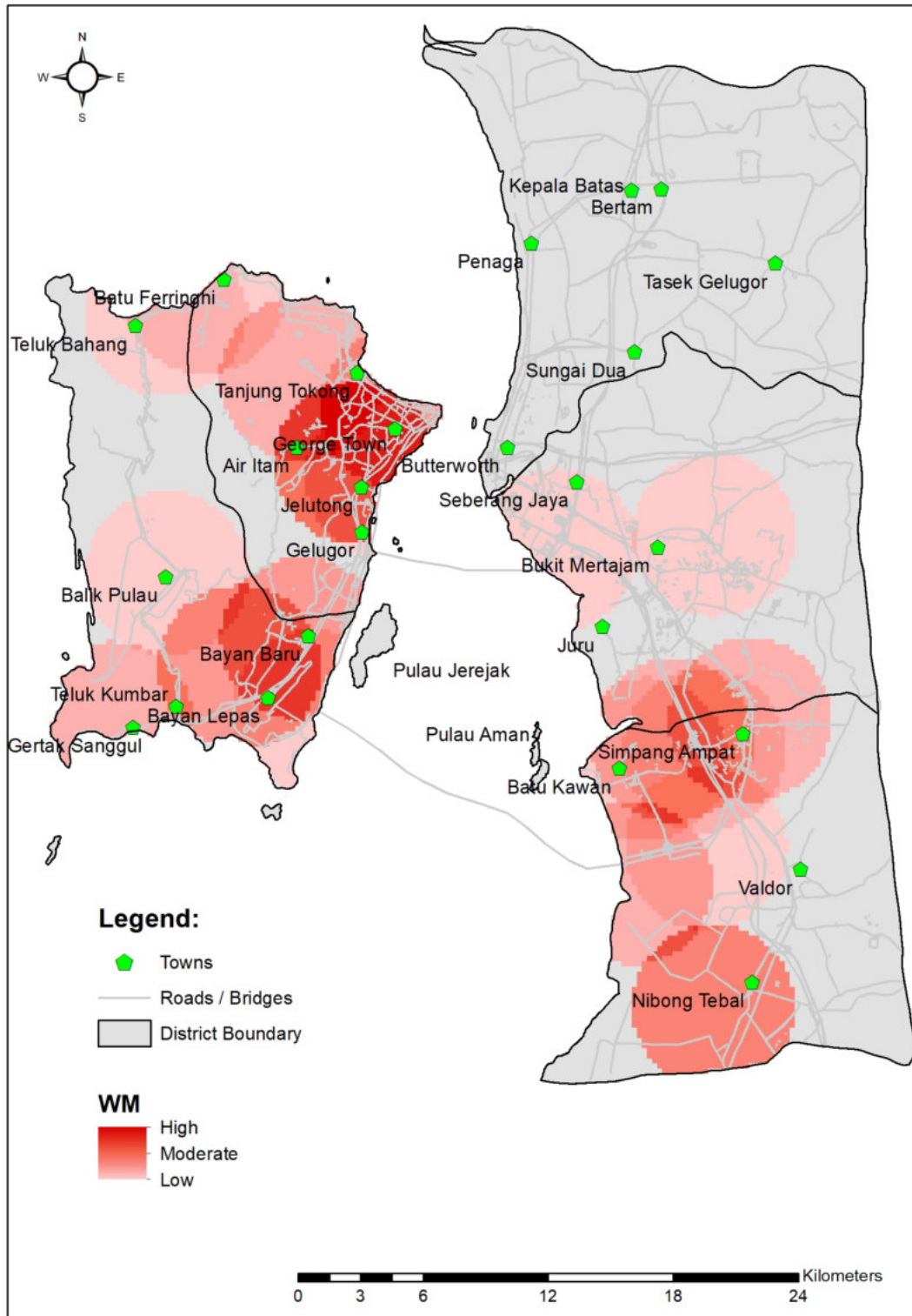
Figure 4.5 Location and Intensity of Waste Management Issues

4.2   Current Practices

This chapter illustrates and showcases the various environmental management practices adopted by the State Government and other stakeholders in Penang state.

4.2.1   Summary Findings from Public Survey

a.   Sustainable Initiatives Taken and Practised by the Public

To date, Penangites have adopted several sustainable initiatives and practices, but their adoption rate for each practice varies as illustrated in Table 4.18. The most common green practice is recycling with the highest percentage of 79.3%. This is followed by conservation of water (67.9%) and conservation of energy (65.2%). Penangites are also conscious to avoid peak hour travelling to town with a percentage of 61.7%. However, the three lowest practices among Penangites are the installation of rain harvesting system (22.8%), e-business (30.5%) and the actual implementation of waste segregation and management (38.8%).

i.   Age

To further understand the adoption rate of a sustainable initiative by age groups, Table 4.18 displays that adult Penangites most embrace the practices of recycling (82.2%), water conservation (71.5%) and energy conservation (68.7%) in the 36-59 age cohort.

The findings also reveal that installation of rainwater harvesting system is the lowest among the elderly (17.0%). They are also the lowest in terms of embracing e-business practices (23.2%) while Penang youth are the highest adopters (33.1%).

Table 4.18 Sustainable initiatives taken and practices by age cohort (%)

Initiative/Age cohort	General Public	Youth	Adult	Elderly
Recycle	79.3	79.0	82.2	73.8
Use and buy green products	50.9	52.9	52.8	39.8
Reduce the use of paper (paperless)	54.8	55.6	54.6	52.3
Plant trees	52.2	49.3	59.0	45.6
Conserve energy	65.2	64.4	68.7	59.6
Conserve water	67.9	67.3	71.5	61.3
Install rainwater harvesting system	22.8	24.6	22.7	17.0
Waste segregation and management	38.8	39.9	37.1	39.2
Use of e-business	30.5	33.1	30.0	23.2
Reduce food waste	54.9	57.0	54.1	50.0
Avoid peak hour travelling to town	61.7	62.0	64.2	54.4
Advocate for better environmental policies	55.7	56.8	56.7	49.7

ii.   Income

Table 4.19 displays the results of sustainable initiatives and practices by income group. Respondents most widely practice recycling in the RM7,000 and above income bracket followed by those earning between RM3,001-6,999. The same pattern is observed for conserving water. As for conservation of energy, the percentage recorded is quite consistent across income groups ranging from 67% for those earning RM7,000 and above and 69% respectively for those earning RM6,999 and below.

Table 4.19: Sustainable Initiatives were taken and Practices by Income Group (%)

Initiative/Income group	RM3,000 & below	RM3,001-RM6,999	RM7,000 & above
Recycle	78.4	83.1	84.0
Use and buy green products	49.9	57.5	63.4
Reduce the use of paper (paperless)	52.2	54.6	71.4
Plant trees	54.8	57.0	56.9
Conserve energy	68.6	68.6	66.9
Conserve water	72.2	69.6	74.0
Install rainwater harvesting system	24.9	24.1	18.9
Waste segregation and management	36.1	41.3	53.4
Use of e-business	30.1	29.1	47.2
Reduce food waste	52.3	61.1	66.8
Avoid peak hour travelling to town	65.3	64.9	70.3
Advocate for better environmental policies	59.4	57.7	53.2

iii.   Education

Sustainable initiatives taken by education level are shown in Table 4.20. For the most popular sustainable initiative (i.e. recycling), the higher adopters are those with informal education (88.3%) while the lowest are those with primary education (78.1%). However, for green practices like conservation of energy and water, the percentage of adoption increases in tandem with the level of education with the lowest adopters being those with informal education followed by primary, secondary and finally tertiary education.

Table 4.20 Sustainable initiatives taken and practices by education level (%)

Initiative/Education level	Informal	Primary	Secondary	Tertiary
Recycle	88.3	78.1	80.2	80.8
Use and buy green products	46.1	40.5	50.3	56.7
Reduce the use of paper (paperless)	48.5	51.5	48.6	61.0
Plant trees	49.4	57.0	57.3	51.7
Conserve energy	58.0	60.8	64.8	69.4
Conserve water	54.1	64.5	68.8	71.5
Install rainwater harvesting system	28.1	20.2	25.9	22.6
Waste segregation and management	32.5	35.7	34.7	43.6
Use of e-business	31.5	24.0	28.7	34.1
Reduce food waste	41.0	43.4	52.7	60.5
Avoid peak hour travelling to town	40.8	55.7	62.7	65.0
Advocate for better environmental policies	46.5	46.7	59.5	56.9

iv.   District

Table 4.21 displays the sustainable initiatives taken and green practices by district. For recycling, the Barat Daya district records the highest percentage (88.3%) followed by Seberang Perai Selatan (83.4%), Seberang Perai Tengah (79.2%), Timur Laut (77.9%) and finally Seberang Perai Utara (73.3%). Conservation of water is also practised by all five districts with Timur Laut being the highest (72.0%) and Seberang Perai Selatan the lowest (62.8%). As for energy conservation, the highest adopter is Seberang Perai Tengah district (67.5%) while the lowest is Seberang Perai Utara district (61.5%). The green practice that is least practised across all districts is the installation of rainwater harvesting system with an overall percentage that does not exceed 30% for all districts. The highest installer of rainwater harvesting system is among those living at Seberang Perai Tengah district (26.9%) while the lowest are those residing at Seberang Perai Utara district (19.0%).

Table 4.21: Sustainable initiatives and practices by district (%)

Initiative/District	BD	TL	SPU	SPT	SPS
Recycle	88.3	77.9	73.3	79.2	83.4
Use and buy green products	57.1	51.7	45.1	50.3	52.7
Reduce the use of paper (paperless)	55.4	56.7	58.0	51.7	49.5
Plant trees	54.1	50.5	51.0	55.2	50.5
Conserve energy	62.6	66.8	61.5	67.5	65.0
Conserve water	65.6	72.0	64.9	68.4	62.8
Install rainwater harvesting system	26.3	20.6	19.0	26.9	22.7
Waste segregation and management	41.0	39.3	43.6	36.2	32.5
Use of e-business	34.6	29.9	29.2	30.7	29.2
Reduce food waste	58.5	56.9	56.7	51.6	49.5
Avoid peak hour travelling to town	65.8	59.9	59.7	63.3	61.7
Advocate for better environmental policies	54.7	54.8	54.9	57.8	56.7

v.   Location

In terms of location, Table 4.22 below shows that there is not much difference in terms of adoption rate between urban and rural Penangites for recycling where urbanites record a slightly higher percentage of 80.0% as compared to 77.5% by their rural counterparts. As for water conservation, urban dwellers are higher adopters (70.5%) compared to rural Penangites (62.2%).   Likewise, urban respondents also record higher percentages for practices like avoid peak hour travelling in town and also energy conservation if compared to their rural counterparts.

Table 4.22 Sustainable initiatives taken and practices by location (%)

Initiative/Location	Urban	Rural
Recycle	80.0	77.5
Use and buy green products	52.3	47.6
Reduce the use of paper (paperless)	55.2	53.8
Plant trees	53.2	49.9
Conserve energy	53.2	49.9
Conserve water	70.5	62.2
Install rainwater harvesting system	23.8	20.6
Waste segregation and management	39.4	37.7
Use of e-business	31.3	28.8
Reduce food waste	55.9	52.7
Avoid peak hour travelling to town	62.6	59.3
Advocate for better environmental policies	56.0	55.0

vi.   Survey method

Table 4.23 displays the sustainable initiatives taken and practices based on the outcome of the survey. The highest sustainable initiative is recycling with 76.1% was recorded for online responses and 80.5% for face-to-face responses. This is followed by water conservation with online responses of 64.1% and face-to-face responses of 69.2%. The third highest green initiative adopted is energy conservation with online responses being 63.3% and face-to-face responses recording 65.9%.

Table 4.23 Sustainable Initiatives taken and practiced by Survey Method (%)

Initiative/Survey method	Online	Face to Face
Recycle	76.1	80.5
Use and buy green products	44.7	53.1
Reduce the use of paper (paperless)	57.8	53.7
Plant trees	45.8	54.5
Conserve energy	63.3	65.9
Conserve water	64.1	69.2
Install rainwater harvesting system	11.9	26.6
Waste segregation and management	45.7	36.4
Use of e-business	24.8	32.5
Reduce food waste	56.6	54.3
Avoid peak hour travelling to town	56.9	63.3
Advocate for better environmental policies	52.5	56.9

b.   *Waste Management Behaviour*

This section presents and analyses the household behaviour on waste management. Figure 4.6 presents the extent to which households in Penang engage in various types of waste management activities. A quick glance at Figure 4.6 shows that waste management activities vary. Among all listed activities, recycling is most frequently practised by respondents of which more than 92% have indicated they often engaged in the activity or have carried them out on a routine basis. This is followed by reducing the usage of non-biodegradable materials (82.8%) and segregating domestic waste at home (82.6%).

Nevertheless, the findings show that few Penangites carry out waste management activities as part of their routine practices. This is clearly depicted by the relatively low percentage of respondents who engage on a routine basis. With the exception of recycling all recyclable materials (11.4%), less than 10% of respondents have practised the listed waste management activities in routine basis (Figure 4.6).
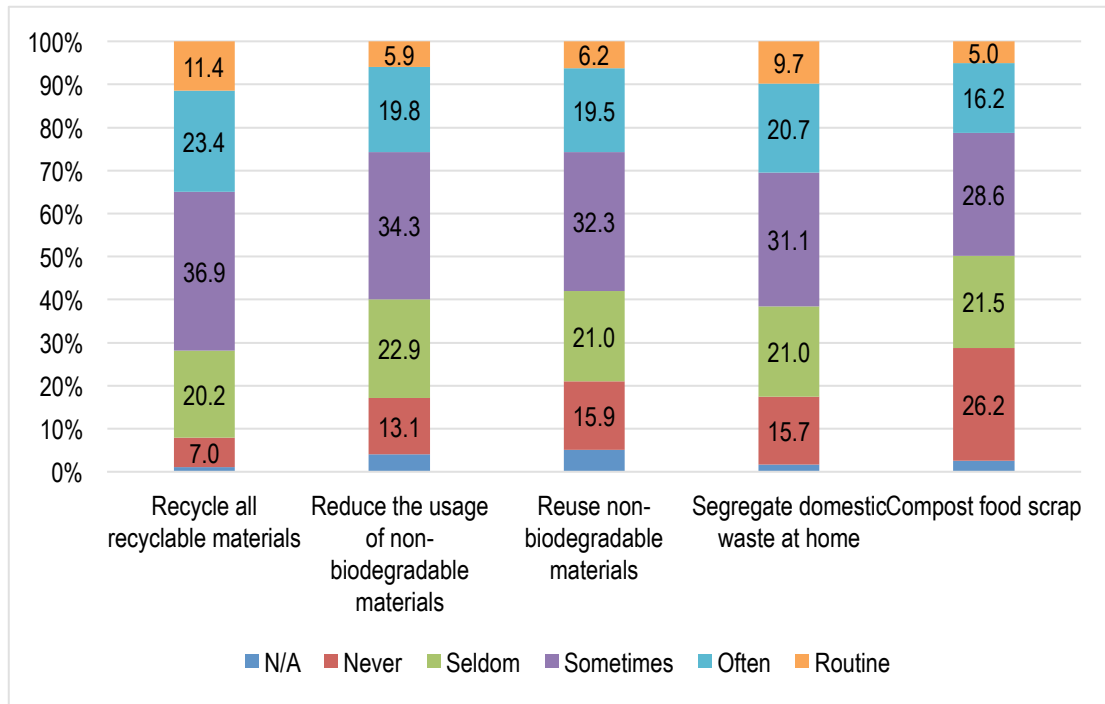
Figure 4.6 Waste Management Practices

The sections below scrutinise waste management practices according to age, income, education, district, location and survey method.

i. *Age*

The findings in Figure 4.7 show that Penang's elderly are more likely to engage in all the listed waste management practices as compared to adults and youth. As shown, about one-fifth of the elderly recycle the recyclable materials routinely, and this is much higher compared to the corresponding percentages for adults (12.2%) and youth (8.9%). A similar finding is observed when combining the percentage of respondents who often carry out the activity or undertake it on a routine basis.
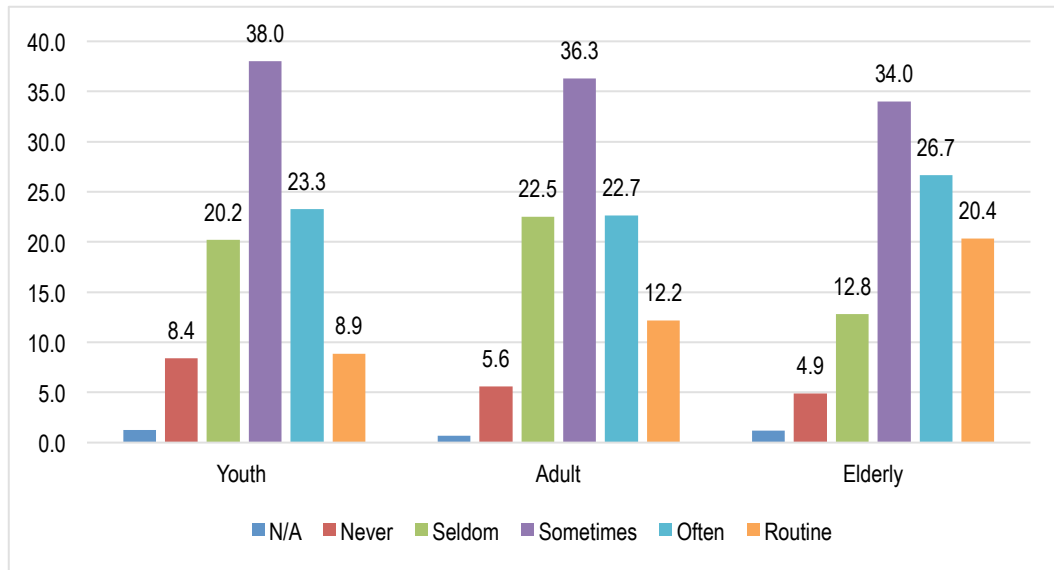
Figure 4.7 Recycle All Recyclable Materials by Age Cohort

Table 4.24 presents the household behaviour on reducing the usage of non-biodegradable materials by age cohort. As compared to the youth and adults, the elderly often engage in reducing the usage of non-biodegradable materials (28.4%) and practice it on a routine basis (9.5%). By comparison, both youth and adults are less likely to engage in this activity. The percentage of youth (13.1%) or adults (15.0%) who never engage in reducing the usage of non-biodegradable materials is much higher as compared to the corresponding percentage for elderly (7.0%).

Table 4.24 Reduce the usage of non-biodegradable materials by age cohort (%)

Frequency/Age	Youth	Adult	Elderly
Routine	5.4	5.3	9.5
Often	17.7	20.0	28.4
Sometimes	36.8	31.7	31.8
Seldom	23.9	22.6	19.2
Never	13.1	15.0	7.0
N/A	3.1	5.4	4.1

Table 4.25 presents household behaviour on the reuse of non-biodegradable materials by age cohort. The elderly (9.2%) are more likely to engage in reducing the usage of non-biodegradable on a routine basis than youth (5.6%) and adults (6.0%). By contrast, the percentages of adults and youth who seldom or never reuse non-biodegradable materials are higher than the corresponding percentage for elderly.

Table 4.25 Reuse of Non-biodegradable materials by age cohort (%)

Frequency/Age	Youth	Adult	Elderly
Routine	5.7	5.9	9.2
Often	18.8	18.1	27.7
Sometimes	33.6	30.0	33.9
Seldom	22.2	21.5	13.9
Never	15.0	18.8	10.6
N/A	4.8	5.7	4.7

From Figure 4.8, more elderly (16.8%) segregated their domestic waste at home routinely compared to youth (7.2%) and adults (11.0%). A similar finding is observed among respondents who often segregate their domestic waste at home. When scrutinising the percentage of respondents who never engage in segregating their domestic waste at home, the result shows that the percentages of youth (16.7%) and adults (16.4%) who do not segregate their domestic waste at home is far higher than the elderly (8.9%).
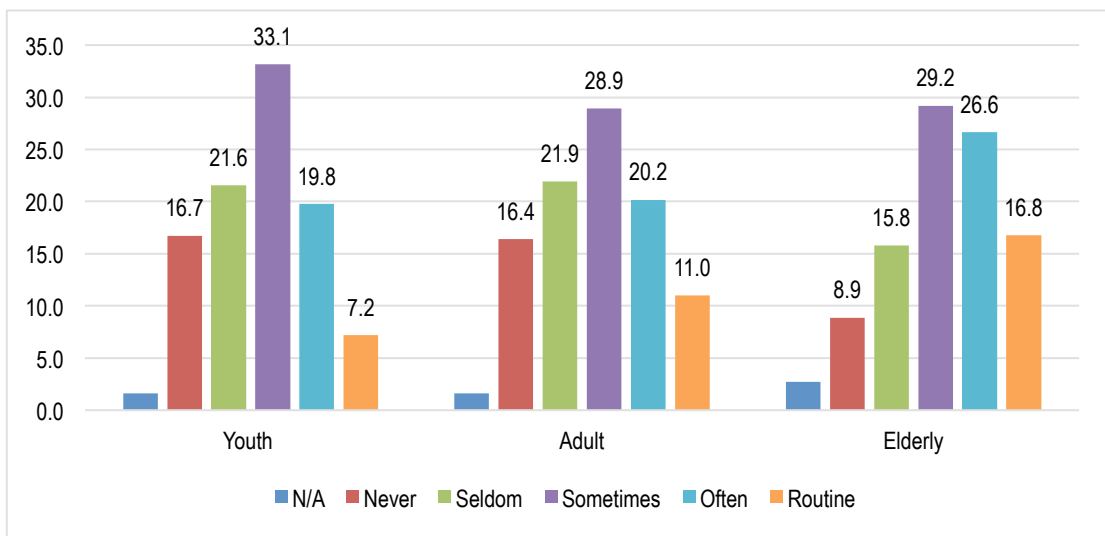
Figure 4.8: Segregation of Domestic Waste at Home by Age Cohort

Figure 4.9 which depicts household behaviour on composting food scrap shows that less than 8% of respondents have composted food scrap on a routine basis and the elderly (7.8%) have greater interest in doing so. Nevertheless, a relatively greater percentage of youth often compost food scrap compared to adult and elderly. More than 29.4% of adults

have no experience composting food scrap. This figure is much higher than the corresponding figures for the youth and elderly.
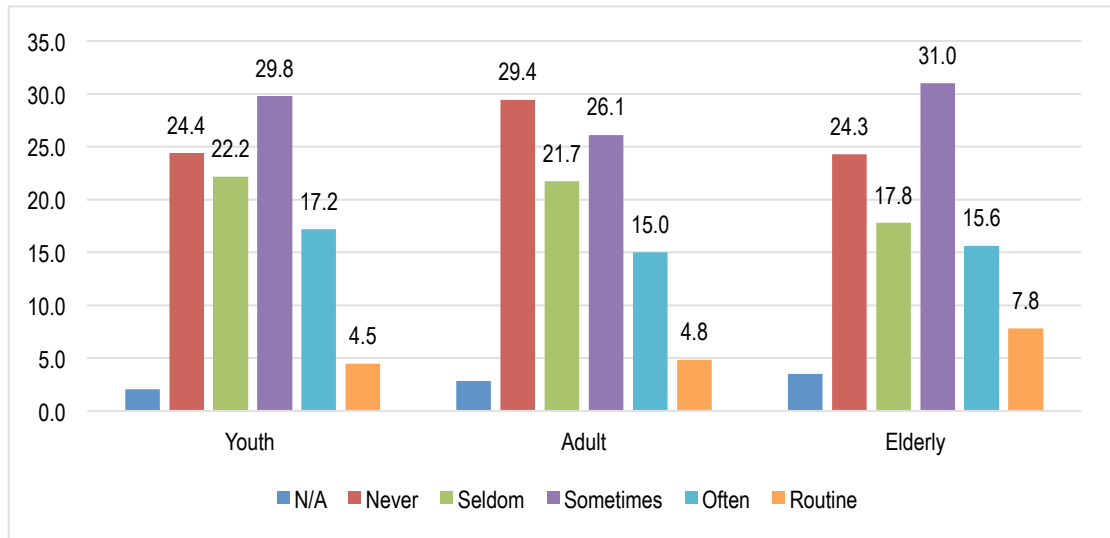
Figure 4.9 Compost Food Scrap by Age Cohort

Figure 4.10 presents waste management practices on a routine basis according to age cohorts. The elderly cohort has the highest percentage of all the five waste management practices compared to youth and adult. Obvious percentage differences are observed between elderly on one hand and youth/adult for both waste management activities, i.e. recycling all recyclable materials and domestic waste segregation at home.
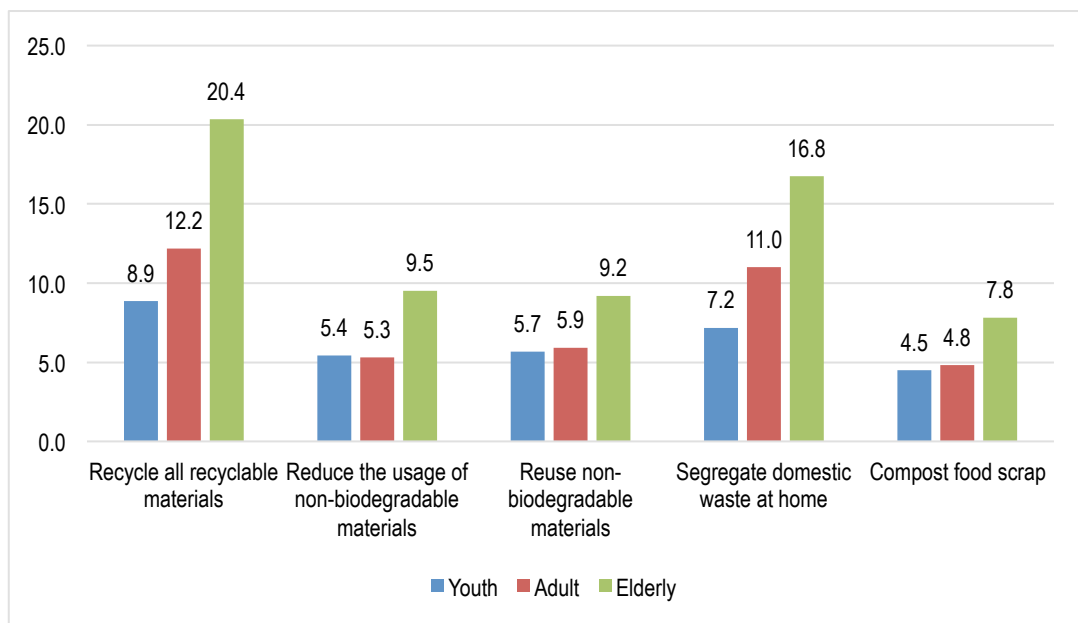
Figure 4.10 Waste management practices on routine basis by age cohort

Table 4.26 displays waste management practices (routine basis) based on income group. It is observed that households with high-income, i.e. RM 7,000 and above, have the highest percentage for all the five waste management practices compared to low-income households (RM3,000 & below) and medium income households (RM3,001 – RM6,999).

Table 4.26 Waste management practices on routine basis by income group (%)

Item/Income group	RM3,000 & below	RM3,001-RM6,999	RM7,000 & above
Recycle all recyclable materials	9.3	8.7	21.6
Reduce the usage of non-biodegradable materials	5.1	4.7	10.0
Reuse non-biodegradable materials	4.3	5.0	14.4
Segregate domestic waste at home	7.1	6.5	22.8
Compost food scrap	5.5	3.7	8.0

iii.   *Education*

In terms of education level, as shown in Table 4.27, the percentage of respondents with tertiary education level is higher for some waste management practices such as segregation domestic waste at home, reuse non-biodegradable materials, and compost food scrap compared to those with lower education level.

Table 4.27 Waste management practices on routine basis by education level (%)

Item/Education level	Informal	Primary	Secondary	Tertiary
Recycle all recyclable materials	9.3	13.2	7.2	13.0
Reduce the usage of non-biodegradable materials	0.0	8.1	4.1	6.7
Reuse non-biodegradable materials	1.7	4.6	3.9	7.8
Segregate domestic waste at home	4.0	10.8	4.7	12.5
Compost food scrap	2.3	4.3	3.9	5.9

Table 4.28 displays the practice of waste management activities on a routine basis according to districts. Among the five districts, respondents who reside in Seberang Perai Utara have the highest percentage who undertake waste management activities on a routine basis. This is consistently observed for all five waste management practices. This is followed by respondents who reside in Timur Laut district, Penang Island.

Table 4.28 Waste management practices on routine basis by district (%)

Item/District	BD	TL	SPU	SPT	SPS
Recycle all recyclable materials	8.9	11.4	19.5	9.7	7.6
Reduce the usage of non-biodegradable materials	4.8	5.7	10.1	4.4	5.1
Reuse non-biodegradable materials	6.0	5.7	8.2	5.7	6.1
Segregate domestic waste at home	8.9	8.9	17.9	7.2	7.6
Compost food scrap	3.4	4.9	8.8	3.1	6.2

v. *Location*

Figure 4.11 shows the practice of waste management activities on a routine basis based on the location of the residential area. As shown, the percentage who undertake waste management practices on a routine basis is consistently higher among respondents who reside in a rural area than those who reside in the urban area. This is consistently observed for all the five waste management practices.
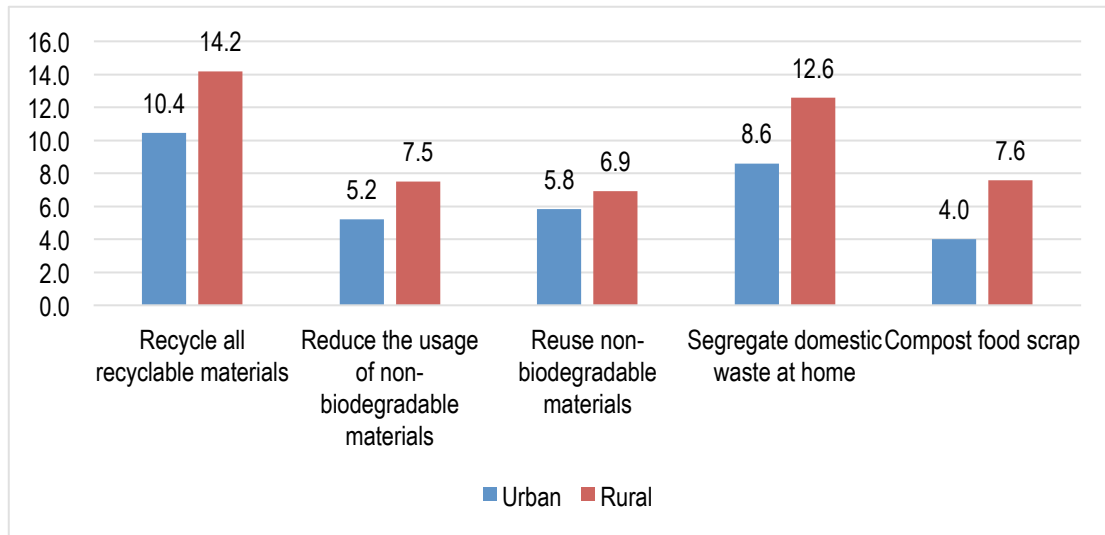
Figure 4.11 Waste management practices on routine basis by location

vi.   Survey method

Table 4.29 presents waste management practices on a routine basis according to survey method. For waste management practices on a routine basis, the results display that online respondents report higher percentages than face-to-face respondents. For example, the percentage of respondents engaging in recycling all recyclable materials routinely is higher for the online survey (24.5%) compared to face-to-face (7.6%).

Table 4.29 Waste management practices on routine basis by survey method (%)

Item/Survey method	Online	Face to Face
Recycle all recyclable materials	24.5	7.6
Reduce the usage of non-biodegradable materials	11.4	4.2
Reuse non-biodegradable materials	11.6	4.6
Segregate domestic waste at home	21.3	6.3
Compost food scrap	8.0	4.1

c. Transportation Behaviour

This section reports individual behaviour on transportation choice. Based on the survey results in Figure 4.12, Penangites still depend heavily on their motor vehicles (i.e. cars, motorcycles) when performing their work or leisure-related activities. For instance, a very high percentage of respondents (77.2%) still use their motor vehicles when going shopping or groceries. The situation is almost the same when commuting to and from work daily which records the second highest percentage of 74.0%. Penangites' reliance on car and motor vehicle is noticed too when they go on vacation.

Except for vacationing with public transport that recorded slightly more than 10%, the rest of the transportation options are below 10%. From Figure 4.12 below, active transportation styles like walking and cycling record the lowest percentages suggesting that fewer respondents choose to walk or cycle when they go to work, shop for groceries or go on vacation. However, there is about 10.2% of respondents who walk for recreational purposes. Similarly, respondents also ride their bicycles for recreational purposes only (6.2%), but are less likely to bike to work, shopping or for vacation given the extremely low percentages (below 3%) reported for these activities.
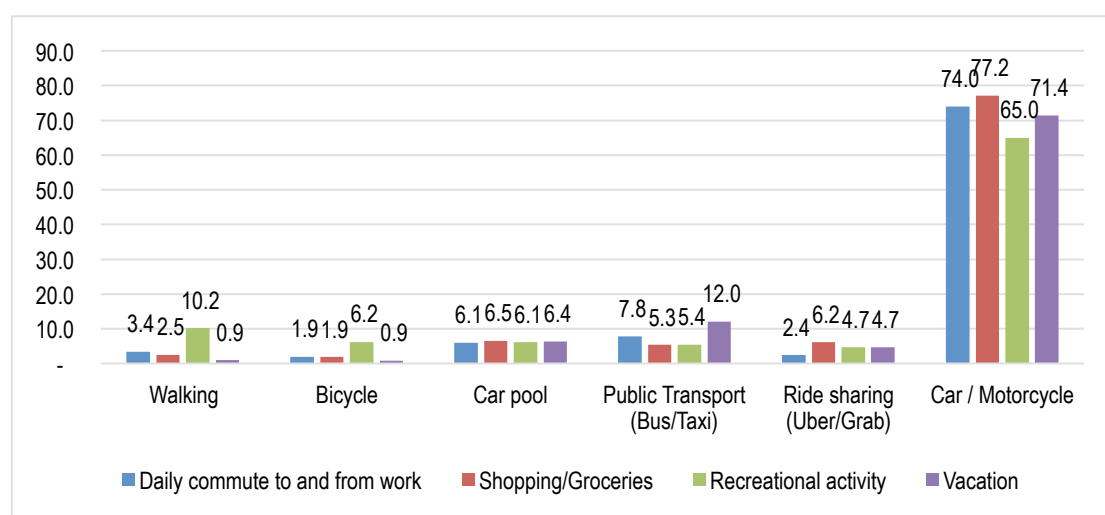
Figure 4.12: Mode of transport used by daily activities

The survey reported that less than 10% of respondents supported and adopted green transportation practices on a routine basis as illustrated in Figure 4.13. For instance, only

7.6% of respondents are willing to adopt a driving style that uses less fuel. As for ride-sharing schemes like Uber and Grab, the percentage of respondents using it on a routine basis is low recording only 4.7%.
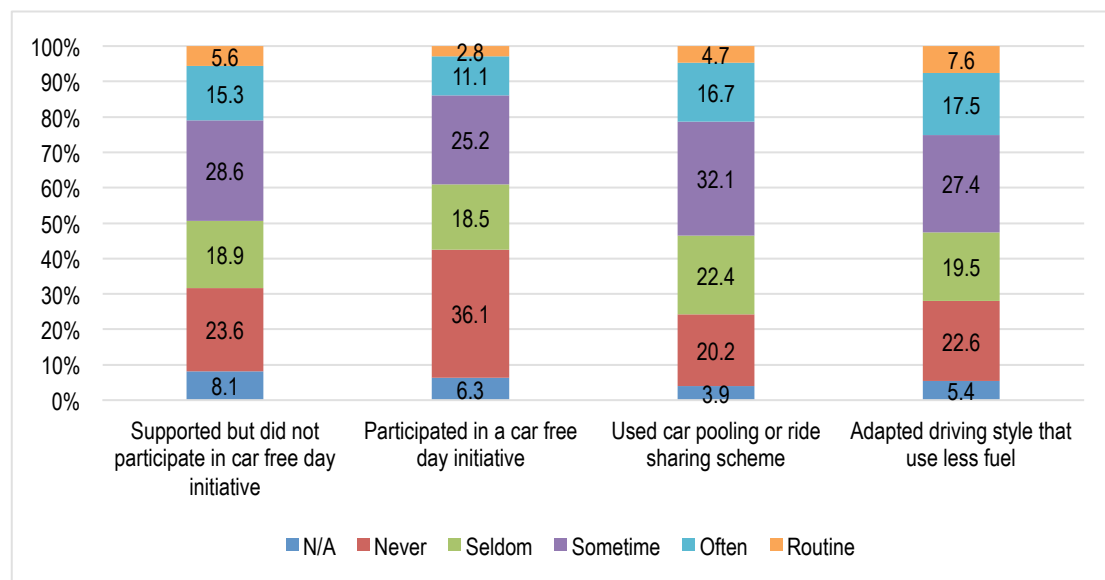
Figure 4.13: Frequency of green transport practices undertaken

Penangites still depend more on private vehicles for their daily activities. As illustrated in Table 4.30, there is high private vehicle usage particularly for activities like shopping/groceries and commuting to and from work daily. For both these activities, the adult cohort assumes the highest percentages, namely 82.0% and 77.8% respectively. The trend is quite similar for leisure-related activities such as vacationing and doing recreational activities where adults are again the highest users of private vehicles recording percentages such as 76.3% and 67.3% respectively.

Table 4.30 : Private vehicle usage for various activities by age cohort (%)

Item/Age cohort	Youth	Adults	Elderly
Daily commute to and from work	71.7	77.8	71.6
Shopping/Groceries	73.6	82.0	77.3
Recreational activity	64.0	67.3	61.6
Vacation	69.1	76.3	65.3

d.   Water Usage Behaviour

In this section, the individual behaviour on water usage patterns is analysed. Penangites have mixed awareness towards conserving water depending on the activity. Collectively, respondents who turn off water routinely comprises 72.3% as illustrated in Table 4.31. However, the adoption rate is lower for activities such as plugging sinks when washing dishes where the collective percentage for 'routine' and 'often' adopters is less than half (i.e., 43.4%). The practice of recycling wastewater is even lower when only 21.9% of respondents practice this approach as a water conservation strategy.

Table 4.31 Water usage patterns

Item/Frequency	Often	Routine	Total (Often & Routine)
Turn off the water while brushing teeth	28.9	43.4	72.3
Plug the sink when washing dishes by hand	22.2	21.1	43.4
Recycle waste water	13.1	8.8	21.9

As shown in Figure 4.14 below, the percentage is highest (48.7%) for elderly followed by adults (43.6%) and then youth (42.3%). Close to 30% of all age cohort groups switch off the tap often though not routinely.
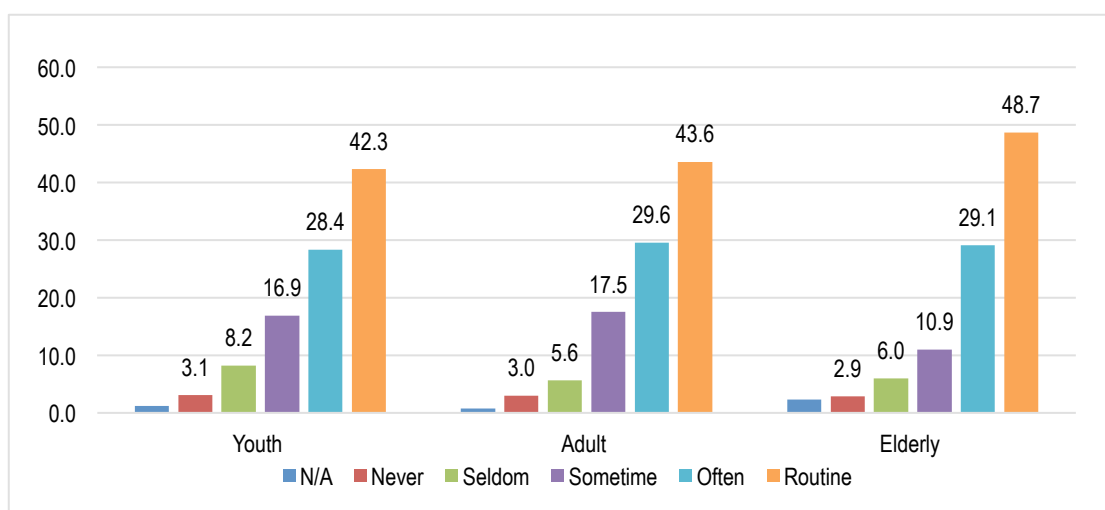
Figure 4.14: Turn off water while brushing teeth by age cohort

As shown in Figure 4.15 \, the elderly cohort is the highest routine wastewater recyclers with a percentage of 11.3% followed by adults (9.3%) and youth (8.1%). Percentages for those who recycle wastewater often reflect the same order with elderly being highest (16.2%) followed by adults (14.6%) and youth (11.5%).
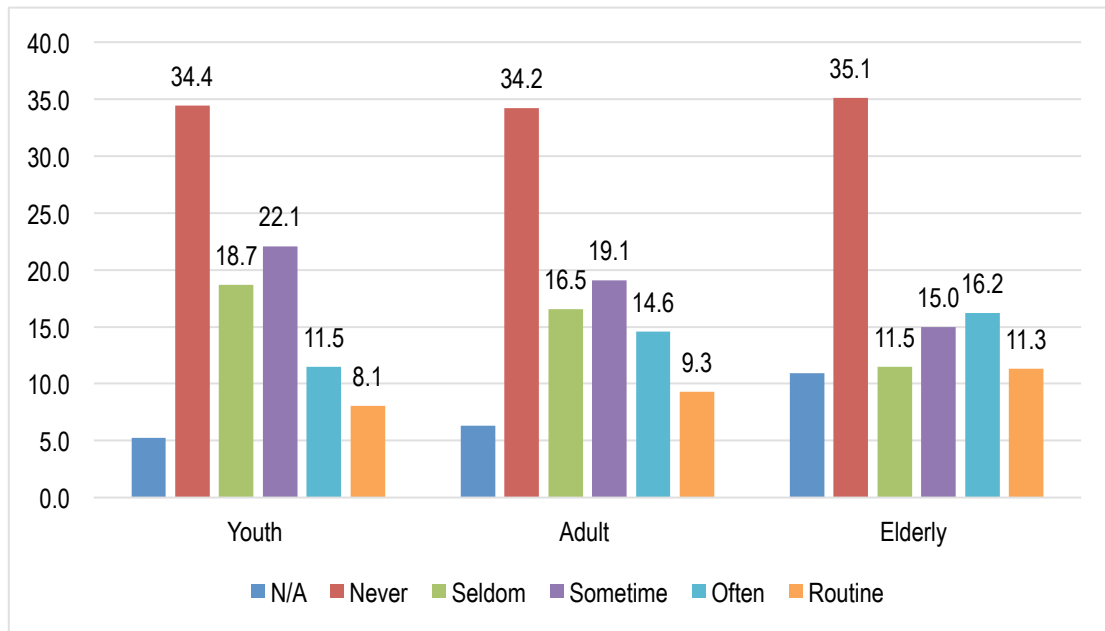
Figure 4.15 Recycle waste water by age cohort

As shown in Table 4.32, the elderly cohort records the highest percentage of 23.4% who plug sink when washing dishes by hand routinely. However, close to one-fifth of respondents still never plug their sinks when washing dishes by hand, with youth being the highest category (19.3%).

Table 4.32 Plug sink when washing dishes by hand based on age cohort (%)

Item/Age cohort	Youth	Adult	Elderly
Routine	20.3	21.8	23.4
Often	21.3	23.1	24.3
Sometimes	22.4	20.5	15.8
Seldom	13.2	13.5	16.1
Never	19.3	17.9	17.7
N/A	3.6	3.2	2.8

This section analyses individual behaviour on energy usage pattern. As shown in Figure 4.16, more than 85% of respondents reported practising some form of energy saving behaviour (The percentage is obtained by summing up the percentage of respondents undertaking energy-saving practices either in 'routine', 'often', 'sometimes' and 'seldom' basis). Scrutinising households who reported engaging in energy saving practices routinely shows that unplugging devices when not in use (30.0%) and using compact fluorescent light (CLF) lightbulbs instead of traditional light bulbs (27.1%) are ranked top in the list. In comparison, the percentages of respondents who routinely reduce the usage of AC and dryers (17.9%) and use staircase whenever possible (17.2%) are much lower.
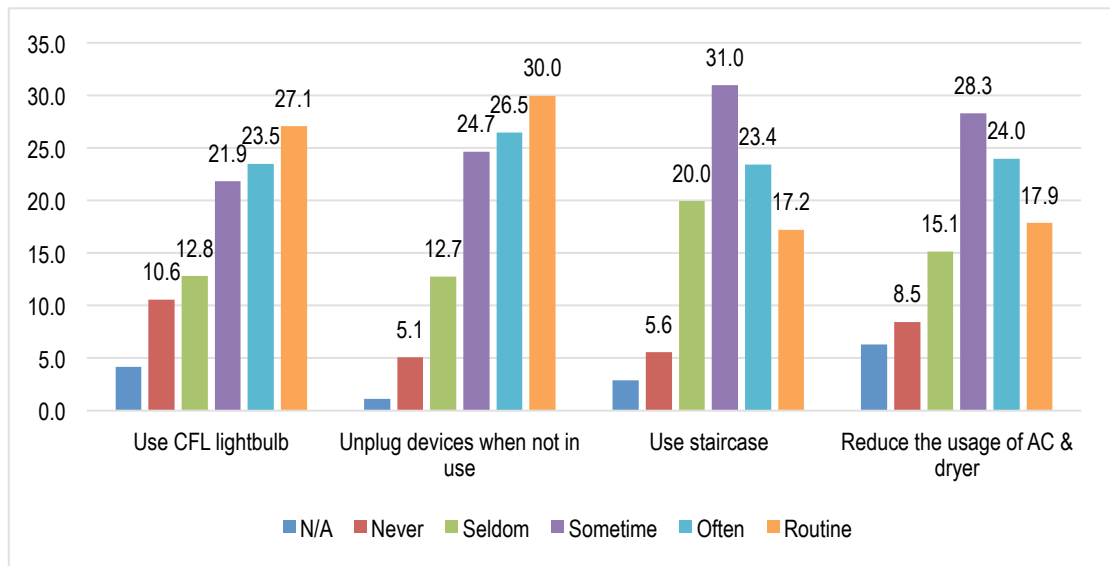
Figure 4.16 Energy saving practices

Figure 4.17 presents individual behaviour on unplugging devices when not in use. A majority of respondents reported unplugging their devices when not in use. Further analysis among those who practice it often or routinely revealed that elderly have a higher tendency to do so as compared to adults and youth.
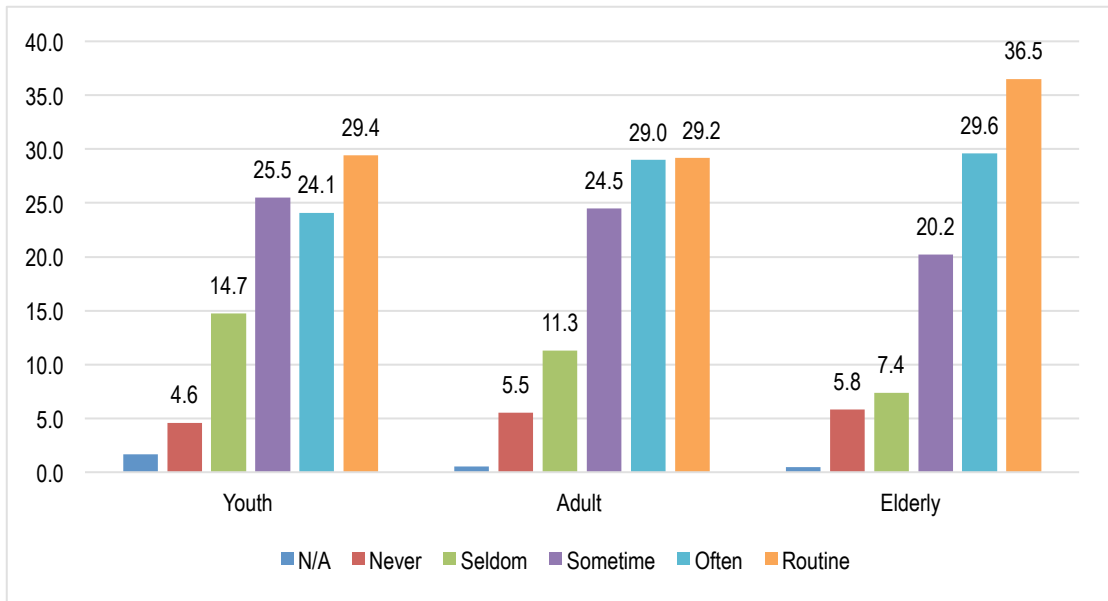
Figure 4.17 Unplug devices when not in use by age cohort

Figure 4.18 presents individual behaviour on using CFL lightbulbs. Similar to the findings on unplug devices when not in use, the percentage of using CFL light bulbs in an often manner or routinely is higher among the elderly compared to adults and youth.
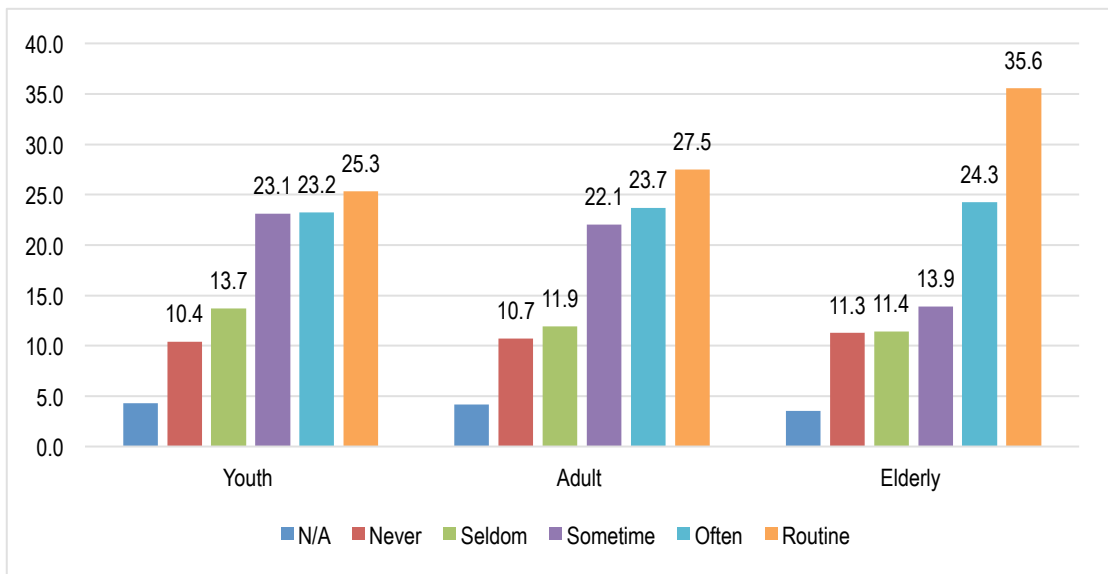
Figure 4.18 Use of CFL light bulb by age cohort

Figures 4.19 and 4.20 display individual behaviour on the usage of the staircase and reducing the usage of AC & dryer, respectively. While a great majority reported using staircase whenever possible, only less than 20% do it routinely. Similar to the findings on unplugging devices when not in use, the percentage of the elderly using staircase in an often

manner or routine basis whenever possible is relatively higher than adults and youth. Similarly, the elderly more frequently reduce the usage of air-conditions & dryer than adults and youth, as reflected by the relatively higher percentage of elderly who reported the practice either doing it "often" or on a "routine" basis.
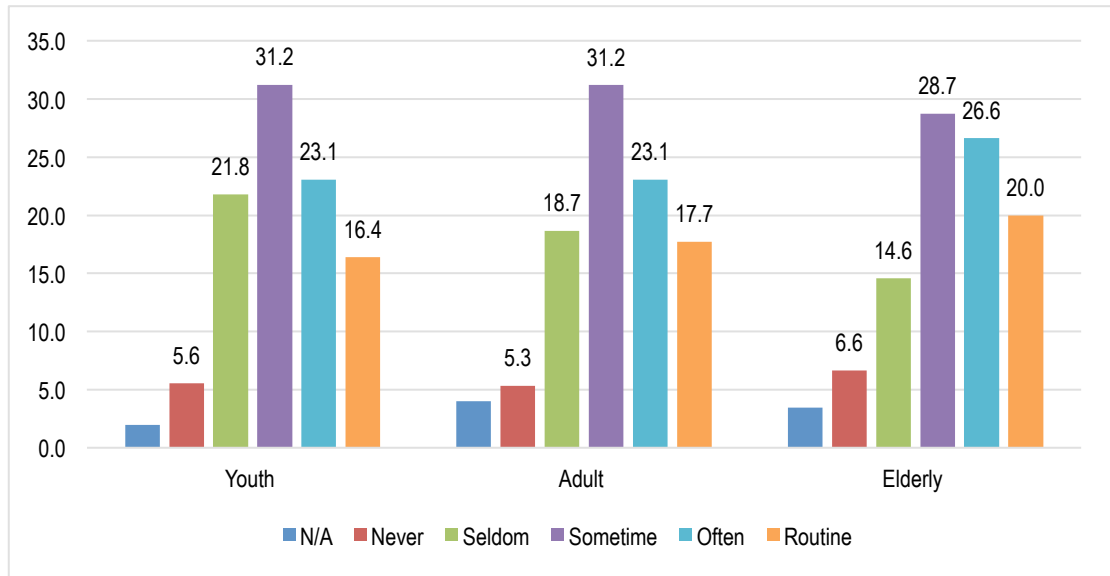
Figure 4.19 Use staircase whenever possible by age cohort
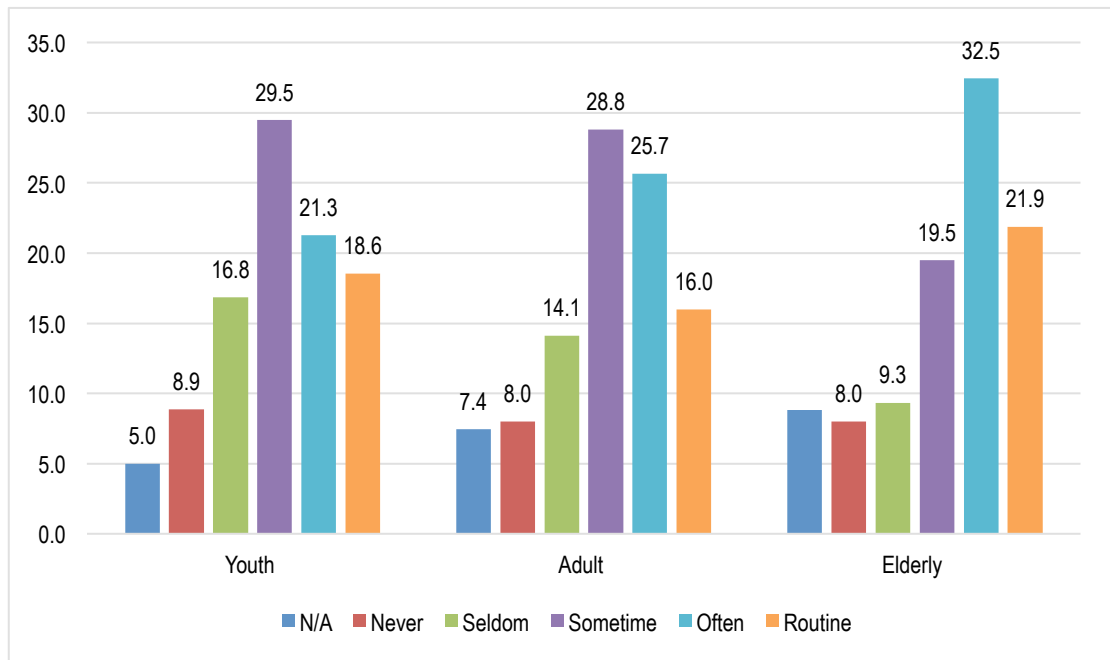
Figure 4.20 Reduce the usage of ac & dryer by age cohort

f.   Green Food Consumption Patterns

This section will discuss and analyse the household behaviour on green food consumption patterns. As illustrated in Table 4.33, respondents who choose food items with less packaging is 28.6% collectively, with those who perform it 'often' being 20.0% and routine adopters stand at 7.6%. The results show that the percentage of respondents who use reusable shopping bags on a routine basis is 23.4%. The culture of carrying one's food or water container when packing food is emerging although those who do it routinely is still low (13.9%). The findings display that one out of five respondents carry their food/water container to pack food often where a percentage of 23.2% is recorded. From the survey, those who adopt this practice 'sometimes' charted the highest percentage (33.8%). It is reported that respondents who eat locally grown food routinely is 13.1% and those who consume it often are more than double the percentage (28.6%). From Table 4.33, consumers who eat locally grown food 'sometimes' assume the biggest percentage (34.2%).

Table 4.33 : Green food consumption pattern (%)

Frequency/Item	Choose food items with less packaging	Use reusable shopping bags for shopping	Carry own food/water container when take-out	Eat food that is locally grown
Routine	7.6	23.4	13.9	13.1
Often	20.0	28.4	23.2	28.6
Sometime	33.3	28.8	33.8	34.2
Seldom	25.8	12.9	19.7	16.7
Never	11.4	5.7	8.5	5.6
N/A	2.0	0.8	0.8	2.0

From Figure 4.21, the results reveal that respondents who limit or avoid meat consumption routinely are still small (i.e., 8.8%) though those who opt to often avoid or limit consuming meat is slightly better with a percentage of 19.4%. The biggest slice of pie represents 36% of respondents who 'sometimes' limit or avoid meat consumption.
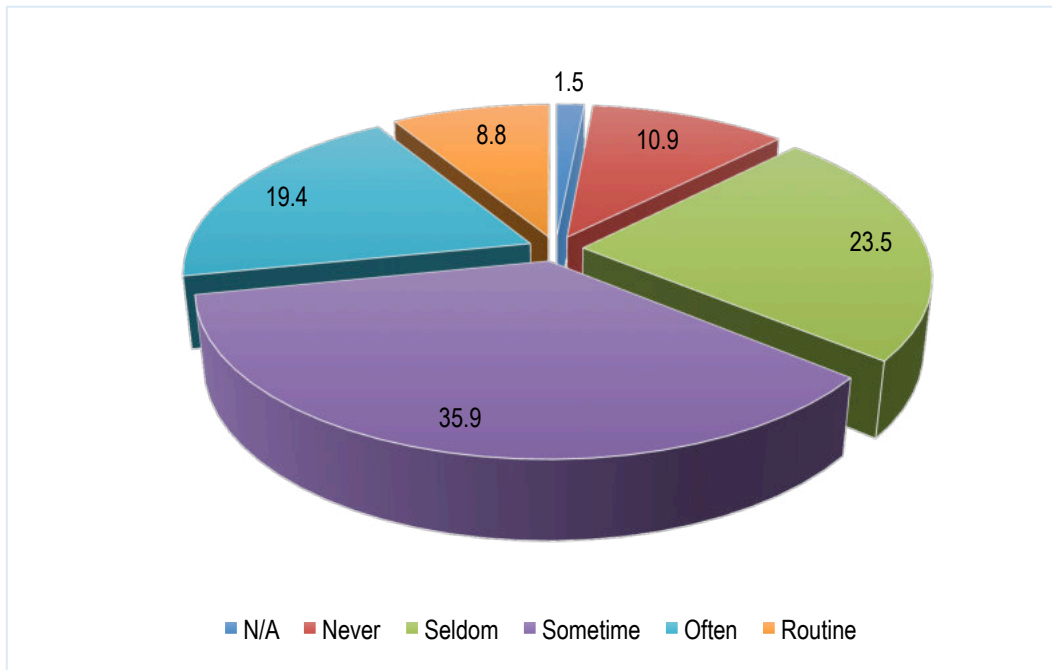
Figure 4.21 Limit or avoid meat consumption

From Figure 4.22, it could be observed that respondents who routinely choose to buy organic products is 10.4% while those who never buy organic products is 10.5%. The biggest slice of 'sometimes' users represent 33.7%.
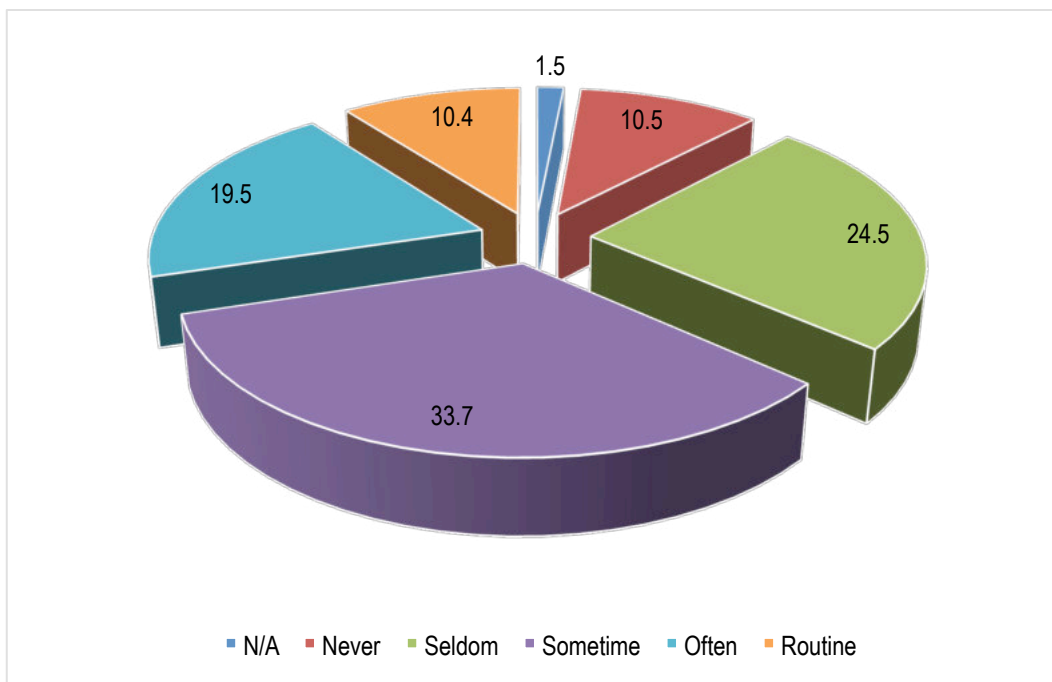
Figure 4.22 Choose organic products

From Table 4.34, respondents who routinely choose food items with less packaging is below 10%. The adult and elderly groups record similar percentage of 8.6% while youth records a slightly lower percentage of 6.8%.

Table 4.34 : Choose food items with less packaging by age cohort (%)

Frequency/Age cohort	Youth	Adult	Elderly
Routine	6.8	8.6	8.6
Often	19.6	19.1	26.0
Sometime	34.5	32.5	29.0
Seldom	24.5	28.1	23.7
Never	12.6	9.9	10.6
N/A	2.1	1.9	2.2

Elderly are more inclined to use reusable shopping bags. For example, as illustrated in Figure 4.23, the percentage of elderly who use it routinely (34.2%) is higher than adults (22.5%) or youth (22.4%). Likewise, the elderly are also the highest 'often' users charting a percentage of 34% followed by adults (28.7%) and finally youth (27.2%).
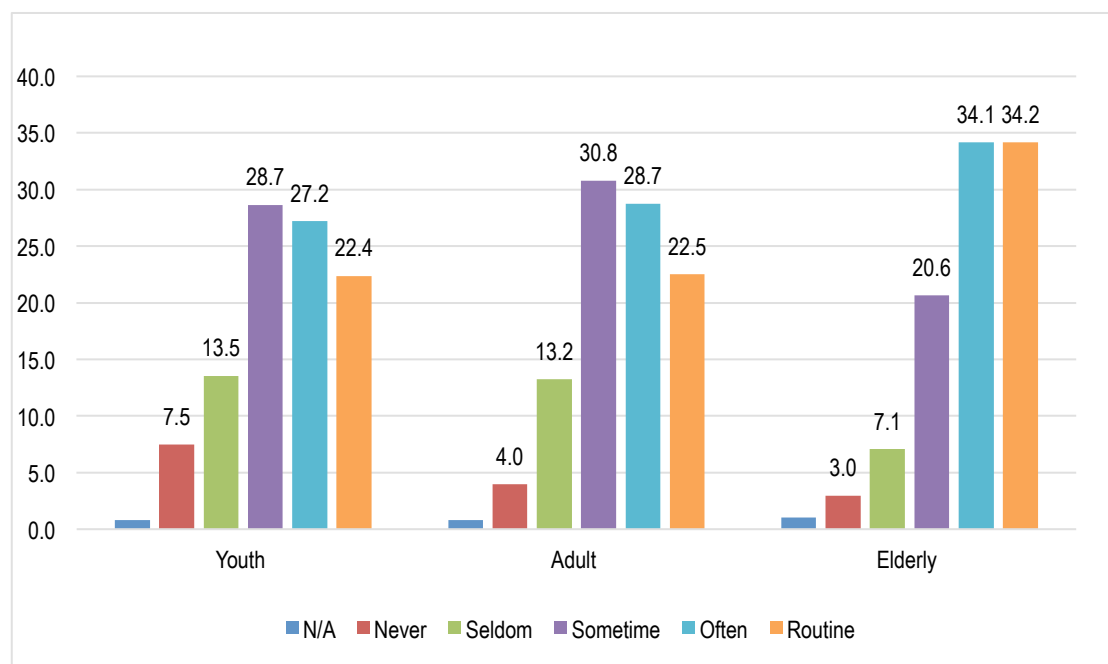
Figure 4.23 Use reusable shopping bags by age cohort

From Figure 4.24, the highest adopter of carrying own food or water container for take-outs routinely (17.9%) or often (29.0%) are elderly. However, adults (33.8%) and youth groups (35.1%) record higher percentage in the 'sometimes' category compared to elderly (25.6%).
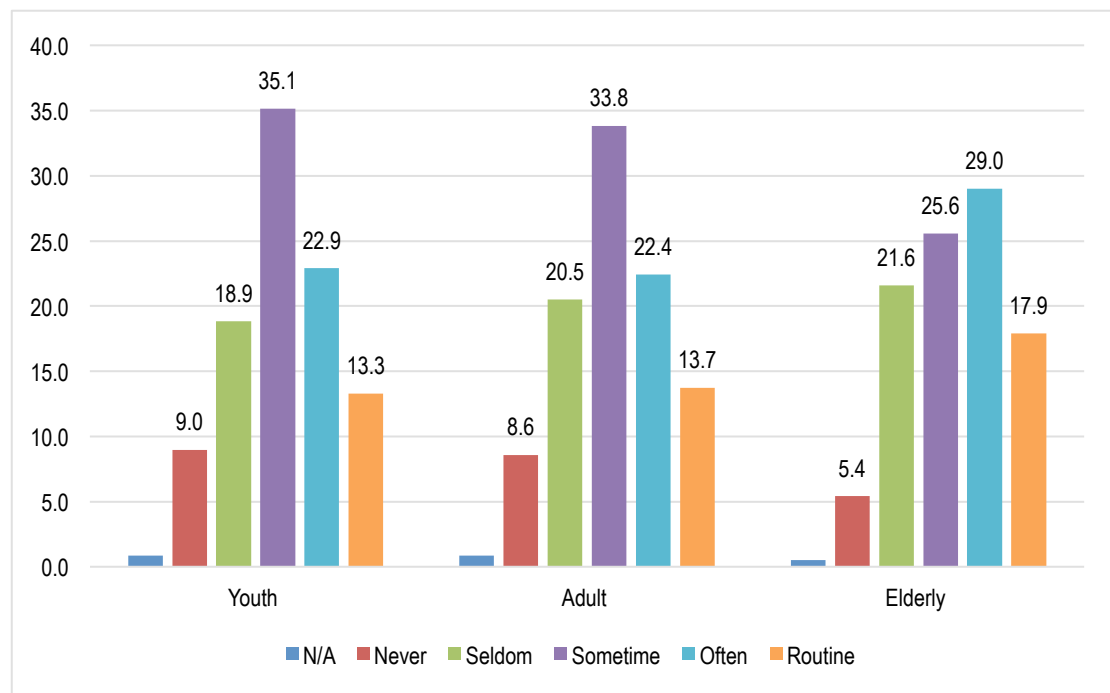
Figure 4.24 Carry own food/water container for take-out by age cohort

The survey data revealed that the culture of consuming locally grown food differs significantly across the different age groups. To date, the elderly seem to be more active consumers of locally grown food compared to their younger counterparts. As shown in Figure 4.25, the percentage of senior citizens eating locally grown food routinely is the highest (18.7%) compared to adults (12.8%) and youth (12.4%). However, for the 'sometimes' response, the youth group charts the highest percentage (36.6) followed by adults (32.5%) and finally senior citizens (26.2%).
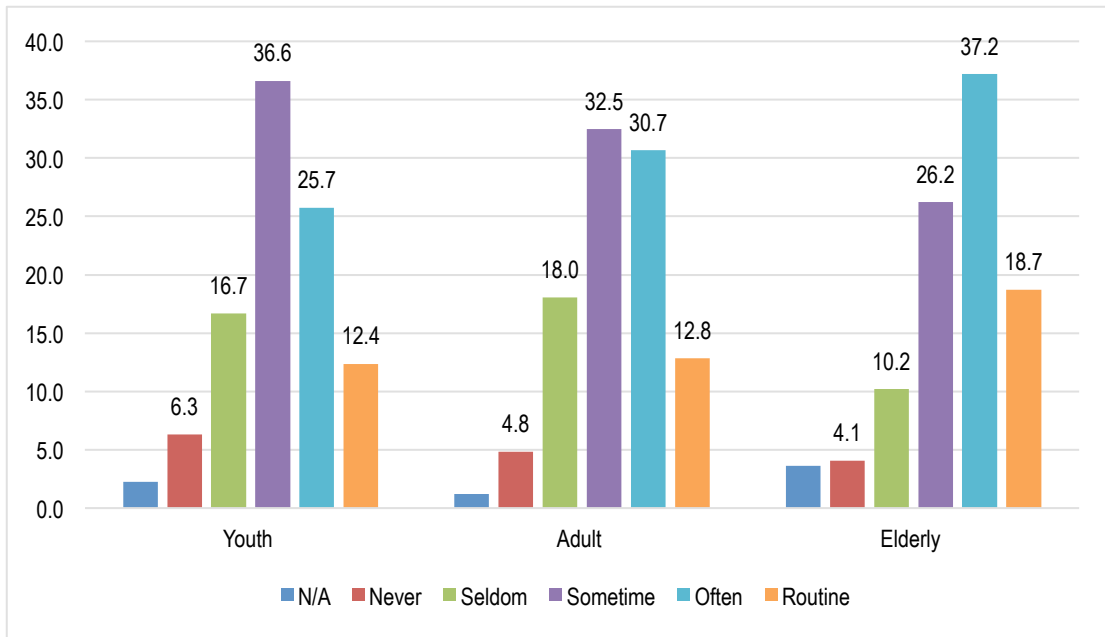
Figure 4.25 Eat food that is locally grown by age cohort

The study also disclosed that within the small percentage of respondents who routinely limit or avoid meat consumption, the highest adopters are elderly (12.3%) followed by youth (8.8%) and adults (8.0%) as shown in Figure 4.26. Those who adopt this practice often was dominated by the elderly group (30%) followed by adults (21.1%) and youth (16.5%). The results show that adults are more active and serious consumers who limit or avoid meat consumption in their daily food intake.
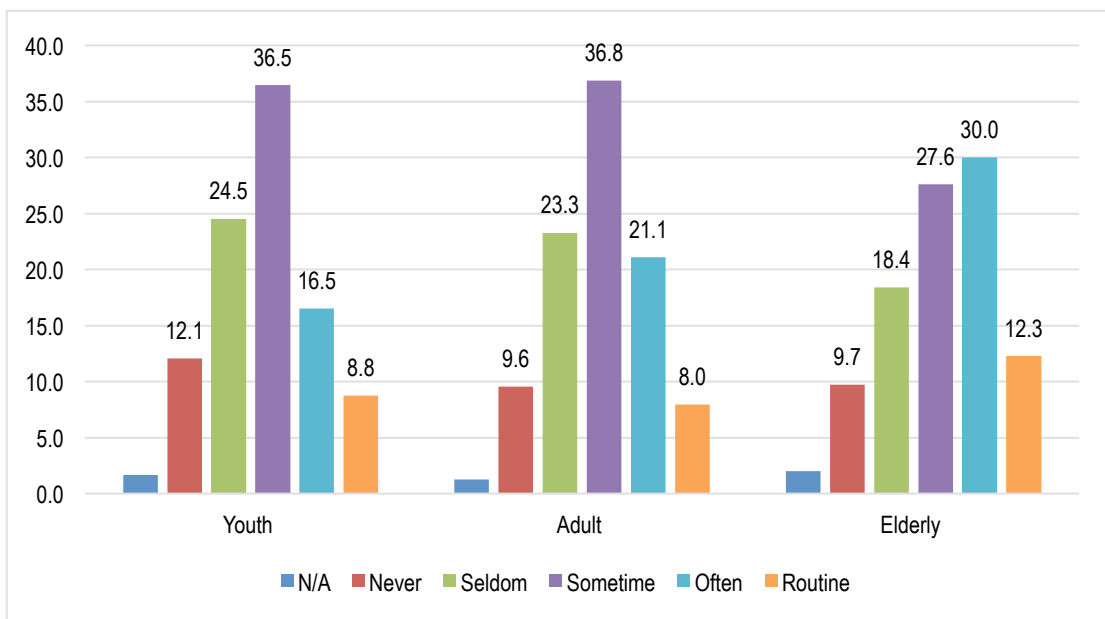
Figure 4.26 Limit/avoid meat consumption by age cohort

Figure 4.27 shows that the elderly are more active consumers of organic products compared to their younger counterparts. For instance, for the routine basis category, elderly (13.9%) outnumber youth (10.7%) and adults groups (9.1%) respectively. It is also observed that elderly (22.9%) and adults (22.5%) choose organic products more often compared to youth (16.7%).
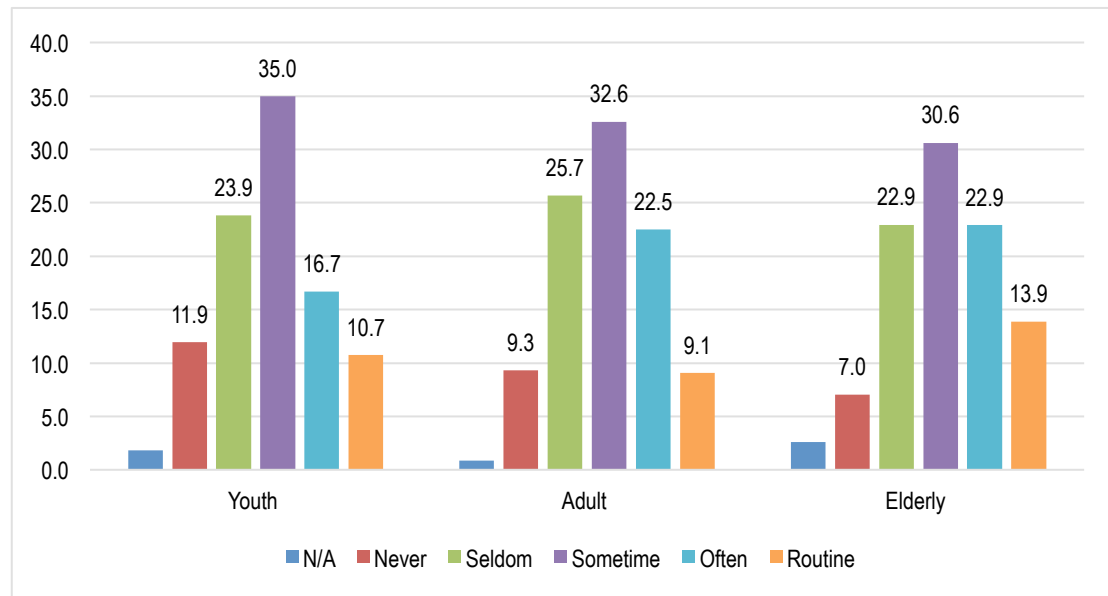
Figure 4.27 Choose organic products by age cohort

g.   Attitude and Engagement Towards Environmental Domains

Table 4.35 presents household attitudes and engagement towards environmental domains. The findings show that the majority of respondents reported positive attitudes towards environmental domains. More than 80% of respondents reported exploring, involving, teaching and encouraging others on environmental knowledge, practices or activities (the percentage is obtained by summing up the percentage of respondents who reported engaging in environmental on a routine, often, sometimes and seldom basis). Nevertheless, very few respondents have engaged themselves in a routine basis. Less than 10% of respondents reported engaging in environmental domains on a routine basis, of which direct involvement in environmental educational campaigns & activities is the lowest (4.7%).

Table 4.35 Household attitudes and engagement towards environmental domains (individual behaviour)

Frequency/Item	Explore & constantly update on personal environmental knowledge & practices	Involved in environmental educational campaigns & activities	Teach others on environmental practices	Encourage others to adopt green practices
Routine	6.1	4.7	5.8	6.9
Often	18.4	15.8	20.1	20.4
Sometimes	35.6	34.9	32.7	31.6
Seldom	26.0	27.4	24.6	23.8
Never	11.3	15.5	15.5	15.5
N/A	2.7	1.9	1.4	1.7

4.2.2 Summary Findings from Focus Group Discussions and Interviews

This section summarises the findings from the focus group discussions and interviews according to the themes identified.

a.   Socioeconomic Issues

From the interviews, besides environment practices and initiatives, there are also non-environmental initiatives such as socioeconomic practices that are practised by Penangites. These practices, however, are predominantly implemented by the public sector which in this case is the state government of Penang. For instance, to address poverty especially absolute poverty, the Penang state has this initiative of topping up the salaries of those who fall below the poverty line (i.e., RM770). For example, if a person earns a salary of RM600, the state would top up and pay the balance of RM170 to ensure that the person is not below the poverty line. In addition, the Penang state also provides other monetary benefits such as *'Program Emas'* to senior citizens, *'Wang Khairat Kematian'* for the bereaved, *'Projek Ekonomi Khas'* and also incentivises those who managed to obtain a place in university. In Penang, aid is also provided to fishermen and taxi drivers. By having the programs above and initiatives, it will assist towards achieving SDG 1 (No Poverty).

Besides SDG 1, elected representatives (i.e.. MPs & EXCOs) in Penang also highlight that health-related initiatives were put in place such as the Artificial Intelligence Medical Application (AIME), Penang Healthy Program and measures to compound houses that are breeding grounds for dengue. These health-related initiatives will go towards achieving SDG 3 which is to ensure the good health and well-being of Penangites.

The public sector in Penang also emphasises the importance to develop and nurture human capital which is in line with SDG 4 (Quality Education). To date, the Penang state has introduced Language Programs and provided incentives for Excellent Education Performance. In selected areas/villages, the multipurpose hall/community hall (i.e., Dewan JKKK) is being used for education purposes.

From the interviews, it is indicative that Penang is a gender-responsive state where females in the state are provided with equal gender employment opportunity. With such a policy in place, it will facilitate towards achieving SDG 5 (Gender Equality).

Interviews with MPs and state EXCO members also highlight other socioeconomic initiatives that are already in place such as the availability of soft loans (through Agrobank) and also the state's microcredit schemes such as *'Tabung Usahawan Petani Muda'* and *'Program Titiansama Rakyat'.* Additionally, initiatives are in place for branding and marketing Penang goods. Among the branding strategies is 'Wholesome Penang' with the 'Made in Penang' logo labelled in all Penang-made products. All the aforementioned socioeconomic initiatives, efforts and programs contribute towards SDG 8 that advocates for decent work and economic growth.

b.   Built Environment

In Penang state, the Municipal Council of Seberang Perai (MPSP) is committed to becoming a low carbon, eco and smart city by the year 2022. With sustainability as their commitment, MPSP applies eco-town criteria to develop and design townships in its municipality (MPSP, 2012). The key eco-town criteria adopted by MPSP are listed below:

- Conservation of rural settlement structure
- Priority of public transport, cycling and walking
- Diversity of housing typology
- Integration between housing and workplaces
- High-quality and diverse public spaces
- Bioclimatic architectural design
- Eco-technology
- Complete water cycle management
- Sustainable urban waste solutions
- Modern digital infrastructure
- Intelligent urban grids
- Experimental laboratory for future habitation

To date, MPSP has undertaken various initiatives to create their brand of eco-cities. One good example is the Batu Kawan Eco-City (see Figure 4.28) where every residential and commercial unit in Batu Kawan must be Green Building Index-certified. This is to ensure that the entire Batu Kawan township will be energy efficient and contribute towards a cleaner and greener environment. Essentially, collective efforts should go towards reducing our per capita ecological footprint and living within our global means. MPSP's strategy of reducing its ecological footprint is by ways of green planning through tree planting, recycling, constructing more bicycle lanes, separating waste at source, emphasis on public transport, propagating the use of solar energy and aspiring towards zero waste (MPSP, 2012). Batu Kawan is also being governed by regulations and guidelines that advocate sustainability and emphasise protection of the environment. To this end, MPSP has placed a condition that all applications for planning permission in Batu Kawan should comply fully with the Batu Kawan Eco-City guidelines. Another notable example is the Bandar Cassia Eco-City which is also on mainland Seberang Perai. Additionally, efforts are underway at MPSP to review and consider implementing Green/Eco-City guidelines at the planning permission stage for the entire Seberang Perai with the aspiration to transform Seberang Perai as a Green/Eco-City. Box 4.1 briefly explains the concept of eco and smart city.

Box 4.1 Brief concept of eco and smart city

The eco and smart city concepts are not new. A smart city or eco town is designed to provide dwellers with more environmentally friendly options and choices in their daily activities. Broadly, eco towns are developed to be friendly to nature and be in harmony with the environment, and these towns strive to eliminate waste to zero by re-using all waste as materials in other sectors (MPSP, 2012). These concepts have been adopted widely by many European countries like Germany, Denmark, Sweden, just to name a few. However, the adoption rate by cities in developing and underdeveloped countries is generally low and at its infancy. With the challenges of environmental degradation and climate change occurring rapidly and irreversibly in recent years, global visions like the New Urban Agenda has enshrined within it the transformative commitment to embrace the smart-city approach (UN, 2017: 19). Essentially, an eco and smart city approach will leverage opportunities from digitalization, clean energy and innovative technologies to reduce carbon emission and pollution in a city. Clearly, the adoption of an eco and smart city approach will go towards achieving several goals of the SDGs such as SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities & Communities) and also SDG 12 (Responsible Consumption and Production) to ensure and boost improvement in energy efficiency. To this end, local authorities worldwide are now aspiring towards becoming eco- and smart cities in their own right.

Figure 4.28 Batu Kawan Eco City

Source: Hijau e-Komuniti, http://www.pmm.gov.my/site_progress, accessed on 6 December 2017.

Besides MPSP, other federal and state agencies in Penang State have highlighted that the development of eco and low carbon cities are in their respective agendas. This is also resonated by the City Council of Penang Island (MBPP).

To translate the above green/eco-city vision into reality, other stakeholders like developers, architects, planners, engineers and other built environment professionals have attempted to incorporate and integrate relevant green guidelines such as Green Building Index (refers to Box 4.2) and policies into the actual construction of housing projects.

The balance between nature and development is important for sustainable livelihood (Khor, n.d.). Sustainable livelihoods can be built through sustainable or green buildings. Features of green buildings include using resources efficiently, reducing waste and pollution and enhancing the quality of life (WGBC, n.d). Green buildings may reduce negative impacts on the built environment and also contribute positively towards climate and the natural environment (WGBC, n.d.). All these are important for sustainable development. According to the World Green Building Council, green buildings are the building blocks towards achieving selected SDGs, namely SDG 3 (Good Health and Well-Being), SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Change), SDG 15 (Life on Land) and SDG 17 (Partnerships for the Goals). Green buildings can reduce the use of energy resources by using renewable energy and hence cost saving, and this can contribute towards achieving SDG 7 (Affordable and Clean Energy). Besides, green buildings may reduce the usage of water resources and can be a means of achieving SDG 15 (Life on Land).

Green Building and Sustainable Development Goals

(Source: World Green Building Council's website,http://www.worldgbc.org/green-building-sustainable-development-goals, assessed on 6 Dec 2017)

In recent years, more and more countries have adopted the Green Building Index (GBI). GBI is a green rating instrument, which has been used by the government to evaluate the extent to which the building is compliant with certain sustainability standards of the built environment. The evaluation is based on the efficiency of resource use and the impact on human health as well as the environment (GBI, n.d.). In Malaysia, Penang is the first state that embraces the GBI (Khor, n.d.). A green building will be awarded for appropriate certification: CERTIFIED, SILVER, GOLD or PLATINUM, based on the score points after inspection.[1] Until today, Penang has a total of 30 certified green projects which have been granted GBI's certification (GBI, n.d.). Among key green projects (and its GBI rating) in Penang include Sandilands (GOLD), Marinox Sky Villas (GOLD), Hotel Penaga (GOLD), 11 Brook Residences (GOLD), Sunway Penang @ Anson (GOLD), The Setia Pinacle (CERTIFIED), Setia Green Phase II (landed parcel) (CERTIFIED), The Light Collection II (CERTIFIED), The Light Point (CERTIFIED), G-Home (CERTIFIED), Kao Penang Office (CERTIFIED), 1 Tanjong (CERTIFIED) and many more (GBI, n.d.).

Box 4.2 Green Building Index

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[1] Assessed from http://new.greenbuildingindex.org/how/classification on 8 Dec 2017.

Interviews with state government officials reveal that the focus on the application of GBI's certification tends to be more on all new residential developments in Penang Island. The government official interviewed also points out that there is a reduction of development charges for certified green building, but the amount of reduction depended on the type of GBI certificates (certified, platinum, gold or higher level) obtained. At the moment, the state government is still using the 'soft approach' in educating the public and has yet to make GBI certification mandatory for the construction of all new buildings.

In line with SDG 11 (Sustainable Cities and Communities), the focus is to build more eco-friendly (or low carbon cities) cities. The state government has identified Batu Kawan as an Eco-City as discussed in the previous section. Green guidelines have been formulated for the development of this Eco-City. For example, all residential and commercial buildings located in this city must obtain at least Green Building Index certification. To ensure efficient use of energy, the state government has included Overall Thermal Transfer Value (OTTV) as one of the requirement when submitting building plans for buildings with a total air-conditioned space exceeding $4000m^2$ and above (GBI, n.d.). OTTV is a measure a measure of the energy consumption of a building which can be used to ensure efficient use of energy which ultimately contributes to sustainable development.

PGC has also initiated a green office project (GOP) which assists organisations to embrace green practices. The green office assessment focuses on eight primary aspects ranging from purchasing, water conservation, energy conservation, waste management, paper usage, printing control, indoor air quality improvement and employee & community engagement. Offices, which have passed through the assessment, will subsequently be audited. A green office logo will be issued to the qualified organisation, which has passed through the audit inspection for two years, and the organisation will need to apply for recertification upon expiry of the certification. It was reported through interviews with state government officials that the Municipal Council of Seberang Perai has obtained the green office certification from PGC.

Besides the state, NGO stakeholders have also taken initiatives to incorporate some green building features within their own business or residential premises. Some NGOs have

installed solar panels on their premises for their electricity consumption. Some built their rainwater harvesting systems in their houses. This practice is in line with SDG 6 (Clean Water and Sanitation).

The construction industry in Malaysia is regulated by a number of acts which are gazetted to ensure environmental sustainability of the industry. These include Environmental Quality (Amendment) Act 2007, Drainage Works Act 1954, Solid Waste and Public Cleansing Management Act 2007, and Street, Drainage and Building (Amendment) Act 2007 (CIDB, n.d.).

Interviews with developer stakeholders indicate that some developers have adopted Industrialised Building Systems (IBS) whereby industrial production techniques were used when undertaking construction activities. The new technique helps to resolve some waste management issues that arose from traditional construction methods undertaken at construction sites. Nevertheless, as compared to Kuala Lumpur, the adoption of IBS is still low in Penang's construction industry.

During the interview, one developer stakeholder indicated that they had adopted Centralised Labour Quarters (CLQ) to provide living quarters for workers employed in their construction project. The CLQ features are described by the developer stakeholder as follows:

> "...we set up a labour living quarter where all workers involved in the construction project will be staying there. It is a proper hostel with modern facilities such as toilets, cooking place and everything. In terms of safety, the living quarter comes with tight security system where the entrance is allowed with access card. Also, modern amenities such as groceries and canteen, recreation areas and sports facilities such as badminton, basketball were also located within the living quarters".

The first CLQ in Malaysia was set up by Gamuda Berhad for their foreign workers employed in the Klang Valley Mass Rapid Transit Project (Gamuda, 26 April 2017). CLQ is a gated and guarded accommodation with modern facilities and amenities. In fact, Construction Labour

Exchange Centre Berhad (CLAB) have discussed with the government of Penang in identifying areas to build CLQ (CLAB, 20 Oct 2017).

c.   Waste Management

After almost seven years of its introduction to the public, findings from interviews and focus group discussions indicate a number of green practices have been undertaken by different stakeholders. The state government has put forward several initiatives to increase participation and awareness on 3R practices among Penang residents. To encourage the adoption of 3R practices among local residents, the state government has introduced its first initiative to reduce the usage of plastic bags by initiating 'No Free Plastic Bag' program in July 2009. Under this program, no free plastic bag(s) will be given to the public on weekends (Saturday and Sunday). This green practice was further extended from initially two days a week to every day of the week with the "Launching of Everyday is No Free Plastic Bags Day" on 1st January 2011. "No Plastic Bag Day" campaign is part of the 'Cleaner, Greener, Safer and Healthier Penang' initiative (refer Box 4.3). In fact, Penang is the first state to do away with a plastic bag every day.

The 'Cleaner, Greener Penang' initiative was first introduced on 22nd May 2010 by the state government of Penang. It is now rebranded as 'Cleaner, Greener, Safer and Healthier Penang'. Some of the important green initiatives introduced by the state government include 'No Plastic Bag Day', 3R (reduce, reuse, recycle) practice and waste segregation. The current recycling rate of Penang is 28.4% (The Star, 10 Oct 2017). This rate is much higher than the corresponding average recycling rate recorded for Malaysia, i.e. 17.39%, but still lower as compared to the corresponding rate for developed countries such as Singapore (59%), Taiwan (60%) and German (62%) (Tan, 20 Mei 2016).

Box 4.3 Brief overview of 'Cleaner, Greener Penang' Initiative

Interviews with government officials reveal that Penang is quite successful in implementing the 'No Plastic Bag' policy. Nevertheless, local government officials also indicate that there is still a need to further increase the practice of 'No Plastic Bag' among Penang residents. The local government officials also disclose that a number of recycling and composting activities have been initiated by the state government. The first stage of waste segregation mainly involves households. The civil community is encouraged to do their own composting at the household level. For example, the Eco-Community unit has conducted and organised a

series of activities to educate the public to produce compost from food waste. In addition, the local government, with the cooperation from the agriculture department, have assisted the community to set up their community farms or *"Kebun Kejiranan"*. As elaborated by one government official,

> *"...Jabatan Pertanian partner kita untuk mengajar orang ramai bertani dan ada penduduk yang rela hati tanah dia kosong, kita menolong mereka membajak atau membajak bersama mereka .... untuk menaman tanaman dan sayur-sayuran seperti terung, kacang dan sebagainya, untuk kegunaan sendiri."*
> (Public Sector)

> "...the Agriculture Department is our partner to educate the general public on ways to cultivate plants and vegetables such as brinjals, beans and such for their consumption..."(Public Sector)

The move to produce food for consumption will also help to reduce the occurrence of hunger, especially among poor communities and hence moving a step closer to achieving SDG 2 (Zero Hunger). The second stage of waste management is targeted at local communities and firms. Food waste from food vendors, restaurant and hotel operators are collected and transformed into by-products that can be used in food and energy production. The state government has also set up a centralised food waste composting facilities in several locations such as Bagan Ajam and Auto City Commercial Centres. In addition, as shown in Figures 4.29 and 4.30, a food waste collection centre has been set up in Chowrasta market to collect food waste from nearby food vendors and outlets before sending to a composting facility.
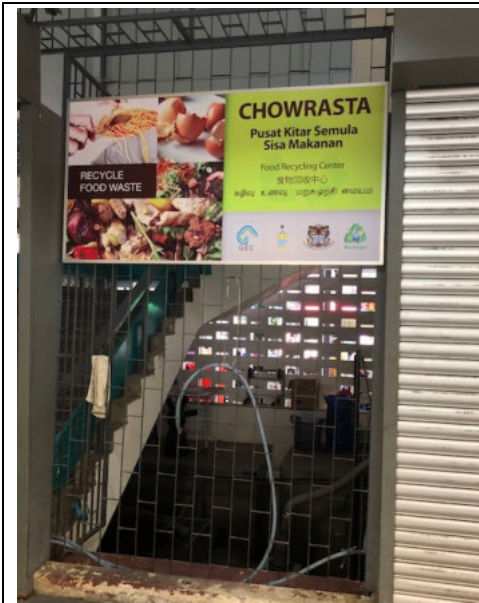
| Figure 4.29 Food Waste Recycling Centre in Chowrasta Market, Georgetown (Source: Fieldwork, 2018) | Figure 4.30 *Recycling Food Waste Giant Containers located beside the staircase in Chowrasta Market, Georgetown* (Source: Fieldwork, 2018) |

Nevertheless, according to the government official, the outcome can only be witnessed in the year 2018. These practices will reduce the dependency on electricity sources provided by Tenaga National Berhad. This has been highlighted by one elected representative as follows:

"*Selain food waste boleh digunakan untuk menghasilkan kompos, kita bergerak satu langkah lagi, food waste boleh dijadikan sumber tenaga elektrik, supaya kita kurangkan pergantungan kepada tenaga yang menyumbang kepada 75% gas "green house" kepada alam sekitar.*" (Public Sector)

"Besides producing compost, food waste can be used as an alternative energy source to reduce our dependence on energy that contributes towards 75% of greenhouse gases to the environment." (Public Sector)

This will move Penang towards the direction of achieving affordable and clean energy, as stipulated in SDG 7. To educate local residents, the state government has put forward a few initiatives to create awareness and to embrace eco-friendly practices such as 3R practices among local residents. A number of activities have been organised to educate local residents

and create a society that practices 3R activities. For example, MPSP has introduced *Up Cycle Program* to increase the practice of recycling. According to MPSP officers, the program aims to educate people on how to transform waste, especially non-recyclable items such as colourful newspaper, carton which could not be recycled, to new items with a creative design such as a bracelet, flower boxes and handicraft items that can be resold. This would also raise public awareness on the importance of recycling for a sustainable environment.

In addition, the state government has introduced campaigns to reduce food wastage. This is to inculcate sustainable consumption as stipulated in SDG 12. For example, *"Kempen Makan Sampai Habis"* has been carried out to cultivate responsible consumption behaviour among local residents. As described by the government official,

> *"Kalau dia ambil five kek dalam pinggan dia, dia kena habiskan."* (Public Sector)
> "If he takes five cakes on his plates, he has to finish them." (Public Sector)

Such campaign may reduce the amount of food waste. Otherwise, such food waste will eventually end up in the landfill and emit methane that is harmful to the environment.

At the school level, Green School Program has been introduced to students in 2010 to cultivate the love for the environment (PGC, n.d.). According to the government official, a total of 152 schools have participated in this program. As a reward, the Penang Excellent Green School Award will be given to the school that is the top scorer for three consecutive years (PGC, n.d.). In addition, various activities have been organised by the state to educate students to take care of the environment. As illustrated by the government official,

> *"Kita ajar mereka (pelajar-pelajar) membuat baja kompos, menanam sayur, …. mengitar semula, menjaga sumber-sumber alam sekitar. Kita didik mereka jadi ranger alam sekitar."* "We teach them (students) to make their compost fertiliser, plant vegetables … recycle, take care of environmental resources. We educate them to become environmental rangers." (Public Sector)

The state government hopes that with this education, it will have spill over effects to parents via Parent and Teacher Associations and lastly to the community.

This study also found that Penang NGOs and youth are keen adopters of green practices such as 'No Plastic Bag' and 3R (reduce, reuse, recycle) practices within their organisations or premises.

As for the private sector, some businesses indicate that they have adopted the paperless approach in their documentation. According to them, they save their documents such as emails in soft copies rather than print the hard copies.

Some NGOs even engage in educating visitors and locals on the needs to minimise the amount of rubbish created in Penang. They have encouraged visitors to bring their food and drink containers, cutlery, baskets, green bags and so forth.

To increase the embracement of green practices, some NGOs have undertaken efforts to educate local residents on 3R practices. They taught residents how to identify and differentiate items that can be recycled through their recycling education centre. They also tried to change the negative perceptions of residents towards recycling. They hope that recycling would eventually become a culture in Penang like how it is widely practised in other developed countries. As shown in Figure 4.31, some residential areas have set up a centre to collect recyclable items.

Figure 4.31 A collection centre for recycling items is set up in Taman Lip Sin. Information such as collection times and items that could be recycled is displayed outside the centre. (Source: Fieldwork, 2018)

d.   Waste Segregation

The elected representatives interviewed in this study have highlighted that compound will be imposed to the household if they fail to segregate their solid waste accordingly. Compounds as high as RM500 will be imposed on defaulted households with effect from 1 Sept 2017 (Tan, 19 Aug 2017).

In Penang, waste segregation has been carried out in two stages. The first stage of waste segregation is carried out at the source, while the second stage of waste segregation is carried out at dumpsites and landfill sites. During the interviews, state government officials indicate that they have installed Material Recovery Facilities (MRF) systems at dumpsites and landfill sites. MRF is a facility that could be used to further identify and recover recyclables that could be diverted from being disposed into dumpsites and landfill sites. Figures 4.32 - 4.33 illustrate the implementation of waste segregation at source in Penang state and the guide to place recyclables and non-recyclables items for households. This will decrease waste generation by reducing the volume of waste to be thrown into dump sites. Figure 4.34 shows the frontage view of Jelutong Dumpsite, which is still in operation.

Figure 4.32 *The Notice of Implementation of Waste Segregation at Source beginning 1st June 2016.*

(Source: Majlis Perbandaran Seberang Perai's website.)

Figure 4.33 Non-recyclable items will be placed into rubbish bins while recyclable items are placed next to roadside bins. Videos to guide the public on waste segregation at source is also embedded on the website of Majlis Perbandaran Seberang Perai.

(Source: Majlis Perbandaran Seberang Perai's website)

Figure 4.34 Jelutong Dumpsite (currently still in operation) with a banner indicating the structure of new monthly dumping fees ranging from RM160 – RM800 and daily dumping fees ranging from RM20 – RM100 with effective from 1st January 2017. (Source: Fieldwork, 2018)

From the interview with the government official, the Pig Farming Enactment 2016 has been adopted by the state government to regulate waste disposal from the pig farm industry. Among the requirements of the new ruling is the need to adopt a closed farming system and implement zero discharge waste by pig farm operators. This will reduce waste pollution into the river and ocean, and hence contribute towards enhancing the quality of water ecosystems which is essential to human health. The government official also highlighted that mud balls made from food waste and other ingredients are thrown into polluted rivers in Penang to improve livability for life below water. All these provide the building blocks towards meeting SDG 6 (Universal Access to Clean Water and Sanitation) and SDG 14 (Life below water).

Some businesses stakeholders indicate that they have their waste segregation centre. They have set up recycling bins for various recyclable items within their offices. As shown in Figures 4.35 - 4.38, waste segregation bins are commonly found in residential areas, shopping complexes, markets, restaurants, etc. in Penang nowadays.

Figure 4.35 Waste segregation bins located in AEON Mall, Bukit Mertajam.
(Source: Fieldwork, 2018)

Figure 4.36 Waste segregation bins located at Restoran McDonald, Setia Tri-Angle, Sungai Ara.
(Source: Fieldwork, 2018)

Figure 4.37 Waste segregation bins located at Chowrasta Market, Georgetown
(Source: Fieldwork, 2018)

Figure 4.38 Waste segregation bins located at Taman Lip Sin (Phase 8)
(Source: Fieldwork, 2018)

e.   Transportation

To address environmentally unsustainable transportation practices, urban managers, government and stakeholders are now exploring alternative urban mobility solutions (refers to Box 4.4). To this end, the State Government of Penang has initiated several green practices which are mainly linked to cycling and promoting the bicycle as a green and eco-friendly vehicle. For instance, the City Council of Penang Island (MBPP) has put in place a Coastal Bicycle Lane for Penangites to cycle along the island's coast. To further inculcate the cycling culture, MBPP has also established the Link Bike Sharing System as shown in Figure 4.39. Similarly, Plan@Malaysia (formerly JPBD) echoed similar initiatives by urging the general public to opt for green vehicles like bicycles through programs such as 'Cycling Day'. The department also highlighted that the Penang Structure Plan has provisions for bicycle lanes.

In today's world, transportation is no longer perceived as merely humans embarking on motor vehicles to move from origin to destination. The equation has stretched further by questioning how environmental-friendly our choice of transportation is towards the environment. The situation becomes doubly challenging when cities begin to sprawl and townships are designed to accommodate vehicles more than people. Resultantly, less desirable impacts of car-centric form of mobility in cities such as congestion, pollution and ultimately increased greenhouse gas emissions, which are detrimental to the environment. If current practices of transportation are deemed environmentally-damaging and unsustainable, urban managers, governments and stakeholders are now challenged to explore what alternative transportation methods are viable, available and can be locally adopted.   In order to achieve SDG 7 (Affordable & Clean Energy) and SDG 11 (Sustainable Cities & Communities), efforts should go towards urban energy efficiency by proposing green traffic management systems and mobility solutions.

Albeit automobile is still a component in the mobility mix, calls are now towards active transport (i.e. walking, cycling) and mass transit options. These options are now mainstay mobility alternatives in many developed countries like Denmark and most European countries (Williams, 2016: 33, 36). For instance in Germany, they are renowned to pioneer and fuse technology in addressing urban issues by inventing intelligent mobility solutions for transport systems in their Smart Cities. As showcased during a German workshop in October 2017, one of the latest German innovation is the 'Traffic and Environment Monitoring System (TEMSys) which is designed to capture realtime area-wide traffic information, record traffic induced-air pollution and even trace microscopic simulation of traffic and emission (German Design Sprint Workshop, October 2017). Clearly, these green urban mobility solutions are designed with preserving the environment in mind.

Box 4.4 Short description of urban mobility solutions

Figure 4.39 The 'Link Bike System' found along Beach Street, George Town, Penang
(Source: Fieldwork, 2018)

The cycling culture is also used as a green strategy by the Municipal Council of Seberang Perai (MPSP). To date, MPSP has undertaken a myriad of cycling activities to motivate the public to take up cycling as a lifestyle in the quest towards sustainability. Among the initiatives include creating a 'bicycle-friendly community' among citizens living on the mainland of Seberang Perai. In addition, MPSP has a campaign that encourages Seberang Perai dwellers to cycle along the river banks since the Municipal Council does not have sufficient funds to create designated bicycle lanes like those in big cities. As an alternative, cyclists in Seberang Perai are urged to use and cycle along river banks that function as a 'natural bicycle lane'.

At the Federal and State levels, calls have gone towards the reduction of private car use and to inculcate and increase the use of public transport to curb emission from motor vehicles into the environment. For instance in Penang, the car-free day initiative is initiated where certain parts of George Town inner city are demarcated as 'Penang Car Free Zone' on every Sunday beginning from 11 December 2011 (refer to Figure 4.40 below). This is to promote walking and cycling as alternative mobility options in George Town. Within this area, there is also the Central Area Transit (CAT) shuttle service to promote the use of public transport.

Figure 4.40 Certain parts of George Town's World Heritage Site are declared as 'Car Free Day' on every Sunday (7.00am – 1.00pm)
(Source: Fieldwork, 2018)

The cycling culture is gaining popularity among Penangites when a local initiative such as the 'G-Cycling Club' is formed. Members will bike every Friday along designated bicycle lanes on the island. Besides embracing a green and healthy lifestyle of cycling, members of this club also create an opportunity to form bonding and friendships through cycling. The business sector such as Rapid has integrated their services by merging buses and ferries to become Rapid Ferry.

Besides such private initiatives, non-governmental organisations (NGOs) like the Consumers Association of Penang (CAP) also promote and advocate green mobility practices through their cycling and walking club. In fact, CAP has also published a small guide to promote the benefits of cycling as a means for transport, health and economic gains as seen in Figure 4.41.

Figure 4.41 CAP's manual on the importance and benefits of cycling. (Source: CAP)

f.   Biodiversity

Following interviews with MPs, State EXCOs and public officials, it was reported that there are already some biodiversity practices and initiatives in place in Penang state. For example, the Penang state government highlighted that their gazette forest reserve remains untouched until today. By maintaining such a stand, it will assist towards achieving two key goals in the SDG, namely, SDG 13 (Climate action) and SDG 15 (Life on land). The move not to touch forest reserves will ensure that the flora, fauna and natural habitats of wildlife in Penang are well protected.

Besides life on land, the state is also concerned with life below water. Penang is adamant to fight against the consumption of shark fins to protect and ensure sharks are not threatened and eventually become endangered. Such an initiative will contribute towards achieving SDG 14 (Life below water).

At the same time, there are already concerted efforts by both the Seberang Perai Municipal Council (MPSP) and Penang Island City Council (MBPP) to plant trees together with the private sector as well as civil society. Such a commendable effort is a promising sign of achieving SDG 17 which advocates partnerships by all key stakeholders for the goals.

g. *Agriculture*

With the escalating level of urbanisation reaching 90.8% (DOS cited in Mok, 2016) in Penang state where land for agriculture is increasingly scarce, alternative ways for farming and agricultural practices should be considered. For instance, practices such as indoor farming or vertical farming[2] can be adopted by the Penang community, especially for those living in high-rise properties as seen in Figure 4.42. Broadly, vertical farming means cultivating plants and producing food in vertically stacked layers and/or integrated into other structures such as in high-rise buildings like apartments, condominiums and skyscrapers.

Figure 4.42 *Vertical farming concept being practised by Penangites who live in apartments.* (Source: Fieldwork, 2018)

The practice of urban farming by urban citizens is a welcome move towards achieving SDG 12, which advocates responsible consumption and production patterns. Urban agriculture

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[2] The Vertical Farm. Feeding the World in the 21st Century. By Dickson Despommier.
(Source: http://www.verticalfarm.com/, assessed on 1 December 2017).

practices can be divided into organic farming or non-organic farming methods. Organic farming differs from non-organic farming because the former does not use pesticide in cultivating crops. When consumers and producers become aware of the importance of caring for the environment through organic farming, then automatically there will be less toxic materials (i.e., pesticides) used and minimal waste and pollutants generated.

The idea of urban farming is mooted and widely propagated by the Municipal Council of Seberang Perai (MPSP). MPSP has taken the initiative to train their communities to create their Community Farms *(Kebun Kejiranan)* where they can later harvest and sell their produce without going through a middleman. The whole purpose of the Community Farming concept is to enable the local community to produce their own food. To date, eight (8) communities in Seberang Perai have embraced this Community Farming concept which will contribute towards achieving SDG 2 (Zero Hunger) and SDG 12 (Responsible Production & Consumption). This will also ensure self-sufficient living. In this case, when the community themselves are directly involved in producing their food, a sense of responsibility and commitment will be there to minimise toxic materials and pesticides used. By producing their food, local communities are also assured to have access to a steady supply of safe, sufficient and nutritious food at all times of the year. This, in turn, will end hunger, achieve food security, improve nutrition intake and promote sustainable agriculture practices. The collaboration between MPSP and the community is illustrated below by an MPSP officer:

"Essentially, the community will provide and prepare their sites, and MPSP will assist by providing agricultural education by collaborating with the Agriculture Department to teach the locals how to plant vegetables as well as do their own composting. Composting techniques are disseminated to the public via our Eco Community Unit." (Public Sector)

Besides urban farming, the State Government also advocates greening initiatives to increase green lungs in Penang State. For instance, Plan@Malaysia (formerly JPBD) has initiated landscape programs such as planting trees along the river. This program is part of their department's National Blue Ocean Strategy (NBOS) initiative. Additionally, MBPP through its Landscape Department has undertaken efforts to increase the planting of trees in Penang Island as an effort to increase and maintain the island's green lungs.

On the island, a popular urban open space is the Penang Botanic Gardens. The Botanical Gardens is well-kept and has been attracting a steady stream of visitors. During one of the interviews, it was mentioned that the management of the Botanical Gardens emulates the management strategies of Singapore's Botanical Garden as a benchmark and point of reference.

Besides the government, Penang has many other stakeholders who are aware of the importance to adopt and embrace sustainable agriculture practices. In particular, local organic farmers like Wonder Wilder farm and Food to Plate who advocate for urban and organic farming have highlighted the importance of local food production and consumption (see Figures 4.43 - 4.45). They also propagate the philosophy of eating organic food. To ensure that their philosophy will turn into reality one day, these NGOs have started to offer food education to children (see Figure 4.46). Inculcating this philosophy to children at a young age will also instil in them responsible food consumption patterns, which in turn will reduce food wastage. This is in line with the state's waste management strategies.

Figure 4.43 Wonder Wilder farm brands itself as a 'Grassroot Organic Farm'. The farm does not use chemicals and pesticides in its agricultural practices.
(Source: Fieldwork, 2018)

Figure 4.44 At Wonder Wilder farm, the public can enjoy a fully organic farm lunch that is prepared in-situ using organic produce.
(Source: Fieldwork, 2018)

In addition, as an effort to promote sustainable agriculture, local NGOs have educated the public on vertical farming.

"In terms of consumption of vegetables, we also teach them (community) on how to grow their own vegetables, so even if you are staying in an apartment with constrained spaces, you can do vertical farming." (NGO)

Local farmers have also adopted various forms of green practices as part of their sustainable production and consumption methods. Among the initiatives is installation of small solar panels to generate clean energy to charge their electrical appliances, which also serves as a way to save money.

"In our farm, we actually have a very small solar panel. We use it to charge our phones and things. It actually helps us to save a lot of money."(Local farmer)

Figure 4.45 A speaker sharing and conveying some green lifestyle practices at the Man Man Market at Pusat Agro Pelancongan, Relau. The market advocates for sustainable agricultural practices as well as disseminate the sustainable production and consumption culture where organic farmers will congregate at Pusat Agro Pelancongan Relau every first Sunday of the month to sell their organic produce.
(Source: Fieldwork, 2018)

Figure 4.46 Man Man Market is also an avenue to create green awareness and provide green education to children while their parents shop for organic produce.
(Source: Fieldwork, 2018)

Apart from urban and vertical farming, other NGOs like the Consumers Association of Penang have initiated their own 'Kitchen Gardening Demonstration' initiative. In addition, CAP has published handy and easy-to-read manuals/booklets to teach the general public on organic farming, composting, preparation of natural pest repellent and using recyclable items to cultivate plants at home. CAP has also promoted the importance of home nutrition garden. According to CAP, home nutrition garden is defined as cultivating vegetables, fruits and herbs in our homes for our consumption, and the cultivation process does not use chemical fertilisers and pesticides. In another of their publication entitled 'From Garden to Plate', CAP has showcased the nutritional values of herbs and plants that can be commonly cultivated in Malaysian gardens. Refer to Figure 4.47 for the manuals and mini booklets published by CAP.
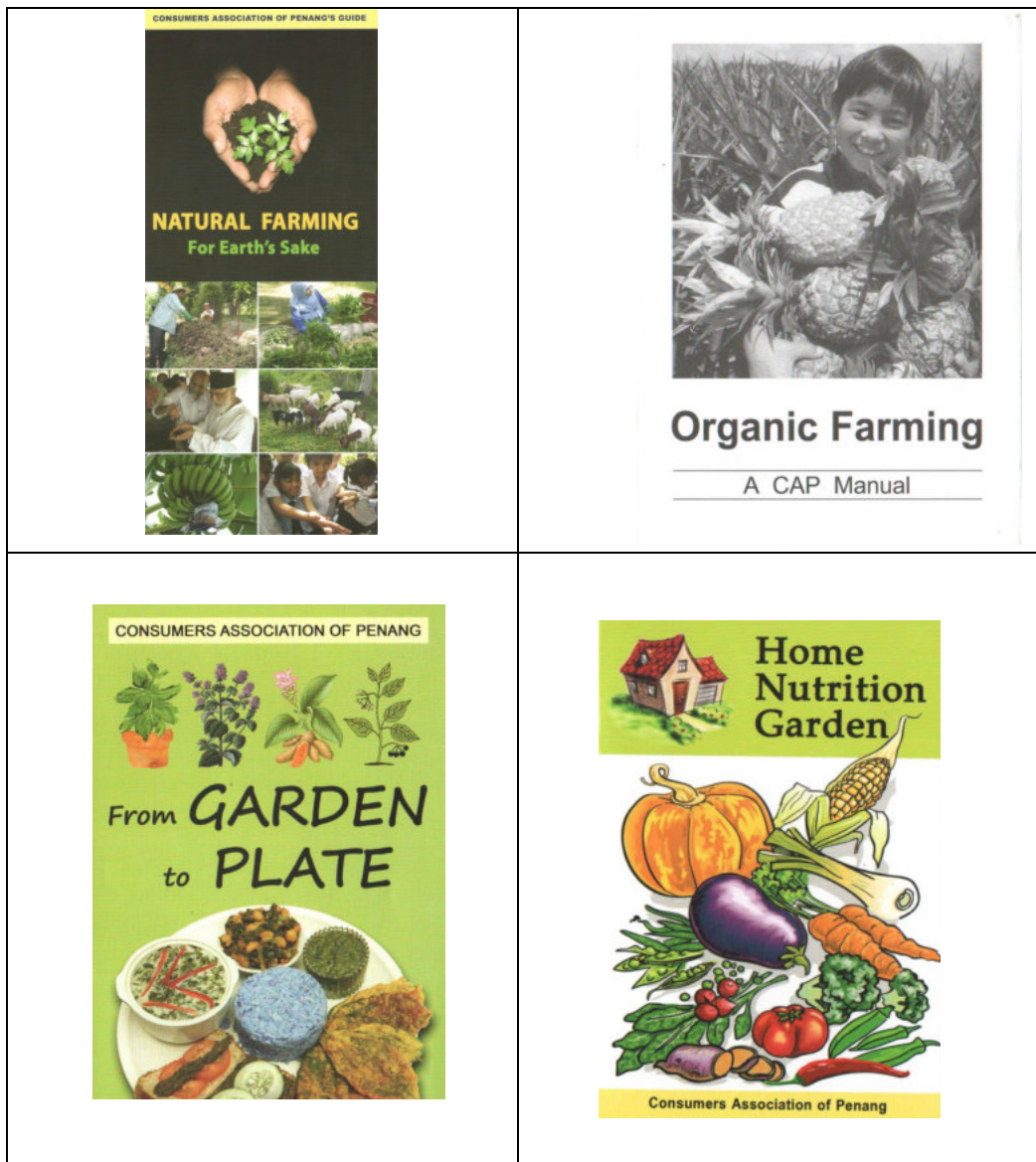
Figure 4.47 Some of the manuals and mini booklets published by CAP on organic farming and the nutritional benefits of home gardening.
(Source: CAP)

h.   Water Security

Water security is the ability to safeguard sustainable access to sufficient amount of clean water for sustainable livelihood and development (United Nations Water, n.d.). This is important in realising SDG 14 (Life Below Water). Interviews and focused group discussion with NGOs revealed that several few non-profit organisations such as Water Watch Penang and Friends of Ulu Muda had been established to ensure water security in Penang. These organisations aim to raise awareness and educate the public towards the sustainability of water resources. For example, Friends of Ulu Muda has been established to create and raise

awareness on the importance of conserving the water catchment area, namely Ulu Muda forest which is now threatened by logging activities (Siti Zuraidah, 2010).

i.   Institution and Governance

Interviews with government officials have highlighted the importance of the involvement of various parties and the need to have a partnership between these parties as stipulated in SDG 17 in realising various SDGs. An interview with a government official from the local authority has highlighted the engagement of the 4Ps program, (i.e., Public, Private, People and Partnership) in their projects in order to build a Cleaner, Greener, Safer and Healthier Penang. According to the government official, "public" component refers to government authorities, "private" component is profit-oriented organisations such as investors, developers, and others, while "people" component is the civil society which includes NGOs, and partnership among these three (3) components are important to ensure sustainable development. However, there is a need to have a leader in order to create a partnership, and a key government official has clearly articulated this as below:

"Kita mesti ada visionary leader … leader will create partners. We don't want to create a boss. A boss will create followers. If you are the leader, you create partnership." (Public Sector)

For example, partnerships between the public and people or between public, people and the private sector have been used to manage and maintain the public space such as parks, roundabouts, and streets in Penang (Christopher, 2016) as well the eco-tourism projects (Maimumah, 24 Nov 2016).

4.2.3   Summary of Current Practices

Table 4.36 summarises current green practices and initiatives in place in Penang according to stakeholders and the SDG that the practices aim to achieve. The majority of the green practices in Penang are initiated by MPs, EXCOs and the public sector although the business sector, developers and NGOs have also introduced several green practices.

From the table, efforts towards achieving SDG 1 (No Hunger) are initiated mainly by the public sector through socioeconomic initiatives with particular emphasis on ensuring Penangites breakaway from the vicious cycle of poverty.

As for green agriculture practices, these efforts are mostly undertaken by the state and public sector as well as several prominent green NGOs in Penang such as CAP and Wonder Wilderfarm. Such green agriculture practices will contribute towards achieving SDG 2 (Zero Hunger) and SDG 12 (Responsible Consumption & Production).

Similarly, waste management practices are mostly undertaken by the state, public sector and NGOs. Key among the initiatives are 3R practices, composting, zero waste, *'Kempen Makan Sampai Habis',* waste segregation, adoption of Pig Farming Enactment 2016 to regulate waste disposal from the pig farm industry into rivers/ocean and throwing mud balls into polluted rivers. These practices are pivotal towards achieving the following goals: SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 6 (Universal Access to Clean Water), SDG 7 (Affordable & Clean Energy), SDG 11 (Sustainable Cities & Communities), SDG 12 (Responsible Consumption & Production) and SDG 14 (Life below water).

As for green transportation practices, such initiatives are jointly-provided by the public sector, business, NGOs and youth. Examples of existing practices include instilling the culture of cycling, the creation of bicycle lanes, the formation of cycling & walking clubs, Car Free Day as well as calls towards more usage of public transportation and less private vehicle usage. The aforementioned green transportation practices will be instrumental towards achieving SDG 6 (Affordable & Clean Energy), SDG 9 (Industry, Innovation & Infrastructure) and SDG 11 (Sustainable Cities & Communities).

In terms of green practices for the built environment, existing initiatives are predominantly by the public sector such as ensuring that new townships comply with eco-town criteria and are Green Building Index-certified. Additionally, developers introduce some green initiatives such as the Industrialised Building System and Centralised Labour Quarters. Collectively, such

moves will assist towards achieving SDG 6 (Affordable & Clean Energy) as well as SDG 11 (Sustainable Cities & Communities).

As for biodiversity-related initiatives, they are mostly initiated by MPs, EXCO members, the public sector as well as NGOs like Penang Hill Watch. Existing practices that are already in place include the state's stand to say no to eating shark fins and to ensure that gazetted forest reserve remain protected and untouched while Penang Hill Watch is entrusted to monitor and report to the state regarding any illegal hill clearing activities at Penang Hill. With such biodiversity protection initiatives in place, they will contribute towards achieving three SDGs, namely, SDG 6 (Affordable & Clean Energy), SDG 14 (Life Below Water) and SDG 15 (Life On Land).

Besides biodiversity initiatives, Penang stakeholders particularly NGOs like Penang Water Watch and Friend of Ulu Muda are constantly monitoring the supply and water condition of the state to ensure that water security of the state is not being compromised. Such initiatives by the NGOs will contribute towards achieving SDG 14 (Life Below Water).

Table 4.36 Current practices by stakeholders and SDGs

SDG Goals	MP's & EXCO members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG1: No Poverty	SE - Projek Ekonomi Khas	SE - Absolute poverty eradication (top up to RM750/790) (Unconditional Case Transfer) - Program Emas, Wang Khairat Kematian, Insentif Masuk Uni - Aid for fishermen/taxi drivers					
		WM - Zero waste	WM -Waste segregation bin				
SDG2: Zero Hunger	AGR - Self Sufficient Living - Community Farming				AGR - Organic farming - Sustainable agriculture awareness - Food Education for children - Publications on organic farming		
		WM -Kempen Makan Sampai Habis					

SDG Goals	MP's & EXCO members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG3: Good Health & Well-Being	SE - AIME (Artificial Intelligence Medical Application) - Compound houses that causes dengue - Penang Healthy Program						
SDG4: Quality Education	SE - Use of Dewan JKKK for education purposes - Language Program	SE - Incentive for excellent education performance					
SDG5: Gender Equality		SE - Equal gender employment opportunity					
SDG6: Clean Water & Sanitation		WM - Pig Farming Enactment 2016 -Mud balls				BE - Rainwater harvesting	
SDG 7: Affordable & Clean Energy		TRANS - Bike Sharing System - Cycling Day - Car Free Zone - Public transport - Cycling by river bank - Bicycle-friendly community	TRANS - Integrated bus and ferry - Rapid Ferry - CAT service			TRANS - G-cycling Club - Cycling & Walking Club - Cycling brochure	TRANS - Bicycle user
	BE - Solar panels						
		BE - Green Building Index - Eco-Town criteria (Batu Kawan - Green Office Project and certification - Low carbon city - Bicycle lane					
	WM -Waste to Energy						
SDG8: Decent Work & Economic Growth	SE - Microcredit (Tabung Usahawan Petani Muda, Program Titiansama Rakyat) & soft loan -Wholesome Penang, Made in Penang logo						

SDG Goals	MP's & EXCO members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG9: Industry, Innovation & Infrastructure		TRANS - Public transport		BE - Industrialized Building System			
SDG10: Reduced Inequalities							
SDG11: Sustainable Cities & Communities	WM - Waste management - Compound for those who don't segregate waste	WM - Mud ball - Green School Program - Material Recovering Facilities	WM - Waste segregation bin	WM Waste mgmt.		WM - 3R education - Waste segregation	WM - 3R
	BE - LED street lights - IQPR	BE - Green Building Index - Eco-Town criteria (Batu Kawan) - Low carbon city - Bicycle Lane - Solar energy use - Planting trees		BE - Centralized Labor Quarters			
		TRANS - Bicycle-friendly community - Cycling by river bank - Public transport - Cycling Day - Car Free Zone	TRANS - Integrated bus and ferry – Rapid Ferry - CAT service			TRANS - G-cycling Club - Cycling & Walking Club - Cycling brochure	
SDG12: Responsible Consumption & Production	WM - No plastic bag - 3R	WM - Waste mgmt. - Upcycle Program - Zero waste - *Kempen Makan Sampai Habis* - Segregation at source - Incentive for 3R (medal)				WM - 3R education - No plastic bag - 'Bring Own Cutleries' practice - Food Education for children (NGO) - 3R practices	
		SE - Eco-Community Unit				AGR - Organic farming -	

SDG Goals	MP's & EXCO members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
	AGR - Community Farming					Sustainable agriculture awareness - Publications on organic farming	
		AGR - Self Sufficient Living					
SDG13: Climate Action	BIO - Untouched gazetted forest reserve				BIO - Penang Hill Watch		
		BE - Solar panels				BE - Rainwater harvesting - Solar panels - Climate Action projects	
SDG14: Life Below Water	BIO - No shark fins	WM - Pig Farming Enactment 2016 -Mud balls				WS - Pg Water Watch - Friends of Ulu Muda	
SDG15: Life on Land	BIO - Untouched gazetted forest reserve						
SDG16: Peace, Justice & Strong Institutions							
SDG17: Partnerships for the Goals		BE - Tree-planting IG - 4 Ps (Public, Private, People, Partnership) - Cleaner, Greener, Safer, Healthier					

This section discusses findings from both quantitative and qualitative results concerning the current green practices by different stakeholders. The qualitative results are drawn from the interviews and focus group discussions with various stakeholders, while the quantitative results are from the survey which has been carried out in Penang. The summary of both quantitative and qualitative results on current green practices is presented in Table 4.37.

The interviews and focus group discussion with various stakeholders have revealed that current green practices in Penang can be subsumed under eight broad categories of initiatives. These are i) socioeconomics, ii) built environment, iii) waste management, iv) transportation, v) biodiversity, vi) agriculture, vii) water security and viii) institutional & governance-related initiatives. Among these initiatives, waste management is frequently highlighted by almost all the stakeholders namely MP & EXCO members, public sector, business, developers, non-profit organisations and youth. This is followed by built environment (5 stakeholders), transportation (4 stakeholders), biodiversity (3 stakeholders), agriculture (3 stakeholders), socioeconomics (2 stakeholders), water security (1 stakeholder) and institutional & governance-related initiatives (1 stakeholder).

Socioeconomics and institutional & governance-related initiatives have been highlighted by the MP & EXCO members, and the representatives from the public sector. However, given that both socioeconomics and institutional & governance themes are not the focus during the interviews and focus group discussions, the current practices by other stakeholders in this regard remain unclear. During the interviews and focus group discussions, the three key current practices which are frequently highlighted are associated with waste management, built environment and transportation regimes.

However, further examination of the current practices by Penangites using the data from the survey revealed interesting points. First, while a great majority of Penangites reported their participation in waste management or agricultural related activities, but very few engage on a routine basis. In comparison, slightly more Penangites segregate their waste at home and recycle all recyclable materials on a routine basis. Similarly, not many Penangites have embraced green agricultural practices such as eating local produce, choosing organic produce or avoid/limit eating meat routinely. Second, the elderly cohort shows greater tendency to engage in waste management and agricultural related activities on a routine basis as compared to youth and adults. This is reflected by the relatively high percentage of elderly engaging in these activities on a routine basis as compared to adults and youth. Third, green transportation practice is still less popular among Penangites. Penangites appear to support and participate in green transportation events such as car-free day, but in practice, many use private vehicles as their primary mode of transportation. This indicates that private vehicle usage is still popular among Penang residents.

Table 4.37 provides the summary of the thematic analysis based on discussion by stakeholders from focus group discussions and in-depth interviews as well as the top seven future issues identified by respondents from the public survey. The column on the elderly and general public is deduced from the public survey. The other columns were responses deduced from focus group discussion and in-depth interview. The column on youth is the combination of responses from focus group discussion, in-depth interview and public survey. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as important in the public survey. Most of the discussions of future issues concentrate on socioeconomic issues, built environment, transportation, energy security, water security and institution and governance.

Table 4.37 Summary of Current Practices by Stakeholders

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Elderly[a]	Youth[a]	General Public[a]
Socioeconomic Issues	◆	◆							
Built Environment	◆	◆	◆	◆		◆			
Waste Management	◆	◆	◆			◆	◆	◆	◆
Transportation		◆					◆	◆	◆
Biodiversity	◆					◆			
Agriculture	◆	◆				◆			
Land Matters									
Water Security						◆	◆	◆	◆
Energy Security							◆	◆	◆
Leadership									
Disaster									
Institution & Governance		◆							

Note: [a] Partial findings from the public survey (Top three current practices)

4.3   Current Challenges

Data and information in this section are obtained through the focus group discussion (FGD) and interviews conducted with multiple stakeholders. The challenges reflect the obstacles currently faced by Penang in its efforts to apply sustainable development. These challenges need to be resolved so that sustainable development in Penang can be realised.

4.3.1   Summary Findings from Focus Group Discussions and Interviews

Of the 17 SDGs, the stakeholders have identified current challenges that are in line with 15 SDGs. Two SDGs that do not have any current challenges are SDG 10, Reduced Inequalities and SDG 12, Responsible Consumption and Production. Current challenges identified are related to aspects of socioeconomics, built environment, transportation, waste management, biodiversity, agriculture, land matters, water security, energy security and institutions and governance. The current challenges raised by stakeholders revolve around biodiversity followed by socioeconomic issues, built environment, water security and governance and institution.

a.   Socioeconomic Issues

The current socioeconomics challenges highlighted by the stakeholders concern SDG1, SDG3, SDG4, SDG6, SDG8, SDG9, SDG11, SDG13 and SDG17. Under SDG1, the current challenge is with regard to the existence of homeless people in the city area. The Public Sector and the EXCO member explained that the difficulties of resolving the problem is because of the attitudes and the wishes of the homeless group to remain homeless.

> "The homeless have their homes, but they don't want to go. Even when
> we talk to the homeless, we want to bring them to old folks' home, they
> don't want to go. They prefer their lifestyle" (Public Sector).

There are various challenges in the health aspect that have been highlighted through the session with the EXCO members, professionals and NGOs. Among the challenges are related to environmental health problems due to water and air pollution, as well as dengue epidemic. Every year, the dengue epidemic continues to threaten the population of Penang state. According to the EXCO member, the majority of Penangites realise the importance of taking preventive actions against dengue. However, their understanding and practice need to be improved. One of the EXCO members observes the practice and attitude of the community that do not give importance to the practice of prevention is better than cure. This constitutes a challenge to the efforts to ensure a healthy life and to promote well-being to all

as underlined under SDG3 (UN, 2016). This notion is shared by the NGO who opined that many people are not into healthy lifestyles and practices such as organic farming to produce healthy food.

SDG4 has caught the attention of many stakeholders including the EXCO Members, public sector, and NGOs. The EXCO Members have the opinion that the concept of sustainability such as sustainable cities is difficult to be understood by many parties including officers from government agencies. In terms of education, the current challenge from the public sector is regarding the future of children from poor families with income below RM770. The current policy of the state government with regard to poor population with income less than RM770 is to top up their income level to RM770. The recipients are required to ensure that their children obtain a proper education. However, the challenge faced is how far can the government monitor recipients for compliance.

Other challenges under SDG4 that have attracted the attention of the EXCO Members, professionals and NGOs are related to the awareness and attitude. Among the challenges are how to educate the people and change their attitude on environmental awareness and to change popular attitudes such as 'not-in-my-backyard attitude'. Whereas, under SDG6, the challenge on attitude has also has been voiced by the public sector, who viewed that the irresponsible attitude of the public towards river cleanliness is very difficult to change.

The presence of foreign petty traders who are trading in small businesses, competing against local small traders, is a current challenge that relates to SDG8. Most of these foreign traders are using the licenses of local businessmen to do business. This is the challenge faced by the local authorities, which is to stop this activity from continuing to spread rampantly. For local traders, the online markets undoubtedly provide many people with opportunities to improve their socioeconomic conditions. A majority of online businesses rely on the postal services to send ordered goods. The packaging of fragile goods usually uses plastic bubble wraps. However, according to the stakeholder from Business group, this can be seen as a challenge to the efforts to reduce the use of plastic-based packaging in Penang state. Under SDG9, this requires the industry sector to innovate and design a packaging system that is more environmentally friendly.

One of the targets under SDG11 is to ensure access to adequate, safe and affordable housing for all (UN, 2016). Businesses see this issue as a challenge in Penang state because the demand for housing in Penang does not only come from citizens of Penang, but also from foreign buyers, which eventually affects the housing price in Penang.

According to one stakeholder, the issue of climate change under SDG13 is a multidimensional challenge. It does not only affect the environment, but also other aspects such as economic social and psychological dimensions.

> "The environmental issues that we have to look to is climate change…
> And climate change is also related to environment and relate to economic, relate to social and also relate to psychological" (Public Sector).

Partnership for sustainable development under SDG17 involves multi-stakeholder partnerships that mobilise and share knowledge. For example, a stakeholder expressed that the responsibility to inculcate environmental values to children does not lie on the government solely, but it is a shared responsibility involving teachers, parents, and others. The partnership also involves the lower levels of administration, such as the local communities and local committees such as Village/District Security and Advancement Committee (JKKK). Currently, the halls under the administration of the JKKKs have been used for certain occasions only. The challenge here is to make these halls used as places for students to do their revision studies, especially for students from the families of the urban poor.

> "We have tried to encourage more JKKKs to do this. But it's a tough thing to do. Because we're talking about JKKK's halls. JKKK manages the hall just like "I'm the boss" (EXCO Member).

NGO participation is also important to achieve the SDG17 target successfully. NGOs in Penang state are overly concerned.

> "*Tapi kalau bagi NGO sebarang penebangan pokok di mana pun menjadi satu isu*" (EXCO Member).
>
> "But for NGOs, any felling of trees, wherever it may be, can become an issue" (EXCO Member).

The loud noise made by NGOs has invited negative sentiments in the society. Not only the NGOs but also some parties in Penang state have become active in voicing their disapproval and protest due to their high level of awareness.

b.   Built Environment

The current challenge in the built environment involved SDG4, SDG9 and SDG11. Many parties including officers from government agencies often find difficulties in understanding the concept of sustainability. In the case of qualified architects, some may have limited knowledge about sustainability practices such as universal design (UD). According to Vavik & Keitsch, (2010), UD can be an important tool to ensure socially sustainable development.

> "*Terdapat arkitek professional yang tidak memahami Universal Design (UD), walaupun mereka trained & qualified architect*" (Public Sector).
>
> "There are professional architects who do not understand Universal Design (UD), even though they are trained and qualified architects" (Public Sector).

There are few challenges in the aspect of built environment under SDG9 that have been raised by the public sector, NGOs and youth. One of them is regarding the drainage system that requires improvement. However, the cost to repair and upgrade the drainage system is very high. Building more roads is undoubtedly something desired by many, considering the conditions of the current roads, which are too congested and unable to support the number of vehicles that continue to increase. However, the NGOs and youth groups opine that increasing the number of roads would not solve the issue of congestion. In fact, it will increase the number of vehicles. For the NGOs, the imbalance in the current urbanisation process is a challenge in the effort to retain green areas because this process will increase

industrial and housing areas, which will consequently cause the gradual reduction of green areas. The challenge with regard to limited areas for building recreation parks for leisure activities has also been voiced by the stakeholder from the public sector. With rapid urbanisation, the quality and quantity of nature are degrading (Razak, 2016).

Enhancing the efficiency of public transportation is among the issues outlined under SDG11. However, according to the stakeholder from the business group, the narrow condition of road reserves in Penang makes it difficult to construct special lanes for buses to improve the efficiency of the public bus system. This was shared by the stakeholders from the public sector who said that the narrow road reserves also makes it difficult to construct more special lanes and other infrastructures for cyclists. Other challenges highlighted under SDG11 are related to the capacity of the local council to manage green areas.

> "There are plenty of open space areas that have the potential to be developed as green areas, but both PBTs have limited capacity to manage it" (Public Sector).

The development of hill slopes in Penang state is seen as getting extensive. The youth group sees this as an unbalanced urbanisation process in attaining development. Whereas the NGOs see the rapid development in Penang state has also posed a challenge in the aspect of preserving spaces for green public areas and farms. The Malaysian Green Building Index (GBI) certification is one of the mechanisms towards the realisation of sustainable cities (Papargyropoulou et al., 2012) under SDG11. However, the current challenge, according to the public sector is that the GBI is still not compulsory.

Planting trees are essential to maintain the balance of the environment. Some of the government agencies have shown their commitment by involving in trees replanting activities. Such commitment is crucial in promoting and creating a partnership for sustainable development, under SDG17. However, according to the stakeholder from the public sector, not all of these agencies would be able to commit in the post-planting activities such as maintenance activities.

c.   Transportation

The challenge to reduce the emissions of carbon dioxide is critical considering the yearly increase in the number of vehicles. The increase in carbon dioxide affects the health of the population, and this could pose a challenge in promoting good health and well-being under SDG3. From the aspect of public transportation, stakeholders from the professional group and NGOs had the same opinion, where the challenge is about the inefficiency of public transportation, which prevents members of the public from using it. The professionals see it as a challenge, especially in efforts to encourage the use of public transportation and use of bicycles to reduce road congestion. For the NGO the best way to resolve traffic congestion and carbon emissions is by encouraging vehicle pooling.

d.   Waste Management

Current challenges in waste management are concerned with SDG4, SDG6 and SDG11. Under SDG4, both professionals and NGOs have highlighted the challenges on how to educate the community on matters concerning waste management. In order to achieve the target of SDG6, the NGOs have stressed the need to find the solution to reduce impurities from residential and industrial areas to rivers. According to Azrina (2011), harmful levels of impurities such as heavy metals and other inorganic elements could affect the quality of drinking water.

With regard to SDG11, a stakeholder from NGO thought that the shortage of landfill sites is a challenge from the aspect of waste management in Penang state. While stakeholder from the public sector sees the challenge for high-rise apartment dwellers to segregate waste, especially for apartments that are still using the system of throwing down trash through a rubbish duct at their respective levels.

> "*Penduduk apartment jenis high-rise ni depa nanti shoot buang sampah ikut lubang… susah bagi depa nak asingkan. Depa asing, tapi masuk dalam tong sama*" (Public Sector).

"The high-rise dwellers will throw their garbage through the garbage duct…
it is difficult for them to segregate their trash… Even though they segregate,
it falls into the same garbage bin" (Public Sector).

From the aspect of policy regarding waste management, the professional group opined that currently there is no proper system to manage the segregation of organic wastes. In addition, the measures taken by the government to compound those who do not segregate waste is a measure that is less popular, according to the stakeholders from the public sector. Whereas for communities living in low-cost housing areas, according to the stakeholders from the public sector and the professionals, the challenge lies in their attitude; they do not care about garbage because they assume that waste is not their responsibility.

e. *Biodiversity*

The current challenge in biodiversity concerns SDG2, SDG11, SDG14, SDG15, and SDG17. The views regarding the challenges related to SDG2 have been expressed by the NGOs and youth. Both groups said that the current challenge is to minimise the impact of land reclamation on the stock of fish, which will indirectly affect food security.

The challenge associated with SDG11 has also been highlighted by the public sector stakeholder who said that the development of housing areas and the opening of land on a large scale for farming have caused many habitats to migrate to other places.

"*Apabila pembangunan yang tidak dirancang dengan betul, kawasan hutan tu ditebang, berlakunya deforestation… Keadaan itu menyebabkan habitat hidupan liar ni lost… Apabila habitat lost ni kehidupan liar tak dapat hidup jadi apabila tak dapat hidup dia keluar dari hutan dan dia pergi ke kawasan public. Antara 2016 dengan 2017 memang ada peningkatan aduan contohnya aduan babi hutan, yang tu memang antara aduan tertinggi dan aduan kera*" (Public Sector).

"When development has not been planned appropriately, forest areas are cleared, deforestation occurs… This condition will cause habitat loss for

wildlife… When the habitat is lost, the wildlife cannot live and thus they come out of the forest and go to public areas. Between 2016 and 2017, there was a clear increase in complaints, the highest number was related to wild boars and complaints about monkeys" (Public Sector)

As a state that is rapidly developing with the limited land area, land reclamation is an alternative choice. One of the EXCO members viewed that land reclamation which is rapidly growing will eventually become a threat to life below water (SDG 14). The challenge to life below water has also been voiced by the youth concerning the current challenge to prevent chemicals and toxic spillage into the sea. The same view has been expressed by the stakeholder from the public sector, developer, and NGO. According to the NGO, land reclamation activity and land development also affect biodiversity and life on land (SDG15). In particular, they affect mangrove forest conservation for fish and other species breeding ground.

f.   Agriculture

It is important to note that among the targets in SDG2 is to end hunger, to achieve food security and improved nutrition, and to promote sustainable agriculture (UN, 2016). However, food wastage will affect food sufficiency. Food wastage is estimated to be at an average of 700 tonnes per day by the state government (Kaur, 2017). This is seen as a challenge, considering that wasting food seems to have become part of the culture for many people.

"*Pembaziran makanan satu budaya. Bukan senang kita nak tukar*"
(EXCO Member).

"Food wastage is a culture. It is not easy for us to change that" (EXCO Member).

Whereas in Seberang Perai Selatan, there have been complaints about the discomfort caused by nuisance from flies coming from poultry farms and stinking smell coming from pig farms. The stakeholders viewed the allowed minimum distance between these farming areas and housing areas need to be monitored and reviewed.

g.   Land Matters

Competition between agricultural land and land for housing, especially in the mainland areas, can be associated with a challenge under SDG2. One of the EXCO members sees this challenge as affecting the production of the agriculture sector, especially paddy. Whereas, the stakeholder from the public sector sees the rapid development of hill slopes in Penang state as a challenge under SDG11, especially in efforts to exercise stricter control.

h.   Water Security

SDG6 is aimed at ensuring availability and sustainability in the management of water and sanitation for all. However, this is the challenge faced by Penang state because water resource in Penang state is dependent upon Kedah and Perak. This challenge has been raised by the EXCO member and the public sector. The stakeholder from NGO also shared the same view regarding the challenge faced by Penang in the aspect of Water Security. According to the NGOs, this challenge occurs because there is a lack of catchment areas in this state. Meanwhile, youth representative sees the challenge to reduce pollution caused by the use of pesticide in water catchment areas, considering that agriculture activities are currently carried out in hill areas.

The public sector representative also mentioned the challenge regarding the dissatisfaction of the public when the state government raised the surcharge on water usage above 35,000 litres, even though this measure was implemented to control wastage among households. Whereas, the NGO group sees the challenge in reducing the dependency of treated water through the rainwater harvesting incentive introduced by the government.

i.   Energy Security

Under SDG7, the public sector group realises that solar energy is a clean and renewable energy source, which needs to be encouraged for use by the public. However, the challenge to encourage the use of solar energy arises because of the high installation costs, while its technology is fast changing. According to Mekhilef et al. (2012) and Abd Aziz et al. (2016),

solar energy in Malaysia is still at the infancy stage due to the high cost of photovoltaic (PV) cells. Significant increases in energy demand are expected to accompany Malaysia's growth over the coming decades. Malaysia is projected to become a net energy importer by the end of the 2030s unless new energy sources of indigenous origin are found and successfully developed (Academy of Sciences Malaysia, 2013). Energy and electricity demand in Malaysia is expected to grow up to 4% per year from 2013 to 2040 (OECD, 2016). This challenge has also been voiced by the NGO stakeholder.

j.   Institution and Governance

The current challenges from the aspect of institutions and governance covered 6 SDGs, namely SDG1, SDG3, SDG4, SDG5, SDG16 and SDG17. Under SDG1, the EXCO member mentioned about the poverty eradication programs that require high costs to implement. Thus, the state government faces the challenge regarding its budget constraints to implementing them. Also, the terms and conditions for such welfare programs are unclear. This constitutes a challenge to the state government to ensure the real objectives of the programs achieve their goals.

SDG3 catches the attention of many stakeholders including the EXCO members, the public sector, the professionals and the NGOs. Among the targets under SDG3 is to achieve universal health coverage and access to safe, effective, quality and affordable health care services (UN, 2016). The NGO has seen this as a challenge, particularly with regard to affordable health care services. Whereas, the spread of some epidemic diseases brought in foreign workers, poses a significant cost burden for the government. Every year the government has to spend a large sum of money to pay for treatment and medication of communicable disease.

Various health-related programs have been designed and implemented to increase awareness among Penangites. However, the challenge is the financial constraints to implement such programs.

SDG4 has caught the attention of the EXCO members and youth. The challenges highlighted by the stakeholders from NGO and youth are regarding how education about sustainable development and environmental issues can be introduced in the school subjects. This is because one of the aims in SDG4 is to ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development, sustainable life styles, and the appreciation of cultural diversity and of culture's contribution to sustainable development (UN, 2016). Environment-related programs and activities are important to educate the people and change their attitude. However, the NGO realises that funds available for such programs are limited.

One of the targets under SDG5 is to ensure full and effective participation of women and to ensure equal opportunities for leadership at all levels of decision-making, be it in politics, economics, or public life. The indicator in the targets is to balance the proportion of women in managerial positions. For the stakeholders in the public sector, this constitutes one of the challenges for the state government, which is to ensure more women are holding positions in the administration of the state government.

One of the targets in SDG16 is to develop effective, accountable and transparent institutions at all levels. A good policy can be designed, but the challenge faced is the aspect of political will among the policymakers.

> "*Sometimes kita ada strategic plan tebal dan kalau kita tak translate into action plan, dia akan tinggal dalam almari lah*" (Public Sector).
> "Sometimes we have a voluminous strategic plan, and if we do not translate it into action plans, it will remain there in the cabinet" (Public Sector).

In terms of leadership, the current challenge concerns the lack of sustainable leadership in public institutions as well as lack of visionary leaders to create the right partnership at the administrative level, which is related to SDG16 and SDG 17 respectively.

"You can put whatever from 1 to 17. If you do not have visionary leaders
to bring this through, then nothing will happen" (Public Sector).

Many challenges from the aspect of institutions and governance have been raised under SDG17. Almost all of these challenges have been voiced by the EXCO members and the public sector. One of the targets of SDG17 is to produce effective public, public-private and civil society partnerships. According to the stakeholders, the challenge is the attitude of resistance to change of the members of the society. This can be overcome through strict enforcement. However, strict enforcement is a less popular action by the members of the society. In fact, the challenge would still be there when some of the development plans might not be approved or do not get the full support from the people. Creating good partnerships, whether between state agencies and the federal government or among agencies of the state government itself constitutes a current challenge. The stakeholders opined that not all government agencies comply with the state or national policies. In addition, at the state level, there are situations where certain standard procedures laid out by the federal government are perceived as not being good enough.

4.3.2   Summary of Current Challenges

Table 4.38 presents a summary of the current challenges obtained through the focus group discussions (FGD) and interviews, involving seven stakeholders, from EXCO members, public sector, businesses, developers, professionals, NGOs and youth representatives. Among the SDGS that have gained the attention of many stakeholders are SDG3, SDG4, SDG6, SDG9, SDG11, SDG14, and SDG17. The current challenges highlighted by the respondents are mostly related to biodiversity followed by socioeconomic issues, built environment, water security and governance and institution.

Table 4.38 Summary of Current Challenges

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG1: No Poverty	IG - Budget constraint for poverty-alleviation programs as it incurs high cost - Some of the terms and conditions of current welfare programs are not clear.						
	SE - Some homeless prefer to be homeless.						
SDG2: Zero Hunger	LAND - Intensified land use competition between agriculture and housing AGR -Food wastage seems to have become part of the culture for many people					BIO - Minimize the impacts of land reclamation towards food security (fish stock).	
SDG3: Good Health & Well Being	IG - Budget constraint for dengue prevention and other health awareness programs SE - Dengue awareness is high, but practice is questionable - "Prevention is better than cure" is not yet a common practice and attitude.	TRANS - Find alternatives to reduce carbon emission as the number of vehicles is increasing year to year. IG - Cost burden associated to communicable disease brought in by foreign workers AGR - Poultry/pig farms minimum separation distance with residential zone.			SE - Find solutions to reduce pollutions (air, water) in order to minimize environmental health problems.	SE - Many people are not into healthy life styles and practices (i.e. organic urban farming) IG - The ability to provide affordable health care services	
SDG4: Quality Education	SE - The concept of sustainable cities itself is still not being well	SE - All children from low income families (below RM770) enroll to school			WM - Find ways to educate the community on waste management matters		

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
	understood by many people as well as officers from government agencies. - Find ways to educate people and to change their attitude on environmental awareness	BE - Some qualified architects have limited knowledge about universal design (UD)				IG - Introduce education on sustainable development and climate change into school curricular - Limited fund for environmental programmes and activities. SE - Popular attitudes i.e. not in my backyard attitude are difficult to change	
SDG5: Gender Equality		IG - More women to hold office in the state government					
SDG6: Clean Water & Sanitation	WS - Penang depends on Kedah Perak for the most of its water supply	WS - Higher water surcharge leads to public dissatisfaction SE - The general public's attitude towards river cleanliness is difficult to change.				WM - Find solutions to reduce impurities from residential and industrial areas to rivers WS - Lack of water catchment area - Find ways to encourage people to harvest rainwater	WS - Find solutions to reduce pesticides contamination in water catchment areas
SDG7: Affordable & Clean Energy		ES - The cost of solar energy is expensive and the technology is rapidly changing				ES - Demand for energy is increasing	
SDG8: Decent Work & Growth		SE - Prevent foreign immigrants run small business using locals' licenses					

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG9: Industry, Innovation & Infrastructure		BE - Limited space for recreation park BE - The cost to develop new drainage system is high.	SE - Innovation on online business packaging (online businesses currently use plastic bubble wrap to pack fragile items)			BE - Building more roads leads to more traffic congestion Imbalance urbanizati on process (more industrial areas than green areas)	
SDG10: Reduced Inequalities							
SDG11: Sustainable Cities & Communities		WM - Waste segregation at source is difficult to implement on high-rise apartment. - Low-cost housing communities consider waste is not their responsibility BE - Local council have limited capacity to manage green areas. - Road reserve is too small to provide a dedicated lane for bicycle and other related infrastructures for cyclist. WM - Waste segregation compound is not politically popular LAND - Control development at hill slopes BE - Green Building Index (GBI) as policy BIO - Animal migration due to development	BE - Road reserve is too small to provide a dedicated lane for bus SE - Foreigners buy houses in Penang for investment		WM - No proper system by Local Councils to manage organic waste segregation. TRANS - How to get people to cycle and use public transport instead of using private vehicles WM - Lack of responsibility on waste disposal	TRANS - Reduce traffic congestio n and carbon emission through carpooling. - Inefficient public transportat ion. BE - Preservati on of green space public areas and farms. WM - Limited landfills	BE - Imbalance urbanizati on process (i.e. How to develop Penang and at the same time protecting hills)

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG12: Responsible Consumption & Production							
SDG13: Climate Action		SE - Adverse effects of climate change on social, economy and politics.					
SDG14: Life Below Water	BIO - Land reclamation is deemed necessary for future development, but it affects life below water.			BIO - Land reclamation affects marine life and reduce fish stock		BIO - Land reclamation threatens life below water	BIO - Prevent chemicals and toxic spillage into the sea
SDG15: Life on Land						BIO - Land reclamation and development affect biodiversity. - Mangrove forest conservation for fish breeding ground and other species	
SDG16: Peace, Justice & Strong Institutions		IG - Lack of political will among policymakers - Lack of suitable leadership in public institutions					
SDG17: Partnerships for the Goals	IG - Resistance to change that requires strict enforcement. - Strict enforcement would not be seen as a popular action by the public - Certain standard procedures laid out by the federal government are perceived as not being good enough	IG - Some of the development plans might not get approval or full support from the people. - Not all government agencies comply with the state/ national policies IG - The needs to have visionary leaders to create the right partners				SE - Negative public sentiment towards NGO	

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
	SE - NGOs in Penang are over concerned - The responsibility to inculcate environmental values is a shared responsibility - To change some JKKKs' mindset towards the function of community hall as a public facility.	SE - Penangites are so active in voicing their disapproval and protest due to high level of awareness. BE - Not all government agencies are committed with tree replanting activities.					

Table 4.39 presents the summary of highlighted current challenges derived from the above discussions that cover ten discussed themes. Among the issues that have gained the attention of many stakeholders are mostly related to an aspect of biodiversity. One issue that has not been discussed directly by the stakeholders is disasters. The column on the elderly and general public is deduced from the public survey. No question on current challenges was asked in the public survey. The other columns were responses deduced from focus group discussion and in-depth interview. The column on youth is the combination of responses from focus group discussion, in-depth interview and public survey. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as important in the public survey. Most of the discussions of future issues concentrate on socioeconomic issues, built environment, transportation, energy security, water security and institution and governance.

Table 4.39 Summary of Current Challenges by Stakeholders

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Retirees	Youth	General Public
Socioeconomic Issues	✦	✦	✦			✦			
Built Environment		✦	✦			✦		✦	
Waste Management		✦			✦	✦			
Transportation		✦			✦	✦			
Biodiversity	✦	✦		✦	✦	✦		✦	
Agriculture	✦	✦							
Land Matters	✦	✦							
Water Security	✦	✦				✦		✦	
Energy Security		✦	✦			✦			
Leadership		✦							
Disaster									
Institution & Governance	✦	✦				✦		✦	

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Chapter 5
Future Scenario

This section provides information on future issues and future challenges. Findings were gathered from qualitative (focus group discussion and in-depth interview) and quantitative data (survey).

5.1   Future Issues

Future issues of Penang are deduced from three questions in public survey and discussion with stakeholders during focus group discussions and interviews.

5.1.1   Summary Findings from Public Survey

This section provides the summary findings from the public survey on three questions that are the public willingness on lifestyle changes, public readiness to embrace and adopt green practices and public hope for the future of Penang. The first two questions are based on a 5-point Likert scale while the questions on the future of Penang is a list of possible future scenarios that best describe future issues.

a.   Public Willingness of Lifestyle Changes

The survey solicits public lifestyle changes in the future. The questions asked are shown in Table 5.1. These questions are vital to seek information on the readiness of the public to adopt lifestyle changes in line with green practices. The mean score of each question is shown in Table 5.1

Table 5.1 Likert scale on the public willingness of lifestyle changes

	No	Yes, within the next five years	Yes, within the next three months	Yes, immediately
	1	2	3	4
1. Switching from private vehicles to public transportation				
2. Switching from private vehicles to active transportation (cycling, walking)				
3. Switching from buying imported products to local products				
4. Switching from eating less meat to more vegetables				
5. Switching from non organic to organic produces				

Table 5.2 Mean score on the public willingness of lifestyle changes

	Mean Score			Interpretation
	General Public	Youth	Elderly	
1. Switching from private vehicles to public transportation	2.42	2.40	2.44	Yes, within the next five years
2. Switching from private vehicles to active transportation (cycling, walking)	2.35	2.32	2.51	Yes, within the next five years
3. Switching from buying imported products to local products	3.01	2.94	3.10	Yes, within the next three years
4. Switching from eating less meat to more vegetables	2.98	2.85	3.16	Yes, within the next five years
5. Switching from non organic to organic produces	2.97	2.91	2.97	Yes, within the next five years

Source: Survey (2018)

From the results portrayed in Table 5.2, it could be deduced that **the general public is NOT READY for IMMEDIATE lifestyle changes.** They are mostly willing to change within the next five years, with exception to switching from buying imported products to local

products, which they are willing to change within the next three years. It could also be assumed that the elderly are more ready to adopt lifestyle changes as compared to youth.

b.   Public Readiness to Embrace and Adopt Green Initiatives Organised by the State Government

The survey also gathers information on the public's readiness to embrace and adopt five (5) green initiatives organised by the state government. The five (5) initiatives are shown in Table 5.3, in which the public is to choose either Not Applicable, No, Maybe or Yes. The elements for readiness to adopt green practices are based on the initiatives launched by the state government from consumption behaviour, waste management behaviour, and transportation behaviour. The mean score of each question is shown in Table 5.4.

Table 5.3 Likert scale on public readiness to embrace and adopt green initiatives organised by the state government

	Not applicable	No	Maybe	Yes
	1	2	3	4
1. No plastic bags				
2. 5R (reduce, reuse, recycle, refuse, repurpose)				
3. Waste segregation				
4. Car free day				
5. Cycle to work				

Table 5.4 Mean score on public readiness to embrace and adopt green initiatives organised by the state government

	Mean Score			Interpretation
	General public	Youth	Elderly	
1. **No plastic bags**	3.50	3.46	3.63	Almost ready
2. **5R (reduce, reuse, recycle, refuse, repurpose)**	3.44	3.42	3.58	Almost ready
3. **Waste segregation**	3.40	3.38	3.56	Almost ready
4. **Car free day**	3.16	3.12	3.30	Not ready
5. **Cycle to work**	3.05	3.04	3.13	Not ready

Source: Survey (2018)

From Table 5.4, it could be deduced that the **general public is not ready to embrace and adopt green initiatives** organised by the state government. It is further deduced that the elderly are more ready to embrace and adopt green initiatives organised by the state government compared to the youth.

c.   *Public Hope for the Future of Penang Development*

The survey solicits public opinion on their hope for Penang's development. Figure 5.1 summarises the findings. The top three (3) were plant more trees, better and efficient public transportation and accessibility to clean water and sanitation. There is little difference between the views of the youth and elderly.
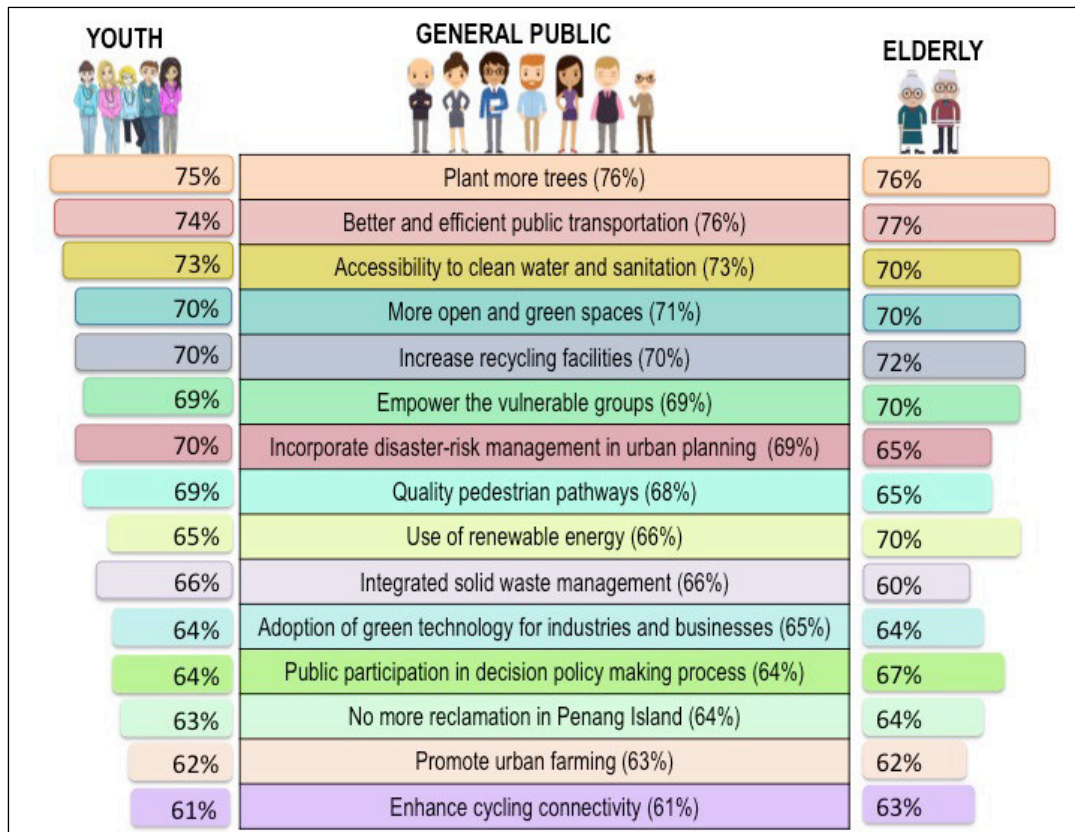
Figure 5.1 Hope for the Future of Penang Development

Source: Survey (2018)

Note: There is no difference between weighted and unweighted data

Analysis of income category (Table 5.5) revealed that the most preferred future expectation of Penangites was planting more trees. Nevertheless, the low-income group put accessibility to clean water and sanitation as their second preference while the middle and high-income group chose better and efficient public transportation as their second preference. Respondents from all the three income categories chose to enhance cycling connectivity and quality pedestrian pathways as their least expectation for Penang in the future.

Table 5.5 Future Expectation of Penang Development – by Income Category

	Individual income								
	RM3,000 and below			RM3,001-6,999			RM7,000 and above		
	online	face to face	overall	online	face to face	overall	online	face to face	overall
a More open and green spaces	6.74	7.04	7.00	7.00	7.09	7.06	7.77	6.79	7.14
b. Use of renewable energy in residential and businesses	6.42	6.32	6.33	6.86	6.56	6.64	7.18	6.73	6.89
c. Enhance cycling connectivity	5.80	6.17	6.13	4.63	5.77	5.47	5.50	6.14	5.91
d. Plant more trees	7.32	7.61	7.58	7.55	7.81	7.74	8.00	7.45	7.64
e. Increase the number of recycling facilities	6.85	6.95	6.94	6.74	6.75	6.74	7.16	6.65	6.82
f. Empower the vulnerable groups (women, children, disabled, elderly)	6.82	7.05	7.02	7.18	6.51	6.68	7.47	6.83	7.05
g. Quality pedestrian pathways	7.05	6.00	6.14	6.95	5.87	6.15	7.12	5.84	6.28
h. Better and efficient public transportation	7.35	6.79	6.86	7.51	7.01	7.13	7.24	7.14	7.16
i. Promote urban farming	5.95	6.34	6.29	6.06	6.22	6.19	5.54	6.82	6.39
j. More active and genuine public participation in decision policy making process	6.55	6.41	6.43	6.31	6.83	6.70	6.71	6.42	6.52
k. Integrated solid waste management	6.17	6.49	6.45	6.65	6.62	6.63	6.00	6.97	6.64
l. Accessibility to clean water and sanitation	7.05	7.39	7.34	7.17	7.09	7.11	6.43	6.94	6.77
m. Incorporate disaster-risk management in urban planning	6.87	6.84	6.84	7.05	6.87	6.92	6.43	6.52	6.49
n. Adoption of green technology for industries and businesses	6.71	6.22	6.28	6.69	6.12	6.27	7.47	6.03	6.54
o. No more reclamation in Penang Island	6.36	6.39	6.39	5.66	6.88	6.57	3.98	6.72	5.77
Total	100	100	100	100	100	100	100	100	100

Based on the education level (Table 5.6), all four categories of respondents expected that the Penang government to put more effort in the future into planting more trees and providing more accessibility to clean water and sanitation for the convenience of the Penang community. They also felt that there should be steps taken to provide better and efficient public transportation facilities for the public. However, informal and primary educated groups

noted that the adoption of green technology for industries and businesses is not a matter of priority by the government in developing Penang. On the other hand, respondents from secondary and tertiary education noted that enhancing cycling connectivity is not a major concern that needs special attention in the future.

Table 5.6 Future Expectation of Penang Development – by Education Attainment

	Education											
	Informal / No Education			Primary			Secondary			Tertiary		
	online	face to face	overall	online	face to face	overall	online	face to face	overall	online	face to face	overall
a More open and green spaces	4.54	6.61	6.50	5.49	7.02	6.96	7.25	7.04	7.06	6.92	7.02	6.99
b. Use of renewable energy in residential and businesses	9.14	6.89	7.01	5.52	6.06	6.04	6.24	6.21	6.21	6.89	6.66	6.73
c. Enhance cycling connectivity	9.15	6.28	6.44	5.53	6.65	6.62	5.63	5.99	5.96	5.77	6.14	6.03
d. Plant more trees	9.12	7.52	7.61	5.51	8.06	7.97	7.28	7.74	7.69	7.36	7.50	7.46
e. Increase the number of recycling facilities	4.56	6.24	6.15	5.50	7.34	7.27	6.60	6.96	6.92	7.01	6.85	6.89
f. Empower the vulnerable groups (women, children, disabled, elderly)	4.54	6.63	6.52	5.48	6.79	6.74	6.71	7.22	7.16	6.56	6.73	6.69
g. Quality pedestrian pathways	4.56	6.56	6.46	5.51	5.57	5.57	6.95	5.80	5.94	7.11	6.33	6.54
h. Better and efficient public transportation	4.56	6.93	6.81	5.50	7.26	7.21	7.69	6.62	6.75	7.38	6.90	7.03
i. Promote urban farming	4.52	6.90	6.77	5.77	7.00	6.95	5.92	6.35	6.30	5.91	6.25	6.16
j. More active and genuine public participation in decision policy making process	9.08	5.65	5.82	8.38	6.60	6.67	6.51	6.38	6.39	6.37	6.45	6.43
k. Integrated solid waste management	4.53	6.74	6.62	8.37	5.97	6.06	6.32	6.56	6.53	6.55	6.47	6.49

Education											
	Informal / No Education			Primary			Secondary			Tertiary		
	online	face to face	overall	online	face to face	overall	online	face to face	overall	online	face to face	overall
l. Accessibility to clean water and sanitation	9.09	8.02	8.08	8.39	7.39	7.43	7.27	7.44	7.42	6.86	7.17	7.09
m. Incorporate disaster-risk management in urban planning	9.05	6.68	6.80	8.36	6.39	6.46	6.92	6.83	6.83	6.76	6.79	6.79
n. Adoption of green technology for industries and businesses	4.53	5.76	5.69	8.36	5.92	6.01	6.61	6.27	6.30	7.03	6.28	6.50
o. No more reclamation in Penang Island	9.02	6.59	6.71	8.33	5.96	6.05	6.10	6.59	6.53	5.50	6.46	6.19
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 5.7 Future Expectation of Penang Development – by District

	Barat Daya		Seberang Perai Utara		Seberang Perai Tengah		Seberang Perai Selatan		Timur Laut	
	online	face to face	online	face to face	online	face to face	online	face to face	online	face to face
a. More open and green spaces	6.67	6.87	6.61	7.11	6.99	7.01	7.79	6.85	7.12	7.15
b. Use of renewable energy in residential and businesses	7.20	6.73	6.46	6.47	7.01	6.18	7.31	5.94	6.70	6.75
c. Enhance cycling connectivity	6.19	5.83	5.26	5.69	6.18	6.13	6.82	5.91	5.67	6.35
d. Plant more trees	7.70	7.57	7.32	7.53	6.80	7.58	7.81	7.41	7.36	7.79
e. Increase the number of recycling facilities	6.94	6.69	6.71	7.19	6.27	6.69	8.06	7.10	7.08	7.04
f. Empower the vulnerable groups (women, children, disabled, elderly)	6.54	7.23	6.52	6.96	6.78	6.97	6.53	6.61	6.51	6.94
g. Quality pedestrian pathways	7.59	5.86	6.82	6.25	6.81	6.28	6.57	6.86	7.04	5.65
h. Better and efficient public transportation	7.56	6.16	7.56	6.64	7.00	7.50	7.04	7.56	7.67	6.25
i. Promote urban farming	5.76	6.54	6.32	6.29	6.23	6.13	4.75	6.48	5.66	6.40

	Barat Daya		Seberang Perai Utara		Seberang Perai Tengah		Seberang Perai Selatan		Timur Laut	
	online	face to face	online	face to face	online	face to face	online	face to face	online	face to face
j. More active and genuine public participation in decision policy making process	6.15	6.47	6.60	6.36	6.56	6.61	4.76	5.87	6.72	6.45
k. Integrated solid waste management	6.53	6.43	6.77	6.93	6.56	6.49	5.77	6.54	6.39	6.37
l. Accessibility to clean water and sanitation	6.91	7.38	7.12	7.13	6.98	7.05	6.28	7.46	7.11	7.46
m. Incorporate disaster-risk management in urban planning	6.52	7.10	7.02	6.47	6.65	6.64	7.26	6.58	6.66	6.93
n. Adoption of green technology for industries and businesses	6.52	6.35	7.02	6.95	6.86	6.05	7.26	6.17	6.99	6.23
o. No more reclamation in Penang Island	5.24	6.80	5.88	6.04	6.32	6.67	5.99	6.65	5.32	6.26
Total	100	100	100	100	100	100	100	100	100	100

In terms of district, respondents from all five districts are looking forward to the Penang government to upgrade their efforts to plant more trees, ensure access to clean water and sanitation to all societies and provide more open and green spaces for Penangites. The respondents from all districts also expect in the future the governments will increase the number of recycling facilities so that more recycling activities will be participated by the local people. Additionally, respondents from Barat Daya and Seberang Perai Tengah hope that in the future there will be more programs designed to empower the vulnerable groups (women, children, disabled, elderly). Respondents also agreed that in the future there would be no public concern regarding the enhancement of cycling connectivity and the same issue with regard to the promotion of urban farming as both issues did not get the attention of respondents.

Table 5.8 Future expectation of penang development – by location

	Location					
	Urban			Rural		
	online	face to face	overall	online	face to face	overall
a More open and green spaces	7.00	7.06	7.05	6.97	6.89	6.92
b. Use of renewable energy in residential and businesses	6.82	6.52	6.58	6.87	6.18	6.40
c. Enhance cycling connectivity	5.82	6.17	6.10	5.88	5.84	5.85
d. Plant more trees	7.35	7.70	7.63	7.34	7.43	7.40
e. Increase the number of recycling facilities	6.88	6.87	6.87	6.98	7.09	7.05
f. Empower the vulnerable groups (women, children, disabled, elderly)	6.60	7.04	6.95	6.60	6.62	6.62
g. Quality pedestrian pathways	7.07	5.91	6.14	6.84	6.65	6.71
h. Better and efficient public transportation	7.51	6.71	6.87	7.42	7.16	7.23
i. Promote urban farming	5.89	6.31	6.23	6.02	6.51	6.36
j. More active and genuine public participation in decision policy making process	6.58	6.50	6.52	6.24	6.07	6.12
k. Integrated solid waste management	6.54	6.47	6.48	6.49	6.57	6.55
l. Accessibility to clean water and sanitation	7.04	7.34	7.28	7.07	7.28	7.21
m. Incorporate disaster-risk management in urban planning	6.67	6.86	6.82	7.10	6.55	6.73
n. Adoption of green technology for industries and businesses	6.88	6.23	6.35	7.16	6.31	6.58
o. No more reclamation in Penang Island	5.35	6.31	6.13	5.00	6.86	6.27
Total	100	100	100	100	100	100

Based on location differences, urban and rural respondents will expect the government to plant more trees and ensure their access to clean water and sanitation in the future. Compared to urban respondents, rural respondents expect better and efficient public transportation in their area. The respondents from both locations also expect in the future the governments will increase the number of recycling facilities so that more recycling activities will be participated by the local people. In addition, respondents from urban and rural areas feel the lowest priority should be given to enhancing cycling connectivity and no more reclamation in Penang Island in the future.

Table 5.9 Future expectation of penang development – by age category

	Youth			Adult			Retirees		
	online	face to face	overall	online	face to face	overall	online	face to face	overall
a More open and green spaces	6.80	7.03	6.99	7.14	7.03	7.05	7.01	6.87	6.94
b. Use of renewable energy in residential and businesses	6.86	6.38	6.47	6.57	6.51	6.52	7.19	6.84	7.02
c. Enhance cycling connectivity	5.86	6.12	6.07	5.51	6.04	5.93	6.40	6.29	6.34
d. Plant more trees	7.35	7.53	7.50	7.35	7.71	7.63	7.10	8.07	7.56
e. Increase the number of recycling facilities	6.93	6.95	6.95	6.85	6.77	6.79	6.81	7.63	7.19
f. Empower the vulnerable groups (women, children, disabled, elderly)	6.52	6.91	6.84	6.56	6.96	6.88	6.75	7.25	7.00
g. Quality pedestrian pathways	7.06	6.15	6.32	7.08	6.00	6.23	6.38	5.83	6.10
h. Better and efficient public transportation	7.46	6.70	6.85	7.36	6.95	7.03	7.62	6.82	7.22
i. Promote urban farming	5.72	6.28	6.18	6.17	6.40	6.35	5.70	6.62	6.15
j. More active and genuine public participation in decision policy making process	6.41	6.40	6.40	6.43	6.40	6.41	6.51	6.73	6.62
k. Integrated solid waste management	6.57	6.53	6.53	6.45	6.51	6.50	6.36	5.66	6.03
l. Accessibility to clean water and sanitation	7.09	7.35	7.30	6.92	7.29	7.21	6.94	6.94	6.95
m. Incorporate disaster-risk management in urban planning	6.75	6.98	6.93	6.97	6.56	6.65	6.42	6.40	6.43
n. Adoption of green technology for industries and businesses	6.96	6.24	6.38	6.99	6.31	6.45	6.76	5.72	6.27
o. No more reclamation in Penang Island	5.65	6.45	6.30	5.66	6.56	6.37	6.03	6.33	6.20
Total	100	100	100	100	100	100	100	100	100

In regards to age group, respondents from all three age categories hope that in the future there will be efforts taken to plant more trees. However, for respondents from youth and adults, they expect that the Penang government will provide access to clean water and sanitation to meet the needs of these people. Meanwhile, for retirees, they want better and efficient public transportation in the future. Besides, the youth and retirees expect that in the future the government will increase the number of recycling facilities in order to attract more people to engage in recycling activities. On the contrary, youth and adults feel that enhancing

cycling connectivity and promoting urban farming is not a major concern for them in the future. For retirees, quality pedestrian pathways and integrated solid waste management is not their main concern for the future.

5.1.2   Summary Findings from Focus Group Discussions and Interviews

From the focus group discussion and interviews, stakeholders have identified nine (9) future issues. Among them are socioeconomic issues, built environment, transportation, biodiversity, agriculture, water security, energy security, disaster and policy matters.

a.   Socioeconomic Issues

Socioeconomic issues are the most currently cited future issues by the stakeholders and largely referring to SDG 3 that is good health and well-being. Most of the issues focus on **empowering the vulnerable groups**, to enhance quality of life (QoL). One major issue highlighted by the EXCO members is the inadequate assistance rendered to the low-income group.

> *" … cuma bukan kita kata tak ada … bantuan orang-orang yang*
> *berpendapatan rendah boleh diperbanyakkan lagi." (EXCO member)*
> *" … not to say that there is none … the assistance to the low-income group*
> *could be increased." (EXCO member)*

More assistance needs to be provided, especially in the development and training assistance rather than just financial assistance. This sentiment is also shared between the public sector and businesses. Other vulnerable groups of concern are homeless as identified by the professionals, who need to be empowered for them to return to their original life before being homeless.

> *"So, di situ peranan NGO, … bergerak memperkasakan semula golongan*
> *ini supaya kembali kepada kehidupan dia. Macam mana sebelum*
> *bergelandangan" (Professional)*

"So, this is the role of NGO, … work to empower this group to return back to their life. Life before being homeless" (Professional)

For youth, the relocation of the population affected by the construction of LRT is a major concern. This is because the land taken from the community for the construction of the LRT will affect their well-being, especially for them to restart life in new settlements. As such, there is a need for the government to take into account the provision of advice and support to ensure that affected communities are able to sustain their lives for the long-term.

"Contoh saya nak ambil kalau dibina LRT, sebanyak manakah tanah yang akan diambil oleh pihak yang merancang itu, contohnya tanah-tanah kampung, rumah-rumah orang Penang ni, ke mana mereka akan pergi, mungkin duit dibayar tetapi ke mana mereka nak pergi? Duit one juta esok pon habis, adakah ia dirancang secara SDG…" (Youth)

"For example, if the LRT is built, how much land will be taken by the government, for example, the village lands, Penangites houses, where they will go, maybe the money is paid but where are they going? 1 million ringgit will be exhausted, is it planned according to SDG ... "(Youth)

Another issue highlighted by youth is related to the well-being of fishermen in the Permatang Damar Laut, Gertak Sanggul and Teluk Kumbar which will be affected by the existence of three artificial islands. Low fishing production effects on habitat and ecosystem damage will cause fishermen to lose their source of income, and this will depress their socioeconomic conditions.

"For example, soon enough if the EIA gets through and if the three islands come to be. How is it going to impact the fisherman in Permatang Damar Laut, Teluk Kumbar and Gertak Sanggul? How has that been a study, which has been done. How do you compensate such people?" (Youth)

Additionally, stakeholders also highlight issues related to assistance that should be considered for middle-income groups to obtain private health services. The reason is that most government subsidies are concentrated in public health services, and this will lead the

middle-income group to face the challenges to obtain certain health services from private sector due to rising medical cost. If this situation continues, the middle-income group has the potential to be vulnerable to access better health services.

> *"mereka ni susah untuk mendapatkan services dekat private mungkin bukan semua services yang mereka boleh dapat eh cuma optional nya ada lagi government sector tapi sejauh mana public boleh cope dengan in term of services semua sebab macam saya cakap tadi dia hanya subsidised public sector eh."* (Public Sector)
>
> "They are hard to get private services maybe they cannot afford all the services ... the only option is the government sector but how can the public cope with all the services because as I said the government only subsidises the public sector ..." (Public Sector)

One important issue raised by the professionals is the high housing prices and the inability of the people, especially youth to purchase a house at the current prices. The direction of house ownership should be centred towards non-transactional housing, in which individuals are allowed to rent for a few years, after which the property ownership of such houses is transferred.

> *"One more, we need to provide housing for the young. Rental non-transactional housing … The engine of growth of the city is the young people. They need housing; they need a place to stay"* (Professional)

Another vital future issue is ensuring that that related to SDG4 the people are equipped with a quality education that is able to change the mindset, culture and attitude of the public.

> *"Pendidikan kepada orang ramai supaya mereka sedar tentang pentingnya kita hidup dengan gaya amalan hidup hijau dan mereka mesti bukan saja sedar tapi mesti faham bahawa apa-apa kesan buruk ke atas alam sekitar .. "* (EXCO member)

> "Education to the public so that they are aware of the importance of adopting green practices and they must not only aware but understand of the negative consequences on the environment" (EXCO member)

Quality education, however, cannot be attained overnight but is a process that needs to be observed from now. If quality education is not addressed now, it is impossible to ensure that the public would adhere and adapt to lifestyle changes in the future for green environment.

> *"I think they should start from primary, secondary school and even in tertiary level environment … should be a major concern regardless of school you are from Math School or Biological … Science Physics you must learn…"* (Youth)
>
> *"And I think one of the things is you have to make it simple education. You can't have man on the street reading a two-pager about recycling. It should probably be just a picture about recycling."* (Youth)

In addressing and preparing Malaysia to be a high-income nation, there is a need to ensure equitable income distribution among the people, an issue highlighted by stakeholders with regard to increasing income divide between the rich and the poor.

From the healthcare perspective, immigrant influx to Penang raises the risks of communicable diseases. Public sector concerns are related to the contagion of infectious diseases and the superfluous cost that the government needs to bare in order to provide immunisation for both legal and illegal immigrants.

> "…seiring dengan pembangunan, banyak pendatang asing yang akan masuk mungkin legal dan … legal tapi di samping itu mereka membawa masuk penyakit penyakit seperti tuberculosis, malaria dan sebagainya. Ini yang ditekankan sebab ia mendatangkan risiko kepada public aaa okay kita ada akta iaitu communicable disease act dimana kita perlu memberi rawatan percuma kepada warga asing untuk mengelakkan spread penyakit ini kepada rakyat tempatan tapi sejauh mana kita dapat protect secara keseluruhannya" (Public Sector)

"...along with the development, many immigrants, may enter into legal and illegal ways, but also they carry diseases such as tuberculosis, malaria and so on. It is a risk to the public. We have a communicable disease act where we need to give free treatment to foreigners to prevent the spread of this disease to the local people but to what extent can we protect it as a whole". (Public Sector)

Penang's rapid development has seen that certain areas, especially in Penang Island, are concentrated by population; either encouraged by industrial demand, employment opportunities, better infrastructure or decent facilities. One drastic move could be urban-rural migration, to even up the population spread between Penang Island and Seberang Perai and within the Penang Island.

"...have to start to initiate the urban-rural migration by developing SPS..."
(EXCO member)

b.   Built Environment

NGOs, EXCO members, professionals and youth call for more green and open spaces. As part of a balanced life to enhance QoL, it is important that the public be provided with green and open spaces that serve as recreational facilities, adequately. Nevertheless, the current rapid development in Penang with limited lands provided a limited avenue for green areas and planting of trees.

"We don't want more buildings, we want more greenery ..." (NGO).

"Kalau untuk kawasan hijau dan rekreasi … saya rasa lagi ramai orang perlukan benda tu … tempat untuk berekreasi dan beriadah … kalau tak, kehidupan kita tidak sihat." (EXCO member)
"If green and recreational area … I feel that more people need that … place for recreational and relaxation … if not, our life is not healthy." (EXCO member)

186

> *"Housing also needs to take account of recreation, green spaces which are*
> *very important, access roads especially in residential areas…"* (Youth)

As part of ensuring green building compliance, there is a need to emphasise on the implementation of Green Building Index (GBI) in the future. EXCO members call for a comprehensive compliance of GBI and not only voluntary. As such, there is also a need to ensure efficient management in monitoring and regulating public spaces.

Additionally, EXCO members, public sector, NGOs and youth have suggested that to ensure the successful of GBI implementation, the rain harvesting system and composting system should be considered as one of the criteria in the construction of GBI certified buildings.

> *"I think before we have green spaces, we need to have this rainwater*
> *harvesting system in place. Like Mr. Seow pointed out. Because those*
> *urban farming and rainwater harvesting goes hand in hand. Ok. Because*
> *if you want to promote farming, how are the plants going to survive*
> *without any form of water?"* (NGOs)

To ensure the sustainability of the city and community development is achieved, the youth emphasises the need to implement integrated solid waste management with the latest technology applications that should able to manage solid wastes efficiently and effectively. The youth view solid waste management issue as a problem that will be highly severe if not addressed appropriately and will affect the well-being of future generations.

The public sector, NGOs and businesses feel that there is a necessity to creatively enhance parking spaces. If parking spaces could be controlled, this would be able to solve many transportation and pollution problems. It was suggested that perhaps parking fees be increased to the maximum to deter people from driving, especially to the congested area such as George Town. With extremely expensive parking fees, people would have to revert to public transportation.

> "Reduce the parking space, makes it so difficult to park. … If you take away
> all the car parks or make it very expensive … Then you automatically limit

the number of private car park … People will still use it but only when they

really need it … And they will start thinking … car pool" (NGO)

NGOs believe that environment could be further enhanced through active transportation such as cycling and walking. At present, the cycling connectivity in Penang is inadequate and poor. Hence, better cycling connectivity would encourage cyclists not only to cycle recreationally but commute to work. For short distances, with improved pedestrian pathways, people would be encouraged to walk.

In addition, business stakeholders expect local authorities to implement appropriate policies to address the shortage of public spaces by reducing private spaces. This policy will help the government to manage the development of the Penang state more sustainably.

> *"Kurangkan private space, tambah public space."* (Business)
> "Reduce private space, increase public space." (Business)

c. *Transportation*

Transportation has always been a debatable topic in Penang. The concerns over congestion and alternative to reduce congestion have been public debates since Penang Transport Master Plan was introduced in 2016. Regardless of the public's views on the Penang Transport Master Plan, it could be concluded that people would want to have the number of private vehicles reduced. Hence, as put forward by the NGOs, this is only attainable should Penang have better and more efficient public transportation. The transportation system in Penang could be improved if this is coupled with encouragement for alternative transportation such as walking and cycling.

> *"Yes. Because based on the traffic jam, seems like every day the vehicles are increasing on the road. So, maybe Penang government should increase the public transport in around Penang. So that the movement would be…it's movement of people in Penang"* (NGOs)

d.   Biodiversity

With rapid development, the public sector raises its concern over deforestation that could easily affect Penang biodiversity. Deforestation is also a result of unbalanced development, uncontrolled development and lack of constant monitoring and good regulation. Uncontrolled development through land reclamation could easily affect mangrove forest in the future.

> *"So, if we chopped off these mangrove forest, landfilling and end up with*
> *land reclamation, this will impact the growth of the mangrove forest. And*
> *in return, the barrier to the reduction will be reduced, and subsequently,*
> *you will have more seawater penetrating the islands of Penang."* (NGOs)

e.   Agriculture

Inevitable population growth calls for innovation to increase and enhance food production. This includes technology driven for industry and farming, as appealed by the professionals.

While many argue that limited lands and Penang landscapes that are dominated by high-rise buildings are not suitable for agricultural activities, Youth are hoping that the concept of urban farming is taken as an alternative to normal farming activities.

> *"There are many things we can do emm like she said the school project*
> *like urban farming … because we realise one thing that can't be denied*
> *is lacking public awareness."* (Youth)

f.   Land Matters

Policies that need to be emphasised should not only focus on balanced development between Penang Island and Seberang Perai, but also towards hillside development in Penang Island. Businesses, NGOs and Youth stakeholders voice that appropriate policies need to be strengthened in order to control the increasingly brisk hillside development in Penang Island and potentially invite disaster risk that will endanger the lives of local communities.

"One of the things which happen when you have hill development is floods. So, and with climate changing, I wouldn't say it is solely because of hill development that we are having more floods. Also, climate change is causing this. But when you have two factors, it makes it even worse…" (Youth)

"I would say more for green. Don't touch the green. Maintain our hillside, maintain all the green. Because I believe that the development on the Island sudah cukup." (Business)

"*For example, it's hill degradation that is used to make for way for commercial and housing development. It's actually a bit dangerous to Penang in the long run.*" (NGOs)

Relevant authorities need to look on the necessity to adopt and practice balanced development between Penang Island and Seberang Perai. At present, it could be observed that Penang Island is overdeveloped and Seberang Perai, although it has recorded significant as opposed to a decade ago, lacks the essential development and growth as compared to Penang Island. NGOs and youth refer to this condition as unbalanced development. As such, relevant authorities should look into the better coordination of resources between Penang Island and Seberang Perai and ensure that resources are used wisely and dispersed accordingly.

g.   Water Security

Being a state with limited water resources and highly dependable on its neighbouring state, Kedah for water supply, the issue of water sustainability is of great concern to NGOs. NGOs call for a mechanism and cooperation between the two states to ensure sustainable water supply is attained in the future and that is, among others, affected by development and activities surrounding the water catchment areas.

For youth, water security issue is due to consumption of non-organic pesticides in agriculture industries mainly in the form of chemical that will be absorbed into the soil and release back by natural processes to rivers and other sources of water.

> *"But when it comes to clean water and sanitation, one of the things I think we are currently facing at the moment is many of the catchment areas are also farmland. So, when you have farmlands, you have usage of fertiliser, stuff like those. Those actually seep into our water, dams and whatnot. So, for example like Teluk Bahang catchment area, there are a lot of farms there. A lot of people using pesticide. So, as to how safe it is, that is one concern."* (Youth)

Considering the underwater life aspect, NGOs in Penang state are of the opinion that the state government should emphasise the empowerment of river basin conservation policies by creating more river life programs for rehabilitation of polluted river in Penang due to industrialisation.

> *"We need to initiate the river of life program, like what they have done from Klang river (51:00) here in Penang Island and also for Seberang Prai…"* (NGOs)

h.   Energy Security

Energy security catches the attention of many stakeholders that include the EXCO members, businesses, professionals and NGOs. All hopes for alternative energy sources to be adapted and adopted in Penang. As a state with a high source of the sun, the possibility of availability and affordable solar energy should be sourced. Other alternative energy sources include biomass given that households generate big amount of waste. These alternative energy sources that are more environmentally friendly have a minimum adverse impact to the environment and are able to reduce air pollution.

> *"Kita kena reduce air pollution. Will be the major concern. Guna new engine to reduce air pollution."* (Business)

"We have to reduce air pollution. It will be the major concern. Use new engine to reduce air pollution"(Business)

i.   Disaster

Youth are more concerned with the effect of hill development that could cause uncontrolled disasters such as flood and landslides. If hill development is not properly regulated, the tragic state-wide flood and Tanjung Bungah landslide, could not just happen again, but on a larger scale and affect more areas.

> *"when you have hillside development which is happening over say, above residential area. How is it going to impact the people below? So, these are questions which I feel have to be thought about in the long run. Because uh, say, hill developments. Sometimes landslide might not happen right away. (It) might take 10 years to happen."* (Youth)

j.   Institution and Governance

EXCO members feel that Penang has to further enhance its industry – community linkages, especially in the agricultural sector. This is to ensure that agricultural products could be prepared as per the requirements of the industry. To add, the professionals call for greater community engagement and commitment to green practices. Government policy would remain a policy if there were no active participation from the public. Active participation from the public, on the other hand, would not happen without support from relevant authorities and agencies. Youth also call for greater public participation in the decision-making process. They encourage and welcome town hall activities in informing the public of a particular activity. The public needs to be consulted before any rule, regulation or policy is implemented.

To achieve the 12th goal in SDG, EXCO members are of the opinion that there is a need to enforce policies on violators of responsible production by tightening the maritime law. This regulation is very important to overcome the problem of overfishing that will cause fish stock deficits in the future.

"We are fishing one whole year round. There no season as odd season, end season. But then, are we to blame the fisherman. Many of them kais sehari makan sehari. … Sea reclamation and all these things. Do we need sea regulations? The answer is yes. We need sea regulations." (EXCO member)

"We are fishing one whole year round. There no season as odd season, end season. But then, are we to blame the fisherman. Many of them live based on daily activities … Sea reclamation and all these things. Do we need sea regulations? The answer is yes. We need sea regulation." (EXCO member)

5.1.3   Summary of Future Issues

Table 5.10 provides the summary of the future issues discussed by stakeholders. As could be deduced, the future issues are discussed by all categories of stakeholders, with the exception of developers. Of the SDGs not discussed are SDGs 1, 2, 5, 8 and 16.

Table 5.10 Summary of Future Issues based on Stakeholders

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs
SDG1: No Poverty						
SDG2: Zero Hunger						
SDG3: Good Health & Well Being	SE -More assistance to low income group -The middle income group cannot afford to get private health services as only public health services been subsidized by the Government				SE -Non transactional housing SE –empowering the homeless to become who they are before they fall into homeless condition	
		SE - influx of immigrant increases the risks of communicable diseases				
SDG4: Quality Education		SE - Simple education to change mindset and culture				
SDG5: Gender Equality						
SDG6: Clean Water & Sanitation						WS -sustainable water resources

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs
SDG7: Affordable & Clean Energy	ES -Alternative energy source -Biomass		ES -Alternative energy source -To reduce air pollution		ES -Alternative energy source -Affordable energy	
SDG8: Decent Work & Growth						
SDG9: Industry, Innovation & Infrastructure					AGR - technology driven for industry and farming	
SDG10: Reduced Inequalities						SE - Equitable income distribution
SDG11: Sustainable Cities & Communities	BE -Green Building Index -Efficient management -Rain water harvesting system -Composting system for residence apartment SE - Rural – urban migration		LAND -Hillside development BE - Reduced private spaces and increase public spaces		IG -Coordination of resources between Island and Seberang Perai	BE -Recreational areas -Plant more trees -Rain water harvesting system -Composting system for residence apartment BIO - plant more tree - land reclamation will affect mangrove growth TRANS -Alternative transportation -Reduction of private vehicles -Better and efficient public transportation BE -Pedestrian pathways -Cycling connectivity BE - Integrated solid waste management
	TRANS -Alternative transportation -Railway transit					LAND - unbalanced development BIO - deforestation at hill side development
		BE -Parking space -Link connectivity between Island and Seberang Prai				
SDG12: Responsible Consumption & Production	IG - violators of responsible production					
SDG14: Life Below Water						WS - river life program for

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs
						rehabilitation of polluted river in Penang
SDG15: Life on Land		BIO - Deforesta-tion due to unbalanced development				
SDG16: Peace, Justics & Strong Instiutions						
SDG17: Partnerships for the Goals	IG – Industry / community linkages				IG - Community engagement and commitment	

Table 5.11 provides the summary of the thematic analysis based on discussion by stakeholders from focus group discussions and in-depth interviews as well as the top seven future issues identified by respondents from the public survey. The column on the elderly and general public is deduced from the public survey. The other columns were responses deduced from focus group discussion and in-depth interview. The column on youth is the combination of responses from focus group discussion, in-depth interview and public survey. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as important in the public survey. Most of the discussions of future issues concentrate on socioeconomic issues, built environment, transportation, energy security, water security and institution and governance.

Table 5.11 Summary of highlighted issues

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Elderly[a]	Youth[a]	General Public[a]
Socioeconomic Issues	♦	♦	♦		♦	♦	♦	♦	♦
Built Environment	♦	♦	♦			♦	♦	♦	♦
Waste Management						♦		♦	
Transportation	♦	♦				♦	♦	♦	♦
Biodiversity		♦				♦	♦	♦	
Agriculture					♦		♦	♦	
Land Matters			♦			♦		♦	
Water Security						♦	♦	♦	♦
Energy Security	♦		♦		♦	♦		♦	
Leadership									
Disaster								♦	
Institution & Governance	♦				♦		♦	♦	♦

Note: [a]Partial findings from public survey (Top seven identified future issues)

5.2   Future Challenges

This section provides the findings of future challenges as identified by stakeholders.

5.2.1   Summary Findings from Public Survey

This section provides the summary of the public survey on identifying the future challenges and solutions. Not everyone who participated in the survey answered these two questions because the questions are open-ended, in which survey participants need to identify the future challenges and write down the three most pressing challenges. All the responses are recorded into groups and the results are presented in the following sub-sections.

5.2.2   Future Challenges Identified by the Public

The survey asks the public to identify three challenges faced by Penang. We have classified the challenges into appropriate themes as shown in Table 5.12. Future issues range from institution and governance, transportation, disaster, socioeconomic issues, waste management, built environment, water security, biodiversity and agriculture. The most pressing challenges identified are a traffic jam, flood and flash flood as well as a landslide. The three latter issues are recent disasters in Penang.

Table 5.12 Future Challenges Identified by the Public

Challenges	Theme	General Public	Youth	Elderly
Traffic jam	TRANS	320	160	14
Flood	DIS	314	172	14
Flash flood	DIS	292	161	14
Landslide	DIS	284	143	23
Air pollution / Haze	BE	250	146	8
Water / river / sea pollution	BE	240	134	7
Rubbish / littering	SE	124	79	6
Deforestation	BIO	108	55	1
Heat wave / rising temperature	DIS	84	52	5
Noise pollution	BE	80	45	3
Extreme / over development	LAND	77	41	3
Climate change / global warming	DIS	79	47	2

Challenges	Theme	General Public	Youth	Elderly
Excessive land reclamation	LAND	76	46	5
Waste management / segregation	WM	74	45	2
Green environment / green space	BE	70	27	5
Alteration of shoreline due to reclamation	BIO	67	40	4
Illegal logging / hillside	LAND	63	32	11
Environmental pollution	BE	39	22	2
Hill development	LAND	33	18	2
Open burning	SE	21	15	0
People's attitude	SE	18	9	0
Affordable housing	SE	17	10	0
Limited land for development	LAND	16	7	2
Water supply problem	WS	15	7	0
Public transportation	TRANS	15	4	0
Illegal / legal immigrants	SE	14	10	0
Too many vehicles	TRANS	14	5	1
Drainage system	BE	14	5	2
Disaster preparation	DIS	13	6	2
Ecosystem	BIO	12	8	0
Increase population	SE	11	4	1
Trafficking	SE	11	6	0
Excessive land use	LAND	10	4	1
High living cost	SE	10	5	0
Overdoing legal logging activities	BIO	9	4	1
Road system	BE	8	4	0
Lack of law enforcement	IG	8	4	1
City planning with clear vision	IG	7	3	0
Land / soil erosion	BIO	8	8	0
Limited parking	BE	7	1	1
Food waste	WM	6	6	0
Safety	SE	6	4	0
Housing development	SE	6	5	0
Disease infection	SE	5	3	1
Over fishing	BIO	5	4	0
Water wasting	WM	5	2	0
Food security	AGR	5	4	1
Imbalance development	LAND	5	2	0
Others		62	29	3
Illegal hawkers, safety, squatters, homeless, education, politics, creating sustainable economy, diminishing culture, healthy living, illegal farming, preservation of heritage building	SE	21	11	0
Clogged drains, landscape, plant more trees, keep Penang clean, road holes,	BE	22	10	2

Challenges	Theme	General Public	Youth	Elderly
bicycle infrastructure, infrastructure, green technology, public facility				
Waste disposal, chemical waste, electronic waste	WM	9	5	1
Poor transportation	TRANS	3	1	0
Loss of biodiversity, natural resources	BIO	1	0	0
Arbitrary land use, cooperation from everyone, urban development	LAND	5	2	0
Support urban farming	AGR	1	0	0

Source: (Survey, 2018)

5.2.3   Future Solutions to the Challenges Identified by the Public

The survey asks the public to identify three solutions to the challenges they have identified. We have summarised the solutions and classified them into appropriate themes as shown in Table 5.13. The top four solutions focus on solving the issues of flood and flash flood through improving drainage system, improving public transportation to solve traffic and congestion issues, controlling development to avoid negative impacts of development to the society, economy and environment and law enforcement in

ensuring that all rules and regulations are abided by the public and relevant stakeholders.

Table 5.13 Solutions to the Future Challenges Identified by the Public

	Theme	General Public	Youth	Elderly
Improve drainage system	BE	201	114	4
Improve public transport, limit car	TRANS	149	81	8
Control development	LAND	121	73	4
Law enforcement	IG	109	62	5
Plant more tree	BE	90	43	4
Compound / fine	SE	67	36	2
Avoid development at hill	DIS	58	30	5
Control logging	LAND	55	33	1
Efficient waste management / segregation	WM	52	32	0
Stop sea / land reclamation	BIO, LAND	51	35	1
Improve road system	BE	36	21	2
Preserve / gazette forest	LAND	33	17	0
Local authority take responsibility	IG	31	19	1
Car pool	TRANS	25	17	0
Increase green space and green house	BE	29	13	0

	Theme	General Public	Youth	Elderly
Imprisonment	IG	29	18	0
Improve traffic system	TRANS	25	14	0
Improve urban plan	IG	23	11	1
Sustainable development	IG	23	15	0
More dust bin	BE	22	13	0
New technology	BE	20	9	1
Clean the river	BE	18	11	0
Widen road	BE	16	8	0
Recycle	SE	15	10	0
Reduce immigrant	SE	15	8	0
Improve infrastructure	BE	11	8	1
Housing development	SE	11	5	1
Reduce open burning	BE	10	5	1
Monitor developer	IG	9	4	0
Environment friendly building	BE	8	5	0
Job opportunities for public	SE	7	3	0
Control housing price	SE	6	1	1
Water storage	WS	6	4	0
More parking	BE	6	1	1
Monitor factory activity	IG	6	2	0
Development on mainland	LAND	5	2	0
Engagement	IG	5	2	0
Stop development	IG	5	2	0
Reduce CO2	BE	5	2	0
Others				
Irrigation system	BE	4	1	0
Disaster management	DIS	3	1	1
Big scale underground water catchment	BE	3	1	0
Community engagement	SE	3	2	0
Reduce plastic	BE	2	2	0
More land fill	BE	2	1	0
Plant more mangroves tree	BIO	2	2	0
Improve building design for ventilation	BE	1	1	0
Landslide preventive plan	DIS	1	0	0
Control and monitor pollution	BE	1	0	0
More study on environment	IG	1	1	0
Improve implementation	IG	1	1	0
Reduce rubbish	SE	1	0	0
Control land use	LAND	1	1	0
Extend land	LAND	1	1	0
Control High rise building	BE,	1	0	0
Farming	AGR	1	1	0

	Theme	General Public	Youth	Elderly
Build factory far from housing	BE	1	0	0
Others		59	35	0

5.2.4   Summary Findings from Focus Group Discussions and Interviews

Future challenges focus on the future challenges of current programs or introducing any program or policy. Of the 12 SDGs, stakeholders have identified future challenges that are in line with nine (9) SDGs. Three (3) SDGs that do not have any future challenges identified to them are SDG 5, Gender Equality, SDG 12, Responsible Consumption and Production and SDG 15, Life on Land.

a.   Socioeconomic Issues

The public sector views the financial aids given to the poor as increasing the poor's dependence on government for assistance. Hence, the poor would have limited capability to further improve their living, continue their dependence on the assistance and prolong their life in poverty. Continuous dependence on assistance would not break the poverty cycle. There is a need to break the poverty cycle through education and not assistance only.

Stakeholders such as the EXCO members, public and NGOs call for a better policy and stringent rules to not only increase awareness of green practices but also to be involved in continuous activities of green practices among the public. While it is easy to create programs, events and activities to enhance awareness, it is rather complex to ensure that the awareness created would embed into habitual practices. The greatest challenge to address is dealing with people's attitude. Many stakeholders claim that it is through education that one's attitude is improved. It is also the important roles of family and community to educate the young on the positive behaviour. Embedding Green Education in school syllabus is a great challenge as it involves national policy.

One important challenge that affects QoL is ensuring equitable employment opportunity for youth in the future. At present, locals are competing with immigrants, legal or illegal for job opportunities, especially in the semi-skilled industries. Employment challenge in the future

deals with the inability of the education system to meet the needs of the changing industry demands. The current education system needs to be ready to change, adopt and adapt timely to industry demand changes. It is not impossible that the future demand of employment focuses more on semi-skilled jobs such as tour guides, xxxx that the current generation is not prepared for. As a result, our youth would lose job opportunities to the immigrants.

Taking into account the influx of foreign workers in Penang, the stakeholders among EXCO members and the public sector predict that the state government will face the difficult challenges to provide universal health services to foreign workers especially for illegal immigrants who migrated to Penang. Immunisation schemes should also be considered for foreign workers to ensure they are not transmitting communicable diseases. If this matter is not addressed appropriately, it is feared that in the future the government will have to spend more money to eradicate the communicable disease that has been spread to the local community.

To ensure that local productivity levels can be enhanced to enable them to contribute to a more sustainable economic growth, the EXCO members foresee the development of training programs specially designed for local industry as a big challenge to the government and the private sector. The appropriate policy should be able to improve the productivity of the local community as well as to create job opportunities that allow trainees to demonstrate their creativity and innovation.

To ensure the SDG 10 target of reducing inequality is achieved. Public sector stakeholders suggested that the government formulate appropriate policies to improve the socioeconomic status of the community, especially for vulnerable groups such as those in the B40 category as well as single mothers who need to care for a large number of children so that they can live a normal life and prosper in the general society.

b.   Built Environment

According to the EXCO members and public sector, appropriate policy implementation to ensure compliance with building standards by developers is extremely challenging. This is

due to the fact that all these while developers are encouraged to comply with GBI without any law enforcement. Therefore, to ensure the implementation of GBI's compliance is fully implemented, the government must formulate a policy that requires developers to comply with the standards set out in GBI. The proposed policy must state GBI's standard structure, so developers can understand and consider GBI as the main element in designing their construction.

> *"That means that engineering redesign. Bangunan yg lama, nothing much you can do. So harvesting of water, the best place to harvest water is new building engineering design. We're talking about rainwater, from the flushing system. The water from the toilet diverted, filtered then we use minimum treatment."* (EXCO member)

Challenges to formulate appropriate policies for introducing new technologies and empowering infrastructure have become a major concern for the public sector and business. According to stakeholders, the government needs to introduce new technology in the state drainage system, and the technology must be able to cope with floods, which will cost a lot to the Penang government for recovery after the flood disaster.

Another issue that requires state government action is related to road safety. Public sector and business are of the view that the main challenge in the implementation of state development policy is to craft well-planned development and take into account the safety elements of road users. The government also needs to make cost-benefit analysis more thoroughly before implementing any development related to road safety systems.

c.   Waste Management

Referring to the solid waste management, the public sector raises issues regarding the current location of the landfill that is full and required to move to a new location. However, the capacity of the new landfill that will operate is still unknown whether it is sufficient to accommodate the growing amount of waste disposal volume in Penang. The government is expected to implement appropriate policies by taking into account the carrying capacity of the new landfill area.

> *"Pulau Burung tapak pelupusan sekarang dah supposedly overlimit lah, supposedly overlimit dan kita harap akan by end of this year dia akan close lah dan kita akan pindah ke tapak pelupusan baru disebelah yang kita harap akan tahan sampai 30 tahun lah, lepas 30 tahun tu mungkin orang lain pulak fikir kot saya berenti dahla kerja."* (EXCO member)

> "The Pulau Burung landfill site is now supposedly over the limit, and we hope that by the end of this year it will close and we will move to a new landfill nearby which we hope to accommodate for 30 years after 30 years maybe someone else has to think about it because I will retire. "(EXCO member)

Another issue on waste management discussed by EXCO members in SDG 11 is on the government's challenge in implementing appropriate policies to address food wastage. This is in line with Penang government's efforts to eradicate food wastage, which contributes to the increase of waste that contributes to environmental pollution.

> *". I explain to the restaurant, save foods. When you save food, not waste the foods, you release the pressure on supply & demand. You also reduce the prices. You also reduce the pressure on production. So they can reduce the usage of chemicals in production. All these are chain reactions, which we cannot deny. You talk about the quantity of food or the quality of food. And the quality of food begins from the day you put the seed until on the table you eat. Change the quality."* (EXCO member)

d. Transportation

One challenge involving the latest technology in the transportation sector was put forward by the business sector. Given that transportation is the primary medium for economic activity globally, there is an urgent need to adopt efficient energy in the public transportation system.

The use of clean energy should be a key focus in policy formulation in the transportation industry and directly contribute to environmental sustainability.

The business sector also recommended that the state government empower the public sector infrastructure in the Penang state by implementing an integrated bus system by introducing a single pass for public transportation.

> *"One of the initiatives, kita nak adopt new system to make it efficient dalam operation. Buying systems that can integrate all bus services dari segi reliablie, accessible, punctual time, semua ada dalam system ini…"* (Business)

> "One of the initiatives we want to adopt new system to make it efficient in operation. Buying systems that can integrate all bus services in terms of reliable, accessible, punctual time, all in this system ... " (Business)

e.   Agriculture

The youth suggested that the state government should give special emphasis on the proper master plan for the fishing industry in Penang state. This master plan is critical as the issue of excessive fishing will threaten fish stocks and will help contain food safety issues among Penangites.

> *"I felt that there is no master plan that is inclusive for fishermen, … mostly are not included at all and people do not see how sustainable city .. and … conserving the ocean .. achieve food security as well."* (Youth)

Stakeholders emphasised the need to adopt cleaner and efficient energy through alternative energy. Nevertheless, the greatest challenge is the high cost involved, either on manufacturing efficient technology or installing such technology. While it is suggested that

small-scale farmers be subsidised for the high cost of solar panel installation, the subsidy is a distortion of the economy. It is inefficient and costly.

The future challenge facing the agricultural sector are branding, packaging and marketing. Local producers lack talent and ability to market their agricultural products due to their limited knowledge and inability to provide consistent supply to meet industrial demand. There have been many programs and assistance rendered to the small businesses, but they still fail to place their products and brands in the global market. While few have been successful, many are still struggling. Many are still dependable on government assistance and unable to spread their wings independently.

Among the biggest challenges for the Penang state is the limited land area to accommodate the growing population of the state, many of the agricultural lands are being converted to residential land. As such, a large number of EXCO members and youth look at this issue and recommend the authorities to implement appropriate policies to safeguard agricultural land in the state. Agricultural land conservation is very much associated with SDG2 which is zero hunger, and thus the policy implemented is expected to maintain an active agricultural area. Indirectly, agricultural land conservation will contribute to the socioeconomic development of the local community.

f.   Water Security

Another challenge that is directly linked to the future issue is sustainable water supply. Given Penang's greatest challenge is dependence on Kedah for water supply, it is imperative that Penang start sourcing for alternative water supply.

g.   Institution and Governance

Based on interviews and group discussions, sustainable cities and communities (SDG11) are the goals most emphasised by participants. Future challenges have been highlighted only by stakeholders from EXCO members, the public sector, business and NGOs that emphasise the relevant policies to ensure adequate, safe and lively urban development can be achieved for the Penang state community. Relevant policies can be divided into issues that are

challenging for state governments to overcome in short and long-term that include compliance with building standards, solid waste management, new technology and infrastructure, road safety, and food waste.

NGOs have discussed the climate change issue as a result of weather uncertainty that refers to SDG 13. They expect a huge future challenge for the government is to design an appropriate action plan to address climate change. The Master Plan is very important in order to build the ability of Penang state to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development.

Goal 16, which refers to peace, justice and strong institutions (SDG16) has received specific attention from EXCO members and public sector members. They highlight that enforcement is very important to ensure the effectiveness of sustainable development strategies taken by the government. As such, the challenge will be borne by the Penang state government is to ensure continuous effort and monitoring. Hence the Penang state government must ensure responsive, inclusive, participatory and representative decision-making at all levels implemented.

Lastly, EXCO members and the public sector are of the opinion that future challenges that need to be addressed by the government are to ensure cooperation and collaboration with other agencies (state and federal). This collaboration is essential in dealing with disaster risk management and immigrant workers. Appropriate policies that parallel to federal level policy need to be implemented so that these issues can be addressed perfectly and effectively for the sake of universal well-being.

5.2.3   Summary of Future Challenges

Table 5.14 provides a summary of future challenges based on the discussion with stakeholders. From the table, it could be observed that the SDGs not being covered under future challenges are SDG 5, 6, 12 and 15. All the other SDGs are discussed and linked to the future issues.

Table 5.14 Summary of Future Challenges

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
SDG1: No Poverty	SE - universal health coverage				SE - homeless		
SDG2: Zero Hunger	AGR -Agriculture to housing -Maintain active agricultural area						AGR - Appropriate master plan for fishing industry - Maintain active agricultural area
SDG3: Good Health & Well Being	SE -Universal health care -Immigrants immunization						
SDG4: Quality Education	SE -Awareness -Continuous practice -Attitude					SE - Awareness - Continuous practice -Attitude	
SDG5: Gender Equality							
SDG6: Clean Water & Sanitation							
SDG7: Affordable & Clean Energy			ES - Efficiency technology			AGR - subsidized small-scale farmers to install solar panel	
SDG8: Decent Work & Growth	SE - training programs tailored to the needs of local industries						
SDG9: Industry, Innovation & Infrastructure	AGR -Modern pig farming -Branding, packaging and marketing of local products -costing & sustainable supply						
SDG10: Reduced Inequalities	SE - Urban-rural gap	SE - Vulnerable groups -Single mothers -B40					
SDG11: Sustainable Cities & Communities	WS - Sustainable water supply Alternative source of water supply / mechanism						
	WM - Food wastage -organic food	BE - Compliance to building					

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Youth
		standard - GBI WM - Waste Disposal - new waste disposal location - Waste segregation at source - impose fines					
		BE - New technology & infrastructure -Drainage system to cope with flood -Well planned development - TRANS -Bus integrated system -Single pass to commute -Road safety – cost benefit analysis					
SDG12: Responsible Consumption & Production							
SDG13: Climate action						IG - Climate Change action plan for Penang	
SDG14: Life Below Water	WS -sea regulations						
SDG15: Life on Land							
SDG16: Peace, Justice & Strong Institutions	IG - Enforcement - Continuous effort and monitoring for sustainable development						
SDG17: Partnerships for the Goals	IG - Cooperation and collaboration with other agencies (state and federal) DIS - Disaster risks management SE - Immigrant workers						

Table 5.15 provides the summary of the thematic analysis based on discussion by stakeholders from focus group discussion and in-depth interview as well as the top eight identified future challenges by respondents from the public survey. The column on the elderly and general public is deduced from the public survey. The other columns were responses deduced from focus group discussion and in-depth interview. The column on youth is the combination of responses from focus group discussion, in-depth interview and public survey. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as important in the public survey.

Table 5.15 Summary of Highlighted Future Challenges

	MPs & EXCO Members	Public Sector	Businesses	Developers	Professionals	NGOs	Elderly[a]	Youth[a]	General Public[a]
Socioeconomic Issues	◆	◆			◆	◆			
Built Environment	◆	◆					◆	◆	◆
Waste Management	◆	◆							
Transportation	◆	◆					◆	◆	◆
Biodiversity							◆	◆	◆
Agriculture	◆					◆		◆	
Land Matters									
Water Security	◆								
Energy Security			◆						
Leadership									
Disaster	◆	◆					◆	◆	◆
Institution & Governance	◆	◆				◆			

Note: [a]Partial findings from public survey (Top eight identified future challenges)

Chapter 6
Open Day

Penang Green Awareness Day (PGA) is a campaign held by the consultation team to educate and create awareness among the public on the importance of conservation and preservation of the environment in Penang as well as to encourage the public towards adopting green practices in their daily life. The Penang Green Awareness Day had been successfully launched at two different locations on two separate weekends. The first event was held on Sunday, November 19, 2017, from 10.00 AM to 5.00 PM at Tesco Penang (E-Gate), Lebuh Tengku Kudin. The second event was held on Saturday, Nov 25, 2017, from 10.00 AM to 5.00 PM at Aeon Mall, Alma, Bukit Mertajam. There were about 1200 visitors who visited various booths on the PGA Day. Many of them also participated in activities offered at each booth. Besides awareness campaign, public concerns on Penang's environmental issues were observed through casual activities across ages such as interactive games (waste segregation game, Sanctuary Endangered Species Game), Sustainable Transportation Kahoot online game, colouring and drawing contest, hands-on vertical planting, and "issues mapping". The PGA Day was assisted by student volunteers from the School of Social Sciences and the School of Technology Industry. Active stakeholders' involvement in environmental and sustainability agenda was expected from the public where the environmental concerns were highlighted in island region. Noteworthy, the artwork from the kids' activities reflected their hope on a greener and happier Penang. Below we discussed the activities conducted during the events.

Figure 6.1 Penang Green Awareness Day Poster, 2017

6.1 Waste Segregation Game

The objectives of the waste segregation station are 1) To educate Penangites on how to segregate wastes accordingly to the bins 2) To gather information on the current knowledge of Penangites on how to do waste segregation. This game is related to SDG 11, SDG 14 and SDG 15.

The public who participated in waste segregation station needs to pick and drop different type of wastes into three recycle bins accordingly namely blue (for papers), brown (for glasses), orange (aluminium and plastics) and green (for food waste). Participants had the flexibility to choose how many wastes they plan to segregate. Some of the participants chose to segregate at minimum 10 wastes up to 50 wastes. The step by step on waste segregation activities are depicted as follows:-

Step 1: Pick up wastes from the boxes

Step 2: Read the labels and colour coordinated

Step 3: Segregate wastes into bins accordingly

Figure 6.2 Waste Segregation Interactive Game, 2017
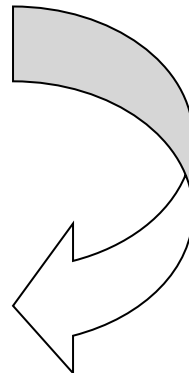
Out of 37 participants who participated in the waste segregation game, 23 have high awareness and knowledge on how to do waste segregation. 10 of the participant have medium awareness and knowledge, and only four participants have low awareness. Only 37 participants participated in this interactive game.
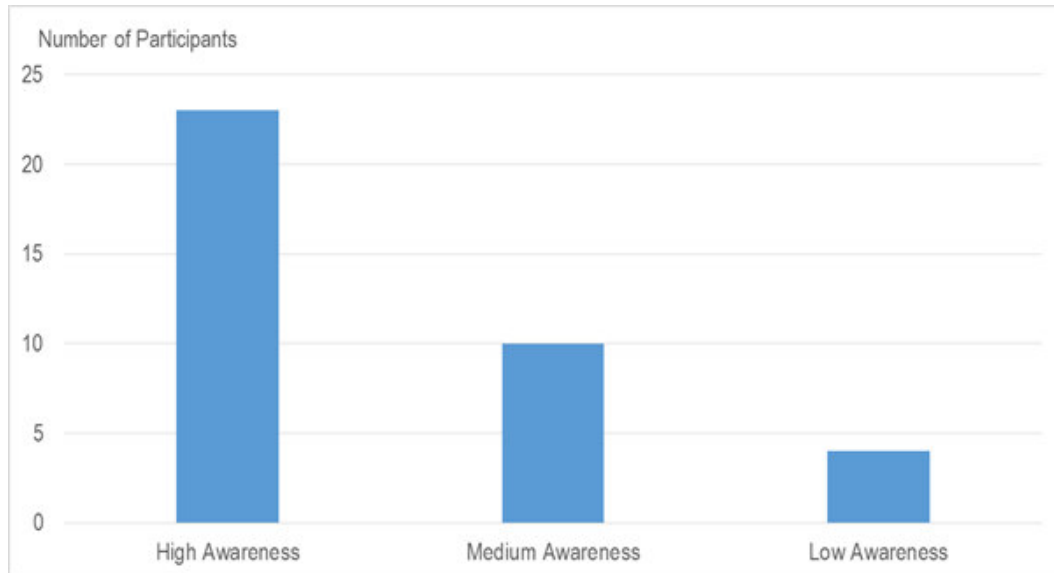
Figure 6.3 Waste segregation awareness among participants, 2017

Art and crafts of recyclable items were displayed at the recycling and waste segregation station such as DIY teddy bear, DIY bookmarks, DIY pencil case and DIY pot and home decoration (see figure 6.4). The objective of displaying the art and craft of recyclable items is to educate Penangites that with art, creativity and innovation there are possibilities to recycle wastes into other value-added products. Hence, zero waste in household production can be achieved. Several interested visitors asked how to do the art and craft from the recyclable items, and the volunteers shared their knowledge and explained how they did it. This activity is related to SDG 12.

Figure 6.4 DIY Art and craft from recyclable items, 2018

6.2 Sanctuary Endangered Species Game

The objectives of the sanctuary endangered species game are 1) To educate Penangites on the World Endangered species. 2) To observe the current knowledge of Penangites on endangered species.

Both kids and adults played this game with the guidance of volunteers. Kids were also guided by their parents to make the activities more fun. We purposefully encouraged parents to guide their kids so that both kids and parents learn about endangered species. Participants were given 15 cards which labelled with endangered. Participants looked at the photos and decided if each animal on the photos is endangered. Participants hang the cards on the animal photos until the end of the game. Some participants especially kids repeated the game to ensure that they remember the right answers. The animals in this interactive game were Blowfish, Turkey, White Leopard, Gorilla, Snail, Polar Bear, Sumatran Tiger, Whale,

Panda, Orangutang, Tarantula, Stork, Beaver, Elephant and Hornbill. Participants who participated in this game received a free eco-bag and handcraft.

Figure 6.5 Endangered Species Sanctuary Game, 2017

Out of 27 participants in the Endangered Species Sanctuary Interactive Game, 19 have high awareness and knowledge in determined the endangered species, six participants have medium awareness, and only two participants have low awareness and knowledge on endangered species.
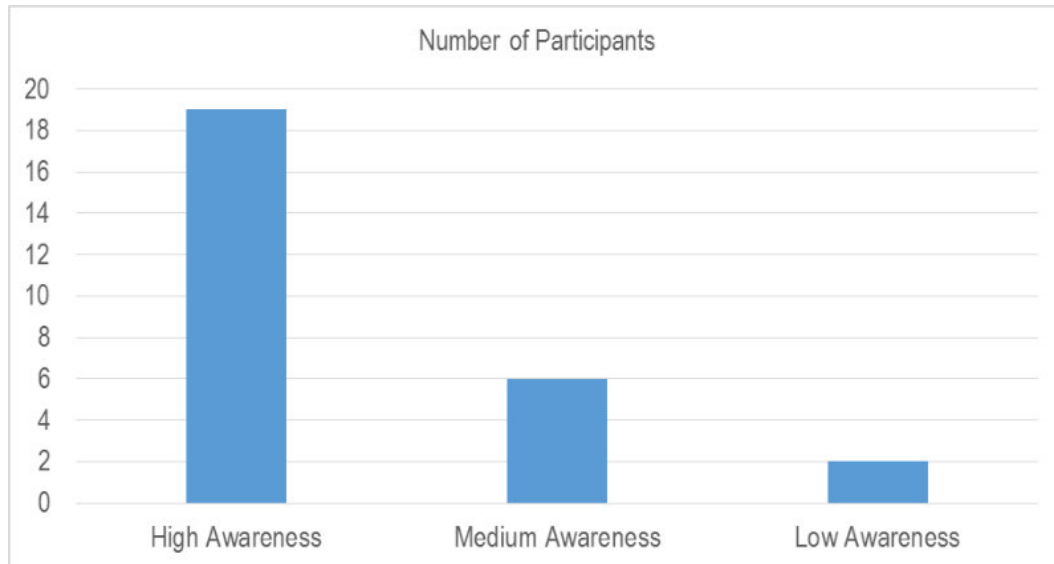
Figure 6.6 Endangered Species Awareness Among Participants, 2017

6.3   Guestbook

Visitors who visited the booths get to sign and write their wishes or suggestions regarding environmental issues in Penang. From the guest book, we were able to gauge responses from the public with regard to their green practices and awareness. For example, some visitors suggested carpooling to reduce air pollution. About 170 people who signed and wrote in the guestbook.

Figure 6.7 Signing the Guestbook – Penangites Hope and Wish for Better Penang, 2017

6.4   Sustainable Transportation: Kahoot and Cycling Posters

Visitors who came to the Sustainable Transportation booth had a chance to test their knowledge on active transportation by playing the Kahoot game on their mobile phones. The objective of the game is to emphasise the importance of active transportation in Penang as well as to create awareness that there is an alternative to the common car-centric culture plaguing Penang. There was about 68 visitors mainly young people who were interested in the game. As shown in Table 6.1, 52 % of participants managed to get correct answers.

Table 6.1 Kahoot Online Game Result

Total Players	68
Questions	12
Overall Performance	
Total correct answers (%)	51.72%
Total incorrect answers (%)	48.28%

Figure 6.8 Open Day Participants Participating the Kahoot Online Game
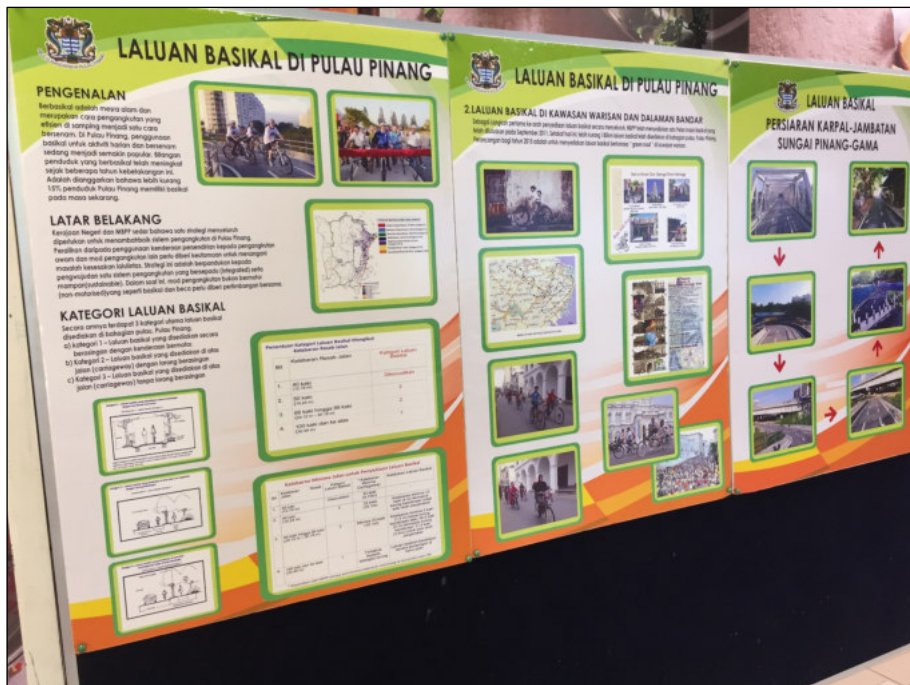
Figure 6.9 Few MBPP Posters on Cycling

Cycling is a potential alternative transportation in Penang. Currently cycling in Penang is more of a recreational activity rather than a mode of transportation. Hence, the display of cycling posters was to educate and inform visitors on cycling activities and infrastructures in Penang. The cycling activities include campaigns on the bike lanes; cycling infrastructures such as bike lanes, cycling bridge, sharrows, and bike parking; and cycling events. The goal is also to encourage visitors to opt for cycling as a mean of commuting. The activities at the Sustainable Transportation booth aim to cover SDG 11 and SDG 13.

6.5 The Sustainable Development Goals (SDGs) Block

The display of SDGs block was to educate the public about SDGs. The blocks were designed in attractive colours to capture the attention of visitors to PGA. Volunteers were prepared to answer questions from visitors about SDGs.17 SDGs attracted visitors, and they read the goals and learnt the SDGs.

Figure 6.10 The Sustainable Development Goals (SDGs) Blocks

6.6   Poster: Ecosystem Services (Physical Environment)

Situation 1: Unsustainable Catchment Management
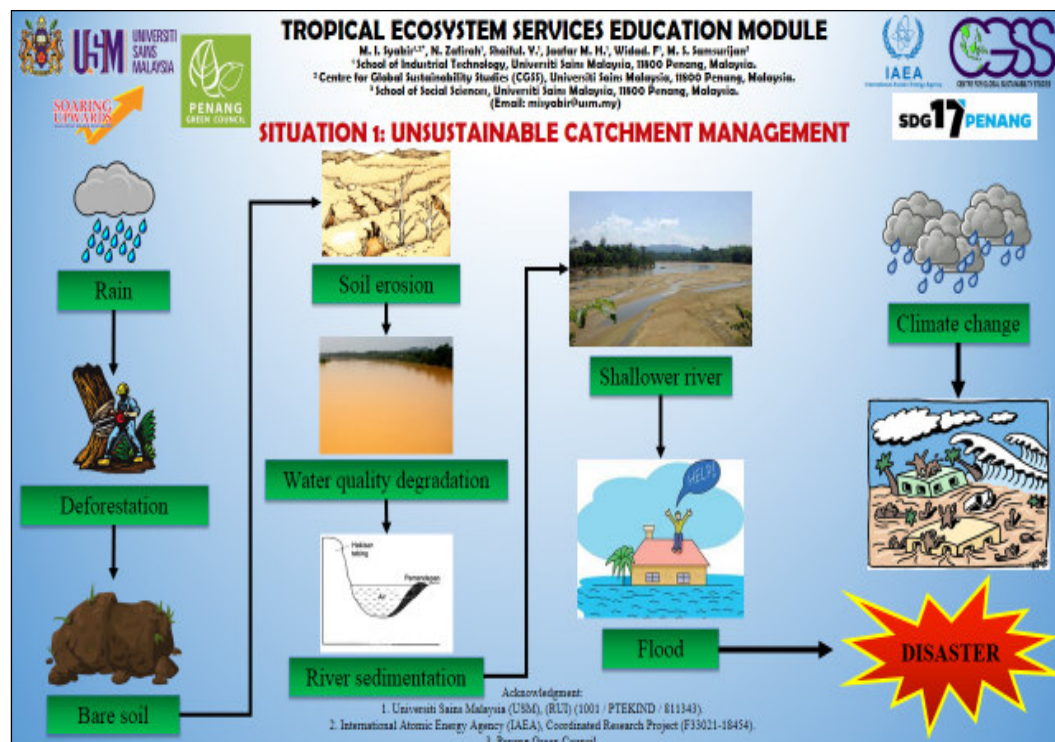
Figure 6.11 Unsustainable Catchment Management Practices

Rainfall is a natural phenomenon in the regional water cycle. However, deforestation can undermine the ecosystem services where absent of interception services from the tree canopies may allow direct rainfall impact to bare land leading to massive soil erosion, increase surface runoff and deteriorate water quality. In addition, rampant development without proper environmental impact assessment may result in the destruction of riparian zone along riverbanks and contribute to massive sedimentation in the river. Accumulative sedimentation, in the long run, will cause a shallower river and make it vulnerable to flood disasters.

Situation 2: Sustainable Catchment Management
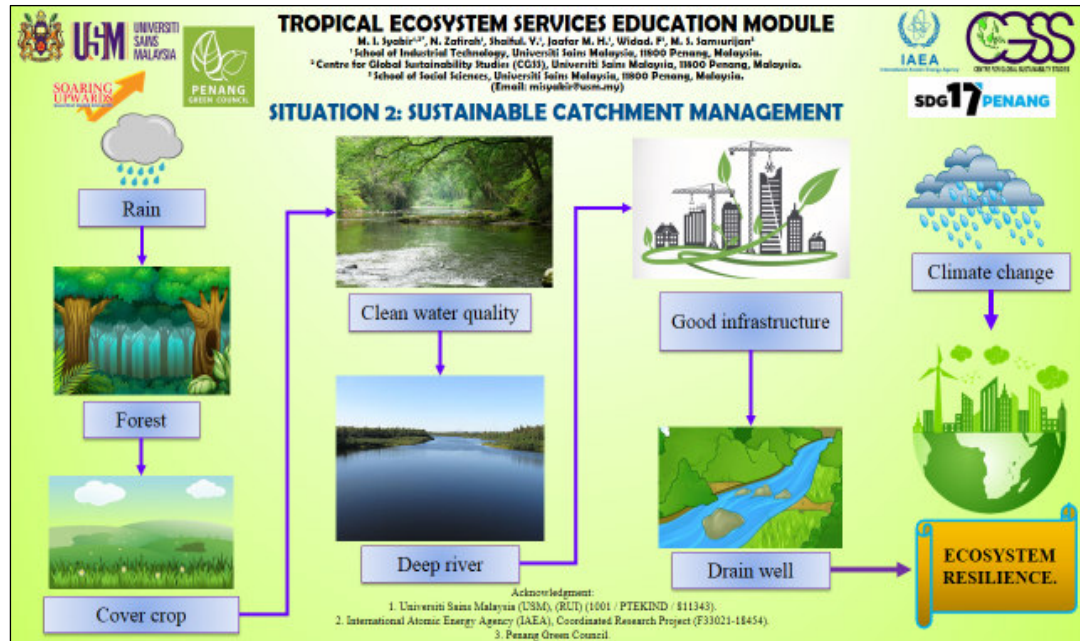
Figure 6.12 Sustainable Catchment Management Practices

Situation two demonstrates a sustainable catchment management flow chart. During monsoon season, Malaysia receives high amounts of rainfall. Nonetheless, with the presence of natural forest, it acts as a sponge to absorb the raindrops impact, later, channel the water flow via interception and infiltration processes, hence, improves water circulation system in soils. Such systematic ecosystem services reflect the roles in supporting the region, regulating the process systematically and provisioning the natural value to humanity (i.e., free fresh water with high-quality).

Figure 6.13 Public Education on Catchment Management Practices

6.7 Combat Disaster Game

The combat disaster game comprises three activities.

   i.   Word search: to think and focus on deforestation and flooding issues.

  ii.   Matching: Understanding the cause-and-effect of deforestation and flooding by matching related pictures to the provided spaces.

 iii.   Fill in the blank: Capturing general public opinion on how to address issues of deforestation and flooding.

6.7.1. Word Search: To Think and Focus on Deforestation and Flooding Issues

Cause of deforestation and flood

Instruction: Participant is required to search and circle the words in the puzzle

V	H	P	E	M	E	N	D	A	P	A	N	S	U	N	G	A	I	L	P	O	G	J	D	L
A	L	B	N	M	D	S	I	S	E	K	D	W	D	Z	Q	F	E	A	J	H	U	J	A	N
M	C	B	H	P	I	O	W	R	M	O	N	S	U	N	D	O	P	C	H	O	A	G	I	O
K	L	D	F	E	J	K	L	I	U	T	Y	O	P	S	D	G	H	J	K	L	W	T	K	P
L	P	E	R	N	I	A	G	A	A	N	D	Z	Q	F	E	A	J	D	Z	Q	F	P	V	E
P	E	A	L	I	N	M	D	S	S	L	U	N	D	O	P	C	H	U	N	D	O	E	A	N
E	R	M	C	N	H	U	I	T	G	P	E	M	B	A	N	G	U	N	A	N	A	R	M	I
R	L	V	A	G	A	O	A	A	I	K	J	H	G	T	F	D	Y	O	Y	M	D	T	K	N

T	O	A	S	K	D	M	D	P	F	P	E	M	B	A	L	A	K	A	N	A	J	A	L	G
Y	M	M	K	A	H	I	O	A	P	E	S	D	N	A	J	R	E	I	G	C	A	N	P	K
U	B	A	L	T	N	M	D	K	I	N	V	A	L	B	N	M	D	S	I	A	L	I	E	A
I	O	M	F	A	A	H	K	P	I	C	A	D	R	T	I	P	A	K	L	I	C	A	R	T
J	N	K	L	N	F	G	J	E	L	A	M	K	L	D	F	G	J	K	L	K	L	N	T	A
H	G	A	L	S	N	M	D	R	I	I	K	A	L	B	N	M	D	S	I	A	L	Y	Y	N
G	A	G	O	U	G	I	K	L	H	R	T	F	D	Y	A	L	B	N	M	D	A	O	U	P
F	N	K	M	H	F	F	T	A	O	A	L	M	H	G	M	C	B	H	U	I	S	P	I	A
D	A	L	G	U	O	P	E	N	K	N	G	A	T	A	A	L	B	N	M	D	F	E	J	R
S	I	O	X	B	M	I	E	C	A	G	E	R	Y	I	L	H	F	A	Q	E	H	N	H	A
Y	P	E	A	H	C	V	E	O	I	L	A	S	E	T	R	A	J	A	K	U	T	E	G	S
O	L	J	P	E	M	B	I	N	A	A	N	J	A	L	A	N	R	A	Y	A	Y	B	F	L
E	R	T	U	O	P	D	F	G	H	S	L	O	E	A	O	P	P	J	S	D	U	A	D	A
G	P	E	R	U	B	A	H	A	N	I	K	L	I	M	S	D	O	Y	U	H	L	N	S	U
O	A	G	I	K	J	H	G	N	F	E	Y	O	L	D	H	K	P	W	I	G	O	G	Y	T
M	D	F	F	T	Y	O	P	L	M	R	G	F	D	E	A	F	G	H	T	E	D	A	A	N
O	A	G	A	F	G	H	U	T	R	E	D	X	Z	B	N	M	L	O	K	V	A	N	C	S
M	D	F	P	E	M	B	U	K	A	A	N	E	M	P	A	N	G	A	N	A	R	H	A	U
Y	A	S	T	Y	I	G	H	D	E	T	J	K	A	R	W	R	T	I	O	M	A	U	M	A
O	L	O	N	G	K	A	N	G	T	E	R	S	U	M	B	A	T	O	U	K	T	T	K	E
G	A	A	H	C	V	E	K	I	O	A	G	T	A	O	A	G	I	K	J	L	U	A	A	T
K	H	U	T	R	E	D	X	Z	M	D	F	O	P	E	G	K	N	G	A	P	T	N	D	Y
P	E	M	B	U	K	A	A	N	T	A	N	A	H	B	A	R	U	X	U	E	I	U	R	T

CAUSE OF DEFORESTATION	CAUSE OF FLOOD
Agriculture	Rain
Mining	Monsoon
Development	Clogged Drains
Logging	River Sendimentation
Tourism Spots	Deforestation
Businesses	Increase in Temperature
Road Construction	Glaciers Melting
Dam Development	Sea level rise
Land Development	Climate change

Figure 6.14 Template of work search activity

6.7.2. Matching: Understanding the Cause-and-effect of Deforestation and Flooding by Matching Related Pictures to the Provided Spaces.

Bahagian 2
Kesan penebangan pokok dan banjir
Arahan: Pilih jawapan betul dan tuliskan jawapan di dalam ruangan yang disediakan.

Kesan penebangan pokok	Kesan banjir
	1.
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.
	10.
	11.

Hakisan tanah Land erosion	Banjir Flood	Pemanasan global Global warming	Tanah runtuh Landslides
Kesan rumah hijau Greenhouse gas effect	Kualiti air terjejas Affected water quality	Kehilangan nyawa Loss of live	Pemendapan sungai River sedimentation
Perubahan iklim Climate change	Tiada bekalan eletrik No electricity source	Bawaan penyakit Infectious disease	Pencairan glasier Glacial melting
Peningkatan paras laut Sea level rise	Kehilangan tempat tinggal *Homeless*	Tiada bekalan makanan No food supply	Tiada bekalan air bersih No clean water supply
Kerosakan harta benda Property damage	Ekonomi menjadi lumpuh Economic downfall	Kemusnahan tanaman Plant destruction	Terputus hubungan Disconnected
	Habitat flora dan fauna terjejas Flora and fauna habitat disruption	Hilang punca pendapatan Loss source of income	

225

Figure 6.15 Template of matching activity
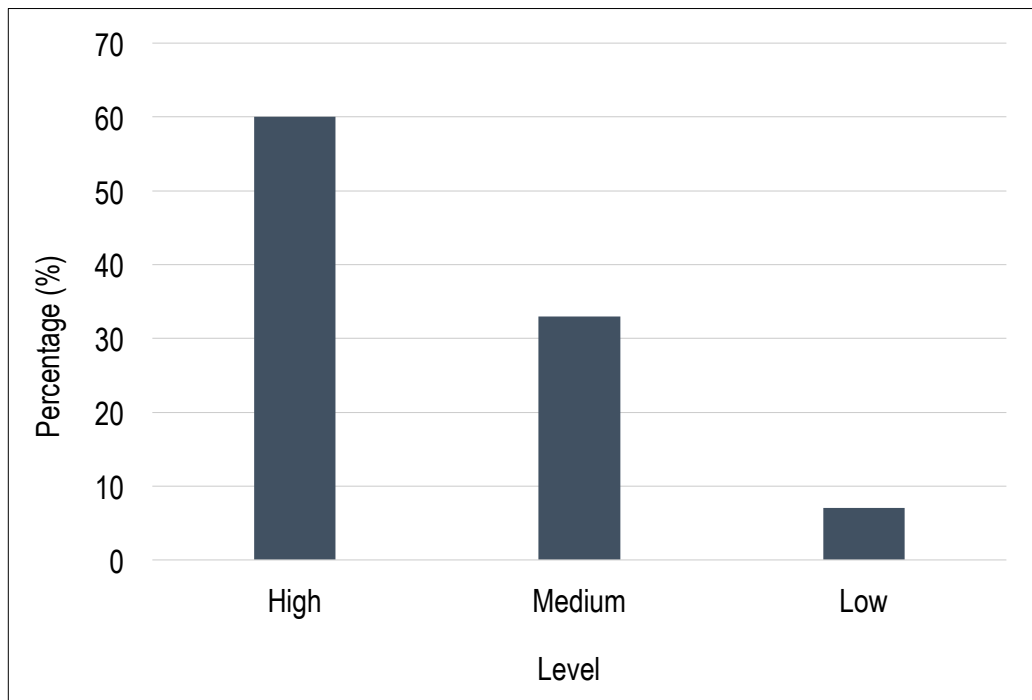
Figure 6.16 Public Understanding of the Impact of Deforestation and Flooding o Humanity

Figure 6.16 illustrates the percentage of participants on the understanding of the impact of deforestation and flooding on humanity. According to the chart, 60% of the participants understand the impact of deforestation and flooding on human beings. About 33% of the participants scored medium marks while only 7% of participants scored low marks.

6.7.2   Fill in the Blank: Capturing Public General Opinion on How to Address Issues of Deforestation and Flooding.

Section 3

How to solve deforestation and floods

Instruction: State how to solve deforestation and flood issues in Malaysia

Table 6.2 Template of Fill in the Blank Activity

How to solve deforestation issue	How to solve flood issue
	1.
	2.
	3.

The activity was divided into deforestation and flooding. Participants were requested to provide five answers on how to address deforestation and flood issues. The aim was to capture public opinion on current deforestation and floods issues.

Figure 6.17 shows the percentage of public opinion on addressing deforestation issues. Stakeholder involvement appears the highest with 27% respondents. Under the stakeholder involvement, enforcement is a popular solution followed by an awareness campaign. Sustainable development ranked the second highest where 23% respondents wanted comprehensive impact assessment for land clearing activities, urbanisation, logging activities, dam construction and road constructions.
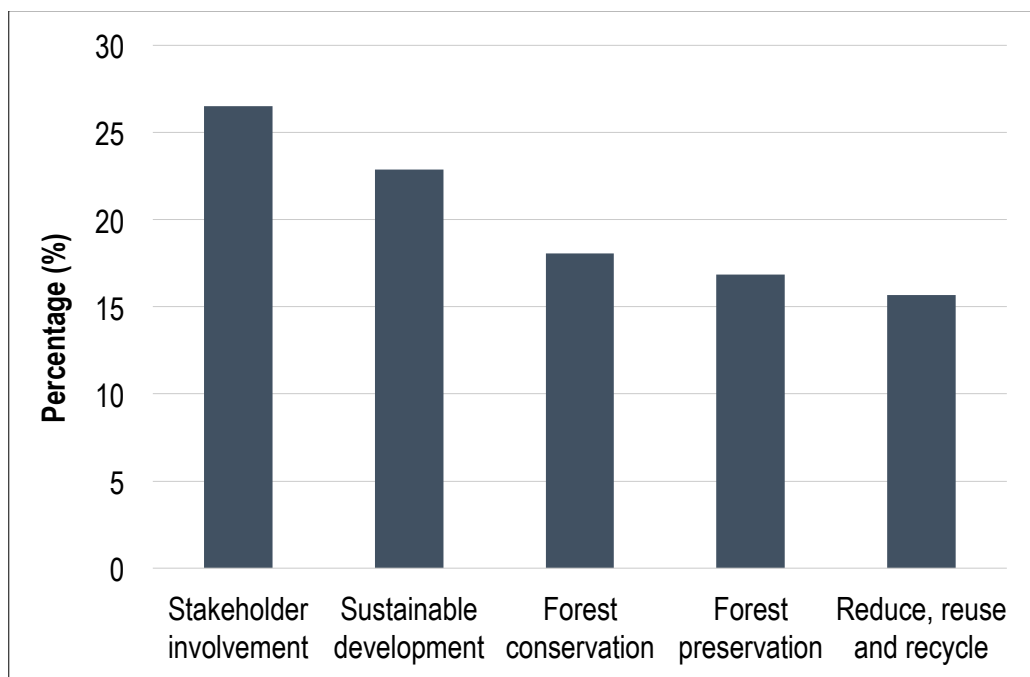
Figure 6.17 Percentage of public opinion on how to address deforestation

Forest conservation was in the third rank with 18% respondents expressing their concern. Afforestation or trees replanting activities was the popular suggestion. About 17% of respondents believe in forest preservation. In addition, 16% of respondents support reduce, reuse and recycle (3R) practices in reducing deforestation. 3R is believed to reduce current consumption of natural resources such as trees for paper, furniture and other wood products.

Figure 6.18 demonstrates the percentage of public opinion on flood mitigation. Five major ideas were captured. Improving drainage system appears the highest (49%) followed by

waste reduction and recycle (21%), forest protection (14%), sustainable land use activities (9%) and awareness (7%).
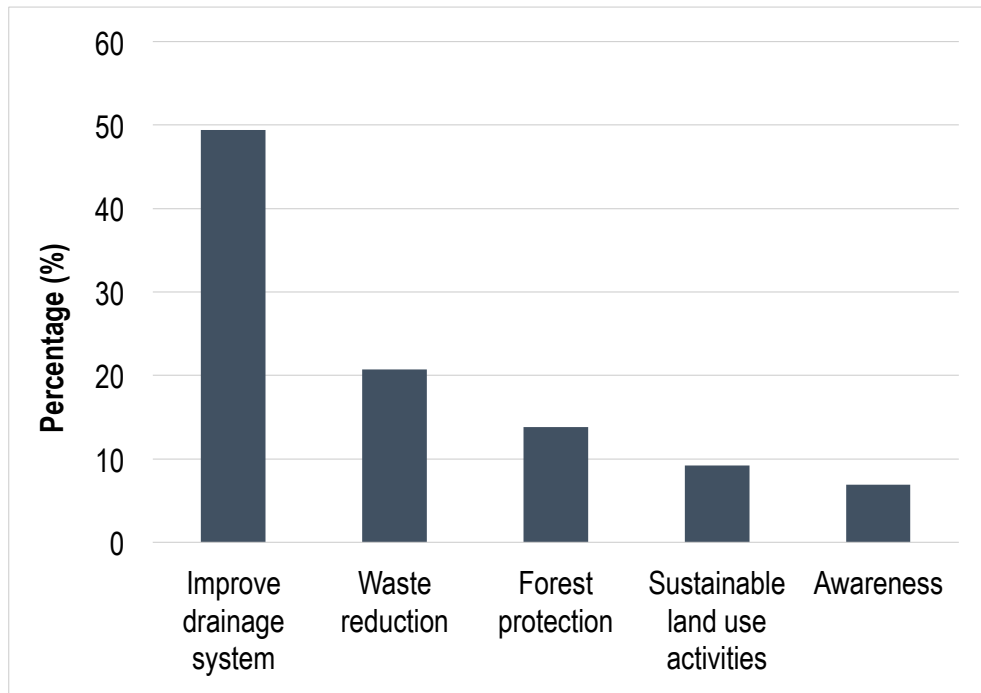
Figure 6.18 Percentage of public opinion on flood solutions

6.8   Mapping of Environmental and Developmental Issues

Sixty-two respondents participated in this activity. They were requested to identify any problems across Penang (Timur Laur (TL), Barat Daya (BD), Seberang Perai Utara (SPU), Seberang Perai Tengah (SPT) and Seberang Perai Selatan (SPS)). The respondents were requested to write the identified problems in a small piece of paper and spot (stick) it on the provided map.

Figure 6.19 Visitor Posted Sticky Notes on Environmental Issues on the Penang Map

6.9   Colouring and Drawing

The open day also organised a colouring (9 to 12 years old) and drawing contest (4 to 8 years old) with selected themes "The Colours of Hope and "Sustainability: The future we want", respectively (Figure 5.21 & 5.22). It is a soft call to action to end poverty, to live in harmony with nature and enjoy peace and prosperity.

Figure 6.20 Kids Colouring Contest
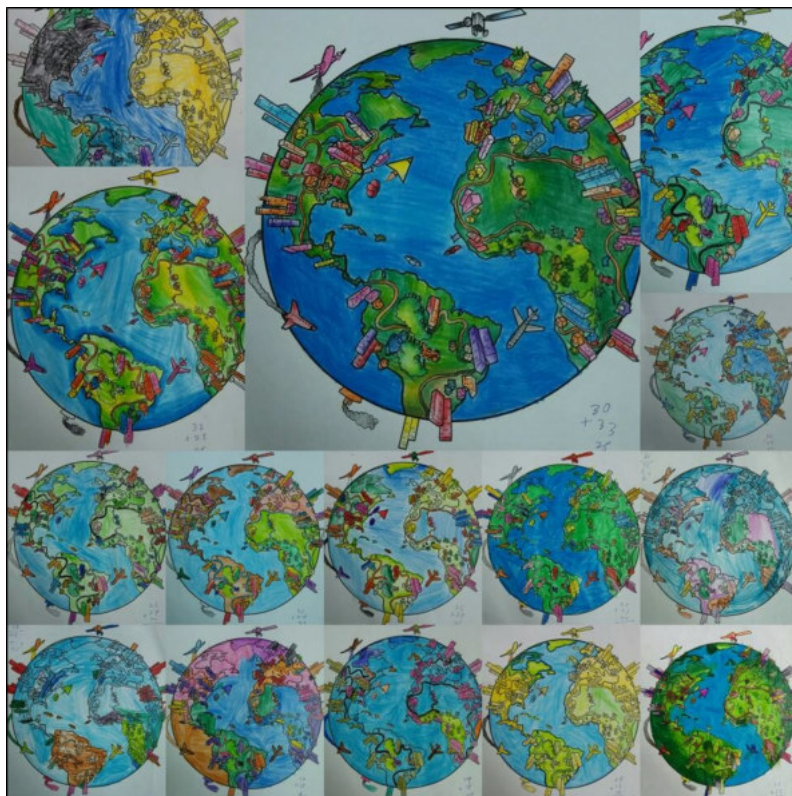
Figure 6.21 The Colours of Hope

Figure 6.22 Poster sustainability: the future we want

6.10   Vertical Planting

The objectives of the 'Vertical Planting Booth' are as follows:

i.   To educate the general public that limited space can be maximised and gardening can still take place in very small and compact areas/spaces (i.e., balcony, patio, etc.)

ii.   To teach the general public how to cultivate their plants/herbs which in turn encourage them towards responsible production and consumption of food.

iii.   To teach the general public how to grow their plants/herbs to ensure food security albeit in a small-scale.

iv.   To share with the general public how to enhance the visual appeal and beauty of one's balcony garden/patio garden/etc.

v.   To inform the general public on how to 'soften' the hard, cold and concrete surfaces of the balcony/patio/etc. by cultivating plants/herbs as well as to improve one's indoor and outdoor air quality with the presence of plants.

To achieve the above objectives, the 'Vertical Planting Booth' organised activities such as "Easy Steps to Kick-start Home Gardening," "Effortless Plants & Herbs to Cultivate for Balconies and Indoor Areas" and "Maintenance & Upkeep of Your Plants."

Figure 6.23 Vertical Farming Demonstration, 2018

Chapter 7
Scope of PGA

The scope of PGA is derived based on the analysis from the primary data collection (focus group discussion and interviews) and secondary data collection from the survey.

7.1   Scope of PGA Against SDGs

Tables 7.1 and 7.2 present a summary of PGA scopes based on the themes gathered from the qualitative and quantitative analysis as per discussions in the previous chapters. As could be seen in Table 7.1, all SDGs are discussed in at least one category of either current issues, current practices, current challenges, future issues and future challenges. This table combines all the summary table as explained in the previous chapters. The red SDGs are the eight SDGs originally identified under the PGA scope by PGC. It could be concluded that all SDGs are relevant in shaping PGA. As emphasised in the Penang Green Symposium as well as in the UN Habitat conference, shaping the green agenda is a holistic approach that encompasses all SDGs and not just limiting policy's focus on selected SDGs. It is through the realisation and accomplishment of all SDGs that the quality of life would be enhanced.

Incidentally, it is important to note that while Penang has been applauded as a state that has the lowest poverty incidence, poverty remains a relevant issue. Under SDGs 1 and 2, issues pertaining to socioeconomic and agriculture are closely linked with the B40, M40, vulnerable as well as poor households. In ensuring that the objectives of both SDGs are achieved, both current, and future challenges acknowledged the importance of issues under policy matters to be relooked, strengthened or revamped.

From Table 7.1, it could be interpreted that SDG 11, sustainable cities and communities be treated as the most important SDGs given the many issues discussed fit in many of the themes. The themes being discussed under SDG11 that fall under current issues, current practices, current challenges, future issues and future challenges include policy matters, built environment, transportation, waste management, land matters and biodiversity.

Hence, to ensure comprehensive coverage of PGA, its focus should be on all the 17 SDGs.

The rank of the priority for the SDGs is as follows:

SDG 11 Sustainable cities and communities

SDG 06 Clean water and sanitation

SDG 07 Affordable and clean energy

SDG 09 Industry, innovation & infrastructure

SDG 01 No poverty

SDG 12 Responsible consumption and production

SDG 13 Climate action

SDG 14 Life below water

SDG 16 Peace, justice and strong institutions

SDG 02 Zero hunger

SDG 03 Good health & well-being

SDG 04 Quality education

SDG 17 Partnerships for the goals

SDG 08 Decent work and economic growth

SDG 10 Reduced inequalities

SDG 05 Gender equality

SDG 03 Good health and well-being

Table 7.1 Summary of PGA Scope against SDGs

	Current Issues	Current Practices	Current Challenges	Future Issues	Future Challenges
SDG 1. No poverty	SE	SE, WM	SE, IG	-	SE
SDG 2. Zero hunger	SE	AGR, WM	AGR, LAND, BIO	-	AGR
SDG 3. Good health & well-being	SE, IG	SE	IG, SE, TRANS, AGR, SE	SE	SE
SDG 4. Quality education	SE, IG, AGR	SE	IG, SE, BE, WM,	SE	SE
SDG 5. Gender quality	SE	SE	IG	-	-
SDG 6. Clean water & sanitation	WM, BE, IG	BE, WM	WS, SE, WM	WS	-
SDG 7. Affordable and clean energy	ES, TRANS	BE, TRANS, WM	ES	ES	ES, AGR

	Current Issues	Current Practices	Current Challenges	Future Issues	Future Challenges
SDG 8.Decent work & economic growth	SE	SE	SE	-	SE
SDG 9. Industry, innovation & infrastructure	BE, IG	BE, TRANS	BE, SE	AGR	AGR
SDG 10. Reduced inequalities	SE, AGR	-	-	SE	SE
SDG 11. Sustainable cities & communities	BE, IG, TRANS, WM, LAND, SE	AGR, BE, TRANS, WM	BE, TRANS, LAND, BIO, WM, SE	BE, LAND, BIO, IG, TRANS, SE, DIS	WS, WM, BE, TRANS
SDG 12. Responsible consumption & production	SE, WM	AGR, SE, WM	-	IG	-
SDG 13. Climate action	DIS, TRANS, BIO, BE	BIO, BE	SE	-	IG
SDG 14. Life below water	BIO, IG, LAND, WM, AGR	BIO, WM, WS	BIO	WS	WS
SDG 15. Life on land	BIO	BIO	BIO	BIO	-
SDG 16. Peace, justice & strong institutions	BE, IG		IG	-	IG
SDG 17. Partnerships for the goals	SE	BE, IG	IG, SE, BE	POLICY	IG, DIS, SE

Note: The highlighted SDGs are the original eight focuses of PGA

7.2 Scope of PGA Against Identified Themes

From the discussions of the previous chapters, Table 7.2 provides a summary of the identified themes for current issues, current practices, current challenges, future issues and future challenges. This table is derived based on the collection of issues discussed during focus group discussions, in-depth interview and public survey for all the five scenarios. The diamond in every cell indicates that the relevant stakeholders had discussed the issue and identified as being important in the public survey.

Table 7.2 Summary of PGA Scope Against Themes

	Current Issues	Current Practices	Current Challenges	Future Issues	Future Challenges
Socioeconomic Issues	◆	◆	◆	◆	◆
Built Environment	◆	◆	◆	◆	◆
Waste Management	◆	◆	◆	◆	◆
Transportation	◆	◆	◆	◆	◆
Biodiversity	◆	◆	◆	◆	◆
Agriculture	◆	◆	◆	◆	◆
Land Matters	◆		◆	◆	
Water Security		◆	◆	◆	◆
Energy Security	◆	◆	◆	◆	◆
Disaster	◆			◆	◆
Institution & Governance	◆	◆	◆	◆	◆

As could be seen, policy matters, socioeconomic issues, built environment, waste management, biodiversity and agriculture are mentioned, discussed and iterated under all the five scenarios. This makes these themes the key areas of concentration for PGA. From the table, it could be concluded that land matters is the least important issue for PGA as it is only discussed under current issues.

Nevertheless, it is important to remember that while some issues receive great concern from certain stakeholders as opposed to other issues, careful and caution interpretations of their significance and importance need to be addressed due to the limitation of number of respondents, restriction of contents discussed limited by knowledge of the participants and level of awareness of participants in any of the issues during focus group discussions and in-depth interviews.

Ideally, PGA should focus on all the 12 themes discussed. Nevertheless, the rank of priority of the themes is as shown in Figure 7.1. The top six issues are policy matters, socioeconomic issues, built environment, waste management, agriculture and biodiversity. These four are the common issues raised by stakeholders for current issues, current

practices, current challenges, future issues and future challenges. Other themes that are worth considering are transportation, water security, energy security, leadership and disaster. The least issue being raised is land matters. Tables 7.3 – 7.14 provide a summary of the issues discussed for each theme.
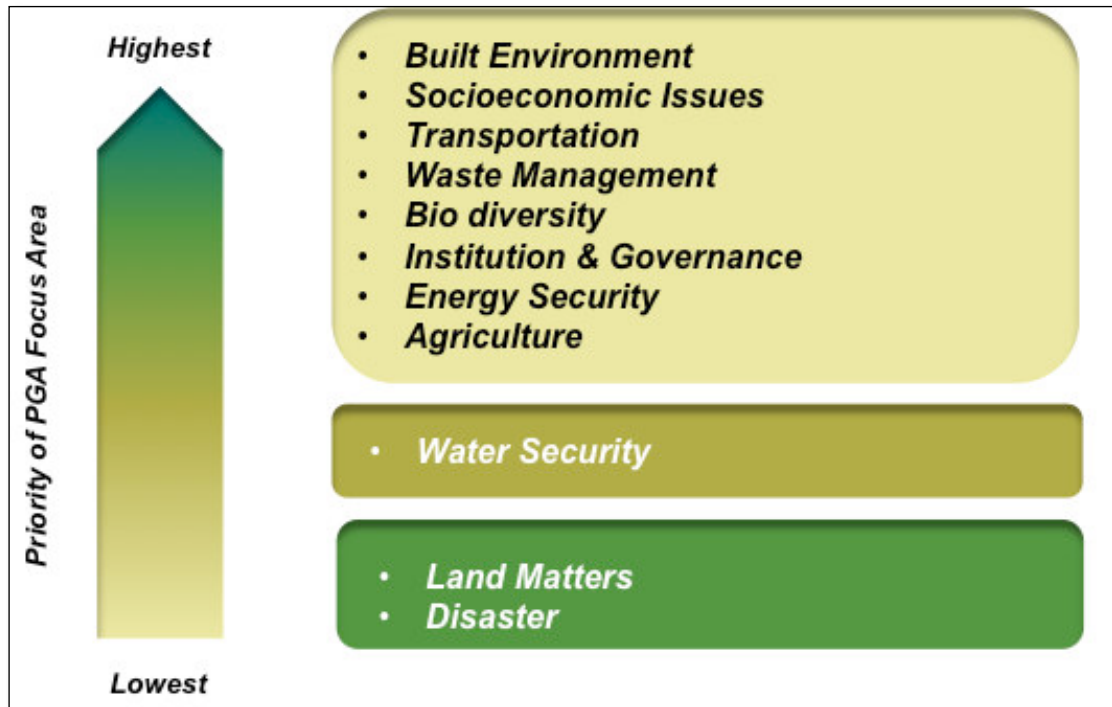
Figure 7.1 Priority of PGA Focus Area

Table 7.3 Summary of Issues for PGA Focus Area – Institution and Governance

INSTITUTION AND GOVERNANCE

Rules and regulations
  a. The integrated waste management system
  b. Strict enforcement to enforce changes (on green practices) among the public
  c. Introduce education on sustainable development, climate change into school curricular
  d. Unpopular agenda
  e. Some development goals do not get full support from the public
  f. The limited capacity of authority to maintain rules and regulations
  g. Equitable policy on women holding positions in public offices

Enforcement
  a. Unclear terms and conditions on the eligibility of welfare assistance program
  b. Political support and interference
  c. Cooperation and collaboration with state and federal agencies
  d. The high cost of healthcare due to spread and control of communicable and non-communicable diseases
  e. The high cost of welfare assistance programs
  f. High cost to organise regular environmental programs and activities
  g. Standard procedures laid by Federal agencies are perceived as not good enough
  h. Not all local authorities comply with state / national policies
  i. Individual resistance to change – requires strict enforcement
  j. Continuous enforcement and monitoring
  k. Climate change action plan for Penang

Leader
  a. No leader talent in environment
  b. Lack of political will among policy makers
  c. Lack of suitable leader in public institutions
  d. Need to have visionary leaders

Table 7.4 Summary of issues for PGA focus area – socioeconomic issues

SOCIOECONOMIC ISSUES

Welfare programs
  a. Programs and assistance for the poor and vulnerable (homeless, single mother, women, beggar)
  b. More assistance to a low-income group
  c. Accessibility of health services
  d. Welfare protection for all
  e. More focus on the vulnerable such as single mothers and the poor
  f. Conditional welfare program – schooling for children from low-income families
  g. Welfare-oriented government – ability to provide affordable and universal health care
  h. Dependence on social assistance program, particularly financial assistance

SOCIOECONOMIC ISSUES

Marine resources
a. Depletion of marine resources that cause a hike in prices (inflation of marine prices)

Health issues
a. Communicable diseases with regard to immigrants
b. Exposure to chemical hazard
c. Risk of asthma due to air pollution

Facilities
a. Limited fire stations

Individuals attitudes
a. Urban poor attitude with regard to poverty
b. Awareness of environmental issues (society and developers)
c. The low attitude on 3R practices
d. Food wastage
e. Continuous usage of plastic bags
f. Lifestyle (homeless)
g. 'Don't care' attitude
h. 'Not at my backyard' attitude
i. Not practising 'prevention is better than cure' attitude
j. Not practising a healthy lifestyle (organic farming)
k. Individuals behaviour that river cleanliness
l. Violators of responsible consumption

Employment
a. Competitive employment opportunities (local vs. foreign)
b. Tailored to the needs of local industries

Culture and value
a. Extinction of small villages
b. Loss and threats of heritage loss
c. Negative sentiment towards NGOs
d. Simple education to change mindset and culture of individuals and communities
e. Low awareness on environment issues
f. Limited practices among the general public, developers and students even if they have some level of awareness
g. Comprehensive and lifelong learning on green practices extended from just school to all communities
h. Limited or non-existence education in environmental education, online business education and waste management
i. Smartphone usage (being too individualistic)

Opportunity in the services sector
a. Competition on retail services – hypermarket reduces the opportunities for small businesses

Funding
a. Limited funding for state and local activities

SOCIOECONOMIC ISSUES

Housing
  a. Affordable housing
  b. Non-transactional housing
  c. Oversupply of high priced houses

Population
  a. High population
  b. Reduction of rural-urban gap

Resources
  a. Sharing of resources among community

Innovation
  a. Innovation on the online business packaging
  b. Alternatives for a cleaner environment (reduce air and water pollution)
  c. Branding, packaging and marketing of local products
  d. Costing and sustainable supply for local retailers and businesses

Compensation due to development
  a. Land/property taken over by the government for development (LRT) project
  b. Relocation of community
  c. The well-being of affected community
  d. Housing needs to be in proportion to the population

Empowerment programs
  a. Need to empower the vulnerable groups – homeless
  b. Equal opportunities for vulnerable groups, single mothers and B40

Immigrants / foreigners
  a. Risk of communicable diseases brought by immigrants
  b. Foreigners purchase a house in Penang for investment purposes
  c. Foreign workers (immigrants) running small businesses
  d. Immigrants immunisation

Income distribution
  a. Equitable income distribution

Community involvement and engagement
  a. The inability of government to get public support for government-related programs and activities
  b. Responsibility to inculcate environmental values to children is a shared responsibility of the community (parents, teachers, community)
  c. NGOs are over concerned
  d. Issues of environment frequently raised by NGOs instead of relevant authority
  e. Penangites are active in voicing out their disapprovals and involve in protests over matters to their dissatisfactions
  f. Industry – Community linkages
  g. Active public participation in decision-making processes

Table 7.5 Summary of Issues for PGA Focus Area – Built Environment

BUILT ENVIRONMENT
Facilities a. Limited and non-comprehensive facilities for workers at construction sites b. Rainwater harvesting system c. Composting system for high-rise building
Infrastructure a. Adequate and safe Infrastructure for cyclists and pedestrians b. Old infrastructure – drainage system c. The unsystematic public transport system d. The high cost of Transport Masterplan e. A limited amount of road reserve for dedicated bus lane f. High cost to develop new infrastructure (new drainage system) g. Road safety h. Building more roads (Transport Master Plan) would lead to more traffic congestion
Green and open spaces a. Limited open spaces for recreation b. The limited capacity of the local council to manage green areas c. Plant more trees d. Preserve public green spaces
Cities and development a. Improper building development that leads to flash flood b. Sustainable cities c. Inappropriate area for development – high-density area, slope cutting activities d. Construction sites cause air and noise pollution e. Green Building Index – work towards making GBI a state policy f. Efficient management g. Imbalance urbanisation process (industrial areas vs. green areas) h. Control on development such as hill slope development i. Imbalanced development – overdevelopment in Penang and Penang Island specifically
Environmental knowledge and awareness a. Limited knowledge among architects on the universal design b. Increase number of environmental programs and activities c. Low awareness of the practice of vertical farming

Table 7.6 Summary of Issues for PGA Focus Area – Waste Management

WASTE MANAGEMENT

Improper and inefficient solid waste management
    a. Poor water quality
    b. Rubbish in river
    c. Polluted marine products

Waste management
    a. Solutions for cleaner waste (impurities from residential and industrial areas to rivers)
    b. Management of waste management in high-rise buildings
    c. Difficulty to implement segregation at source
    d. Lack of responsibility for waste disposal
    e. Limited landfill
    f. Limited capacity to manage organic waste management
    g. Waste segregation compound
    h. New waste disposal location

Table 7.7 Summary of Issues for PGA Focus Area – Transportation

TRANSPORTATION

Increase number of private vehicles
    a. Traffic congestion
    b. Pollution (carbon emission)

Alternative transportation   a. Find alternatives to reduce traffic congestion by encouraging alternative (carpool) and active transportation (cycling and walking)

Public transportation
    a. Better and efficient public transportation
    b. Inefficient public transportation
    c. Bus integrated system (BIS)
    d. Single pass to commute
    e. Encourage people to use public transportation

Parking facilities
    a. Reduce private parking areas
    b. Increase parking fees to discourage use of private vehicles

Table 7.8 Summary of Issues for PGA Focus Area – Agriculture

AGRICULTURE

Food security
    a. Depletion of marine resources
    b. Increase in marine prices
    c. Food wastage
    d. Sustainable model of aquaculture
    e. Appropriate master plan on the fishing industry

Technology and infrastructure
    a. Technology-driven by industry and farming
    b. Technology for urban farming
    c. The distance of poultry farm from residential areas
    d. Maintain active agricultural area
    e. Efficient modern pig farming

Table 7.9 Summary of Issues for PGA Focus Area – Biodiversity

BIODIVERSITY

Effect of development on biodiversity
    a. The decline in fish resources
    b. Extinction of fauna
    c. Destruction of forest habitat
    d. Sea/water pollution
    e. Disrupt mangrove growth

Activities that negatively affect biodiversity
    a. Deforestation
    b. Chemical and toxic discharge and spillage into the sea
    c. Land reclamation – limited control of its activity and its impact on food security
    d. Illegal logging

Activities that positively affect biodiversity   a. Plant more trees

Conflict of resources for development
    a. The conflict between wild animals and human beings
    b. The necessity of land reclamation for development that affects marine life and fish stock
    c. Land reclamation threatens life below the water

Table 7.10 Summary of Issues for PGA Focus Area – Water Security

WATER SECURITY

Sustainable water resources
    a. Dependence on Kedah for Penang water supply
    b. Lack of water catchment area
    c. Dissatisfaction over high water surcharges
    d. Adoption and implementation of rainwater harvest in residential areas
    e. An alternative source of water supply mechanism

Clean water and sanitation
    a. Solutions to reduce pesticides contamination in water catchment areas
    b. River life program for rehabilitation of polluted river

Table 7.11 Summary of Issues for PGA Focus Area – Energy Security

ENERGY SECURITY

Alternative and affordable energy
    a. The alternative energy source to reduce pollution: biomass, solar
    b. To meet the increasing demand for energy

Technology
    a. Lack of initiative and technology on green energy and practices
    b. Solar energy and the need of reducing its cost with the possibility to subsidise the cost of solar panel installation especially to small farmers
    c. Efficient technology for green energy

Table 7.12 Summary of Issues for PGA Focus Area – Disaster

DISASTER

Natural disaster
    a. Flood
    b. Climate change that leads to monsoon change, adverse weather, tidal effect, sea level rise
    c. Destruction of mangrove areas
    d. Coastal erosion
    e. Disaster risks management

Table 7.13 Summary of Issues for PGA Focus Area – Land Matters

LAND MATTERS

Land issues
    a. Land reclamation
    b. The focus on land development from Penang Island to Mainland – high-density population
    c. Limited land
    d. Intensified land use competition and conversion of agriculture land to industrial and residential areas
    e. Land acquisition for development – agriculture to residential

Chapter 8
Policy Implications

8.1   Role of Key Players

Policy implications for the Penang Green Agenda are examined through the lens of the Quintuple Helix model. Quintuple Helix is a pragmatic model developed and expanded from previous triple helix and quadruple helix models (Etzkowitz & Leydesdorff, 1995). The innovative model was introduced to understand the complexity of interactions between four important stakeholders involved in the PGA such as the government, industries, academic, and public. These stakeholders interact in a dynamic natural environment. According to Carrayanis and Campbell (2012), the Quintuple Helix can be potentially used to analyse the sustainable development and social ecology.
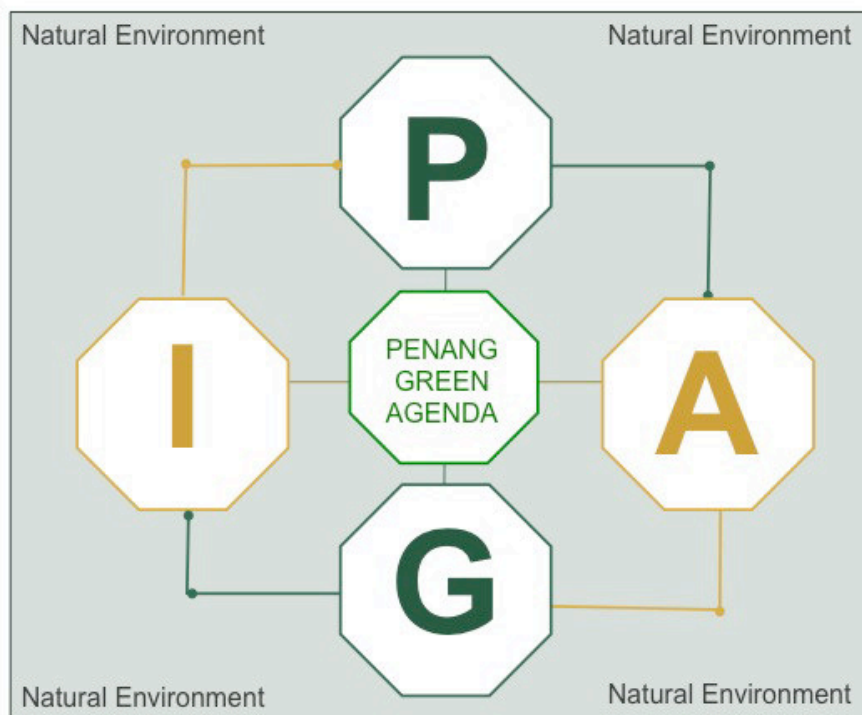
Figure 8.1 Principle of Quintuple Helix

8.1.1   Role of Government

The role of government cannot be stressed enough in making sure the Penang Green Agenda is a reality. Often, the government at state or local levels is considered to be the most significant stakeholder given their proximity to other stakeholders such as the industries

246

and academia. In fact, the Triple Helix model was designed to specifically examine the interactions between these stakeholders (Etzkowitz & Leydesdorff, 2000). According to Carrayanis and Campbell (2012), the interaction between these pivotal actors are required to promote and visualise a cooperation system of knowledge, know-how, and innovation for more sustainable development (Carayannis & Campbell 2010). By including the natural environment as a new subsystem to the knowledge and innovation model, "the knowledge production and creation of new innovation will be crucial for preservation, survival, vitalisation of humanity and the possible inventions of new green technologies" (Carayannis, Barth, & Campbell 2012, 5)

Typically, the way government used to conduct its business is hierarchically i.e., top-down approach. To remain relevant, the government can no longer afford to close its door to other stakeholders. Bottom-up theorists emphasise target groups and service deliverers, arguing that policy is made at the local level (Matland 1995, 146). Hence, it is a lot more effective than the top-down approach. The bottom-up approach is also applied to policymaking decisions and not necessarily during the policy implementation process. In other words, the bottom-up approach invites other stakeholders to participate in the decision-making process. This includes participation from stakeholders to revisit and restructure current environmental and developmental policies. To revisit and restructure current policies can be a lengthy and tedious process, but with proper planning and methods of public participation, the result can be encouraging.

In certain areas where improvements are necessary, coming up with new policies is a must. Understandably, making new policies can take time. However, if necessary changes need to happen in the future, new policies can be significant to provide better solutions to the current problems. For instance, two questions were asked in a public survey regarding policy implications. The first question was "How does Penang's rapid development affect the economy, society and environment?"
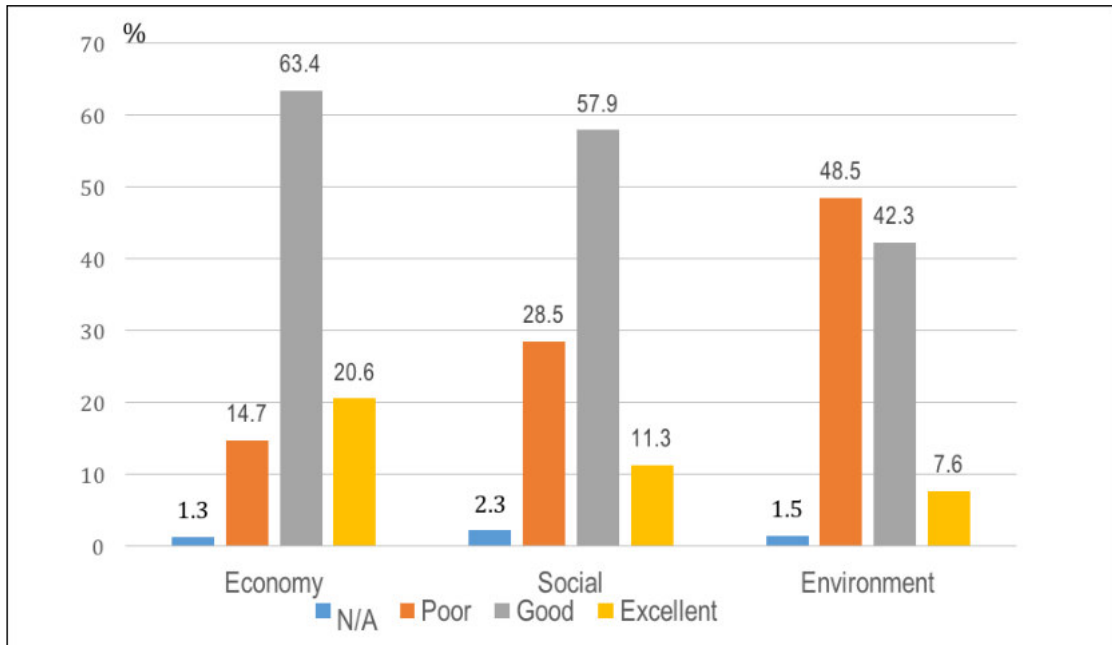
Figure 8.2 How does Penang's rapid development affect the economy, society and environment?

According to Figure 8.2, Penangites believe that rapid development in Penang has a positive impact on the economy (63.4 %) and society (57.9 %). However, it has had a negative impact on the environment (48.5%). This supports the environmental Kuznets curve theory where developing economies will have a negative effect on the environment. Given this situation, a stringent policy for the environment, which will balance the economic development and reduce its negative impact towards the environment can be considered by the government. The next question is related to policy implication "What is your opinion on the influx of immigrants in Penang?"
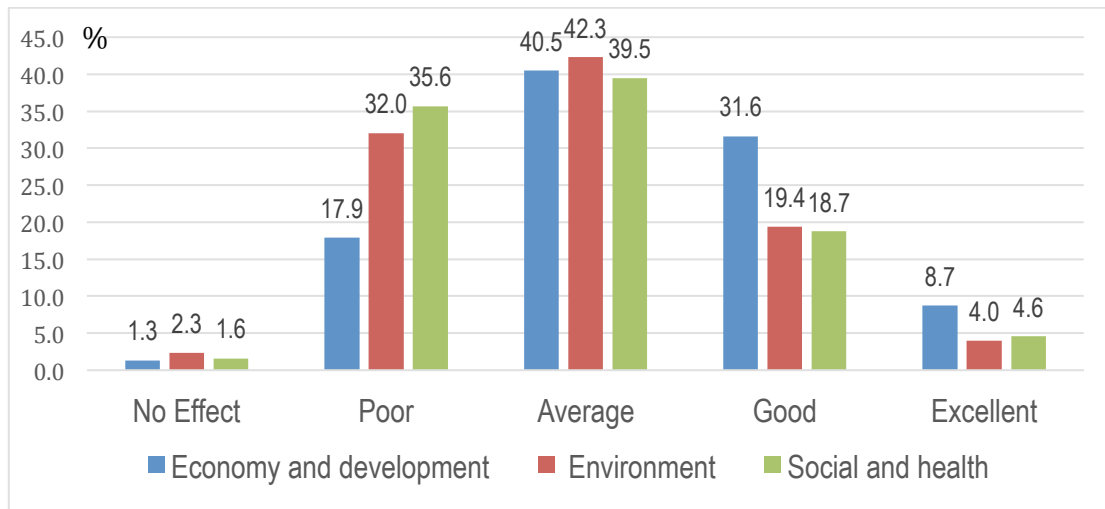
Figure 8.3 What is your opinion on the influx of immigrants in Penang?

The influx of immigrants in Penang was believed to give an average impact on the economy and development (40.5 %), environment (42.3 %) and society and health (39.5 %). Only 8.7% of Penangites believe that the influx of immigrant has an excellent impact on economy and development, environment (4.0 %) and society and health ((4.6 %). Most immigrants in Penang are the unskilled labour working in factories and construction sector. In this situation, the state government would not have many options given that immigration policy falls under the federal matters. As commented by one of the government officials,

> "Federal level is doing policy. Actually, who is the one who implements it? Actual implement. They have to implement it on the ground. Who are on the ground? Local authorities" (Public Sector)

8.1.2   Role of the Public

The public can be defined in several ways such as the citizens at large and the civil societies. It plays an important role to support any public policies. Their readiness to embrace and adopt sustainable practices are crucial to the success of green agenda. Based on the findings, it is clear that the public still has the attitude of "don't care" and "not-in-my-backyard" syndrome. While some of them realised and supported green practices, their willingness to adopt such practices in daily life is still lacking. One of the government officials lamented that,

> "...So we must have a proper planning, and then to me planning alone tak cukup. You have to...yang paling penting sekali ni, public. Public ni kena play

249

a role..attitude kena tukar. Kalau public tak tukar nak buat apa pun tak boleh"
(Public Sector)

... So we must have a proper planning, and then to me planning per se is not
enough. You need the public. The public needs to change their attitude. If
they cannot change the attitude, nothing could be done." (Public Sector)

Hence, how to get the public ready, change their attitude and get into action? For this,
awareness and education programs are important. While the government and other
stakeholders are doing this, it is pertinent to intensify the efforts. Equally important is the
incentive that comes with it. Perhaps, at some point, the carrot and stick approach might be
the option.

As mentioned elsewhere, the public also demanded more platforms for them to actively
participate in the policy-making processes. When the public is involved in policy making, they
will get a sense of "public ownership of policies, better decisions that are sustainable,
supportable, and reflect community values; agency credibility; less opposition; and faster
implementation of plans and projects" (Giering 2011, 10).

Civil societies do play significant roles in environmental awareness agenda. In fact, based on
our findings, civil societies in Penang are considered to be vibrant and played active roles as
a watch-dog to the government. While some NGOs do have collaborative roles with the
government (such as Penang Hills Watch and Bike On Fridays), dissatisfaction and qualms
among the NGOs abound.

Effective public participation is a crucial element in good governance. For instance, Health
Canada and International Association of Public Participation outline five levels of participation
towards effective public participation among stakeholders.

For PGA to be successful, it is important for the government to be at a high level of public
involvement (Level 5). This includes the fact that citizens need to be empowered and
educated. They need to know that their participation mattered and diverse representation will
have an impact on decisions (King et al. 1998). Figure 8.4 outlines five levels of participation

towards active public participation between stakeholders. Industries are required to widen knowledge sharing and practices with government, community and academia.
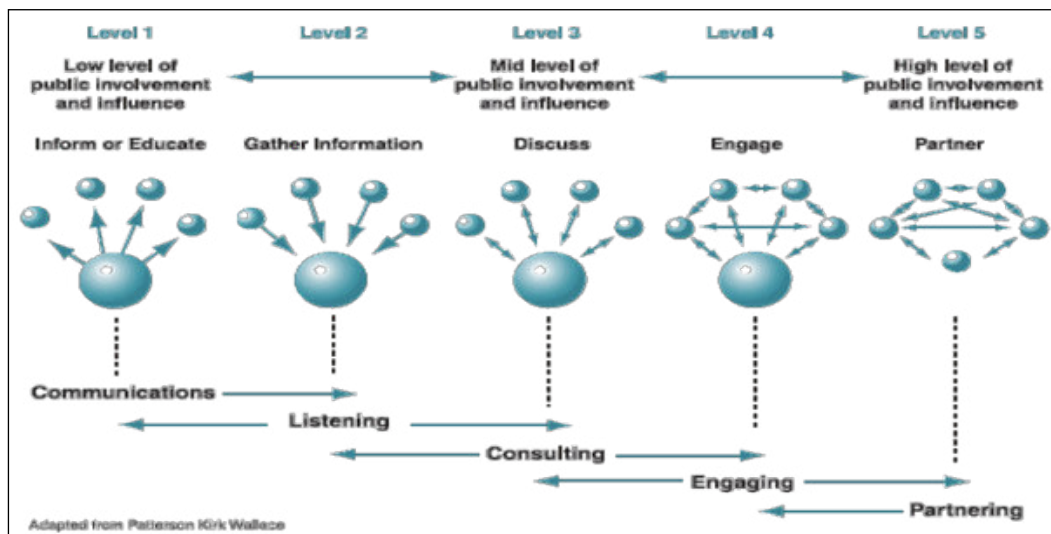
Figure 8.4 Five Levels of Participations towards Effective Public Participation

Source: Health Canada and International Association of Public Participation (2000)

8.2.3   Role of Industry

As an industry, they are the practitioners, and they might have a different experience and view as compared to the government servants and academia. For instance, in terms of technical expertise, they may share their current practices such as which technology they use for eco-friendly practices towards the waste management of the industries. One example of the knowledge sharing by industry with government and communities is the Korean Sharing program (KSP) which was launched in 2004. KSP was initiated by the Korean Ministry of Finance and Economy. KSP is a cooperation program where Korean shares their experience, skills and knowledge through research work and policy with Korea Development Institute (KDI) as a key role. KSP in Korea has general infrastructure for knowledge exchange where there are three critical points which is 1) knowledge forum to discuss and share on policy challenges 2) knowledge network involves three pivotal actors namely experts, practitioners and government officials and 3) knowledge platform which is a search-and-match platform that provides practical information on development solutions and case studies.

Industries are also required to intensify corporate social responsibility to the community. The industries could initiate a program which related to economic development and environmental awareness to schools and public. They could be a sponsor for environmental campaigns and programs which may require money for renting places, provide equipment and other materials for preparation. In addition, adhering to rules and regulations is crucial for industries. They should not deviate from the sustainable practices just for the sake of making profits. As mentioned in the previous chapters there were issues related to waste management by industries such as industrial waste and building material wastes. As mentioned by a government officer in the interview, a partnership for goals is important. In this case, a partnership for waste management is lacking. Waste management is among the most important issues in Penang.

> "...We think that is walkable, but we need a partnership for the goals. Without this partnership, yang saya kata 4P's tu kan., Public, Private, People, Partnership. People ni is important." (Public Sector)

> "...We think that is walkable but we need partnership for the goals. The four Ps., Public, Private, People, Partnership and People is important. (Public Sector)

8.2.4   Role of Academics

Academics are required to intensify research and development on green technology and environmental policy. Academicians are supposed to widen knowledge sharing (engagement) with the community. One example of knowledge sharing by academicians can be learned from the UK Knowledge Transfer Partnership. This project is funded partly by the UK government and Innovate UK. Innovate UK or formerly known as The Technology Strategy Board (TSB), is a brokerage organisation that enable companies, industry, academia to collaborate on innovative projects. KTP enables a business to bring in new skills and the latest academic thinking to deliver a specific, strategic innovation project through a knowledge-based partnership. It allows the businesses to develop better as they can obtain academic expertise that they do not have in-house. There are three ways of partnership in this program which is between businesses, academic and graduate. The academic institution

employs the recently-qualified graduate who works at the company. The graduate, known as the 'associate', brings new skills and knowledge to the business. KTP can last between 12 and 36 months depending on the project and the needs of the business. It is partly funded by a grant where the businesses will have to contribute to the salary of the associate and the cost of the supervisor (UK Cabinet Office 2015).

As academicians do a lot of research, they could contribute regarding the most recent knowledge and practices that have been done by other governments as policy-making or community practices in other countries. For instance, other developed countries had better practices on recycling and waste segregation technique. In a developed nation such as Germany, recycling and waste segregation practice among Germans is the most successful in the world. According to the European Environment Agency (2013), Germany was one of the first European countries which introduced landfill limiting policies in the 1990s. These included schemes for collecting packaging waste, bio-waste and waste paper separately. By 2001, Germany recycled about 48% of its municipal waste (just above NI's current level of 46.2% (as of June 2016). This increased to 62% in 2010 (well beyond the EU 2020 target of 50%), landfilling was almost 0% and incineration 37%. Eurostat data for 2014 shows that Germany has the highest recycling and compost rate for the municipal waste of all EU Member States, at 64%. A ban on landfilling un-pretreated municipal waste, producer responsibility and a focus on separate collection has proven to be important policy initiatives for successful recycling rates in Germany.

The Northern Ireland Assembly had review recycling and waste segregation policy in Germany. Box 8.1 describes a summary of recycling and waste management policy in Germany.

Waste Hierarchy

Waste management in Germany adopted waste hierarchy namely waste prevention, reuse, recycling, recovery and disposal. This is the foundation of waste management in Germany. Waste prevention means consuming fewer raw materials and reducing burdens on the environment. Waste recovery means reintroducing raw materials and energy into the economic cycle. Waste management is an important industrial sector in Germany and provides high-quality technology for the efficient use of waste as a resource and the environmentally sound disposal of remaining residual waste

Aims

The German government aims to achieve almost complete high-quality recovery, of municipal waste at least, by 2020. The target for other types of waste is a recycling and energetic recovery quota of 65%. This will eliminate the need to landfill wastes, which has adverse effects on the climate.

Policy Implementation

Significant ecological progress was made with the entry into force of the strict ban on landfilling untreated household waste or general waste from industry on 1 June 2005.

Key instrument: Product Responsibility

Product responsibility is at the heart of waste management policy in Germany. It puts the idea into practice that waste is best prevented by holding the generator of waste responsible. Accordingly, producers and distributors must design their products to reduce the waste occurrence and allow environmentally sound recovery and disposal of the residual substances, both in the production of the goods and in their subsequent use. The legal bases for this are the Circular Economy Act and the Federal Immission Control Act. Product responsibility has been introduced for packaging, end-of-life vehicles, waste electrical and electronic equipment, batteries and waste oils.

The German government supports sustainable waste management concepts for obtaining raw materials or energy from waste. This led to zero waste and bioeconomy. The German waste management sector has the highest waste recovery quotas worldwide, and thus already contributes significantly to sustainable development and climate-friendly policies. Germany often takes on a pioneering role in shaping EU waste legislation

Consumer Roles

Waste prevention starts with shopping habits such as bringing baskets or shopping bags instead of buying plastic or paper bags, choosing products with no packaging over products with elaborate packaging and buying reusable bottles instead of one-way bottles or cans. In Germany, the pre-recycling technique is introduced in some groceries shops.

Box 8.1 Short Summary on Recycling and Waste Management Policy in Germany

Source: http://www.bmub.bund.de/en/topics/water-waste-soil/waste-management/general-information/

Academicians are also required to enhance educational program on environmental awareness and sustainable issues among the public via campaigns, road shows, demonstrations or other avenues. As mentioned in the previous chapter, students and the public need to be exposed on environmental education. Hence, the number of environmental awareness needs to be increased.

One example of the environmental campaign was conducted by the United Nations with a combination of three universities, i.e., the City University of New York, New York University, and Fordham University (Box 8.2).

UN-ASPIRE Campaign: I'm Green, and I Know It
Several chapters of United Nations ASPIRE, which consist of the City University of New York, New York University, and Fordham University, have launched I'm Green and I know It Campaign, seeking to get young people around the world to speak up and speak out against environmental injustices and to urge policymakers to accelerate negotiations. They are getting ready to "make some noise" in support of the United Nations Conference on Sustainable Development (Rio + 20), taking place in Rio de Janeiro in June 2012. Their objective is to encourage young people to become engaged in global dialogue and activism on the issue of sustainable development.

As part of the I'm Green, and I know It Campaign, ASPIRE members will be releasing video interviews of experts in the field of environmental and energy policy, as well as international relations scholars. They are planning on adding into their collection even dance music to make an impact out of their campaign. Their projects will be conducted locally in the New York area as well as overseas simultaneously in collaboration.

As a first step, they have launched a Facebook page, which will post stories, interviews, photos and video reports. It will include helpful tips to lessen our carbon footprint and even a little dance music to make an impact really.

ASPIRE stands for Action by Students to Promote Innovation and Reform through Education. It grew out of the United Nations Academic Impact, which aligns institutions of higher education with the UN and with each other in support of the UN agenda based on ten universally accepted principles in the areas of human rights, literacy, sustainability and conflict resolution.

Box 8.2 UN-Asprire Campaign

Source: United Nation

8.2   Natural Environment

The natural environment is viewed as a composite asset that provides a variety of services (Tietenberg and Lewis, 2015). The natural environment produces goods and services directly

to consumers such as the air, the food and drinks, the protection from a shelter, and biodiversity from the environment via ecosystem goods and services. Indeed, the natural environment is a very special asset to Penang thus the four pivotal actors in quintuple helix model. The government, academics, industry and public are required to interact in a collective action to conserve, preserve and manage this asset. Inputs such as energy, air, water and amenities, and raw materials are obtained from the environment and later processed as end products and consumed by industries or households. The outputs lead to externalities such as air pollution, solid waste, waste heat and water pollution. The interaction between human beings and the environment is shown in Figure 7.4.
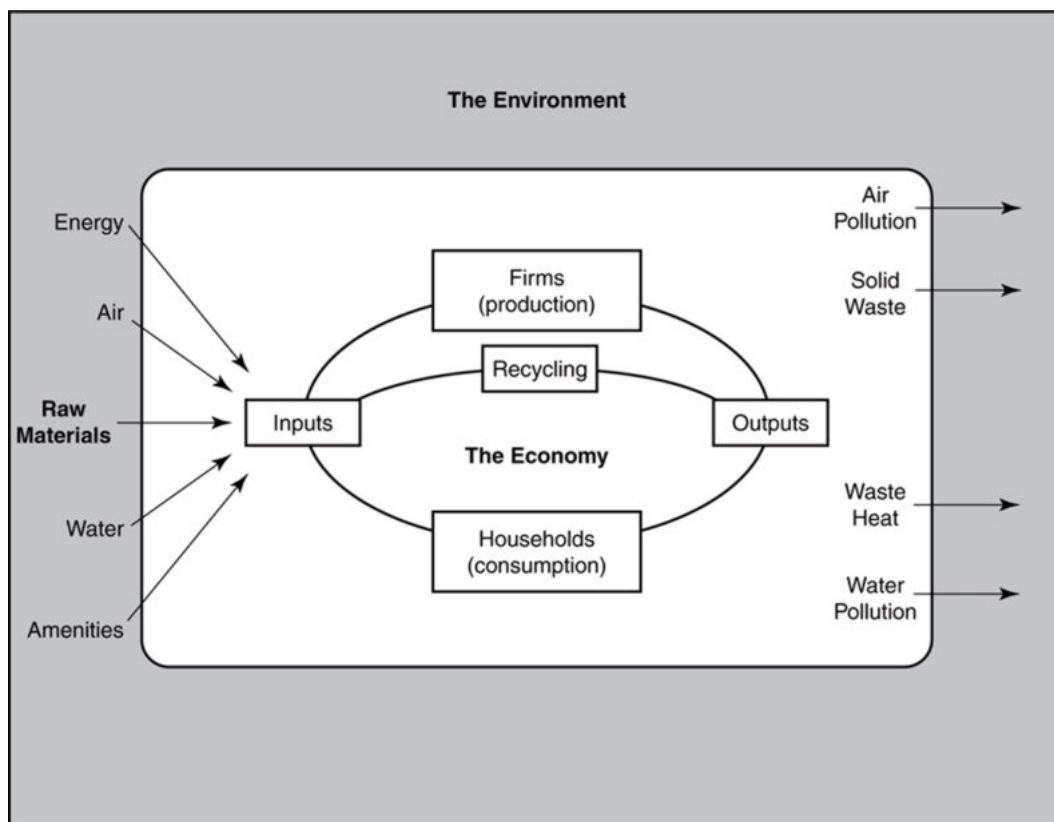
Figure 8.5 Human and Environment Relationship
Source: Tietenberg and Lewis, 2015

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Chapter 9
Conclusion

This study offers significant insights that can assist the state government in developing the green agenda. As discussed in the previous chapters, policy matters, socioeconomic issues, built environment, waste management, biodiversity and agriculture are mentioned, discussed and iterated under all the five scenarios. Hence, this makes these themes areas of concentration for PGA. Other themes that are worth considering are transportation, water security, energy security, leadership and disaster.

Despite rapid development in Penang, many stakeholders still shared their concern over bread-and-butter issues, often framed as socioeconomic issues such as welfare programs, health issues, facilities, employment, housing, and income distribution. This speaks volume to the fact that the bottom of Maslow's hierarchy of human needs is still significant and relevant.

Current issues related to sustainable cities and communities appear as the most concern of Penangites. However, the majority of the respondents emphasise their concern on socioeconomic issues like high population, the influx of immigrant, rampant land conversion and affordable housing is the most worrisome. Moreover, the environmental aspects cannot be discounted considering the issues like pollution, limited green spaces, poor drainage system and deterioration of Penang heritage. Concerns are also highlighted on transportation issues particularly on traffic congestion and efficient public transportation system.

As for what is happening at the moment, stakeholders expressed grave concerns on issues that have a direct impact on their life, i.e. flash floods, solid waste management, limited green spaces and recreational areas as well as affordable housing.

Nonetheless, the stakeholders also realised the importance of taking immediate actions in order to avoid environmental disaster in the future. They asserted their concerns on long-term environmental issues such as climate change, erosion, pollution and limited green spaces. Indeed, these issues are among the most pressing environmental issues across the globe and in the long run have a harmful impact on human survival.

While awareness of green issues is considerably high, routine green practices are noticeably low. The high level of awareness is possibly due to the state's initiatives and campaigns on the importance of sustainable practices such as no plastic while shopping for groceries, waste segregations and car-free day. However, embracing environmental-friendly practices as a habit is still a challenge. Not surprisingly as social change can take considerably some time to have an impact.

It is common knowledge that for sustainable practices to become second nature, education and awareness need to be consistent. This study reported that limited budget, lack of regulation and enforcement are the main roadblocks towards strengthening education and increase awareness of the importance of sustainable practices.

Appendix

Appendix A – Forms for Focus Group Discussion and In-Depth Interview

a.   Demographic Form

Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda (PGA)

SURVEY FORM – BASIC DEMOGRAPHIC INFORMATION

A.   Overview of Environmental Issues in Penang

A1.   As a Penangite, do you feel issues related to environmental degradation are a major concern nowadays?

[ ]   Yes   [ ]   No

A2.   What are the environmental degradation issues that affect you? (You can tick more than one and please rank the top three environmental degradation issues).

Rank (Top Three)

A21.	Chronic traffic jam	[ ]	[ ]
A22.	Flash floods	[ ]	[ ]
A23.	Rising temperature	[ ]	[ ]
A24.	Limited open and green space	[ ]	[ ]
A25.	Diminishing waterfronts/shorelines	[ ]	[ ]
A26.	Air pollution	[ ]	[ ]
A27.	Water pollution (i.e. sea, river, streams)	[ ]	[ ]
A28.	Noise pollution	[ ]	[ ]
A29.	Overfishing	[ ]	[ ]
A210.	Excessive land reclamation	[ ]	[ ]
A211.	Inefficient solid waste management	[ ]	[ ]
A212	Deforestation	[ ]	[ ]

A3. Are you willing to make sacrifices and changes now to save the environment for the future?

☐ Yes ☐ No

A4.

Socio Demographic Information

A1. Age _____

A2. Gender ☐ Male ☐ Female

A3 Ethnicity ☐ Chinese ☐ Indian ☐ Bumiputera
☐ Others

A4. Education Level
☐ Informal Education / No Education
☐ Primary Education
☐ Secondary Education (SRP/PMR/MCE/SPM)
☐ Tertiary Education

A5. Current Employment
☐ Unemployed
☐ Private Sector
☐ Public Sector
☐ Self-employed
☐ Others. Please state _____

A6. Individual Income RM _____

A7. Household Income
☐ Below RM999
☐ RM2000 – RM3499
☐ RM5000 – RM6499
☐ RM6500 – RM7999
☐ > RM7999

b.   Kahoot Questions

1. As a Penangite, do you feel issues related to environmental degradation are a major concern nowadays?   Y/N

2. What are the environmental degradation issues that affect you?

a. Chronic traffic jam Y/N

b. Flash floods Y/N

c. Rising temperature Y/N

d. Limited open and green space Y/N

e. Diminishing waterfronts/shorelines Y/N

f. Air pollution Y/N

g. Water pollution (i.e. sea, river, streams) Y/N

f. Noise pollution Y/N

g. Overfishing Y/N

h. Excessive land reclamation Y/N

i. Inefficient solid waste management Y/N

j. Deforestation Y/N

3. Are you willing to make sacrifices and changes now to save the environment for the future?

Y/N

4. Are you willing to make the following changes? Switching from…

a. Private vehicle to public transportation Y/N

b. Private vehicle to alternative transportation (cycling and walking) Y/N

c. Buying imported products to local products Y/N

d. Eating less meat to more vegetables Y/N

e. Nonorganic to organic produces Y/N

5. Are you ready to embrace and adopt green initiatives organized by the state government?

a. No plastic bags Y/N

b. 3R Y/N

c. Waste segregation Y/N

d. Car free day Y/N

e. Cycling Y/N

c. FGD and In-depth interview questions

A. Guided questions for Focus Group Discussion (FGD) – English version

Theme 1: Understanding of Sustainable Development Goals (SDGs)

1. What do you understand on SDGs; on their goals and objectives?

2. What are the current and future environmental issues of major concerns to your NGO/agency/organization/youth group/professional body/department that need to be addressed by referring to the SDGs?

No.	SDGs	Current Issues	Future Challenges	Programs Done	Adequate (Yes / No) If No, what else need to be done?
1	Goal 2: Zero hunger	1. 2. 3.	1. 2. 3.	1. 2. 3.	
2	Goal 6: Clean water and sanitation	1. 2. 3.	1. 2. 3.	1. 2. 3.	
3	Goal 7: Affordable and clean energy	1. 2. 3.	1. 2. 3.	1. 2. 3.	
4	Goal 11: Sustainable cities and communities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
5	Goal 12: Responsible consumption and production	1. 2. 3.	1. 2. 3.	1. 2. 3.	
6	Goal 13: Climate action	1. 2. 3.	1. 2. 3.	1. 2. 3.	
7	Goal 14: Life below water	1. 2. 3.	1. 2. 3.	1. 2. 3.	
8	Goal 15: Life on land	1. 2. 3.	1. 2. 3.	1. 2. 3.	

9.	Other SDGs- Goal 1: No Poverty	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 3: Good Health and Well being	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 4: Quality Education	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 5: Gender Equality	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 8: Decent work and economic growth	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 9: Industry, innovation and infrastructure	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 10: Reduce Inequalities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 16: Peace, justice and strong institution	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 17: Partnership for the goals	1. 2. 3.	1. 2. 3.	1. 2. 3.	
10.	Other Issues 1. 2. 3.	1. 2. 3.		1. 2. 3.	

Theme 2: Development in Penang

3a. Please rank developmental issues in Penang based on their importance to your NGO/ agency/ organization / youth (group)/ professional body/department.

1. _____
2. _____
3. _____
4. _____
5. _____

3b. How do the issues listed above affect the quality of life in Penang?

Theme 3: Personal Views

4. In your opinion, what are the main elements for the implementation of sustainable development in Penang?

5. What and how would you like to see and have to with regards to Penang development?

B. Mapping the location of current environmental concerns

We seek your kind cooperation to identify the location of current developmental and environmental concerns (your department and yourself).

George Town
Jelutong
Gelugor
Balik Pulau
Bayan Baru
Bayan Lepas

Kepala Batas
Tasek Gelugor
Sungai Dua
Permatang Pauh
Butterworth
Bukit Mertajam
Simpang Ampat
Nibong Tebal

A. Panduan soalan bagi sesi perbincangan berkumpuan (FGD) – Bahasa Melayu version

Tema 1: Memahami matlamat pembangunan lestari (SDGs)

1. Apakah yang anda faham mengenai *SDGs*: Dari segi matlamat dan objektif?

2. Apakah isu-isu semasa dan masa hadapan berkaitan alam sekitar yang menjadi keutamaan bagi NGO/ agensi/organisasi/kumpulan belia/badan professional/jabatan tuan, yang perlu di ketengahkan berdasarkan matlamat pembangunan lestari *(SDGs)*?

Bil	SDGs	Isu Semasa	Cabaran Masa Hadapan	Program yang dilaksanakan	Adakah ianya mencukupi (Ya / Tidak) Jika tidak, apa yang perlu dilakukan?
1	*Goal 2:* *Zero hunger*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
2	*Goal 6:* *Clean water and sanitation*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
3	*Goal 7:* *Affordable and clean energy*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
4	*Goal 11:* *Sustainable cities and communities*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
5	*Goal 12:* *Responsible consumption and production*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
6	*Goal 13:* *Climate action*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
7	*Goal 14:* *Life below water*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
8	*Goal 15:* *Life on land*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
9.	*Other SDGs-* *Goal 1:* *No Poverty*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 3: *Good Health and Well being*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 4: *Quality Education*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 5: *Gender Equality*	1. 2. 3.	1. 2. 3.	1. 2. 3.	

		1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 8: *Decent work and economic growth*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 9: *Industry, innovation and infrastructure*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 10: *Reduce Inequalities*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 16: *Peace, justice and strong institution*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 17: *Partnership for the goals*	1. 2. 3.	1. 2. 3.	1. 2. 3.	
10.	*Other Issues* *1.* *2.* *3.*	1. 2. 3.		1. 2. 3.	

Tema 2: Pembangunan di Pulau Pinang

3. Bagaimana anda melihat pembangunan infrastruktur fizikal yang rancak di Pulau Pinang memberi kesan kepada timbulnya isu-isu ekonomi, sosial dan alam sekitar?

3a. Sila nyatakan isu pembangunan di Pulau Pinang berdasarkan kepentingannya kepada NGO/ agensi/ organisasi / Kumpulan belia/ badan professional/jabatan.

    1. _____

    2. _____

    3. _____

    4. _____

    5. _____

Tema 3: Pandangan Peribadi

4. Pada pandangan anda apakah elemen utama yang harus ada dalam melaksanakan satu pembangunan lestari di Pulau Pinang ini?

5. Apa yang anda inginkan atau harapkan dari segi pembangunan di Pulau Pinang?

B. Menanda kawasan persekitaran yang menjadi keutamaan semasa.

Kami memohon kerjasama Tuan untuk mengenal pasti kawasan persekitaran yang menjadi keutaman semasa(menurut jabatan/ agensi/ organisasi/ institusi serta pihak tuan sendiri)

A. Guided questions for interview sessions

1. What are the current and future environmental issues of major concerns to your department / agency / organization / institution that need to be addressed by referring to the Sustainable Development Goals (SDGs)?

Bil	SDGs	Current Issues	Future Challenges	Programs Done	Adequate (Yes / No) If No, what else need to be done?
1	Goal 2: Zero hunger	1. 2. 3.	1. 2. 3.	1. 2. 3.	
2	Goal 6: Clean water and sanitation	1. 2. 3.	1. 2. 3.	1. 2. 3.	
3	Goal 7: Affordable and clean energy	1. 2. 3.	1. 2. 3.	1. 2. 3.	
4	Goal 11: Sustainable cities and communities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
5	Goal 12: Responsible consumption and production	1. 2. 3.	1. 2. 3.	1. 2. 3.	
6	Goal 13: Climate action	1. 2. 3.	1. 2. 3.	1. 2. 3.	
7	Goal 14: Life below water	1. 2. 3.	1. 2. 3.	1. 2. 3.	
8	Goal 15: Life on land	1. 2. 3.	1. 2. 3.	1. 2. 3.	
9.	Other SDGs- Goal 1: No Poverty	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 3: Good Health and Well being	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 4: Quality Education	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 5: Gender Equality	1. 2. 3.	1. 2. 3.	1. 2. 3.	

	Goal 8: Decent work and economic growth	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 9: Industry, innovation and infrastructure	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 10: Reduce Inequalities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 16: Peace, justice and strong institution	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 17: Partnership for the goals	1. 2. 3.	1. 2. 3.	1. 2. 3.	
10.	Other Issues 1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	

2. How would Penang development be affected if the mentioned issues are not well managed?

3. What are the main elements required if Penang is to implement Sustainable development?

4. Is sustainable development a key element in shaping actions and decisions in your department / agency / organization / institution? If yes/no, please explain why.

5. What are some of the sustainable development initiatives/policies/practices that have been adopted/embraced by your department / agency / organization / institution so far?

B. Mapping the location of current environmental concerns

We seek your kind cooperation to identify the location of current environment concerns (your department and yourself)

A. Panduan soalan untuk sesi temubual

1. Apakah isu-isu semasa dan masa hadapan berkaitan alam sekitar yang menjadi keutamaan bagi jabatan/agensi/organisasi/ institusi Tuan, yang perlu di ketengahkan berdasarkan *Sustainable Development Goal (SDGs)*

Bil	SDGs	Isu Semasa	Cabaran masa hadapan	Program yang telah dijalankan	Mencukupi (Ya / Tidak) Jika tidak, apakah lagi yang boleh dilakukan? Adequate
1	Goal 2: Zero hunger	1. 2. 3.	1. 2. 3.	1. 2. 3.	
2	Goal 6: Clean water and sanitation	1. 2. 3.	1. 2. 3.	1. 2. 3.	
3	Goal 7: Affordable and clean energy	1. 2. 3.	1. 2. 3.	1. 2. 3.	
4	Goal 11: Sustainable cities and communities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
5	Goal 12: Responsible consumption and production	1. 2. 3.	1. 2. 3.	1. 2. 3.	
6	Goal 13: Climate action	1. 2. 3.	1. 2. 3.	1. 2. 3.	
7	Goal 14: Life below water	1. 2. 3.	1. 2. 3.	1. 2. 3.	
8	Goal 15: Life on land	1. 2. 3.	1. 2. 3.	1. 2. 3.	
9.	Other SDGs- Goal 1: No Poverty	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 3: Good Health and Well being	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 4: Quality Education	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 5: Gender Equality	1. 2. 3.	1. 2. 3.	1. 2. 3.	

	Goal 8: Decent work and economic growth	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 9: Industry, innovation and infrastructure	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 10: Reduce Inequalities	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 16: Peace, justice and strong institution	1. 2. 3.	1. 2. 3.	1. 2. 3.	
	Goal 17: Partnership for the goals	1. 2. 3.	1. 2. 3.	1. 2. 3.	
10.	Other Issues 1. 2. 3.	1. 2. 3.	1. 2. 3.	1. 2. 3.	

2. Bagaimana pembangunan di Pulau Pinang akan terjejas sekiranya isu ini tidak ditangani dengan betul?

3. Apakah elemen utama yang perlu ada sekiranya Pulau Pinang ingin melaksanakan pembangunan lestari?

4. Adakah pembangunan lestari merupakan elemen utama dalam menentukan tindakan atau keputusan dalam jabatan/ agensi/ organisasi/ institusi? Jika ya, nyatakan mengapa.

5. Apakah antara inisiatif/ polisi yang telah digunapakai di dalam jabatan/ agensi/ organisasi/ institusi Tuan setakat ini?

B. Menanda kawasan persekitaran yang menjadi keutamaan semasa.

Kami memohon kerjasama Tuan untuk mengenal pasti kawasan persekitaran yang menjadi keutaman semasa(menurut jabatan/ agensi/ organisasi/ institusi serta pihak tuan sendiri)

Appendix B - Sample Questionnaires for Full-Scale Survey

a.   Questionnaire in Bahasa Melayu

Tuan/Puan yang dihormati,

Anda dijemput mengambil bahagian di dalam satu kajian bertajuk *"Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda"* Kajian ini dijalankan oleh sekumpulan penyelidik dari Universiti Sains Malaysia (USM).

Tujuan kajian ini adalah untuk mendapatkan maklum balas mengenai isu-isu alam sekitar dan pembangunan di sekitar negeri Pulau Pinang, Malaysia. Kami memohon kerjasama Tuan/Puan untuk membantu dalam melengkapkan borang soal selidik ini. Kerjasama pihak Tuan/Puan, kami dahului dengan ucapan terima kasih.

Penyertaan Tuan/Puan dalam kajian ini adalah bersifat sukarela dan Tuan/Puan bebas untuk tidak menyertai atau menarik diri pada bila-bila masa tanpa sebarang masalah. Segala bentuk respon, kenyataan kebenaran dan data terkumpul akan hanya boleh di akses oleh penyelidik sahaja. Kesemua jawapan ke atas soalan-soalan yang dikemukakan akan di rahsiakan. Sebarang maklumat terperinci yang diperlukan adalah untuk tujuan kajian semata-mata. Sila berikan jawapan yang sejujurnya terhadap soalan-soalan yang telah dikemukakan. Sila jawab setiap soalan.

Kami sangat menghargai kesudian pihak Tuan/Puan dalam mengambil bahagian dalam kajian ini. Segala kerjasama yang diberikan oleh pihak Tuan/Puan sangat bermakna untuk kajian ini dan sekali lagi kami ucapkan ribuan terima kasih di atas masa yang telah diluangkan oleh pihak Tuan/Puan untuk menjawab soal selidik ini.

Profesor Madya Dr. Saidatulakmal Mohd
Ketua Perunding
Kajian bertajuk *"Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda"*
Telefon   : +604 653 3358 / 653 2720
Email   : eieydda@usm.my

Persetujuan Responden

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 Tandatangan Responden   Tarikh

PART A. KARAKTER KE ATAS PEMBANGUNAN DAN ALAM SEKITAR

A1. Berapa serius isu alam sekitar seperti yang berikut di Pulau Pinang?
     Sila tanda pada respon yang paling sesuai (satu setiap baris)

Isu-isu alam sekitar	Tidak serius	Sedikit serius	Agak serius	Serius	Sangat serius
	1	2	3	4	5
a. Kesesakan lalu lintas					
b. Banjir kilat					
c. Kenaikan suhu					
d. Ruang terbuka hijau yang terhad					
e. Persisiran/ pinggir pantai berkurang					
f. Pencemaran udara					
g. Pencemaran air					
h. Pencemaran bunyi					
i. Menangkap ikan dengan terlampau					
j. Penambakan tanah yang berlebihan					
k. Pengurusan sisa pepejal yang tidak cekap					
l. Penebangan hutan					

A2. Adakah anda bersedia untuk melakukan perubahan seperti berikut?
     Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak	Ya, dalam tempoh masa 5 tahun berikut	Ya, dalam tempoh tiga tahun berikut	Ya, dengan segera
	1	2	3	4
a. Bertukar daripada pengangkutan sendiri kepada pengangkutan awam				
b. Bertukar daripada pengangkutan sendiri kepada pengangkutan aktif (berbasikal, berjalan kaki)				
c. Bertukar daripada membeli produk import kepada produk tempatan				
d. Bertukar dengan mengurangkan pengambilan daging kepada melebihkan pengambilan sayuran				
e. Bertukar daripada pengeluaran tidak organik kepada organik				

A3.   Adakah anda bersedia untuk melakukan inisiatif hijau yang dijalankan oleh kerajaan tempatan?

Sila tanda pada respon yang paling sesuai (satu setiap baris)

Inisiatif hijau	Tidak berkenaan	Tidak	Mungkin	Ya
	1	2	3	4
a. Tidak kepada beg plastik				
b. 5R (kurangkan, guna semula, kitar semula, menolak, nilai semula)				
c. Pengasingan sisa				
d. Hari Tanpa Kenderaan				
e. Berbasikal untuk berulang-alik				

A4.   Bagaimana perkembangan pesat Pulau Pinang mempengaruhi perkara berikut?
Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak berkenaan	Lemah	Bagus	Sangat bagus
	1	2	3	4
a. Ekonomi				
b. Sosial				
c. Alam sekitar				

A5.   Adakah anda berpuas hati dengan aspek-aspek berikut di kawasan anda?
Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tiada pendapat	Sangat tidak memuaskan	Tidak memuaskan	Memuaskan	Sangat memuaskan
	1	2	3	4	5
a. Kualiti udara					
b. Kualiti air					
c. Akses kepada ruangan terbuka hijau					
d. Tahap bunyi bising					
e. Sampah sarap					
f. Akses kepada pengangkutan awam					
g. Pembangunan tanah					
h. Perumahan mampu milik					
I. Kemudahan kesihatan dan ketercapaian					
j. Kemudahan pendidikan dan ketercapaian					

A6.   Pernahkah anda mendengar 'Sustainable Development Goals' (SDGs)?

Ya   ☐   Tidak   ☐

A7.   Sila pilih respon yang paling tepat, sesuai dengan keprihatinan anda berkenaan isu SDG.

	Tidak cukup prihatin	Prihatin	Sangat prihatin
a. Masalah am alam sekitar			
b. Perubahan iklim dan pemanasan global			
c. Pencemaran udara			
d. Pencemaran air (sungai / laut / tasik / aliran / kolam)			
e. Kekurangan bekalan air			
f. Keselamatan makanan (harga, kebolehcapaian, ketersediaan)			
g. Penebangan hutan (bukit, hutan, tanah lapang, cerun)			
h. Kehilangan biodiversiti (di darat, di bawah air)			
i. Gaya hidup orang ramai berkaitan masalah sisa (pengurusan sisa, kitar semula)			
j. Aktiviti perdagangan yang membawa kepada masalah alam sekitar (penggunaan tempatan vs. barang import)			
k. Pertumbuhan penduduk			
l. Kesamarataan jantina (wanita dan kanak-kanak perempuan)			
m. Kemiskinan			
n. Ruang terbuka hijauan & kawasan rekreasi			
o. Kebolehcapaian kepada pendidikan berkualiti			
p. Kecekapan tenaga			
q. Kebolehcapaian kepada kerja berkualiti			
r. Perumahan mampu milik			
s. Kecekapan pengangkutan awam			
t. Pemeliharaan dan pemuliharaan budaya dan warisan semula jadi			
u. Pembangunan tidak seimbang (bandar vs luar bandar, Penang Island vs Seberang Perai)			
v. Peraturan, undang-undang dan polisi-polisi pembangunan lestari			
w.Perkongsian serantau dan global bagi pembangunan lestari			
x. Persetujuan persekutuan dan negeri mengenai isu-isu pembangunan			
y. Kawasan ekosistem dilindungi (Darat dan Marin)			
z. Lain-lain, sila nyatakan _____ _____			

A8. Apakah inisiatif lestari yang diambil dan diamalkan oleh anda?

Sila tanda semua inisiatif yang berkenaan

a. Kitar semula
b. Guna dan beli produk hijau
c. Mengurangkan penggunaan kertas (tanpa kertas)
d. Penanaman pokok
e. Penjimatan tenaga
f. Penjimatan air
g. Memasang sistem penuaian air hujan
h. Pengasingan dan pengurusan sisa
i. Penggunaan e-bisnes
j. Mengurangkan sisa makanan
k. Mengelak perjalanan ke bandar pada waktu puncak
l. Menyokong dasar alam sekitar yang lebih baik

PART B: PENGURUSAN PENJANAAN SISA ISI RUMAH, KITAR SEMULA DAN SISA.

B1.   Secara purata, berapa banyak sisa campuran yang dihasilkan oleh isi rumah anda pada setiap minggu?

Ini tidak termasuk sisa yang disusun untuk kitar semula / pengkomposan

Pertama, pilih saiz beg

| 10 litres (2 1/2 gallons) | 20 litres (5 gallons) | 30 litres (7 1/2 gallons) | 50 litres (12 1/2 gallons) | 100 litres (25 gallons) |

Kedua, sila nyatakan secara hampir bilangan beg sisa campuran yang anda hasilkan secara purata dalam seminggu.

0 beg   15 atau lebih   Tidak

tahu

B2.   Adakah isi rumah anda selalunya?

Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Kitar semula bahan yang boleh dikitar semula						
b. Kurangkan penggunaan bahan tidak terbiodegradasi						
c. Guna semula bahan tidak terbiodegradasi						
d. Pengasingan sampah domestik di rumah						
e. Kompos sisa makanan						
f. Mengamalkan sisa sifar						

PART C: TINGKAH LAKU ISI RUMAH DAN PEMILIHAN PENGANGKUTAN

C1.   Apakah mod pengangkutan utama anda untuk setiap aktiviti berikut?
Sila pilih mod, yang menyumbang kepada jarak yang jauh.

	Tidak berkenaan	Jalan kaki	Basikal	Kongsi kenderaan	Pengangkutan awam (bas, teksi,)	Kongsi perjalanan (Uber /Grab)	Kereta/ motosikal
a. Berulang alik ke tempat kerja							
b. Membeli belah/ barang runcit							
c. Aktiviti rekreasi							
d. Percutian							

C2.   Kira-kira, berapa lama anda mengambil masa untuk ke tempat kerja (sehala)?

a. Kurang dari 15 minit
b. 15 – 30 minit
c. 31 – 45 minit
d. 46 minit – 1 jam
e. Lebih dari 1 jam

C3.   Bandingkan dengan mod pengangkutan biasa anda, berapa lama masa yang diambil untuk sampai ke tempat kerja menggunakan mod pengangkutan yang berbeza?

	Tidak berkenaan	Jalan kaki	Basikal	Kongsi kenderaan	Pengangkutan awam (bas, teksi)	Kongsi per-jalanan (Uber /Grab)	Kereta/ Moto-sikal
a. Lebih dari 30 minit **lebih singkat**							
b. 16 – 30 minit **lebih singkat**							
c. 5 – 15 minit **lebih singkat**							
d. Sama tempoh (lebih kurang)							
e. 5 – 15 minit **lebih panjang**							
f. 16 – 30 minit **lebih panjang**							
g. Lebih dari 30 minit **lebih panjang**							
h. Tidak tahu/ tidak mungkin							

C4.   Sepanjang tahun lepas, pernahkah anda melakukan mana-mana aktiviti yang berikut?
Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Menyokong tetapi tidak mengambil bahagian dalam inisiatif Hari Tanpa Kenderaan						
b. Mengambil bahagian dalam inisiatif Hari Tanpa Kenderaan						
c. Menggunakan skim kongsi kenderaan atau kongsi perjalanan						
d. Mengadaptasi gaya pemanduan yang mengurangkan penggunaan bahan api						

PART D: TINGKAH LAKU ISI RUMAH DAN PENGGUNAAN AIR

D1.   Berapa kerap anda melakukan perkara berikut dalam kehidupan harian anda?
        Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Munutup air semasa menggosok gigi						
b. Memasang pemalam sinki apabila mencuci pinggan menggunakan tangan						
c. Mengadaptasi sistem penuaian air hujan						
d. Kitar semula sisa kumbahan						

PART E: TINGKAH LAKU ISI RUMAH DAN PENGGUNAAN TENAGA

E1.   Berapa kerap anda melakukan perkara berikut dalam kehidupan harian anda?
        Sila tanda pada respon yang paling sesuai (satu setiap baris

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Gunakan mentol lampu kalimantang termampat (CFL) daripada mentol biasa						
b. Tanggalkan plag peranti apabila tidak digunakan						
c. Gunakan tangga pada bila-bila masa						
d. Kurangkan penggunaan penyaman udara dan alat pengering						

PART F: TINGKAH LAKU ISI RUMAH DAN PENGGUNAAN MAKANAN

F1.   Adakah isi rumah anda selalunya?
        Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Kompos sisa makanan						
b. Pilih barangan makanan yang kurang pembungkusan.						
c. Guna semula beg membeli-belah untuk membeli barang makanan.						
d. Bawa bekal makanan dan bekas air sendiri apabila keluar						
e. Ambil makanan dari sumber tempatan						
f. Menghadkan atau mengelak pengambilan daging						
g. Memilih produk organik						

F2.   Kira-kira, berapa bahagian makanan yang dibeli oleh isi rumah anda dibuang?

Sila kecualikan bahagian makanan yang tidak boleh dimakan, contohnya kulit, benih, dan lain-lain.:

0%   100%   Tidak tahu

|--|

PART G. SIKAP ISI RUMAH BERKENAAN DOMAIN PEMBANGUNAN DAN ALAM SEKITAR

G1.   Adakah anda terlibat dalam tindakan yang berikut?

	Tidak berkenaan	Tidak pernah	Jarang-jarang	Kadang-kadang	Kerap	Rutin
	1	2	3	4	5	6
a. Mencari dan sentiasa mengemaskini pengetahuan alam sekitar dan amalan peribadi						
b. Terlibat dalam kempen dan aktiviti pendidikan alam sekitar						
c. Tunjuk ajar orang lain (ahli keluarga, rakan, jiran dan lain-lain) mengenai amalan alam sekitar						
d. Galakkan orang lain untuk mengamalkan amalan hijau						

PART H. PENDAPAT ISI RUMAH TERHAD PENDATANG

H1.   Apakah pendapat anda mengenai kemasukan pendatang dengan banyaknya di Pulau Pinang?

Sila tanda pada respon yang paling sesuai (satu setiap baris)

	Tiada kesan	Lemah	Pertengahan	Bagus	Sangat bagus
	1	2	3	4	5
a. Ekonomi dan pembangunan					
b. Alam sekitar					
c. Sosial dan kesihatan					

PART I: JANGKAAN MASA HADAPAN TERHADAP PEMBANGUNAN DI PULAU PINANG

I1.   Apa yang anda mahukan berkaitan pembangunan Pulau Pinang pada masa akan datang?
Sila pilih respon yang paling tepatsesuai dengan keadaan anda.

	Tidak berkenaan	Tidak	Mungkin	Ya
	1	2	3	4
a. Lebih banyak ruang terbuka dan hijau (kawasan rekreasi, taman)				
b. Penggunaan tenaga boleh diperbaharui di kawasan kediaman dan perniagaan				
c. Meningkatkan jaringan berbasikal				
d. Menanam lebih banyak pokok				
e. Meningkatkan bilangan kemudahan kitar semula				
f. Memperkasa golongan yang lemah (wanita,kanak-kanak, orang kurang upaya, warga emas)				
g. Laluan pejalan kaki yang berkualiti				
h. Pengangkutan awam yang lebih baik dan cekap				
i. Mempromosikan pertanian bandar				
j. Penglibatan awam yang lebih aktif dan telus dalam proses membuat keputusan dasar				
k. Pengurusan sisa pepejal bersepadu				
l. Kebolehcapaian untuk air bersih dan sanitasi				
m. Menggabungkan pengurusan risiko bencana dalam perancangan bandar				
n. Mengadaptasi teknologi hijau dalam industri dan perniagaan				
o. Tiada lagi penambakan tanah di Pulau Pinang				
p. Lain-lain, sila nyatakan _____ _____ _____				

PART J: CABARAN MASA HADAPAN DAN PENYELESAIAN

J1. Sila senaraikan tiga (3) cabaran alam sekitar yang paling mencabar dihadapi di Pulau Pinang pada masa hadapan dan cara mengatasi.

Nombor	Cabaran	Penyelesaian
Contoh	Jerebu akibat pembakaran gambut	Pemenjaraan pesalah
1		
2		
3		

PART R: MAKLUMAT KEDIAMAN

R1. Daerah

☐ Barat Daya
☐ Seberang Perai Utara
☐ Seberang Perai Tengah
☐ Seberang Perai Selatan
☐ Timur Laut

R2. Alamat kediaman (Taman / Kampung / Jalan / Lorong)

_____

R3. Lokasi ☐ Bandar ☐ Luar bandar

R4. Lokasi GPS X:_____ Y:_____

PART S. MAKLUMAT DEMOGRAFI SOSIO

S1. Umur _____

S2. Jantina ☐ Lelaki ☐ Perempuan

S3 Etnik

☐ Cina
☐ India
☐ Bumiputera
☐ Lain-lain

S4. Tahap Pendidikan

☐ Pendidikan tidak formal / Tiada pendidikan
☐ Pendidikan Rendah
☐ Pendidikan Menengah (SRP/PMR/MCE/SPM)
☐ Pendidikan Tinggi

S5.   Pekerjaan Semasa

☐ Tidak bekerja
☐ Sektor swasta
☐ Sektor awam
☐ Bekerja sendiri
☐ Lain-lain, sila nyatakan _____

S6.   Pendapatan Individu.   RM _____

S7.   Pendapatan Isi Rumah

☐ Bawah RM999
☐ RM1,000 – RM1,999
☐ RM2,000 – RM2,999
☐ RM3,000 – RM3,999
☐ RM4,000 – RM4,999
☐ RM5,000 – RM5,999
☐ RM6,000 – RM6,999
☐ RM7,000 – RM7,999
☐ RM8,000 dan ke atas

S8.   Bilangan Isi Rumah   _____   orang

S9.   Pengaturan hidup

☐ Hidup sendiri
☐ Hidup bersama pasangan sahaja
☐ Hidup bersama anak kecil
☐ Hidup bersama ibu bapa/mertua
☐ Hidup bersama saudara mara
☐ Hidup bersama lain-lain (bukan ahli keluarga)

S10.   Maklumat kenderaan

☐ Tiada kenderaan sendiri
☐ Basikal   _____ unit
☐ Motosikal   _____ unit
☐ Kereta   _____ unit
☐ MPV/ SUV   _____ unit
☐ Van   _____ unit
☐ Bas/Trak/Lori   _____unit
☐ Lain-lain   _____ unit

b.   Questionnaire in English

Dear Sir / Madam,

You are invited to take part in a study entitled "*Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda*" This study was conducted by a group of researchers from Universiti Sains Malaysia (USM).

The purpose of this study is to obtain the feedback on environmental issues and development around the state of Penang, Malaysia. We seek your cooperation to assist in completing this questionnaire. We advance our thank for your co-operation.

Your participation in this study is voluntary and you are free to opt out or withdraw at any time without any issue. All forms of response, statement of permission and collected data can only be accessed by researchers. All answers to the questions asked will be kept secret. Any detailed information required is solely for study purposes. Please provide an honest answer to questions that have been asked. Please answer each and every one of the question.

We greatly appreciate your willingness to participate in this study. All the co-operation provided by Sir/Madam meant a lot to this study and once again we would like to thank you for the time spent in answering this questionnaire.

Associate Professor Saidatulakmal Mohd
Head of Consultancy
The study entitled "*Services for Stage 1's Stakeholder Consultation for Developing the Penang Green Agenda*"
Phone   : +604 653 3358/653 2720
Email   : eieydda@usm.my

Respondent's Approval

----------------------------------   -----------------------
 Respondent's Signature   Date

PART A. ATTITUDINAL CHARACTERISTICS ON DEVELOPMENT AND ENVIRONMENT

A1.   How serious are the following environmental issues in Penang?
       Please tick the most appropriate response (one per row)

Environmental issues	Not serious	Slightly serious	Fairly serious	Serious	Extremely serious
	1	2	3	4	5
a. Chronic traffic jam					
b. Flash flood					
c. Rising temperature					
d. Limited open and green spaces					
e. Diminishing waterfront / shoreline					
f. Air pollution					
g. Water pollution					
h. Noise pollution					
i. Overfishing					
j. Excessive land reclamation					
k. Inefficient solid waste management					
l. Deforestation					

A2.   Are you willing to make the following lifestyle changes?
       Please tick the most appropriate response (one per row)

	No	Yes, within the next five years	Yes, within the next three years	Yes, immediately
	1	2	3	4
a. Switching from private vehicle to public transportation				
b. Switching from private vehicle to active transportation (cycling, walking)				
c. Switching from buying imported products to local products				
d. Switching from eating less meat to more vegetables				
e. Switching from non-organic to organic produces				

A3.   Are you ready to embrace and adopt green initiatives organized by the state government?
       Please tick the most appropriate response (one per row)

Green initiatives	N/A	No	Maybe	Yes
	1	2	3	4
a. No plastic bags				
b. 5R (Reduce, Reuse, Recycle, Refuse, Repurpose)				
c. Waste segregation				
d. Car free day				
e. Cycle to commute				

A4.   How does Penang's rapid development affect the followings?
       Please tick the most appropriate response (one per row)

	N/A	Poor	Good	Excellent
	1	2	3	4
a. Economy				
b. Social				
c. Environment				

A5.   How satisfied are you with the following aspects in your area?
       Please tick the most appropriate response (one per row)

	No opinion	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied
	1	2	3	4	5
a. Air quality					
b. Water quality					
c. Access to green and open spaces					
d. Level of noise					
e. Litter and rubbish					
f. Access to public transportation					
g. Land development					
h. Affordable housing					
I. Health facilities and accessibilities					
j. Education facilities and accessibilities					

A6.   Have you heard of Sustainable Development Goals (SDGs)?

       Yes ☐   No ☐

A7.   Please tick the most appropriate response that best suit your concern with regard to the issues of SDGs.

	Not very concerned	Concerned	Extremely concerned
a. General environmental problems			
b. Climate change & global warming			
c. Air pollution			
d. Water pollution (river / ocean / lake / stream / pond)			
e. Water shortage			
f. Food security (price, accessibility, availability)			
g. Deforestation (hill, forest, terrain, slope)			
h. Loss of biodiversity (on land, under water)			
i. People's lifestyles on waste related problems (waste management, recycle)			
j. Trade related activities that lead to environmental problems (local consumption vs. imported goods)			

k. Population growth			
l. Gender equality (women and girls)			
m. Poverty			
n. Green space & recreational areas			
o. Accessibility to quality education			
p. Energy efficiency			
q. Accessibility to quality jobs			
r. Affordable housing			
s. Efficient public transportation			
t. Preservation and conservation of cultural and natural heritage			
u. Unbalanced development (rural vs urban, Penang Island vs Seberang Perai)			
v. Rules, regulations, laws and policies for sustainable development			
w. Regional and global partnership for sustainable development			
x. Federal and State consensus on development issues			
y. Ecosystem Protected Areas (land base and marine)			
z. Other, please state _____ _____			

A8. What are the sustainable initiatives taken and practiced by you?

Please tick all applicable initiatives

a. Recycle
b. Use and buy green products
c. Reduce the use of paper (paperless)
d. Plant trees
e. Conserve energy
f. Conserve water
g. Install rain water harvesting system
h. Waste segregation and management
i. Use of e-business
j. Reduce food waste
k. Avoid peak hour travelling to town
l. Advocate for better environmental policies

PART B: HOUSEHOLD WASTE GENERATION, RECYLING AND WASTE MANAGEMENT

B1.   On average, how much mixed waste does your household generate each week?

This excludes waste sorted for recycling / composting

First, choose the size of bag

| 10 litres
(2 1/2 gallons) | 20 litres
(5 gallons) | 30 litres
(7 1/2 gallons) | 50 litres
(12 1/2 gallons) | 100 litres
(25 gallons) |

Second, please indicate approximately the number of bag of mixed waste that you generate on average in a week.

0 bag   15 or more   Don't know

B2.   Does your household usually?

Please tick the most appropriate response (one per row)

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Recycle all recyclable materials						
b. Reduce the usage of non-biodegradable materials						
c. Reuse non-biodegradable materials						
d. Segregate domestic waste at home						
e. Compost food scrap						
f. Practice zero waste						

PART C: HOUSEHOLD BEHAVIOUR AND TRANSPORT CHOICE

C1.   What is your main mode of transportation for each of the following activities?

Please choose the mode, which accounts for the greatest distance:

	N/A	Walking	Bicycle	Car Pool	Public Transport (bus, taxi,)	Ride sharing (Uber /Grab)	Car / Motor-cycle
a. Daily commute to and from work							
b. Shopping/ Groceries							
c. Recreational activity							
d. Vacation							

C2.   Approximately, how long does it take you to get to work (one way)?

        a.   Less than 15 minutes
        b.   15 – 30 minutes
        c.   31 – 45 minutes
        d.   46 minutes – 1 hour
        e.   More than 1 hour

C3.   Compare to your usual mode of transport, how long would it take to get to work using different modes of transport?

	N/A	Walking	Bicycle	Car Pool	Public Transport (bus, taxi)	Ride sharing (Uber /Grab)	Car / Motor-cycle
a. More than 30 minutes **shorter**							
b. 16 – 30 minutes **shorter**							
c. 5 – 15 minutes **shorter**							
d. Same time (approximately)							
e. 5 – 15 minutes **longer**							
f. 16 – 30 minutes **longer**							
g. More than 30 minutes **longer**							
h. Don't know / Not possible							

C4.   During the past year, have you done any of the following?
Please tick the most appropriate response (one per row)

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Supported but did not participate in car free day initiative						
b. Participated in car free day initiative						
c. Used car pooling or ride sharing scheme						
d. Adapted driving style that use less fuel						

PART D: HOUSEHOLD BEHAVIOUR AND WATER USE

D1.   How often do you do the following in your daily life?

Please tick the most appropriate response (one per row)

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Turn off the water while brushing teeth						
b. Plug the sink when washing the dishes by hand						
c. Adopt rain harvesting system						
d. Recycle waste water						

PART E: HOUSEHOLD BEHAVIOUR AND ENERGY USE

E1. How often do you do the following in your daily life?
        Please tick the most appropriate response (one per row)

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Use compact fluorescent light (CFL) lightbulb instead of traditional lightbulb						
b. Unplug devices when not in use						
c. Use staircase whenever possible						
d. Reduce the usage of AC and dryer						

PART F: HOUSEHOLD BEHAVIOUR AND FOOD CONSUMPTION

F1.   Does your household usually?
        Please tick the most appropriate response (one per row)

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Compost food waste						
b. Choose food items with less packaging						
c. Use reusable shopping bags for food shopping						
d. Carry own food or water container for take-out						
e. Eat food that is locally grown						
f. Limit or avoid consumption of meat						
g. Choose organic products						

F2.   Approximately what proportion of food bought by your household is thrown away?

Please exclude non-edible parts of food, e.g. peelings, seeds, etc.:

0%   100%   Don't know

|---|

PART G. HOUSEHOLD ATTITUDES ACROSS DEVELOPMENTAL AND ENVIRONMENTAL DOMAINS

G1.   Do you engage in the following actions?

	N/A	Never	Seldom	Sometimes	Often	Routine
	1	2	3	4	5	6
a. Explore and constantly update on personal environmental knowledge and practices						
b. Involved in environment educational campaign and activities						
c. Teach others (family members, friends, neighbors, etc.) on environmental practices						
d. Encourage others to adopt green practices						

PART H. HOUSEHOLD OPINIONS ON IMMIGRANTS

H1.   What is your opinion on the influx of immigrants in Penang?
Please tick the most appropriate response (one per row)

	No effect	Poor	Average	Good	Excellent
	1	2	3	4	5
a. Economy and development					
b. Environment					
c. Social and health					

PART I: FUTURE EXPECTATIONS OF PENANG DEVELOPMENT

I1.   What would you like to have with regard to future Penang development?

Please take the most appropriate response that best suits your situation.

	N/A	No	Maybe	Yes
	1	2	3	4
a. More open and green spaces (recreational areas, park)				
b. Use of renewable energy in residential and businesses				
c. Enhance cycling connectivity				
d. Plant more trees				
e. Increase the number of recycling facilities				
f. Empower the vulnerable groups (women, children, disabled, elderly)				
g. Quality pedestrian pathways				
h. Better and efficient public transportation				
i. Promote urban farming				
j. More active and genuine public participation in decision policy making process				
k. Integrated solid waste management				
l. Accessibility to clean water and sanitation				
m. Incorporate disaster-risk management in urban planning				

	N/A	No	Maybe	Yes
	1	2	3	4
n. Adoption of green technology for industries and businesses				
o. No more reclamation in Penang Island				
p. Other, please state _____ _____ _____				

PART J: FUTURE CHALLENGES AND THEIR SOLUTIONS

J1.   Please list three (3) most pressing future environmental challenges of Penang and provide solutions for the challenges.

Number	Challenges	Solutions
Example	Haze due to peat fire burning	Imprisonment of offenders
1		
2		
3		

PART R: RESIDENTIAL INFORMATION

R1.   District   ☐ Barat Daya
☐ Seberang Perai Utara
☐ Seberang Perai Tengah
☐ Seberang Perai Selatan
☐ Timur Laut

R2. Residential address   (Taman / Kampung / Jalan / Lorong)

_____

R3. Location   ☐ Urban   ☐ Rural

R4.GPS location   X:_____Y:_____

PART S. SOCIO DEMOGRAPHIC INFORMATION

S1.   Age   _____

S2.   Gender   ☐ Male   ☐ Female

S3   Etnik   ☐ Cina
☐ India
☐ Bumiputera
☐ Lain-lain

S4.   Education Level   ☐ Informal Education / No Education
                         ☐ Primary Education
                         ☐ Secondary Education (SRP/PMR/MCE/SPM)
                         ☐ Tertiary Education

S5.   Current Employment   ☐ Unemployed
                             ☐ Private Sector
                             ☐ Public Sector
                             ☐ Self-employed
                             ☐ Others. Please state _____

S6.   Individual Income.   RM _____

S7.   Household Income   ☐ Below RM999
                           ☐ RM1,000 – RM1,999
                           ☐ RM2,000 – RM2,999
                           ☐ RM3,000 – RM3,999
                           ☐ RM4,000 – RM4,999
                           ☐ RM5,000 – RM5,999
                           ☐ RM6,000 – RM6,999
                           ☐ RM7,000 – RM7,999
                           ☐ RM8,000 and over

S8.   Household size   _____   people

S9.   Living Arrangement   ☐ Live alone
                             ☐ Live with spouse only
                             ☐ Live with young children
                             ☐ Live with parents/ in law
                             ☐ Live with relatives
                             ☐ Live with others (non family members)

S10.   Vehicle information (No) ☐ No private transportation _____ unit
                                 ☐ Bicycle   _____ unit
                                 ☐ Motorcycle   _____ unit
                                 ☐ Car   _____ unit
                                 ☐ MPV/ SUV   _____ unit
                                 ☐ Van   _____ unit
                                 ☐ Bus/Truck/Lorry   _____ unit
                                 ☐ Others   _____ unit

No. Rujukan:		
Lokasi :	X	
	Y	
Kawasan :		

c.   Questionnaire in Mandarin

尊敬的先生/女士，

您被邀请参加题为"第一阶段利益相关者磋商发展槟城绿色议程的服务"的研究。本研究由马来西亚理科大学（USM）的一组研究人员进行。

本研究的目的是为了获取马来西亚槟城州环境问题和发展情况的反馈意见。我们寻求合作与协助完成这份调查问卷。尊敬的先生/女士，我们感谢您的合作。

您参与本研究是自愿的，您可以随时选择退出或再无条件下退出。所有形式的回应，真实性和积累的数据只提供于研究人员使用。所有回答的答案将一切被保密。所需的详细信息仅用于研究目的。请对问卷里的每一道问题提供一个真实的答案。

我们非常感谢您愿意参加这项研究以及阁下所提供的合作对本研究都是非常有意义的。我们再次感谢万分您回答这份调查问卷的时间。

副教授 Profesor Madya Saidatulakmal Mohd
咨询负责人
研究题目   ："第一阶段利益相关者磋商发展槟城绿色议程的服务"研究报告
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<div align="center">批准受访者</div>

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回答者签名   日期

部分 A．行为特征发展与环境

A1. 在槟城，以下的环境问题有多严重？
请在最合适的回应打勾（每行只限一个）

环境问题	不严重	稍微严重	非常严重	严重	极度严重
	1	2	3	4	5
a. 长期交通堵塞					
b. 闪电式水灾					
c. 氣候升溫					
d. 有限的开放和绿色空间					
e. 海滩的下蚀/ 海岸线的后退					
f. 空气污染					
g. 水源污染					
h. 噪音污染					
i. 过度捕捞海产					
j. 过度填海					
k. 低效率废物管理					
l. 森林砍伐					

A2. 您是否愿意进行以下生活方式的改变吗？
请在最合适的回应打勾（每行只限一个）

	不愿意	愿意，在未来五年内	愿意，在未来三年内	愿意，立刻
	1	2	3	4
a. 从私家车转改用公共交通工具				
b. 从私家车转改用积极交通工具（例：骑脚踏车，走路）				
c. 从原本购买进口产品转改用本地产品				
d. 从 少吃肉转变成多吃蔬菜				
e. 从非有机产品改用有机产品				

A3. 您是否准备接受和采取州政府策划的以下绿色举措吗？

请在最合适的回应打勾（每行只限一个）

绿色举措	不相关	不	也许	是
	1	2	3	4
a. 没有塑料袋				
b. 5R（减少，重新使用，回收，拒绝使用，重新规划）				
c. 垃圾分类				
d. 无车日				
e. 使用骑脚踏车往返				3

j. 导致环境问题的贸易相关活动（当地消费与进口商品）			
k. 人口增长			
l. 性别平等（妇女和女童）			
m. 贫穷			
n. 绿色空间和游艺区域			
o. 可近性的优质教育			
p. 能源效率			
q. 可近性的优质工作			
r. 可负担房子			
s. 高效率的公共交通			
t. 保存和保护文化和自然遗产			
u. 不平衡的发展（农村 vs 城市 槟岛 vs 威省）			
v. 可持续发展的规章,制度,法律和法规			
w. 区域和全球性可持续发展的合作关系			
x. 联邦政府和州政府对发展问题的共识			
y. 生态维护的区域(陆地，海洋)			
z. 其他，请声明 _____ _____			

A8. 您会采取和实践以下可持续发展的举措吗？

选择适用的举措　（请打勾）
a. 回收
b. 使用和购买环保产品
c. 减少使用纸张（无纸）
d. 植树
e. 节约能源
f. 节约用水
g. 安装雨水收集系统
h. 废物分类与管理
i. 使用电子商务
j. 减少食物的浪费
k. 避免高峰时段进入城市
l. 提倡更好的环境政策

301

3

部分 B：家庭废料生产. 回收和废料管理

B1.　　你的家庭平均每周生产多少混合废物？
　　　　这不包括可回收 /堆肥的废物

　　　　首先，请选择袋子的大小

| 10 litres (2 1/2 gallons) | 20 litres (5 gallons) | 30 litres (7 1/2 gallons) | 50 litres (12 1/2 gallons) | 100 litres (25 gallons) |

　　　　其次，请说明一周内平均安置生产混合废物垃圾袋的数量。

0 袋　　　　　　　　　　　　　　　　　15 袋以上　　　　不知道

B2.　　你的家庭时常采取以下的举措吗?

请在最合适的回应打勾（每行只限一个）

	不相关	决不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 回收所有可回收的材料						
b. 减少使用不可生物分解的材料						
c. 重复使用不可生物分解的材料						
d. 在家实行分类生活垃圾						
e. 实行堆肥食品废料						
f. 实行零浪费						

部分 C：家庭交通方式的选择

C1.　　　　根据以下的活动,您的主要交通方式是什么？

请选择最长行驶的交通方式：

	不相关	走路	脚踏车	拼车	公共交通（巴士，计程车)	骑行分享（Uber / Grab）	汽车/摩托车
a. 每天往返上班							
b. 购物/购杂货							
c. 娱乐活动							
d. 假期							

C2.　　　　你大概需要多久的时间去上班（单程）？

     a. 不到 15 分钟
     b. 15 – 30 分钟
     c. 31 – 45 分钟
     d. 46 分钟 – 1 小时
     e. 超过 1 小时

C3.与您通常使用的交通方式相比，使用以下的交通方式去上班需要更长的时间吗(单程)??

	不相关	走路	脚踏车	拼车	公共交通（巴士，计程车)	骑行共享（Uber / Grab）	汽车/摩托车
a. 行程时间将会缩短超过 30 分钟							
b. 行程时间将会缩短 16 – 30 分钟							
c. 行程时间将会缩短 5 – 15 分钟							
d. 大约一样的行程时间							
e. 行程时间将会增加 5 – 15 分钟							
f. 行程时间将会增加 16 – 30 分钟							
g. 行程时间将会增加超过 30 分钟							
h. 不知道/不可能							

303

C4.　在过去一年中，您是否有参与以下的活动?
　　　请在最合适的回应打勾（每行只限一个）

	不相关	决不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 支持但没有参加无车日活动						
b. 参加无车日活动						
c. 拼车或骑行共享						
d. 改变驾驶风格而降低燃油消耗						

部分 D: 家庭使用水的行为

D1.　在日常生活中，你大概需要多久实行一次以下的举措?
　　　请在最合适的回应打勾（每行只限一个）

	不相关	决不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 刷牙时关掉水						
b. 用手洗碗时，安装水槽						
c. 采用雨水收集系统						
d. 回收废水						

部分 E: 家庭能源使用的行为

E1.　在日常生活中，你大概需要多久实行一次以下的举措?
　　　请在最合适的回应打勾（每行只限一个）

	不相关	从来不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 使用紧凑型荧光灯（CFL）灯泡以代替传统的灯泡						
b. 不使用电器时,拔下插头						
c. 尽可能使用楼梯						
d. 减少空调和干燥机的使用						

部分 F：家庭食物消费的行为

F1.   你的家庭时常采取以下的举措吗?
   请在最合适的回应打勾（每行只限一个）

	不相关	从来不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 用食物垃圾做堆肥						
b. 选择较少包装的食品						
c. 当食物购买时，使用可重复使用的购物袋						
d. 当外带时,携带自己的食物或水容器						
e. 选择吃当地种植的食物						
f. 限制或避免食用肉类						
g. 选择有机产品						

F2.   在你家庭购买的食物当中，大概有多少会被丢弃？

   请排除食品不可食用的部分，例如外皮，种子等:

0%   100%   不知道

|--|

部分 G. 家庭对发展和环境领域的态度

G1.   你是否有参与以下的活动?

	不相关	从来不	很少	有时	经常	例行
	1	2	3	4	5	6
a. 探索并不断更新个人环境知识和实践						
b. 参与环境教育活动						
c. 教导他人（家庭成员，朋友，邻居等）环境作法						
d. 鼓励他人采取绿色举动						

部分 H. 家庭对移民的见解

H1.   你如何看待槟城的移民潮对以下各领域的发展？
   请在最合适的回应打勾（每行只限一个）

	没有效果	差	普通	好	很好
	1	2	3	4	5
a. 经济与发展					
b. 环境					
c. 社会与健康					

部分 I:槟城未来发展的期望

I1.　　对于槟州未来的发展，你有什么期待吗？

　　　　根据最适合您的情况，请选择最适当的回应。

	不相关	不	也许	是
	1	2	3	4
a. 更多的开放与绿色空间(游艺，公园）				
b. 住宅和企业使用可再生能源				
c. 加强脚踏车道的连接性				
d. 种植更多的树木				
e. 增加回收设施的数量				
f. 赋予弱势的群体（妇女，儿童，残疾人，老人）				
g. 优质的行人道				
h. 更好和更高效的公共交通				
i. 促进城市农业				
j. 公众更加积极和真正的参与决策过程				
k. 综合固体垃圾管理				
l. 可近性的清洁饮水和卫生设施				
m. 将灾害风险管理纳入城市规划				
n. 行业和企业采用绿色科技				
o. 不允许槟岛再填海				
p. 其他，请声明 ＿＿＿＿＿＿＿＿＿＿ ＿＿＿＿＿＿＿＿＿＿ ＿＿＿＿＿＿＿＿＿＿				

部分 J: 未来的挑战及其解决方案

J1.　　请您列出槟城的三（3）个最紧迫的未来环境挑战和提供其解决方案。

Number	挑战	解决方案
例子	由泥炭燃烧而产生的烟霾	监禁违法者
1		
2		
3		

部分 R：住宅信息

R1.　　**区域**　　槟岛西南区　☐

　　　　　　　　威省北区　☐

　　　　　　　　威省中区　☐

　　　　　　　　威省南区　☐

　　　　　　　　槟岛东北区　☐

R2.　　住宅地址　　(花园 / 村 / 道路 / 莖)

_____

_____

R3.　　住宅区域　☐　城市　　☐　乡村

R4.　　GPS 位置　　X:_____Y:_____

部分 S. 社会人口统计信息

S1.　　年龄　　　_____

S2.　　性别　☐　男　☐　女

S3　　族裔　☐　其他　☐　华人　☐　印度人　☐　土著

S4.　　教育程度　☐　非正规教育/无正规教育

　　　　　　　☐　完成小学教育

　　　　　　　☐　完成中学教育（SRP / PMR / MCE / SPM）

　　　　　　　☐　完成高等教育

S5.　　目前就业　☐　失业

　　　　　　　☐　私人部门

　　　　　　　☐　公共部门

　　　　　　　☐　自雇人士

　　　　　　　☐　其他，请声明_____

S6.　　个人收入(月)　　RM _____

307

9

S7.　家庭收入（月）　　　☐　RM999 以下

　　　　　　　　　　　　　☐　RM1,000 – RM1,999

　　　　　　　　　　　　　☐　RM2,000 – RM2,999

　　　　　　　　　　　　　☐　RM3,000 – RM3,999

　　　　　　　　　　　　　☐　RM4,000 – RM4,999

　　　　　　　　　　　　　☐　RM5,000 – RM5,999

　　　　　　　　　　　　　☐　RM6,000 – RM6,999

　　　　　　　　　　　　　☐　RM7,000 – RM7,999

　　　　　　　　　　　　　☐　RM8,000 以上

S8.　家庭成员　　　_____　人

S9.　生活安排　　　☐　独居

　　　　　　　　　　☐　和伴侣同住

　　　　　　　　　　☐　和孩子同住

　　　　　　　　　　☐　和父母/公婆同住

　　　　　　　　　　☐　和亲戚们同住

　　　　　　　　　　☐　和其他非家庭成员同住

S10.　交通工具（数量）　☐　没有私人交通工具　　　____辆

　　　　　　　　　　　　　☐　脚踏车　　　　　　　　____辆

　　　　　　　　　　　　　☐　摩托车　　　　　　　　____辆

　　　　　　　　　　　　　☐　汽车　　　　　　　　　____辆

　　　　　　　　　　　　　☐　MPV/ SUV(多用途车)　　____辆

　　　　　　　　　　　　　☐　货车　　　　　　　　　____辆

　　　　　　　　　　　　　☐　巴士/卡车/运货车　　　____辆

　　　　　　　　　　　　　☐　其他　　　　　　　　　____辆

d.   Questionnaire in Tamil

அன்புள்ள ஐயா / மேடம்,

" பினாங் பசுமை செயற்பட்டியலை அபிவிருத்தி செய்வதற்கான நிலை 1 இன் பங்குதாரர் ஆலோசகர்களுக்கான சேவைகள்" என்ற தலைப்பில் ஒரு கலந்துரையாடலில் பங்கேற்க நீங்கள் அழைக்கப்படுகிறீர்கள். யுனிவர்சிட்டி சயன்ஸ் மலேசியாவின் *(யுஎஸ்எம்)* ஆராய்ச்சியாளர்களின் குழுவால் இந்த ஆய்வு நடத்தப்பட்டது.

இந்த ஆய்வின் நோக்கம் மலேசியாவின் பினாங்கு மாநிலத்தின் சுற்றுச்சூழல் பிரச்சினைகள் மற்றும் அபிவிருத்தி பற்றிய கருத்துக்களை பெற வேண்டும்.
இந்த கேள்வித்தாளை நிறைவு செய்வதற்கு உதவ நாங்கள் உங்களின் ஒத்துழைப்பை நாடுகிறோம். எங்களது ஒத்துழைப்புடன், நாங்கள் உமக்கு நன்றி தெரிவிக்கிறோம்.

இந்த ஆய்வில் உங்கள் பங்களிப்பு தானாகவே உள்ளது மற்றும் நீங்கள் எவ்வித பிரச்சனையுமின்றி எந்த நேரத்திலும் விலகவோ அல்லது விலக்கவோ முடியும். பதில் வடிவங்கள், உண்மை அறிக்கைகள் மற்றும் சேகரிக்கப்பட்ட தரவு ஆராய்ச்சியாளர்களுக்கு மட்டுமே அணுக முடியும் . சமர்ப்பிக்கப்பட்ட கேள்விகளுக்கான எல்லா பதில்களும் இரகசியமாக வைக்கப்படும். தேவையான விரிவான தகவல்கள் ஆராய்ச்சி நோக்கங்களுக்காக மட்டுமே. சமர்ப்பிக்கப்பட்ட கேள்விகளுக்கு சத்தியத்தை வழங்குங்கள்.தயவுசெய்து ஒவ்வொரு கேள்விகளுக்கும் பதிலளிக்கவும்.

இந்த ஆய்வில் பங்கேற்க உங்கள் விருப்பத்தை மிகவும் பாராட்டுகிறோம்.. உன்னதமானவரால் வழங்கப்பட்ட அனைத்து ஒத்துழைப்பும் இந்த ஆய்விற்கு மிகவும் அர்த்தமுள்ளவை, இந்த கேள்விக்கு பதில் அளிப்பதற்கு நீங்கள் செலவிட்ட நேரத்திற்கு மீண்டும் நன்றி தெரிவிக்க விரும்புகிறோம்.

பேராசிரியர் Dr. Saidatul Akmal Mohd
ஆலோசனை தலைவர்
"பினாங்கு பசுமை செயற்பட்டியலை அபிவிருத்தி செய்வதற்கான நிலை 1 இன் பங்குதாரர் ஆலோசகர்களுக்கான சேவைகள்"

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மின்னஞ்சல்   *முகவரி* : eieydda@usm.my

பதிலளித்தவரின் ஒப்புதல்

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பதிலளித்தவரின் கையொப்பம்   *தேதி*   309

பகுதி எ. அபிவிருத்தி மற்றும் சுற்றுசூழலுக்கான தன்னார்வ இயற்பியல்

A1.   பினாங்'இல் பின்வரும் சுற்றுச்சுழல் பிரச்சனைகள் எவ்வளவு முக்கியம் ?

மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	தீவிரமாக இல்லை	சற்று கடுமையானது	மிகவும் கடுமையானது	தீவிரமானது	மிகவும் தீவிரமானது
	1	2	3	4	5
a. நாள்பட்ட போக்குவரத்து நெரிசல்					
b. திடீர் வெள்ளப்பெருக்கு					
c. உயரும் வெப்பநிலை					
d. குறைந்த திறந்த மற்றும் பச்சை இடைவெளிகள்					
e. குறைந்த நதிக்கரை / கடற்கரை					
f. காற்று தூய்மைக்கேடு					
g. நீர் தூய்மைக்கேடு					
h. ஒளி மாசுபாடு					
i. அளவுக்கு அதிகமாக மீன்பிடித்தல்					
j. அதிகமான நில மீட்பு					
k. திறனற்ற திட கழிவு மேலாண்மை					
l. காடழிப்பு					

A2.   பின்வரும் வாழ்க்கை முறை மாற்றங்களைச் செய்ய நீங்கள் தயாரா?
மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

இருந்து மாறுகிறது	பதில் இல்லை	ஆம், அடுத்த ஐந்து ஆண்டுகளில்	ஆமாம், அடுத்த மூன்று ஆண்டுகளில்	ஆம், உடனடியாக
	1	2	3	4
a. தனியார் போக்குவரத்திலிருந்து பொது போக்குவரத்துக்கு மாறுகிறது				
b. தனியார் வாகனத்திலிருந்து சுறுசுறுப்பான போக்குவரத்துக்கு (சைக்கிள் ஒட்டுதல் , நடைபயிற்சி) மாறுகிறது				
c. இறக்குமதி பொருட்களை வாங்குவதிலிருந்து உள்ளூர் உற்பத்தி பொருள்களை வாங்குவதற்கு மாறுகிறது				
d. குறைவான இறைச்சியும் அதிகமான காய்கறிகளை சாப்பிடுவதற்கு மாறுகிறது				
e. கரிம அல்லாதவையிலிருந்து கரிம உள்ள (ஆர்கானிக்) பொருட்களுக்கு மாறுகிறது				

310

1

A3. மாநில அரசாங்கத்தால் ஏற்பாடு செய்யப்பட்ட பச்சை (இயற்கை) முயற்சிகளை நீங்கள் ஏற்றுக்கொள்ள தயாரா?

மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

பச்சை முயற்சிகள்	பதில் இல்லை	இல்லை	இருக் கலாம்	ஆம்
	1	2	3	4
a. நெகிழி (பிளாஸ்டிக்) இல்லை				
b. (குறைக்க, மறுபயன்பாடு, மறுசுழற்சி, மறுக்கும், மறுபடியும்)				
c. கழிவு பிரித்தல்				
d. கார் இல்ல நாள்				
e. பயணிக்க சைக்கிளை ஓட்டுதல்				

A4. பினாங்கின் விரைவான வளர்ச்சி பின்பற்றுதலை எவ்வாறு பாதிக்கிறது?
மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	ஏழை	நல்ல	சிறந்த
	1	2	3	4
a. பொருளாதாரம்				
b. சமூகம்				
c. சுற்றுச்சூழல்				

A5. உங்கள் உள்ளூர் வளர்ச்சி மற்றும் சுற்றுச்சூழலின் (உங்கள் பகுதியில்) பின்வரும் அம்சங்களுடன் எவ்வளவு திருப்திகரமாக இருக்கிறீர்கள்?

மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	கருத்து இல்லை	மிகவும் அதிருப்தி	அதிருப்தி	திருப்தி	மிகவும் திருப்தி
	1	2	3	4	5
a. காற்றின் தரம்					
b. நீரின் தரம்					
c. பச்சை மற்றும் திறந்த இடைவெளிகளுக்கு அணுகல்					
d.சத்தம் அளவு					
e. குப்பை					
f. பொது போக்குவரத்து அணுகல்					
g. நில வளர்ச்சி					
h. மலிவான வீடுகள்					

311

I. சுகாதார வசதிகள் மற்றும் அணுகல் வசதிகள்				
j. கல்வி வசதிகள் மற்றும் அணுகல் வசதிகள்				

A6.　நிலையான வளர்ச்சி இலக்குகள் (SDG க்கள்) பற்றி கேள்விப்பட்டீர்களா?

　　　ஆம் ☐　　　　　　　இல்லை ☐

A7.　SDG களின் பிரச்சினைகள் குறித்து உங்கள் அக்கறைக்கு ஏற்றவாறு மிகச் சிறந்த பதிலைப் பெறவும்.

	அரிதான கவலை	அக்கறை	மிகவும் கவலை
a. பொது சுற்றுச்சூழல் பிரச்சினைகள்			
b. பருவநிலை மாற்றம் & புவி வெப்பமடைதல்			
c. காற்று தூய்மைகேடு			
d. நீர் தூய்மைகேடு de (நதி / கடல் / ஏரி / நீரோடை / குளம்)			
e. நீர் பற்றாக்குறை			
f. உணவு பாதுகாப்பு (விலை, அணுகல், கிடைத்தல்)			
g. காடழிப்பு (மலை, காடுகள், நிலப்பரப்பு, சரிவு)			
h. பல்லுயிர் இழப்பு (நிலத்தில், தண்ணீருக்கு கீழ்)			
i. கழிவு தொடர்பான பிரச்சினைகள் (கழிவு மேலாண்மை, மறுசுழற்சி) மீதான மக்கள் வாழ்க்கை முறை			
j. சுற்றுச்சூழல் பிரச்சினைகள் (உள்ளூர் எதிராக இறக்குமதி செய்யப்பட்ட பொருட்கள்)			
k. மக்கள்தொகை வளர்ச்சி			
l. பாலின சமத்துவம் (இளம்பெண்கள் மற்றும் மகளிர்கள்)			
m. வறுமை			
n. பச்சை (இயற்கை) இடைவெளிகள் மற்றும் பொழுதுபோக்கு பகுதிகளில்			
o. தரமான கல்விக்கான அணுகல்			
p. ஆற்றல் திறன்			
q. தரமான வேலைகளுக்கு அணுகல்			
r. மலிவான வீடுகள்			
s. செயல்திறன் மிக்க பொது போக்குவரத்து			
t. கலாச்சார மற்றும் இயற்கை பாரம்பரியத்தை			

பாதுகாத்தல் மற்றும் பாதுகாப்பு			
u. சமநிலையற்ற வளர்ச்சி (கிராம் Vs நகர்ப்புற, பெனாங் தீவு Vs செபெராங் பெராய்)			
v. விதிகள், ஒழுங்குமுறைகள், சட்டங்கள் மற்றும் நிலையான வளர்ச்சி கொள்கை			
w. நிலையான வளர்ச்சிக்கான பிராந்திய மற்றும் உலகளாவிய கூட்டாண்மை			
x. அபிவிருத்திப் பிரச்சினையில் மத்திய மற்றும் மாநில அரசாங்கத்தின் ஒத்துழைப்பு			
y. சுற்றுச்சூழல் பாதுகாப்புப் பகுதிகள் (நில அடித்தளம் மற்றும் கடல்)			
z. மற்றவை, தயவு செய்து குறிப்பிடவும் _____ _____			

A8. நீங்கள் எடுக்கப்பட்ட மற்றும் நடைமுறைப்படுத்தப்படும் நிலையான முயற்சிகள் யாவை?

தயவுசெய்து பொருந்தும் எல்லா முயற்சிகளையும் தொடருங்கள்

a. மறுசுழற்சி
b. பச்சை (இயற்கை) பொருட்களை பயன்படுத்துதல் மற்றும் வாங்குதல்
c. காகித பயன்பாட்டை குறைக்கவும்
d. மரங்களை நடுதல்
e. ஆற்றல் சேமிக்க
f. நீர் சேமிக்க
g. மழைநீர் அமைப்பு அறுவடை நிறுவவும்
h. கழிவு பிரித்தல் மற்றும் மேலாண்மை
i. மின் வணிகத்தின் பயன்பாடு
j. உணவு கழிவுகளை குறைத்தல்
k. நகரத்திற்கு பயணிக்கும் உச்ச மணிநேரத்தைத் தவிர்க்கவும்
l. சிறந்த சுற்றுசுழல் கொள்கைகளை பின்பற்றவும்

313

பகுதி B: வீடமைப்பு வீண்செலவு, மறுபயன்பாடு மற்றும் கழிவு மேலாண்மை

B1.   சராசரியாக, உங்கள் வீட்டில் ஒவ்வொரு வாரமும் எத்தனை கலந்த கழிவுகள் உற்பத்தியாகிறது?

மறுசுழற்சி / கம்போஸ்டிங் ஆகியவற்றிற்கான கழிவுகள் உள்ளடங்காதவை.

முதல், பையின் அளவை தேர்வு செய்க

| 10 litres (2 1/2 gallons) | 20 litres (5 gallons) | 30 litres (7 1/2 gallons) | 50 litres (12 1/2 gallons) | 100 litres (25 gallons) |

இரண்டாவதாக, ஒரு வாரம் சராசரியாக உற்பத்தி செய்யும் கலந்த கழிவுப்பொருளின் பையைக் குறிக்கவும்.

0 பை --- <15| தெரியவில்லை

B2.   உங்கள் வீட்டுக்கு வழக்கமாக இருக்கிறதா?
       மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	இல்லவே இல்லை	சில நேரங்களில்	சில நேரங்களில்	பெரும்பாலும்	வழக்கமாக
	1	2	3	4	5	6
a. அனைத்து மறுசுழற்சி பொருட்கள் மீளமைக்கவும்						
b. உயிரியல்மயமாக்கப்படாத பொருட்களின் பயன்பாடு குறைக்க						
c. உயிரற்ற						

314

5

மறுமதிப்பற்ற பொருட்களை மீண்டும் பயன்படுத்துங்கள்						315
d. வீட்டிலேயே கழிவுகள் வீழ்ச்சியடையும்						
e. உரம் உணவு						
f. பூஜ்ஜிய கழிவுகளை பயிற்சி செய்யவும்						

பகுதி சி: வீட்டு உரிமையாளர் மற்றும் போக்குவரத்து தேர்வு

C1.   கீழ்க்கண்ட செயல்பாடுகள் ஒவ்வொன்றிற்கும் உங்கள் பிரதான பயன்முறை என்ன?

தயவுசெய்து, மிகப்பெரிய தொலைவிற்கான கணக்கை தேர்வு செய்யவும்:

	பதில் இல்லை	நடைபயிற்சி	சைக்கிள் ஓட்டுதல்	கார் பூல்	பொது போக்குவரத்து (பஸ், டாக்ஸி)	ரைடு பகிர் (யுபர் / கிராப்)	கார் / மோட்டார் சைக்கிள்
a. வேலைக்கு தினசரி பயணம்							
b. ஷாப்பிங் / மளிகை							
c. பொழுதுபோக்கு செயல்பாடு							
d. விடுமுறை							

C2.   ஏறக்குறைய, எவ்வளவு காலம் நீங்கள் வேலை செய்யப் போகிறீர்கள் (ஒரு வழி)?

a.   15 நிமிடங்களுக்கும் குறைவாக
b.   15 - 30 நிமிடங்கள்
c.   31 - 45 நிமிடங்கள்
d.   46 நிமிடங்கள் - 1 மணி
e.   1 மணிநேரத்திற்கும் மேலாக

C3. போக்குவரத்து வழக்கம் போலவே, வெவ்வேறு வழிகளில் போக்குவரத்தை பயன்படுத்தி வேலைக்கு செல்ல எவ்வளவு நேரம் ஆகும்?

	பதில் இல்லை	நடைப் பயிற்சி	சைக்கிள் ஓட்டுதல்	கார் பூல்	பொது போக்குவரத்து (பஸ், டாக்ஸி)	ரைடு பகிர் (யுபர் / கிராப்)	கார் / மோட்டார் சைக்கிள்
a. 30 நிமிடங்களுக்கும் குறைவான நேரம்							
b. 16 - 30 நிமிடங்கள் குறுகியதாக							
c. 5 - 15 நிமிடங்கள் குறுகியதாக							
d. அதே நேரம் (தோராயமாக)							
e. 5 - 15 நிமிடங்கள் அதிகம்							
f. 16 - 30 நிமிடங்கள் அதிகம்							
g. 30 நிமிடங்களுக்கும் மேலாக							
h. தெரியாது / முடியாது							

C4.   கடந்த ஆண்டு, நீங்கள் பின்வரும் எதை செய்தீர்கள்?
       மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	ஒரு போதும் இல்லை	எப் போதாவது	சில நேரங்களில்	அடிக் கடி	வழக்க மாக
	1	2	3	4	5	6
a.ஆதரவு கார் இல்ல நாளுக்கு ஆனால் பங்கேற்கவில்லை						
b. கார் இல்ல நாள் முயற்சியில் பங்கேற்றது						
c. பயன்படுத்திய கார் குரல் அல்லது சவாரி பகிர்வு திட்டம்						
d. குறைவான எரிபொருளைப் பயன்படுத்தும் ஓட்டும் நடைமுறை						

பகுதி டி: வீட்டு உரிமையாளர் மற்றும் நீர் உபயோகம்

D1. உங்கள் அன்றாட வாழ்க்கையில் நீங்கள் எவற்றை அடிக்கடி செய்கிறீர்கள்?
மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	எப் போதாவது	எப் போதாவது	சில நேரங்களில்	அடிக் கடி	வழக்க மாக
	1	2	3	4	5	6
a. பல் துலக்குதல் போது தண்ணீர் அணைக்க வேண்டும்						
b. கையால் தட்டுகளை கழுவும் போது மடு இணைக்கவும்						
c. மழை நீர் அறுவடை முறை						
d. கழிவு நீர் மறுசுழற்சி						

316

7

பகுதி E: வீட்டு உபயோகம் மற்றும் ஆற்றல் பயன்பாடு

E1. உங்கள் அன்றாட வாழ்க்கையில் நீங்கள் எவற்றை அடிக்கடி செய்கிறீர்கள்?
மிகவும் பொருத்தமான பதிலுக்கு டிக் செய்யவும் (ஒரு வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	ஒரு போதுமில்லை	எப் போதாவது	சில நேரங்களில்	அடிக்கடி	வழக்கமாக
	1	2	3	4	5	6
a. பாரம்பரிய லைபுல்புபிற்கு பதிலாக சிறிய ஃப்ளோரசன்ட் லைட் (சி.எஃப்.எல்) லைட்பல்ப் பயன்படுத்தவும்						
b. பயன்பாட்டில் இல்லாதபோது சாதனங்களைத் துண்டிக்கவும்						
c. முடிந்தவரை மாடிப்படி பயன்படுத்தவும்						
d. AC மற்றும் உலர்த்தி உபயோகத்தை குறைக்கவும்						

பாகம் F: வீட்டுத் தோற்றம் மற்றும் உணவு

F1.உங்கள் வீட்டுக்கு வழக்கமாக இருக்கிறதா?
மிகவும் பொருத்தமான பதில் (வரிசைக்கு ஒரு முறை)

	பதில் இல்லை	ஒரு போதுமில்லை	எப் போதாவது	சில நேரங்களில்	அடிக்கடி	வழக்கமாக
	1	2	3	4	5	6
a. உணவு கழிவு உரம்						
b. குறைந்த பேக்கேஜிங் கொண்ட உணவு பொருட்களை தேர்வு செய்யவும்						
c. உணவு பொருட்களை வாங்க மறுபயன்பாட்டு ஷாப்பிங் பைகள் பயன்படுத்தவும்						
d. Take-out க்கான சொந்த உணவு அல்லது தண்ணீர் கொள்கலன் எடுத்து						
e. உள்நாட்டில் வளர்க்கப்படும் உணவு சாப்பிடுங்கள்						
f. இறைச்சிகளை குறைக்க அல்லது தவிர்க்க						
g. கரிம (ஆர்கானிக்) பொருள்களை தேர்வு						

317

F2.	உங்கள் வீட்டால் வாங்கப்பட்ட ஏறத்தாழ என்ன விகிதம் விசப்படுகிறது?

உணவு அல்லாத பிற பாகங்களை விலக்கவும், எ.கா. விதைகள், முதலியன

0%   100%   தெரியவில்லை

|--|
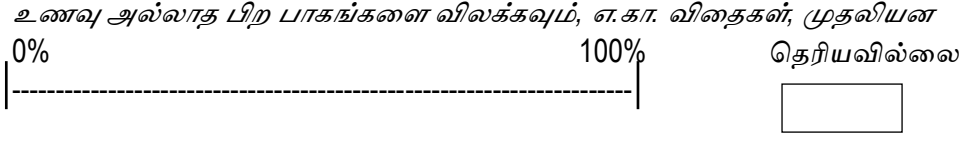
பகுதி G. வீட்டு அபிவிருத்தி மற்றும் சுற்றுச்சூழல் சிவிலியன்களை அணுகுகிறது

G1.	பின்வரும் செயல்களில் ஈடுபடுகிறீர்களா?

	பதில் இல்லை	ஒருபோதுமில்லை	எப்போதாவது	சில நேரங்களில்	அடிக்கடி	வழக்கமாக
	1	2	3	4	5	6
a. தனிப்பட்ட சுற்றுச்சூழல் அறிவு மற்றும் நடைமுறைகளை தொடர்ந்து ஆராயுங்கள்						
b. சுற்றுச்சூழல் கல்வி பிரச்சாரத்திலும் நடவடிக்கைகளிலும் ஈடுபடுதல்						
c. சுற்றுச்சூழல் நடைமுறைகளில் பிறரை (குடும்ப உறுப்பினர்கள், நண்பர்கள், அயல் நாடுகள் போன்றவை) கற்றுக்கொள்தல்						
d. பச்சை (இயற்கை) நடைமுறைகளை பின்பற்றுவதை மற்றவர்களை ஊக்குவிக்கவும்						

பகுதி H. குடிவரவாளர்கள் மீதான வீட்டுத் தீர்ப்புகள்

H1.   பினாங்கில் குடியேறுபவர்களின் வருகையைப் பற்றி உங்கள் கருத்து என்ன?
மிகவும் பொருத்தமான பதில் (வரிசைக்கு ஒரு முறை)

	விளைவு இல்லை	ஏழை	சராசரி	நல்ல	சிறந்த
	1	2	3	4	5
a. பொருளாதாரம் மற்றும் வளர்ச்சி					
b. சுற்றுச்சூழல்					
c. சமூக மற்றும் ஆரோக்கியம்					

பகுதி I: பினாங்கு வளர்ச்சி பற்றிய எதிர்கால எதிர்பார்ப்பு

I1.   எதிர்கால பினாங்கு வளர்ச்சி குறித்து நீங்கள் என்ன விரும்புகிறீர்கள்
உங்கள் சூழ்நிலைக்கு ஏற்றவாறு மிகச் சரியான பதிலைப் பெறுங்கள்.

	பதில் இல்லை	இல்லை	இருக்கலாம்	ஆம்
	1	2	3	4
a. மேலும் திறந்த மற்றும் பச்சை (இயற்கை) இடைவெளிகள் (பொழுதுபோக்கு பகுதிகள், பூங்கா)				
b. குடியிருப்பு மற்றும் வணிகங்களில் புதுப்பிக்கத்தக்க ஆற்றலின் பயன்பாடு				
c. சைக்கிள் ஓட்டுதல் இணைப்பு மேம்படுத்துதல்				
d. மேலும் மரங்களை நடுதல்				
e. மறுசுழற்சி வசதிகளின் எண்ணிக்கை அதிகரிக்கும்				
f. பாதிக்கப்படக்கூடிய குழுக்களை (பெண்கள், குழந்தைகள், ஊனமுற்றோர், வயதானவர்கள்)				
g. தரமான பாதசாரி பாதைகள்				
h. சிறந்த மற்றும் திறமையான பொது போக்குவரத்து				
i. நகர்ப்புற விவசாயம் ஊக்குவிக்க				
j. முடிவெடுக்கும் கொள்கையை நடைமுறைப்படுத்துவதில் அதிகமான செயலூக்கமான மற்றும் உண்மையான மக்கள் பங்கேற்பு				
k. ஒருங்கிணைந்த திட கழிவு மேலாண்மை				
l. தண்ணீர் மற்றும் சுத்திகரிப்பு சுத்திகரிக்க அணுகல்				
m. நகர்ப்புற திட்டமிட்டலில் பேரழிவு-இடர் முகாமைத்துவத்தை இணைத்தல்				
n. தொழில்கள் மற்றும் தொழில்களுக்கான பச்சை தொழில்நுட்பத்தை ஏற்றுக்கொள்தல்				
o. பினாங் தீவில் மறு மீட்பு இல்லை				
p. மற்றவை, தயவு செய்து குறிப்பிடவும் _____ _____ _____				

பகுதி J: எதிர்கால சவால்கள் மற்றும் அவற்றின் தீர்வுகள்

J1.   பினாங்கின் மூன்று (3) எதிர்கால சுற்றுச்சூழல் சவால்கள் மற்றும் சவால்களுக்கான
        தீர்வுகளை வழங்குவதை தயவுசெய்து பட்டியலிடுங்கள்.

எண்	சவால்களை	தீர்வுகள்
உதாரணமாக	எரிச்சலூட்டும் நெருப்பினால் எரியும் நெருப்பு	குற்றவாளிகளுக்கு சிறை
1		
2		
3		

பகுதி R: குடியிருப்பு தகவல்

R1.மாவட்டம்: தென்மேற்கு ☐

வடக்கு செபெராங் பெர்ய் ☐

செபெராங் பெர்ய் டெங்கா ☐

செபெராங் பெர்ய் தெற்கு ☐

வடகிழக்கு ☐

R2. வீட்டு முகவரி (தோட்டம் / கிராமம் / சாலை / லொராங்) _____

_____

R3. இருப்பிடம் : ☐ நகர்ப்புறம்   ☐   கிராமப்புறம்

R4.   GPS இடம்   X:_____Y:_____

பகுதி S : சமூக மக்கள்தொகை தகவல்

S1.   வயது   _____

S2.   பாலினம்   ☐ ஆண்   ☐ பெண்

S3   இனம்   ☐ சீனர் ☐ இந்தியர்   ☐ பூமிபுத்ரா   ☐ மற்றவர்கள்

S4.   கல்வி நிலை   ☐ முறைசாரா கல்வி / கல்வி இல்லை

                               ☐ முதல்நிலை கல்வி

                               ☐ இரண்டாம் நிலை கல்வி (SRP / PMR / MCE / SPM)

                               ☐ மூன்றாம் நிலை கல்வி

S5.   தற்போதைய வேலைவாய்ப்பு   ☐ வேலை இல்லாமை

                                       ☐ தனியார் துறை

                                       ☐ பொதுத்துறை

                                       ☐ சுயதொழில்

                                 ☐ மற்றவை, குறிப்பிடவும் _____

S6.   தனிப்பட்ட வருமானம். RM _____

S7.   வீட்டு வருமானம்   ☐ RM999க்கு கீழே

                             ☐ RM1,000 – RM1,999

                             ☐ RM2,000 – RM2,999

                             ☐ RM3,000 – RM3,999

                             ☐ RM4,000 – RM4,999

                             ☐ RM5,000 – RM5,999

                             ☐ RM6,000 – RM6,999

                             ☐ RM7,000 – RM7,999

                             ☐ RM8,000 and over

S8.   வீட்டு அளவு   _____   மக்கள்

பகுதி S : சமூக மக்கள்தொகை தகவல்

321

Appendix C – Public Feedback and Responses

Number	Feedback	Consultants Response	Remark
Feedback from Bah. Kerajaan Tempatan, PSUKPP			
1	Page 82: Box 3.1 Brief concept of eco and smart city. According to Bellissent (2010), there are three types of smart cities i.e. new cities purposely designed as smart cities, existing cities with enhanced smart city elements and "non-cities" that are implemented with smart city features.	The consultants opine that the existing literature on eco and smart city is sufficient. No further elaboration is required.	
2	Pages 61-64 (Transportation): Table 6.7 Mode of transportation in Penang. Reduce 10% 2014 death yearly by 2020 (road safety plan) Penang government apply CAT congestion allocation transport BEST FTZ/KOMTAR PBT apply bicycle lanes	The discussion on transportation was limited to agencies attended the FGD	
3	Page 140: Is this practice to take only 1 public comments of out 1.8 million population? How this is considered? Problem should have solutions. Any engagement with state agencies?	Among the objectives in the TOR of this project is to identify current and future issues, and to report findings as it is. It is not in the TOR to propose solutions for issues/problems identified. Several state officials and EXCO members have been interviewed for this study.	
4	Page 141: How this is surely being conducted? How practice to take only 1 survey in this report? Problem is considered, where is the solution?	The verbatim is a respondent point of view from in-depth interview. It is not in the TOR to propose solutions for	

			issues/problems identified.	
5	Page 145: Replacement of mangrove forest is it taken into account? All problems showed be answered with a solution.	This future challenge was not highlighted by the public during the survey (asked through an open ended question). It is not in the TOR to propose solutions for issues/problems identified.	
6	Pages 150-152: This programs has been part of Penang State Government's initiative to rehabilitate rivers.	Yes, they were identified and mentioned by stakeholders during FGD and interview.	
7	Page 195: Define how this policy was obtained? (policy on land issues) Is this same with the state policy?	It is beyond the scope of this project to define how policies are obtained. The project merely report findings as there are.	
8	Page 197: Define C & D (policy with regard to transportation) How is this defined as part of policy? Does this is incline with state policy? Has been and being carried out. So? (Environmental programs)	It is beyond the scope of this project to define how policies are obtained or to revisit existing policies. The project merely report findings as there are.	
9	Pages 198-199: Table 6.4 Define limitations? (Funding) Compensation done to development: Define if this is according to land act for development for public facilities/infrastructure? Compensation guideline has to be according to act by government How does this survey consideration is taken into? 1 number?	It is beyond the scope of this project to define how policies are obtained or to revisit existing policies. The project merely report findings as there are.	Some of the comments provided are incomprehensible.

10	Page 200: Table 6.7: Does this issue has solution? Has state's initiatives taken into consideration?	It is not in the TOR to propose solutions for issues/problems identified. Yes, state initiatives have been considered.	
11	Page 22: Sample size does not represent population.	The consultants have revisited the methodology to address this query.	
12	Page 23: Is it appropriate to quote people?	Names of respondents/informants have been removed. They are now anonymous.	
13	Page 56: Confident index (C1)? Sample size?	The consultants have revisited the methodology to address this query.	
14	Page 140: Are you sure on the survey conducted? It is very negative and misleading.	The consultants have revisited the methodology to address this query.	
15	Page 141: Any possibility to get state concern? Of course we got all the EIA report etc.	Several state officials and EXCO members have been interviewed for this study.	
Feedback from Invest-in-Penang Berhad (InvestPenang)			
1	Pages 155-156: Survey with the public proposed the solutions of (1) monitor factory activities; and (2) build factory far from housing areas as part of solutions for environmental issues in Penang.	It is unclear what InvestPenang is trying to highlight. The report is merely reporting findings as they are.	
2	Sharing of industry practice on environment-friendly practice (p. 208), industry may sponsor environmental campaigns and programs (p. 208) and industry interactive action with the government, academics, and the public (p. 213) are some of the suggestions in the study involving industry.	It is unclear what InvestPenang is trying to highlight. The report is merely reporting findings as they are.	

Feedback from Penang Development Corporation (PDC)			
1	Do the survey results/outcome will be different if the timeline of the survey is different?	Yes, definitely.	
Feedback from Jabatan Kesihatan (Health Department)			
1	Isu berkaitan kesihatan mental harus turut diberi penekanan atau dibincangkan SDG target 3.4.	This issue was not raised during the interviews and focus group discussions. The report is merely reporting findings as they are.	
Proposals from George Town World Heritage Incorporated			
1	GTWHI suggests a disaster risk reduction plan for all areas which have high risk of flood and fire Public education and awareness programs which highlights global climate change and its impact should also be a part of the Penang Green Agenda Waste management plan and awareness for commercial entities and business should be included in the agenda Using technology to promote or create awareness on green initiatives and programmes Raise the awareness of recycling heritage building materials	While proposals from key stakeholders are welcomed, but it is not within the TOR and scope of this study to propose and include solutions/suggestions. The proposals suggested by GTWHI will be kept in view for Stage 2's stakeholder consultation for developing the Penang Green Agenda.	
Feedback from Indah Water Konsortium			
1	Coordination of this report with Green Transformation Master Plan – national level (2017-2030). Need to be in line with the Green Transformation Master Plan at national level in relation to wastewater treatment by 2030: 50% biosolids to be recycled 50% bio effluent to be recycled For further details, please refer to KETTHA website on this green masterplan.	It is not in the TOR and beyond the scope of this project to coordinate and align this study with national level plans. The report is merely reporting findings as they are.	

	Feedback from PBA		326
1	Water security issue is/may not well understand by general public. Hence, the survey done did not well address the concern on this subject for current issues, current challenges, futures issues and future challenges.	This study is Stage 1 of the entire process of developing Penang's Green Agenda. While the survey (conducted by this study) managed to capture some issues related to water security but it is not within the TOR and beyond the scope of this project to address this concern in an in-depth manner when deliberating current issues, current challenges, future issues and future challenges.	
2	The Stage 2 of this report should look into professional input on water security subject and look into strategies and solutions to overcome this. Water security issue should cover catchment, logging law & enforcement. Water quality matters and sustainable water supply.	Yes, Stage 2 of this project will look into strategies and solutions to address issues related to water security.	