



Final Report
Public Survey on Climate Change in Penang 2016

Prepared by

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Executive Summary

Climate change is considered the most serious global challenge of humankind in the present moment of time and governments at all levels, the private sector, civil society, the public and individuals need to adapt to and make commitments to mitigate against this global threat. This report is based on a state-wide “Public Survey on Climate Change in Penang in 2016”. The objectives of this survey are: To investigate public awareness on the issues and effects of climate change; To examine public perception on the causes of climate change; and to study public perception and behaviours on climate change mitigation. Results of this survey are then used as the basis to formulate policy recommendations for a Penang State Climate Change Action Plan for the General Public (PSCCAPGP). This is seen, amongst other strategies, a response strategy that recognises the importance of climate change impacts on the Penang public and to mobilise the public to take action to mitigate against climate change. Creating greater public awareness and commitment towards climate change and its mitigation is seen as a step towards enabling Penang State to engage the public to reduce the state’s vulnerability to climate change and associated negative impacts. This action plan is the result of a one year public survey based on a participatory process involving the academia, civil society and the Penang public under the leadership of the Penang Green Council, Universiti Sains Malaysia and Water Watch Penang executed by a multi-stakeholder cum multidisciplinary taskforce. Policy recommendations are solely targeted towards the general public.

The results indicate that “Awareness and Concern of Penang Public on Climate Change” are high, as the majority rated climate change issues as moderately to extremely important. However, climate change issues were only ranked a lowly 6th behind awareness and concern for environmental issues, crime, economic issues, transportation and other social issues. Hence, a great of work on raising the Penang public’s awareness on climate change remains to be done. Other results showed that most of the Penang public believe that climate change is happening in the world as well as in Penang. The majority also feel that the climate of the past ten years has changed when compared to the present climate. These results substantiate the fact that the majority of the Penang public are aware of climate change.

In terms of the Penang public’s general perception and understanding of climate change, the survey results indicate that most of them believed that climate change is due to a combination of natural cycles and human activities. This indicates that they have a balanced view that climate change is not solely caused by nature nor by humans alone, but a combination of both. This indicates that the Penang public hold humans to be much more responsible for climate change than natural causes. This being the case, then it is logical that solutions to address climate change should be focused on changing human actions. However, results from open-ended questions showed that the majority of the respondents did not know what the Carbon Footprint is. Likewise, the majority of respondents did not know what were Green House Gases. These results revealed that the respondents’ knowledge on Carbon Footprint and Green House Gases is very limited. Results also showed that most respondents feel that the Penang State Government should be responsible for tackling the issue of climate change in Penang, followed by the Federal Government and the local council. Interestingly, 67.0 % of the respondents believed that the local community and themselves should be responsible for tackling climate change. This bodes well for climate change action involving the general public since the public is ready to be held responsible for such action. Other results indicate that the Penang public

also feels that NGOs (46 % of respondent believed so) and the private sector (50.5 % of respondents believed so) should be mainly responsible for tackling climate change in Penang.

The Penang public's general understanding of the effects of climate change was found to be good as results show that the Penang public believe that floods, drought/water crisis, haze, and sea level rise will happen if climate change were to occur in Penang, as compared to few respondents who believed that climate change will cause AIDS epidemics, unemployment and political unrest in Penang. However, the Penang public is only aware of the effects of climate change locally and not globally. Almost half of respondents believe that climate change is happening now, and only the minority believes that climate change will only happen in 1-50 years in future, and a negligible percentage (0.6 %) do not believe that climate change is happening. These results indicate that the Penang public does not deny that climate change is happening but in fact believes that it is already happening now. In terms of climate change mitigation, the Penang public believe individuals can help address climate change as the majority (57.3 %) think/believe that individuals can make a difference with regards to climate change. These results imply that Penang people are likely to get involved or engaged in climate change programmes or actions.

In terms of "Action and Behaviour to Combat Climate Change", results indicate that the top ranked practice/action of the respondents was that of avoiding food wastage. The second ranked practice was that of practicing energy savings in the home. The third ranked practice to mitigate against climate change was the practice of 3Rs. The fourth ranked practice was that of taking part in environmental educational activities or campaigns. All the top four ranked practices had more than 60 % of respondents practising them. All other practices had less than 50 % of respondents practising them. These include the practice of using public transport, choosing to walk instead of driving, the purchasing of green vehicle to protect the environment, eating of less meat, the fitting of water saving devices and the installation of rainwater harvesting system in the home.

Overall, it can be inferred from the results that the Penang public is moderately aware and concerned about climate change, but in terms of priorities, they ranked the other issues of environment, crime, economy, transportation and other social issues as more important. Most of the Penang public had a balanced view believing that climate change is due to a combination of natural cycles and human activities. However, despite the fact that the Penang public's general understanding of the effects of climate change was good, their understanding of climate change was shallow as they did not know what was meant by Carbon Footprint or Green House Gases. Most feel that the Penang State Government should be responsible for tackling the issue of climate change in Penang, followed by the Federal Government and the local council. Interestingly, most also believed that the local community and themselves should be responsible for tackling climate change. The Penang public is only aware of the effects of climate change locally but not globally, but they believe that climate change is happening now. The Penang public believe that individuals can help address climate change and can make a difference, as shown by their engagement in several practices/actions that mitigate against climate change.

Ringkasan Eksekutif

Perubahan iklim merupakan cabaran global yang paling serius terhadap masyarakat dunia pada masa kini dan pihak kerajaan di semua peringkat pentadbiran, sektor swasta, masyarakat awam, orang awam dan individu perlu menyesuaikan diri dan membuat komitmen untuk mengurangkan risiko terhadap ancaman global ini. Laporan ini ditulis berdasarkan kaji selidik yang telah dilakukan di seluruh negeri yang bertajuk "Tinjauan Umum Mengenai Perubahan Iklim di Pulau Pinang pada tahun 2016". Objektif kajian ini adalah: Meneliti kesedaran awam tentang isu dan kesan perubahan iklim; Mengkaji persepsi masyarakat tentang punca perubahan iklim; dan meneliti persepsi dan tingkah laku orang ramai terhadap usaha pengurangan risiko dan bencana perubahan iklim. Keputusan kaji selidik ini dijadikan asas untuk merangka cadangan dasar bagi Pelan Tindakan Perubahan Iklim di Negeri Pulau Pinang untuk Masyarakat Awam (PSCCAPGP). Ini merupakan salah satu strategi tindak balas yang menyedari kepentingan kesan perubahan iklim ke atas masyarakat Pulau Pinang dan sekaligus menggerakkan orang ramai supaya mengambil tindakan membantu mengurangkan risiko perubahan iklim. Usaha mewujudkan kesedaran dan komitmen awam yang lebih tinggi terhadap perubahan iklim dan pengurangan risiko ini dilihat sebagai satu langkah ke arah membolehkan Pulau Pinang melibatkan orang ramai dalam usaha meminimumkan kesan perubahan iklim serta kesan negatif yang berkaitan ke atas negeri ini. Pelan tindakan yang telah dilaksanakan oleh pelbagai pihak yang berkepentingan dan pasukan petugas pelbagai disiplin ini merupakan hasil daripada kaji selidik awam yang telah dijalankan selama setahun berdasarkan satu proses penyertaan yang melibatkan ahli akademik, masyarakat sivil dan awam di Pulau Pinang, di bawah pimpinan Penang Green Council, Universiti Sains Malaysia dan Water Watch Penang. Cadangan dasar yang dirangka hasil daripada kajian ini disasarkan kepada orang awam semata-mata

Hasil kajian menunjukkan bahawa tahap kesedaran dan kebimbangan masyarakat awam Pulau Pinang terhadap perubahan iklim adalah tinggi kerana majoriti meletakkan isu perubahan iklim dalam lingkungan sederhana kepada yang sangat penting. Walau bagaimanapun, isu perubahan iklim hanya berada di tahap kedudukan yang agak rendah iaitu kedudukan yang ke-6 selepas isu kesedaran dan keprihatinan terhadap isu-isu alam sekitar, jenayah, isu-isu ekonomi, pengangkutan dan isu-isu sosial yang lain. Oleh itu, masih banyak usaha yang perlu dijalankan bagi meningkatkan kesedaran masyarakat Pulau Pinang tentang perubahan iklim ini. Hasil kajian juga menunjukkan kebanyakan masyarakat Pulau Pinang percaya bahawa perubahan iklim yang sedang berlaku di Pulau Pinang juga sedang berlaku di seluruh dunia. Majoriti juga merasakan iklim sepuluh tahun yang lalu telah banyak berubah berbanding iklim masa kini. Hasil kajian ini membuktikan hakikat bahawa majoriti rakyat Pulau Pinang sememangnya sedar akan perubahan iklim tersebut.

Dari segi persepsi umum dan pemahaman orang ramai di Pulau Pinang tentang perubahan iklim, dapatan kajian menunjukkan bahawa ramai yang menganggap perubahan iklim berpunca dari gabungan kitaran semula jadi dan aktiviti manusia. Ini jelas menunjukkan pandangan masyarakat Pulau Pinang yang seimbang, yang mempercayai perubahan iklim bukan disebabkan oleh alam semula jadi semata-mata dan bukan juga disebabkan oleh manusia sahaja, tetapi merupakan gabungan kedua-duanya. Dalam hal ini, masyarakat Pulau Pinang meletakkan manusia sebagai pihak yang lebih bertanggungjawab terhadap perubahan iklim berbanding proses alam semula jadi. Maka dalam hal ini, secara logiknya, penyelesaian bagi menangani perubahan iklim perlu memberi tumpuan kepada perubahan tindakan manusia. Walau bagaimanapun, keputusan daripada soalan terbuka menunjukkan bahawa kebanyakan responden tidak tahu tentang Jejak Karbon (Carbon Footprint) dan Gas Rumah

Hijau (Green House Gases). Dapatan ini juga membuktikan pengetahuan responden terhadap Jejak Karbon (Carbon Footprint) dan Gas Rumah Hijau (Green House Gases) adalah sangat terhad. Hasil kajian juga memaparkan pendapat kebanyakan responden yang merasakan bahawa Kerajaan Negeri Pulau Pinang, diikuti oleh Kerajaan Persekutuan dan pihak berkuasa tempatan, perlu bertanggungjawab dalam menangani isu perubahan iklim di Pulau Pinang. Menariknya, 67.0% daripada responden percaya masyarakat tempatan dan mereka sendiri perlu bertanggungjawab dalam menangani perubahan iklim. Ini merupakan satu petanda baik bagi menjalankan usaha menangani perubahan iklim yang melibatkan orang ramai yang dilihat sudah bersedia memikul tanggungjawab tersebut. Dapatan lain menunjukkan rakyat Pulau Pinang cenderung merasakan bahawa pihak NGO (pendapat 46% responden) dan sektor swasta (pendapat 50.5% responden) terutamanya harus bertanggungjawab dalam menangani perubahan iklim di Pulau Pinang.

Pemahaman umum masyarakat Pulau Pinang tentang kesan perubahan iklim didapati amat baik. Majoriti rakyat Pulau Pinang sedar bahawa banjir, kemarau / krisis air, jerebu, dan kenaikan paras laut akan berlaku jika perubahan iklim berlaku di Pulau Pinang, berbanding beberapa responden yang percaya bahawa perubahan iklim akan menyebabkan wabak AIDS, pengangguran dan pergolakan politik di Pulau Pinang. Walau bagaimanapun, pengetahuan dan pemahaman tentang kesan perubahan iklim ini hanyalah pada tahap tempatan sahaja dan bukan pada peringkat global. Hampir separuh daripada responden percaya bahawa perubahan iklim sedang berlaku sekarang. Sebahagian minoriti yang lain pula percaya perubahan iklim hanya akan berlaku dalam tempoh 1-50 tahun akan datang, manakala sebilangan kecil responden (0.6%) tidak percaya bahawa perubahan iklim sedang berlaku. Keputusan ini menunjukkan bahawa rakyat Pulau Pinang tidak menafikan apa yang sedang berlaku. Malah mereka sebenarnya sedar akan perubahan iklim yang sudah dan sedang berlaku sekarang. Dari segi usaha menangani perubahan iklim, masyarakat Pulau Pinang percaya setiap individu boleh membantu dalam usaha ini kerana majoriti (57.3%) percaya bahawa setiap individu boleh melakukan perubahan yang berkaitan dengan perubahan iklim. Keputusan ini menunjukkan rakyat Pulau Pinang akan melibatkan diri dalam apa jua program perubahan iklim yang diadakan.

Dari segi "Tindakan dan Tingkah Laku dalam Memerangi Perubahan Iklim", hasil kajian menunjukkan bahawa amalan / tindakan yang menduduki tangga teratas dari kacamata responden adalah mengelakkan pembaziran makanan. Amalan kedua adalah penjimatan tenaga di rumah. Amalan ketiga adalah mengurangkan risiko perubahan iklim dengan amalan 3R. Amalan keempat adalah mengambil bahagian dalam kempen atau aktiviti-aktiviti pendidikan alam sekitar. Lebih daripada 60% daripada responden yang terlibat mengamalkan kesemua empat amalan di atas. Kurang daripada 50% responden mengamalkan amalan yang lain. Amalan lain ini merujuk kepada amalan menggunakan pengangkutan awam, memilih untuk berjalan dan bukannya memandu, pembelian kenderaan hijau untuk melindungi alam sekitar, mengurangkan pemakanan daging, pemasangan peranti penjimatan air dan pemasangan sistem penuaian air hujan di rumah.

Secara keseluruhannya, rumusan yang boleh dibuat hasil daripada kaji selidik ini adalah masyarakat di Pulau Pinang sedar dan peka serta prihatin tentang perubahan iklim, Walaubagaimanapun, dari segi keutamaan, masyarakat Pulau Pinang menganggap isu yang lain lebih penting seperti isu alam sekitar yang berlainan, isu jenayah, isu ekonomi, isu pengangkutan dan isu sosial. Kebanyakan masyarakat awam di Pulau Pinang mempunyai pandangan yang seimbang dan mempercayai bahawa perubahan iklim adalah disebabkan gabungan kitaran semula jadi dan aktiviti manusia. Walaupun, pemahaman mereka tentang kesan perubahan iklim agak baik, pemahaman tentang perubahan iklim

didapati agak cetek memandangkan mereka tidak memahami maksud Jejak Karbon (Carbon Footprint) atau Gas Rumah HIjau (Green House Gases).

Kebanyakan daripada responden merasakan bahawa Kerajaan Negeri Pulau Pinang, diikuti oleh Kerajaan Persekutuan dan pihak berkuasa tempatan perlu bertanggungjawab dalam menangani isu perubahan iklim di Pulau Pinang. Menariknya, sebahagian besar juga mempercayai bahawa masyarakat setempat dan mereka sendiri perlu bertanggungjawab dan turut serta menangani kesan perubahan iklim. Masyarakat Pulau Pinang hanya sedar akan kesan perubahan iklim dalam negara sahaja dan bukan di peringkat global. Walaubagaimanapun mereka sedar akan perubahan iklim yang sedang berlaku sekarang. Orang ramai di Pulau Pinang percaya bahawa setiap individu boleh membantu menangani masalah perubahan iklim dan boleh membuat perbezaan, seperti yang ditunjukkan dalam penglibatan mereka dalam beberapa amalan / tindakan yang membantu mengurangkan kesan perubahan iklim.

行政摘要

气候变化被认为是人类目前面对最严峻的全球挑战，各级政府部门、私人界、民间社会、民众及个人都必须适应及做出承诺来缓解这全球威胁。这是根据在全槟展开的“2016年槟州气候变化民调”整理出来的报告。这项民调的主要目的是：调查民众对气候变化课题及影响的醒觉、研究民众对导致气候变化的因素的认知，以及研究民众对于“缓解气候变化”的概念及行为。这项民调的结果将提呈给“槟州民众气候变化行动计划”（Penang State Climate Change Action Plan for the General Public, PSCCAPGP），以作为制定政策建议的基底。在其他战略中，这被视作一个反应战略，意识到气候变化影响对槟城民众的重要性，并动员公众采取行动缓解气候变化。提高民众对于气候变化及缓解方案的醒觉及承诺，将被视作迈向一步使槟州让民众参与，以减少槟州对气候变化和相关负面影响的脆弱性。该行动计划是根据进行了一年民调得来的结果，这民调则是涉及学术界、民间社会和槟城民众的参与，并由槟城绿色机构、槟城理工大学以及Water Watch Penang带领下，由多利益有关方暨多学科工作队执行。

结果显示，基于大多数人认为气候变化问题是“中等至极其重要”的，因此，槟州民众对于气候变化的醒觉及关注度是高的。然而，民众对于气候变化课题的醒觉及关注度却是排名第6，那就是排名在环境课题、罪案课题、经济课题、交通课题及其他社会课题之后。因此，提高民众对于气候变化的醒觉的大量工作还是有待完成。其他结果则显示，大多数的槟城民众相信全球及槟州都在发生着气候变化。大多数受访者也觉得与过去10年的气候相较之下，现在的气候已经改变了。这些结果证实了这一事实，那就是，槟州民众是意识到气候变化的。

在“槟州民众对气候变化的普遍认知及理解”方面，民调结果显示大多数受访者相信气候变化是由自然周期及人类活动的结合所造成的。这显示他们拥有平衡的看法，那就是气候变化不单单只是因自然或人类所引起，而是两者的结合。这也显示了槟城民众认为人为因素比自然因素更应该为气候变化负责。在这种情况下，缓解气候变化的解决方案应该集中在注意改变人类行为，是符合逻辑的。然而，开放式问题的结果显示，大多数受访者不知道碳足迹是什么。同样的，大多数受访者不知道什么是温室气体。这些结果显示，受访者对碳足迹和温室气体的了解非常有限。结果还显示，大多数受访者认为槟州政府应该负责解决槟城的气候变化问题，其次是联邦政府和地方政府。有趣的是，67.0%的受访者认为当地社区和他们本身应该为应对气候变化而负责。这对于涉及公众的气候变化行动是很好的，因为公众已经准备好对这种行动负责。其他结果表明，槟城公众还认为非政府组织（46%的受访者相信）和私人界（50.5%的受访者相信）应主要负责应对槟城的气候变化。

槟城公众对气候变化影响的一般理解被认为是好的，因为结果显示，槟城民众认为如果在槟城发生气候变化，洪水，干旱/水危机，烟霾和海平面上升将会发生，而很少有人认为气候变化将导致槟州的爱滋病流行，失业和政治动荡。然而，槟城公众只知道气候变化在当地而不是全球的影响。几乎一半的受访者认为气候变化正在发生，只有少数人认为气候变化只会在未来1-50年内发生，极小数的百分比（0.6%）不相信气候变化正在发生。这些结果显示，槟城民众不否认气候变化正在发生，但实际上认为它已经发生了。在缓解气候变化方面，槟城民众认为个人可以帮助应对气候变化，因为大多数（57.3%）认为/相信个人可以在气候变化方面发挥作用。这些结果意味着槟城人很可能涉及或参与气候变化计划或行动。

在“应对气候变化的行动和行为”方面，结果显示，被受访者列为排名最高的做法/行动是避免食物浪费。排名第二的做法是在家里实行节能。缓解气候变化的第三种做法是3R的做法。排名第四的做法是参加环境教育活动或运动。超过60%的受访者实践前4名排名的做法，另外则有不到50%的受访者实践其他举措。这些举措包括使用公共交通工具，选择走路而不是驾驶，购买绿色车辆以保护环境，减少吃肉，装置节水装置和在家中安装雨水收集系统的做法。

整体而言，从结果可以推断，槟城民众对气候变化有着中等意识和关注，但在优先排名方面，他们将环境、犯罪、经济、交通和其他社会问题列为更重要。大多数槟城民众都有一个平衡的观点，认为气候变化是由于自然周期和人类活动的结合。然而，尽管槟城民众对气候变化影响的一般理解是好的，但他们对气候变化的理解很浅，因为他们不知道碳足迹或温室气体是什么意思。大多数人认为槟州政府应该负责解决槟城的气候变化问题，其次是联邦政府和地方政府。有趣的是，大多数人则认为，地方社区和他们本身应该负责应对气候变化。槟城民众只觉得气候变化发生在本地而不是全球的影响，但他们认为气候变化正在发生。槟城民众认为，个人可以帮助应对气候变化及做出改变，如参与缓解气候变化的一些实践或举措。

1. Introduction

Penang State is located in the northern part of Peninsular Malaysia. With population over 1.6 million people, Penang is one of the smallest states in Malaysia, but has a population density that is ranked among the highest in Malaysia. Hence, improving Penang's resiliency and sustainability to climate change is a big challenge to the policy makers. Responding to this global challenge, a concerted effort from all stakeholders, especially the public, and a bottom-up approach based firmly on both science and policy is recommended towards developing a comprehensive climate policy for the state. This "Public Survey on Climate Change in Penang" is a collaborative effort carried out jointly by Penang Green Council, Universiti Sains Malaysia and Water Watch Penang. The project aims to understand Penangites' views and awareness on the climate change issue. The outcomes of the project will be useful for developing the Penang Green Agenda (formally known as Penang Sustainable Development Agenda), local climate action, and to help the Penang Green Council (PGC), related government agencies, and related organisations to develop educational programmes and materials for educating the public on climate change mitigation and adaptation. enhance

The objectives of this survey are:

- i. To investigate public awareness on the issues and effects of climate change
- ii. To examine public perception on the causes of climate change
- iii. To study public perception and behaviours on climate change mitigation

2. Approach

The locations studied covers both Penang Island and Seberang Perai. The quantitative questionnaire survey method was used as the research tool for studying the public's perception and awareness on climate change in Penang. A questionnaire was developed with the literature review of the publications and reports related to this study. A pilot study was conducted before the actual sample collection to ensure the questions are clear and understandable to the public. The pilot survey was conducted on 20th August 2016 in a Roadshow located at Taman Jajar, Jalan York, Penang. In the pilot study, 70 people from the public were consulted by filling in the questionnaires. Besides, the questionnaire was also verified by three environmental experts to ensure the questions asked in the questionnaire were valid to the subject of climate change as well as relevant to Penang State. Improvements were then made to the questionnaire after the pilot study incorporating all the valid comments obtained from the experts. In order to make sure the people in Penang have equal chances to fill in the questionnaire, the data collection was done via statistical sampling methods. The sample collected in the survey is based on stratified sampling to represent closely the percentages of Penang population's social-economic strata (<http://penanginstitute.org/v3/resources/data-centre/122-population> Accessed 20 August 2016), whereby sampling methods include data collection via an online questionnaire survey, door-to-door visits and roadshows in shopping malls. The main survey started on 1st October 2016 and ended on 18th December 2016. As a result, more than 1,400 respondents were interviewed but a total of 1373 respondents (valid samples) were obtained during the survey period. The number of respondents for the online survey was 242 respondents while the number of respondents for the face to face survey was 1,131 respondents. The rest of the invalid questionnaires were discarded. After the data collection, the data was analysed using the Statistical Package for Social Sciences (SPSS).

3. Profile of Respondents

A total of 1373 respondents were sampled/interviewed (Table 1). Of this total, 790 respondents (57.5%) were selected from Penang Island and 583 respondents (42.5%) from Seberang Perai. In terms of gender, 619 respondents (45.1%) were males, while 754 respondents (54.9%) were females. In terms of the age group distribution of the respondents, the majority of the respondents were from the age group of 20 – 39 years old, representing 66.4 percent of the sample. As for the distribution of ethnicity, 46.8 percent of the respondents were Chinese, followed by Malays (43.7%) and Indians (7.4%). The rest of the respondents were categorised as others, and they include Sarawakians, Sabahans or permanent residents staying or working in Penang. A total of 84.3 percent of the respondents were residents of Penang State, while the remaining 15.7 percent are non-residents working in Penang State.

Table 1. Profile of Respondents in Penang State Climate Change Study

ITEM	FREQUENCY	PERCENTAGE
Gender		
Male	619	45.1
Female	754	54.9
Age (years)		
18 – 19	91	6.1
20 – 29	550	40.1
30 – 39	361	26.3
40 – 49	217	15.8
50 – 59	118	8.6
60 and above	36	2.6
Ethnicity		
Malay	600	43.7
Chinese	643	46.8
Indian	101	7.4
Other	29	2.1
Educational Level		
Degree	647	47.1
Diploma	195	14.2
Upper Secondary (Form 4-6)/ Matriculation	363	26.4
Lower Secondary (Form 1-3)	69	5.0
Primary school (Standard 1-6)	99	7.2
Are you a resident of Penang State?		
Yes	1157	84.3
No	216	15.7
District		

Penang Island	790	57.5
Seberang Perai	583	42.5

N= 1373

4. Results

4.1 Awareness and Concern of Penang Public on Climate Change

A question was asked to identify the public perceptions regarding the importance of the major issues that the citizens of Penang are concerned with. More than 40 percent of the respondents (Table 2) rated environmental, crime, and economic issues as extremely important. This shows that their awareness and concern on environmental issues is at par with that of crime and economic issues. Following these issues, 39 percent of the respondents rated the transportation issue also as extremely important in Penang State. For the climate issue, 31.8 percent of the respondents rated it as extremely important. Climate was rated the 6th in terms of importance on Penang public concern. This indicates that Penang public is aware and concerned about climate change, but do not rate it very highly amongst their top concerns as crime, environmental and economic issues are more concerning for them. Even transportation and other social issues are rated higher than climate change.

Table 2. Public perception regarding the importance of the major issues in Penang State.

Issue	Percentage of respondent				
	Extremely Important	Very Important	Moderate Important	Slightly Important	Not Important
Political Issues	29.7	30.2	27.2	8.8	4.0
Crime Issues	43.8	30.8	15.1	6.1	4.2
Environmental Issues	45.7	31.1	13.4	5.6	4.2
Economic Issues	42.1	34.8	13.2	5.7	4.2
Social Issues	32.1	37.2	20.1	8.1	2.5
Climate Issues	31.8	31.5	24.3	9.3	3.1
Transportation Issues	39.0	30.6	17.0	8.6	4.7
Religious Issues	27.5	23.3	26.6	15.4	7.1

N=1373

Results of another question showed that most of the respondents believed that climate change is happening in the world as well as in Penang (Figure 1 and Figure 2). When they were asked to compare the present climate conditions to the past ten years, the majority of the respondents reported they feel the climate has changed (Figure 3). These results again shows that the majority of the Penang public are aware of climate change.

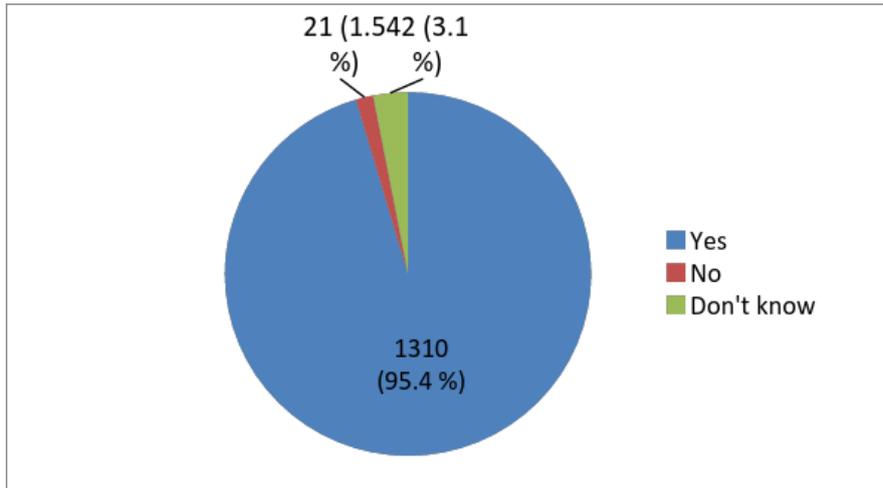


Figure 1. Do you believe that climate change is happening in the world?

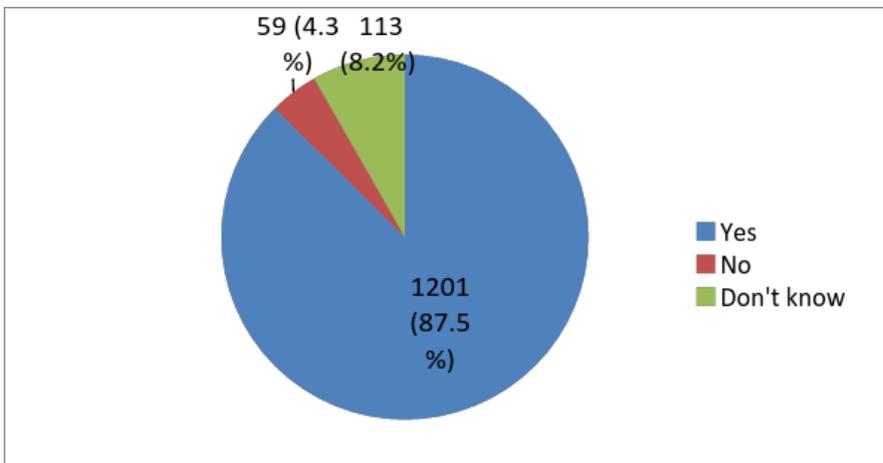


Figure 2. Do you believe that climate change is happening in Penang?

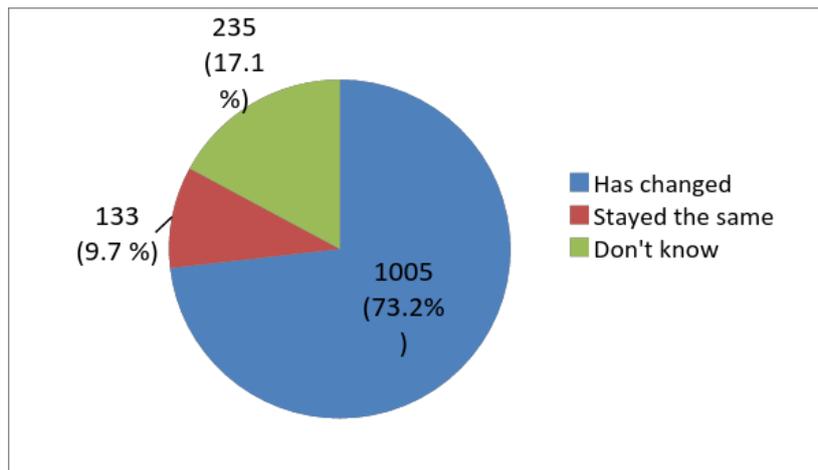


Figure 3. Compared to the past 10 years, do you feel that the climate has changed in Penang?

When respondents were further queried on public concerns on climate change, more than three-quarters of the respondents claimed they are “moderately concerned” or “extremely concerned about

climate change” (Figure 4). The results again showed the majority of the Penang public are concerned about climate change. If they are concerned, then they are aware on how the climate change is affecting them.

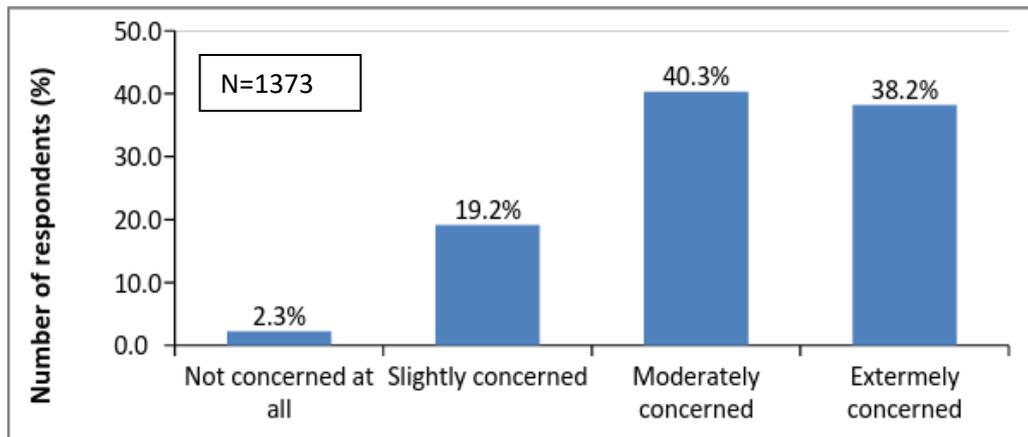


Figure 4. How concerned are you about climate change?

4.2 Perception and Understanding of Climate Change

Figure 5 illustrates the Penang public’s perception on what causes climate change. The results show that nearly half of the respondents believes climate change is due to a combination of natural cycles and human activities. This indicates that they are aware of climate change being not solely caused by nature nor by humans alone, but a combination of both. However, a significant portion of the respondents (37.2%) firmly believes that climate change is solely caused by human activities. In contrast, very few of the Penang public opinionated that climate change is part of the natural cycle and is completely due to natural causes. Even fewer thinks that climate change is due to God’s will. This indicates that the Penang public blames society for climate change rather than natural causes. This being the case, then it is logical that solutions to address climate change should be focused on changing human actions.

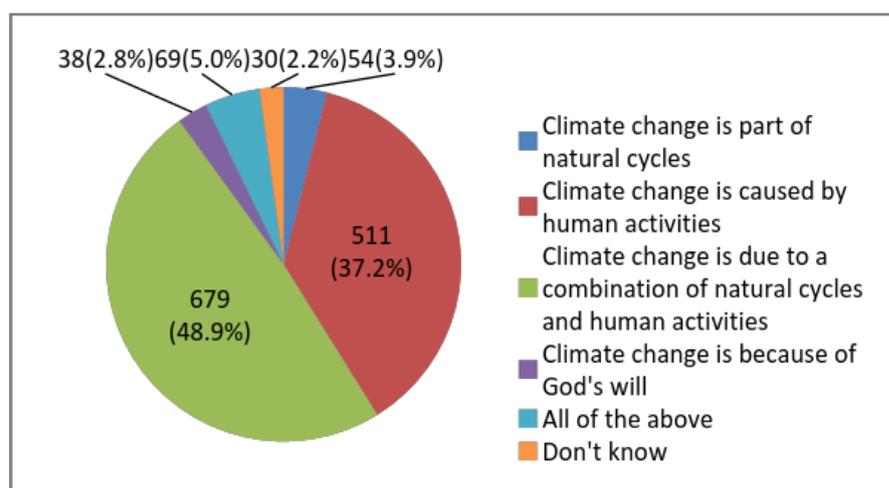


Figure 5. Public perception regarding the cause of climate change.

To understand public perception better, two structured open-ended questions were asked. The first gauged public knowledge on the carbon footprint. Results in Figure 6, based on comments provided by the respondents, showed that the majority of the respondents did not know what the Carbon Footprint is. Only 14.9 percent of those who wrote down comments knew what carbon footprint was. Likewise, the majority of respondents did not know what was Greenhouse Gases (Figure 7). These results revealed the respondents' knowledge on Carbon Footprint and Greenhouse Gases is very limited.

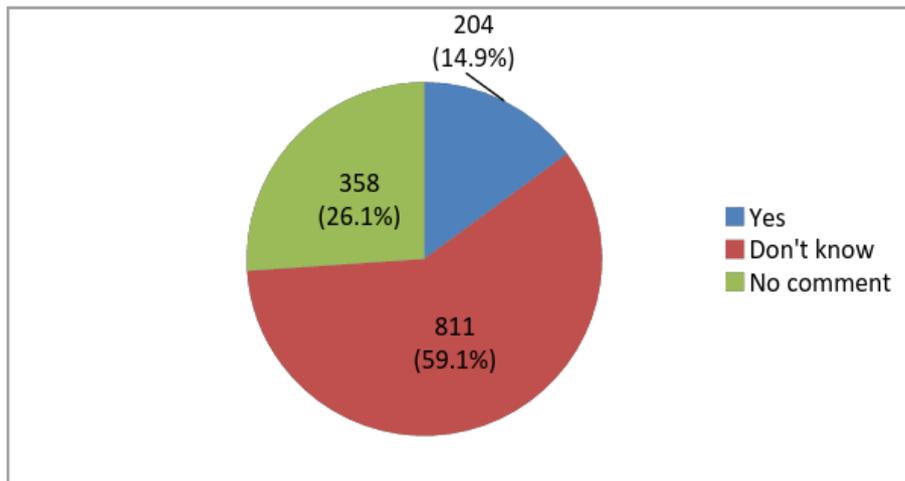


Figure 6. Do you know what Carbon Footprint is?

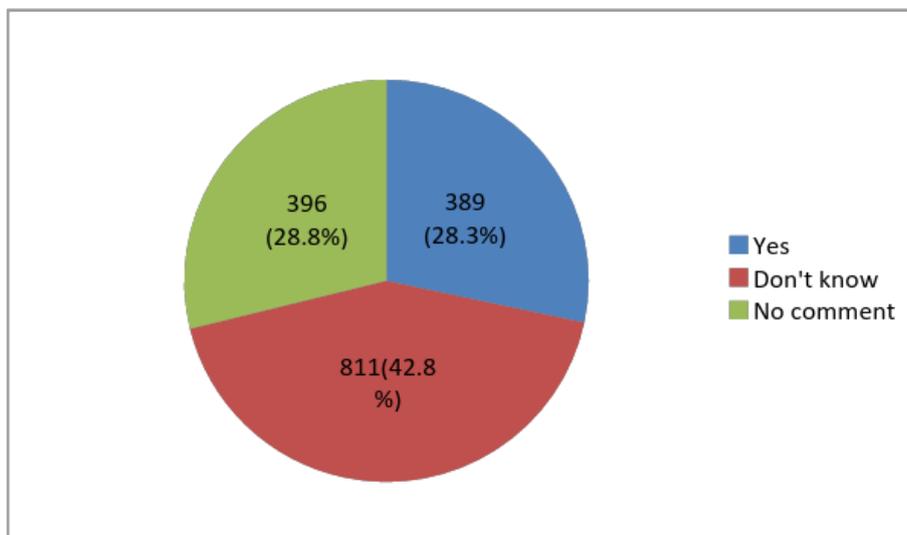


Figure 7. Do you know what Green House Gases are?

Respondents were then posed the question as to who they think should be mainly responsible for tackling the climate change in Penang State. Referring to the results in Figure 8, most respondents (78.2%) feel the Penang State Government should be responsible for tackling the issue of climate change in Penang, followed by the Federal Government (65.8% of respondents believed so) and the local council (63.3% believed so). Interestingly, 67.0% of the respondents believed the local community and themselves should be responsible for tackling climate change. This bodes well for climate change action involving the general public since the public is ready to be held responsible for

such action. Other results also indicates that Penang citizens feel that NGOs (46 % of respondent believed so) and the private sector (50.5 % of respondents believed so) should be mainly responsible for tackling climate change in Penang.

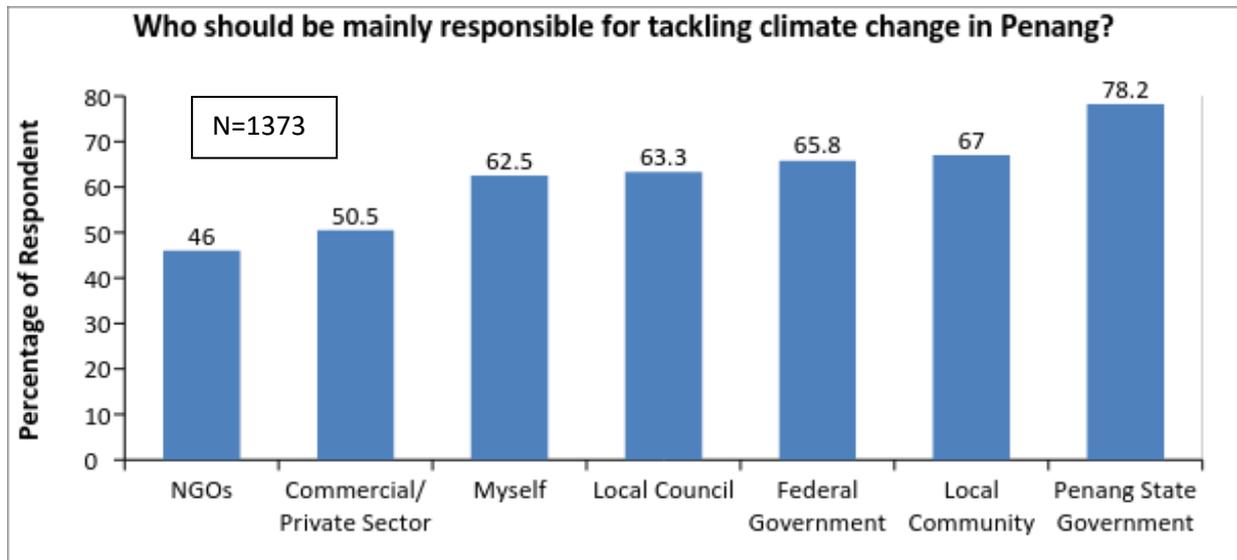


Figure 8. Who should be mainly responsible for tackling the climate change in Penang State?

Respondents were then asked whether they think climate change was currently affecting them or was going to affect them personally. Results of this question in Figure 9 showed that most respondents (78.3 %) actually believe/think climate change is currently affecting them or is going to affect them personally.

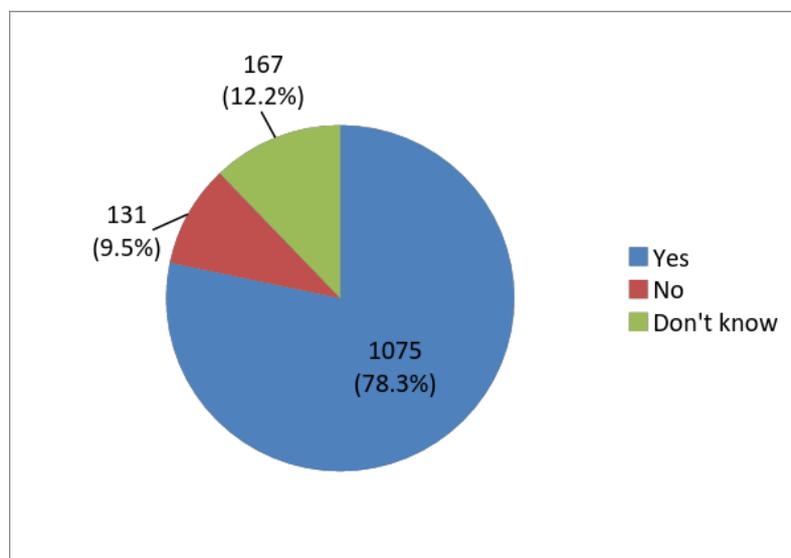


Figure 9. Do you think climate change is currently affecting you or is going to affect you personally?

To further test the respondents understanding of the effects of climate change, they were asked to mention all the effects of climate change were to occur in Penang. Figure 10 showed the results of public perception regarding the effects of the climate change in Penang, clearly indicating the

majority of the respondents believed that floods, drought/water crisis, haze, and sea level rise will happen if climate change were to occur in Penang. Fewer respondents believed that climate change will cause AIDS epidemics, unemployment and political unrest in Penang. However, a significantly large percentage of 45.2 percent of the respondents believed that climate change will lead to conflict and war between countries in the future (Figure 11).

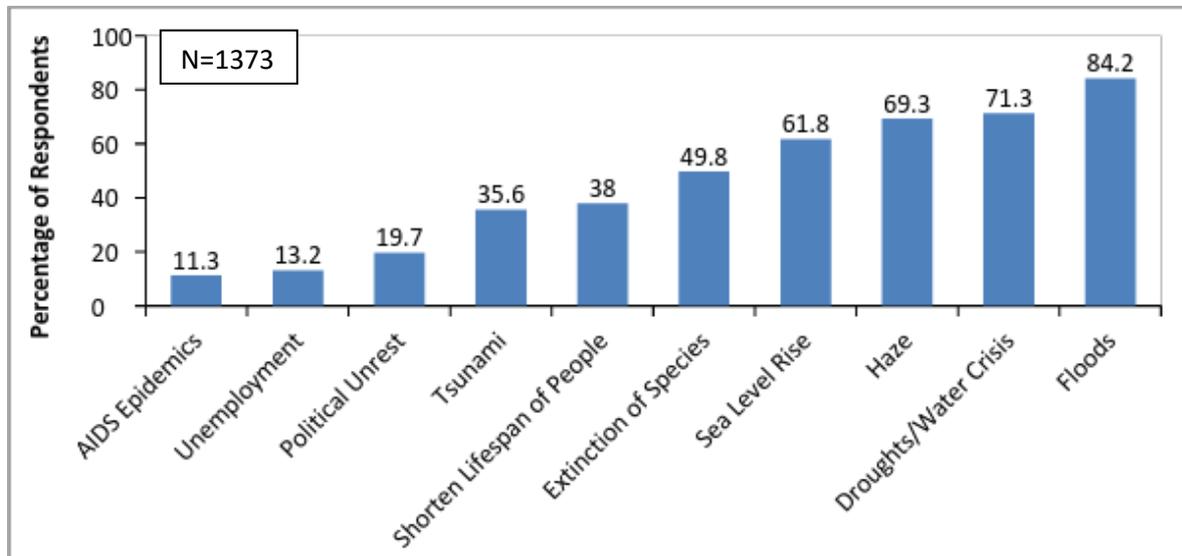


Figure 10. If climate change occurs in Penang, what will it cause?

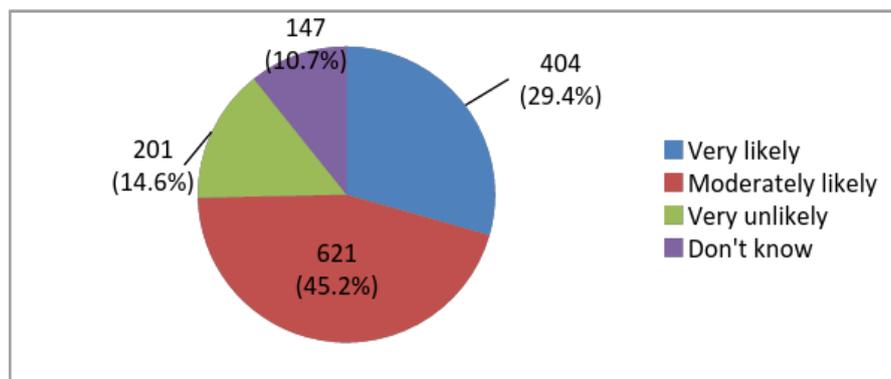


Figure 11. How likely, in your opinion, will climate change lead to conflict and war between countries in the future?

A question was then asked to determine public knowledge on climate change. Referring to Figure 12, the majority of the respondents thinks climate change does not only affect places in the Polar Region, but will affect Penang which is located in the equatorial region. This indicates misunderstanding of the effects of climate change on places/regions. This also indicates how the Penang public is only aware of the effects of climate change locally and not globally.

In another question when respondents were asked about when climate change will most likely happen, almost half of them believed that climate change is presently occurring whereas the minority believed that climate change will only happen in 1-50 years in future (Figure 13). Interestingly, only 0.6

percent of the respondents thinks climate change is not going to happen. The results of this question indicates that Penang citizen does not deny that climate change is happening but in fact is presently taking place.

Figure 14 tries to gauge whether the Penang public believed individuals can help address the climate change issue. Results show that the majority (57.3 percent) of the respondents think/believe that individuals can make a difference in regards to climate change. Hence, these results imply that Penang people are likely to get involved or engaged in climate change programmes or actions.

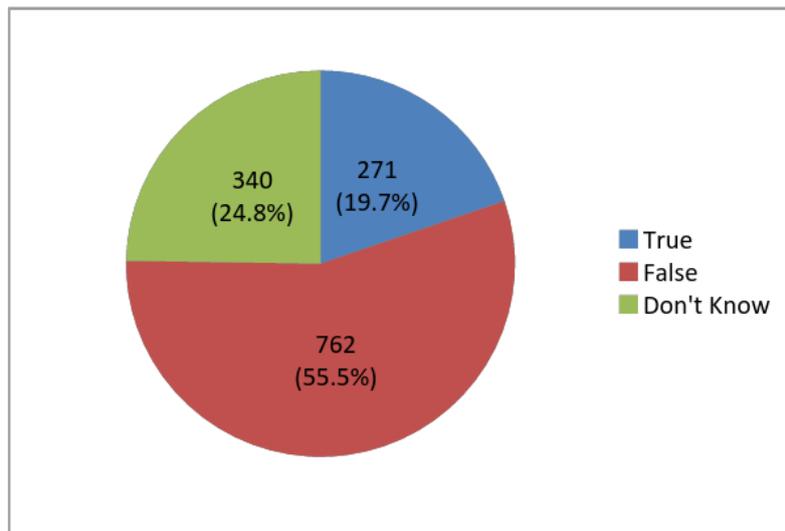


Figure 12. Climate change mostly affects places in the Polar Regions such as Arctic and Antarctic regions, but not in Penang which is located in the Tropics/Equatorial region.

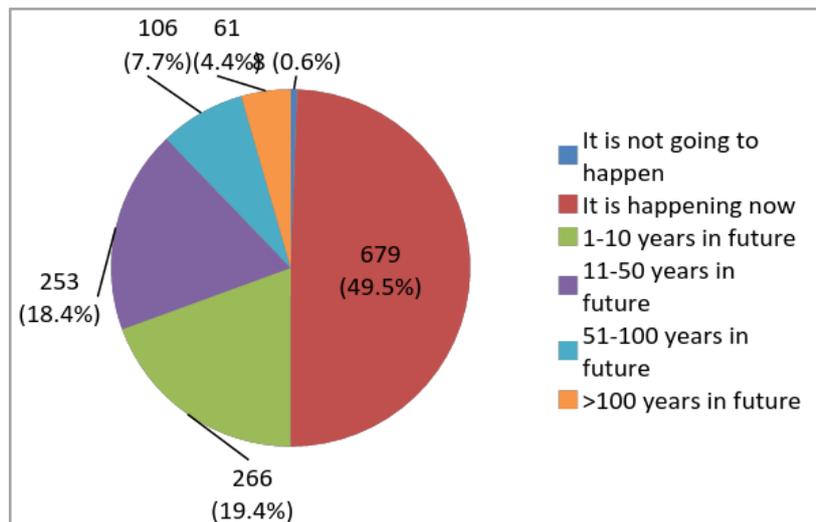


Figure 13. In your opinion, if climate change were to occur, when will it most likely happen?

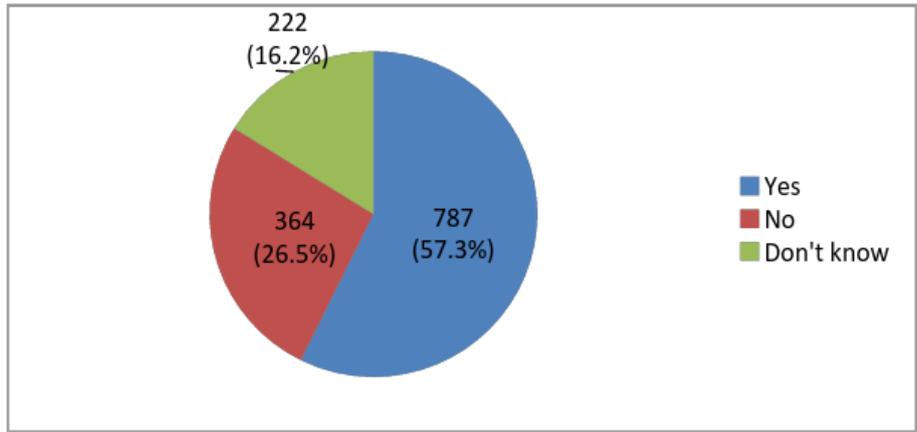


Figure 14. Do you think that individuals can make a difference with regards to climate change?

4.3 Action and Behaviour to Combat Climate Change

In order to study public lifestyle related to climate change mitigation, respondents were asked questions on combating climate change which they practised in their life. Table 2 shows the top ranked practice of the respondents was avoiding food wastage. The more a person wastes food, the more demands he/she exerts on food which translates to more usage of resources (including fossil fuels) used to produce the food. Hence, more food demands (and more food wastage) means more greenhouse gases emitted. In contrast, the less a person wastes food, the less greenhouse gases are emitted. Followed later by the practice of energy savings in the home as the second highest ranked practice. Saving energy means less energy used and this translates into less greenhouse gases emitted. The third ranked practice to mitigate against climate change was the practice of 3Rs. The more a person practises 3Rs, the less demands on resources and the less greenhouses gases emitted. The fourth ranked practice was that of taking part in environmental educational activities or campaigns. Such campaigns will educate more people about climate change and influence them to take action to reduce climate change. All the top four ranked practices had more than 60% of respondents practising them. All other practices had less than 50% of respondents practising them. These include the practice of using public transports, choosing to walk instead of driving, the purchasing of green vehicle to protect the environment, eating less meat, the fitting of water saving devices and the installation of rainwater harvesting system in the home.

Table 2. Lifestyle that practiced by the public that related to climate change mitigation.

Lifestyle	Percentage of Respondents	
	Yes	No
I avoid food wastage.	94.5	5.5
I practice energy saving in my home/ room.	92.3	7.7
I practice 3R (reduce, reuse, recycle) to minimize waste generation.	89.9	10.1
I take part in environmental educational activities or campaigns.	63.3	36.7
I use public transportation, instead of driving, to protect environment.	47.6	52.4
I choose to walk, instead of driving, to protect environment.	47.5	52.5
I purchase/ drive hybrid car / green vehicle to protect environment.	41.7	58.3

I don't consume meat / I eat less meat to protect environment.	38.5	61.5
I install water saving devices in my home.	34.3	65.7
I install rainwater harvesting system in my home.	20.3	79.7

N=1373

5. Findings and Policy Recommendations

5.1 Findings

The results discussed above indicates that “Awareness and Concern of Penang Public on Climate Change” are high, as the majority rated environmental issues as extremely important. These results proved their awareness and concerns on environmental issues is up to par with the crime and economic issues. However, the Penang public’s awareness and concerns about climate change is only average as they do not rate it very highly amongst their top concerns. The Penang public also rated transportations and other social issues with higher importance than climate change.

Overall, results from another question showed that most of the respondents believed that climate change is happening in the world as well as in Penang. The majority of the respondents also reported they feel that climate over the past decade has changed when compared to the present climate conditions. These results substantiate the fact where the majority of the Penang public are aware of climate change.

The survey results also indicates the majority of the Penang public was “moderately concerned” to “extremely concerned” about climate change. In terms of the Penang citizen’s general perception and understanding of climate change, the survey results indicates that most of them believed climate change is due to a combination of natural cycles and human activities. This indicates that they have a balanced view on how climate change is not solely caused by nature nor humans alone, but a combination of both. This indicates Penang citizens holds society to be much more responsible for climate change rather than natural causes. That being said, to change human behaviours, only logical solutions are needed to when addressing climate change.

However, results from open-ended questions showed the majority of the respondents did not know what the Carbon Footprint is. Likewise, the majority of respondents did not know what was Greenhouse Gases. These results revealed that the respondents’ knowledge on Carbon Footprint and Greenhouse Gases is very limited.

The survey results also showed that most respondents feel the Penang State Government should be responsible for tackling the issue of climate change in Penang, followed by the Federal Government and the local council. Interestingly, most respondents also feel that the local community and themselves should be responsible for tackling climate change. These results appear promising for climate change action involving the general public since the public is ready to be held responsible for such action. The Penang public also feels that NGOs and the private sector, to a lesser extent should be mainly responsible for tackling climate change in Penang.

Results of public perception regarding the effects of climate change in Penang clearly indicates that

the majority of the respondents believed floods, drought/water crisis, haze, and sea level rise will happen if climate change were to occur in Penang. Fewer respondents believed that climate change will cause AIDS epidemics, unemployment and political unrest in Penang. However, a significant number of respondents believed that climate change will lead to conflict and war between countries in future. Results show that Penang public's level of awareness on the effects of climate change is limited to effects in their local area as they are poor in awareness of the global effects elsewhere.

Results show the majority of the Penang public believed that climate change is happening now whereas only a minority believed that climate change will only happen in 1-50 years in future. Interestingly, a negligible percentage of the respondents believed that climate change is not going to happen. The results of this question indicates that Penang citizen does not deny that climate change is happening but is also presently taking place.

Most importantly, the results show the majority of the respondents think/believe that individuals can make a difference in regards to climate change. Hence, these results imply that Penang citizens are likely to get involved or engaged in climate change programmes or actions.

In terms of taking action to combat climate change, the Penang citizens claimed they practise a variety of lifestyles that mitigate against climate change. The Penang public's top ranked climate change mitigation practices includes avoiding food wastage, practising energy savings, practising 3Rs and taking part in environmental educational activities or campaigns.

5.2 Policy Recommendations

In this day and age, climate change is considered the most serious global challenges faced by society. No country or region can escape from the effects of climate change as the effects have a global coverage. This 2017 policy recommendation by Penang State Climate Change Action Plan for the General Public (PSCCAPGP) is a response strategy which recognises the importance of climate change impinging on the state's development. This PSCCAP developed in 2017 is a step towards enabling Penang State to engage the public to reduce the state's vulnerability to climate change, adapt to the changing climate and improving the state's ability to take advantage of the opportunities offered by climate change while reducing its negative impacts. This action plan is the result of a year long survey to the public based on a participatory process involving the academia, civil society and the Penang citizen under the leadership of the Penang Green Council, Universiti Sains Malaysia and Water Watch Penang executed by a multi-stakeholder cum multidisciplinary taskforce. Policy recommendations are solely targeted specifically towards engaging the Penang general public.

Policy Recommendations for Penang State Government:

Number	Action
1	Protect, Gazette and Restore all forests in Penang State by focussing on engaging the Penang public (e.g. as watchdogs, as volunteers in tree planting, as sponsors of trees, etc). Penang public stakeholders include Community Forest Associations, forestland owners, and pastoralists and local communities
2	Develop and maintain a robust and up-to-date climate change knowledge management system for Penang State

3	Develop a physical climate change resource centre for Penang State called Penang State Climate Change Resource Centre (PSCCRC).
4	Address the capacity gaps required to implement the PSCCAPGP in the government agencies coordinating, private companies and NGOs identified to lead climate change action strategies in the action plan.
5	Provide capacity development support to climate change actors at the State, District, City/Municipal and Village level to move forward with implementing the PSCCAPGP (based on an identification of priorities of each action).
6	Establishment of an effective Public Awareness Campaign associated with the Penang State Climate Change Resource Centre (PSCCRC).
7	Integration of climate change into all levels of Penang State's education system.
8	Implement an extensive Mass Transit System for Penang State, based predominantly on public transport system (e.g. Light Rail Transit (LRT)). Encourage the public to use public transport
9	Develop a process to mainstream low-carbon development opportunities into the Penang State Government's planning process, including the planning process of MBPP and MPSP.
10	Establish the Penang State Climate Change Fund – a fund that will become the main financing mechanism for all of Penang State's climate change action projects under the PSCCAPGP.
11	Prioritise climate change funding in the Annual Penang State Budget, including the Creation of a Climate Change Budget Code (a specific budgetary code for climate change within the Integrated Financial Management Information System).
12	Establish a Penang State-level Climate Change Council (PSCCC) that is made up of government officers, private sector workers, NGO workers, researchers and the public to play the primary coordination, policy direction, technical oversight and guidance role in relation to climate change response.

Policy Recommendations for Penang Green Council:

Number	Action
1	Run a Project to Protect, Gazette and Restore all forests in Penang State via engaging the Penang public (e.g. as watchdogs, as volunteers in tree planting, as sponsors of trees, etc). Penang public stakeholders include Community Forest Associations, forestland owners, and pastoralists and local communities
2	Run a project to develop capacity on climate change awareness, education and action for Stakeholders as a step towards implementing the PSCCAPGP (based on an identification of priorities of each action).
3	Run an effective Public Awareness Campaign in collaboration with the Penang State Climate Change Resource Centre (PSCCRC), private sector and NGOs.
4	Produce Educational Materials and Tools related to climate change for use in Penang State's informal education system.
5	Run a Car-Free Day once a year campaign vis-à-vis the Promotion of Public transport system. Encourage the public to use public transport