

Local Conference of Youth Hong Kong 2022

Hong Kong Youth Statement Keep 1.5 °C Alive

Youth Collective Position Papers

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This document was edited by CarbonCare InnoLab representing the LCOY HK 2022 Operation Team.

We thank the inputs from the following members, in alphabetical order:

Editing

Alec, Tam Ngai Hei
Blair, Ho Tsz Ching
Kenneth, Leung Kam Kit
Yung Man Tat

Advisory

Alissa, Tung Wing Sze
Thierry, Leung Pak Wai

Facilitation

Alec, Tam Ngai Hei
Alfred, Chang Yu Ching
Calvin, Wong Tsz Kwan
Carly, Leung Pui Yee
Chammie, Lo Long Ching
Chan Hiu Ching
Christie, Oh Cui-shan
Connie, Lam Chung Yan
Eleanore, Chan Wing Yan
Hermia, Chan Tin Lam
Hugo, Leung Hin Ho
Ivan, Choi Man Ho
Jasmine, Siu Yin Nam
Kenneth, Leung Kam Kit
Lam Chin Chin
Mark, Cheung Kong Wai
Priscilla, Lin Lan Hei
Ryan, Yip Yuk Long
Venus, Cheung Yan Ling

1. Introduction

By Blaire Ho and Yung Man Tat

According to the Emission Gap Report 2022 by the United Nations Environment Programme (UNEP), there is a 50% chance that the critical point of 1.5 °C temperature rise in the Glasgow Climate Pact will be reached in 2027. Despite the fact that COP26 reached a number of emission reduction agreements, such as phasing down fossil fuels and a moratorium on methane emissions and deforestation, it is still estimated that the temperature will rise by 2.4°C to 2.8°C by the end of this century. Thus, we must seize the opportunity to “Keep 1.5°C Alive” at the 2022 Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27).

COP27, held in Sharm El Sheikh, Egyptian, from 8 November to 18 November 2022, will pave the way to a turning point where the world leaders will come together and demonstrate the requisite political will to take on the climate challenge through concerted, collaborative and impactful action. Under the theme of “Together for Implementation”, the first global stocktake, which is a process for taking stock of the implementation of the Paris Agreement with the aim to assess the world’s collective progress towards achieving the purpose of the agreement and its long-term goals, will continue to take place at COP. Besides, the implementation plan of phasing down coal and inefficient subsidies will be one of the focal points at COP27. Meanwhile, holding COP in African soil, loss and damage fund, climate adaptation, climate finance and climate justice are embedded in the main agenda of the climate negotiations.

In the meantime, cities are the key contributor to climate change while urban activities are the major sources of greenhouse gas emissions. Hong Kong, as a C40 member city, plays a pivotal role in combating climate change as well. Hong Kong government published Hong Kong’s Climate Action Plan 2050 in 2021, to set out the vision of “Zero-carbon Emissions · Liveable City · Sustainable Development” and outlines the targets and strategies to achieve carbon neutrality before 2050. In terms of climate actions, Hong Kong youth is our key stakeholder who could be our future global, national and local climate leaders, creative problem solvers, advocates and networkers. To co-create a platform for youth to get involved in climate change, to connect and empower each other through knowledge-sharing and networking, CCIL, co-organised with Hong Kong Youth for Climate Action (HKYCA), Jockey Club Museum of Climate Change (MoCC), Network of Environmental Student Societies (NESS) and V’air Hong Kong, and supported by Hang Seng Bank, to hold the Local Conference of Youth Hong Kong (LCOY HK) 2022 on the 8th and 9th of October 2022. One of the key deliverables of LCOY HK is the position paper, where participants expressed their views and opinions to call for a carbon-neutral and just future in Hong Kong. The topics covered (1) Action for Climate Empowerment, (2) Climate Mitigation, Energy and Cities, (3) Climate Adaptation, Resilience and Health, (4) Climate Finance, (5) Food and Agriculture, (6) Nature and Biodiversity, (7) Politics, Policymaking, and Governance, (8) Reimagining and Transforming Economies, (9) Technology and Innovation, and (10) Water. The position paper was sent to UNFCCC through the Hong Kong youth representatives of COP27.

2. Action for Climate Empowerment

By Yung Man Tat and Pang Sin Yau

Action for Climate Empowerment (ACE) is a term expressed under the United Nations Framework Convention on Climate Change (UNFCCC) with a focus on the following six distinct areas: education, training, public awareness, public participation, public access to information, and international cooperation. (Change, n.d.) While education and training both aim at imparting knowledge regarding the changing climate and people's ability to alleviate and respond to the climate crisis, education focuses more on the innate habit and training focuses more on crisis management such as climate data collection and visualization and climate-friendly technologies skills. Public awareness and access to information look into ways to increase public awareness through capacity building and the transparency of government (public) information, and accessibility to the knowledge of climate change. With sufficient public access and awareness, the public should have enough knowledge to deliberate possible solutions, as well as act upon alleviating the issue of climate change and its related problems. In terms of public participation and international cooperation, they focus on the extent that the public can debate and establish partnerships with local and international counterparts and implement responses to climate change (蔡豫盼, 2019).

Problems

Insufficient participation of citizens

The participation of citizens in climate change is insufficient, especially with regard to policy decisions. In 2020 and 2021, an environmental protection non-governmental organization (NGO) graded "D+" for Hong Kong's climate action in the "Governance" category under the Paris Watch report (CCIL, 2020; CCIL, 2021). Such a grade is given due to the highly inadequate transparency of the Hong Kong government's action on climate (CCIL, 2021). High transparency in climate action implemented by the government is essential to public participation. Opinions generated through policy deliberations can facilitate and help implement and innovate related climate policies. Specifically, on low carbon transition, the government does not report on the climate risk regularly to the public. The Office of Climate Change & Carbon Neutrality under the Environmental Bureau now holds the responsibility for the low carbon transition without the central authority to direct government agencies to establish the Office's climate action policies (Hung, 2021). However, effort on low carbon transition requires inter-departmental cooperation to govern and implement the corresponding policies. Therefore, we call for a centralized planning department on such a subject.

Insufficient government capacity for climate response implementation with low awareness of climate change

Compared to other jurisdictions that experienced harder hits by hazards caused by climate change, climate-related casualties and economic losses in Hong Kong are rare. Therefore, the awareness of Hong Kong citizens regarding the influence of climate change remains low. Without a serious threat directed at them, climate change seems to be irrelevant to them. This attitude becomes a prominent barrier to advancing ACE in Hong Kong. In addition, the Hong Kong government has yet to implement effective policies to drive Hong Kong's transition into a zero-carbon economy. The Hong Kong Public Opinion Research Institute (PORI) conducted a survey in 2020 on the attitude and actions of Hong Kong citizens on climate change, results showed that only 16% of interviewers consider climate change has a significant impact on their livelihood, while 84% of interviewers expressed climate change will adversely impact future

generations. With little concern about the immediate consequences and impact of climate change, Hong Kong citizens in general are unaware of the urgency of the climate crisis (Ho, 2020).

In terms of the implementation ability of the Hong Kong government to combat climate change, it can be present as insufficient or inaction. We call for the government to lead in pursuing low-carbon policies as we empower more Hong Kong citizens to join the climate action. With the government's inaction as the biggest barrier to a zero-carbon transition, the effectiveness of policy implementation is highly subpar if we just rely on citizens' individual efforts.

This is also reflected in the PORI survey that 80% of interviewers consider that the Hong Kong government should bear the biggest responsibility in combating climate change, including halting the reliance on fossil fuels as the main ingredient of electricity generation (Ho, 2020). Specifically on that, another major obstacle is from the private sector. Coal still accounts for 50% of the power generation fuel mix, and the adoption of renewable energy only accounts for an extremely small fraction of 0.1% in 2021 (HK Electric, 2022). With evidence of the underdevelopment of renewable energy adoption in Hong Kong, public-private partnerships should be stepped up in renewable energy development to increase the use of the power generation fuel mix, and subsidize the non-renewable energy.

Lack of communication platform

The lack of a communication platform between the government and citizens can be seen in the existing disaster notification system. For now, the disaster notification between the government and citizens relies on the Hong Kong Observatory (HKO). The HKO notifies the citizens when natural hazards like typhoons and earthquakes are forecasted. The Hong Kong government will also send SMS to citizens in the midst of emergencies, such as extremely cold weather. The Emergency Alert System (EAS) sends important real-time information to mobile phone users in emergency situations that might endanger people's safety and property. When the government issues an alert, a smartphone with the EAS will be turned on and notify citizens. However, the EAS has not been utilized when natural hazards hit.

Incomprehensive education curriculum

Currently, climate change education is not a key part of Hong Kong's 12-year compulsory education. The climate change curriculum is only part of the environmental science-related (elective) courses. While there is a unit related to the climate curriculum in Liberal Studies called "Energy, Technology, and Environment", which involves ecology, global warming, and energy, the Education Bureau designed the unit as one of HKDSE. All of the content trends to academics with a lack of participation and discussion. This may not attract pupils to explore further on their own terms. At the same time, pupils do not have any experience with climate participation. The Carbon Care Innolab (CCIL) implemented a survey on Hong Kong climate education with PORI in 2022 and indicated that 90% of interviewers consider that climate education should be part of secondary education and 92% of all interviewees considered climate education should be taught in primary education. We call for climate education to be taught by experience and provide structured and sufficient climate education training and teaching materials to teachers. 80% of interviewers supported this recommendation (immediiahk, 2022)

Current policies

Hong Kong's Climate Action Plan 2050

The Hong Kong government has implemented strategies and measures lately to meet the goal of Hong Kong's Climate Action Plan 2050 to reach carbon neutralization in the following categories: net-zero electricity generation, energy saving and green buildings, green transport and waste reduction. The Plan also indicated the government will review the measures on net-zero electricity generation and waste reduction. In the aspect of net-zero electricity generation, the Hong Kong government plans to substitute coal with renewable energy before 2035, raise the percentage of renewable energy in power generation fuel mix up to 7.5-15%, reduce the percentage of coal in power generation fuel mix to less than 25%, and try out the use of new energy and strengthen cooperation with neighboring regions to achieve the long-term target of net-zero electricity generation before 2050 (SDC, 2021).

In the aspect of waste reduction, combustion is still the dominant method to handle MSW. While Hong Kong is practicing different low(er) carbon waste treatment methods like recycling, biological treatment, biofuel, etc., they are far from becoming mainstream. Currently, the Hong Kong government announced plans to develop more waste-to-energy facilities on or before 2035 to reach the goal of carbon neutrality in waste management, and to suspend the reliance on landfill. An example of a waste-to-energy facility in Hong Kong is T-PARK, a waste-to-energy facility which integrates advanced technologies with recreational, educational, and ecological features.

Green Community

The Environmental Protection Department (EPD) established a community recycling network called The Green Community to promote recycling in local communities (EPD, 2022a). The EPD also established various recycling facilities in 18 districts, including recycling stations, stores, and spots. These facilities accept eight different types of recyclable materials - paper, metal, plastic, glass bottles, regulated electrical equipment, small electrical appliances, fluorescent lamps and tubes, and rechargeable batteries. They also accept small electrical appliances and regulated equipment. To encourage people to recycle, all types of recyclable materials will be sorted before being transported to a downstream recycler. On November 16, 2020, EPD began pursuing the GREEN\$ (Greeny Coins) smart card. Citizens can swap presents and earn green bucks. Through financial and material incentives, this program may persuade people to include recycling in their daily lives.

The insufficiency of policies

Lack of overall planning authority dedicated for managing climate change issues

The government established the Office of Climate Change and Carbon Neutrality to encourage public-private partnership in the zero-carbon transition, extensive planning, and pursuit of deep decarbonization (CEO, 2021; ISD, 2021a). However, some of the evaluation's results suggest that the newly established Office of Climate Change and Carbon Neutrality under the Environment Bureau lacks overall planning authority. This ends up being the main barrier preventing the creation of new policies. In order to implement zero-carbon transition plans, the Office of Climate Change and Carbon Neutrality is presently unable to collaborate with other government agencies. The main issue is the absence of the Environmental Bureau's authority over resource distribution and monitoring. Managing the large zero-carbon transition initiative across bureaus is now extremely difficult for the Office of Climate and Carbon Neutrality. For instance, the decarbonization of the public transportation sector is not currently a priority for the Development of the Transport and Housing bureau (lu, 2021).

Lack of transparency in policies decision

Transparency of policy decisions is key to resolving the government's ineffective response to the climate crisis. Although the Hong Kong government has proposed achieving carbon neutrality by 2050, the "Hong Kong's Climate Action Plan 2050". The roadmap and timeline for achieving carbon neutrality have not yet been launched by the government. The government should include a roadmap and timeline for achieving carbon neutrality and formulate progressive carbon reduction policies, including raising the proportion of Hong Kong's renewable energy power generation to at least 10% by 2030, implementing electronic road pricing, phasing out fuel vehicles, etc., achieving zero emissions on the road by 2050, various government departments The extreme conditions brought about by climate change are also taken into account when implementing policies to address the climate crisis in an all-round way (Greenpeace, 2021b).

Recommendations

Star endorsement effect

We consider that the star endorsement effect will entice citizens to be concerned about or participate in climate action. Citizens will pay attention to the things that are related to the celebrity that they look up to. If prominent celebrities endorse the government's climate-related policies, they will gain traction and raise public awareness.

Increase transparency in policymaking

Low transparency is a key problem of the government in environmental protection policymaking. An example is the aforementioned zero-carbon transition policy decision. It is known that transparency is the main element in policies making procedures, not only in environmental-related policies. Increased policy decision transparency can cause citizens to understand the policy's contents and the operation situation, so they can give comments to the bureau. The bureau can improve the policies according to the comments from citizens.

Establish a concern group with civic representatives

Establishing a concern group with civic representatives would offer another method to send civil opinions to the government. Civilians are more prone to impact caused by the abnormal change of climate, their voices are therefore critical in policymaking.

Education system reformation

We consider climate change education to be a standalone core subject. By doing so, climate education will have more airtime at school and people will be more educated and aware of climate change and its impact. Moreover, the Education Bureau should set the minimum learning hour for climate change education to ensure all the students are well-equipped with knowledge on this topic. In a survey conducted by Green Sense in 2022 on Hong Kong climate change education, 71% of the interviewers supported adding climate change education to core subjects (Green Sense, 2022).

3. Climate Mitigation, Energy and Cities

By Amelia Luk, Esther Leung, Ka Ming, John and Ivy

Unsustainable resource usage and waste problems have been pressing issues in Hong Kong, a linear city which heavily follows the "take, make, dispose of" economic model. The dramatically accelerating rates of

resource extraction and waste disposal remarkably expedited the climate crisis, and natural resource depletion and induced a variety of other environmental problems such as biodiversity loss and pollution, which threaten both the natural environment and human health (Ghisellini, Cialani & Ulgiati, 2016).

In the case of Hong Kong, whilst being one of the economies with the highest resource consumption, only 28% of its municipal solid waste (MSW) was recycled in 2020 (EPD, 2020). This is one of the lowest rates in the past decade, in comparison to 48% in 2011 (EPD, 2011). Although the COVID-19 outbreak in 2020 could largely explain the particular drop in recycling waste (as citizens refrained from leaving their apartments to minimize the chance of being infected), this is still a worrying observation if this pattern of waste disposal continues.

On the other hand, most local recyclables are exported. In 2018, over 92% of recyclables recovered from MSW in Hong Kong were exported for recycling. The magnitude of Scope 3 carbon footprint is not assessed, which may potentially outweigh the Scope 1 and 2 benefits earned from all the recycling efforts.

Existing Policies

According to the government's "Waste Blueprint for Hong Kong 2035", the current target is to reach a 55% recycling rate by 2035. Compared to the similar goal set by the European Union, which aims at 65% by 2035, the Hong Kong government should take a more aggressive approach to handling MSW.

Furthermore, Hong Kong's policies for the private sector to develop local recycling and upcycling industries are not helpful. A recent example is a challenge Mil Mill is facing. The only drinks carton recycler in Hong Kong was notified by the government-managed Hong Kong Science and Technology Parks Corp (HKSTP) that Mil Mill's lease will not be renewed after 2022.

Current policies on waste management have been leaning on "handling waste" instead of reducing waste at source. While there are multiple "waste-to-energy" facilities, such as T-Park, O-Parks, I-Parks etc. to incinerate wastes, it does not address the root cause of the waste problem in Hong Kong.

Suggestions

Rethinking government procurement approach

We call for the government to encourage the use of locally recycled materials to raise demand for recyclables in the local market. The government should lead the use of locally recycled materials by changing its procurement system and principles. Traditionally, the government has always adopted the "lowest bid wins" principle, which places an overwhelming focus on economic factors at the expense of all the other non-economic factors such as social and environmental.

A current approach is a short-sighted approach as social and environmental benefits could also be economically beneficial in the long run. For example, procuring the cheapest electronic appliances at the initial stage, which are usually of inferior quality and less energy efficient, would most likely result in higher total expenditure in a 5-year term when the maintenance and replacement costs are also factored in. When environmental footprint and social factors are taken into consideration, the government would be able to make procurement decisions that are more cost-effective and sustainable in the long run and reduce damage to the environment.

The government should also introduce a tax reduction policy for manufacturers who purchase locally produced recycled materials. The procurement system and principle may effectively tackle Scope 1 and 2 carbon footprints, but not the Scope 3 emission. Although it might be difficult to calculate the exact carbon emitted from Scope 3 channels, locally produced recyclables would certainly triumph over overseas recyclables. More importantly, it also encourages local market growth with the rise of demand.

Procuring locally produced recyclables may result in a higher cost of goods sold (COGS) for the manufacturers as Hong Kong has a much higher average salary level and rental cost compared to most neighboring regions in Asia. To address such reluctance to use locally produced recyclables, the government should consider offering tax rebates, so that these manufacturers using locally sourced recyclables at a higher cost can be compensated financially from a reduced operating expense perspective.

Improve the business environment for the recycling industry

Besides, the government should cultivate a supportive and stable business environment for the local recycling industry, including by providing long-term land tenancy of at least 10 years.

Recycling plants are a capital-intensive business, which requires heavy manufacturing investments for daily operations. These expensive and durable machines are often amortized over a long period (at least 5 years) before these initial investments could break even.

The current 3-year short-term lease provides little assurance to private companies in the recycling industry. Such uncertainty discourages new investment as the lease could even be shorter than the time it requires for the business to break even.

Unlike other for-profit organizations, the benefits that the recycling industry brings to society are more far-reaching as it encompasses tremendous environmental and ecological benefits on top of financial returns. These industries deserve more long-term support from the government than businesses that do not contribute much to conserving the environment.

Reduce resource consumption and waste production from source

Even if society manages to increase the recycling rate, the number of recyclables when compared to the amount that was first consumed can never be 100%. According to the waste hierarchy, recycling is never the most preferred option (Figure 1). Instead, prevention and re-use are of higher priority (EC, 2008).

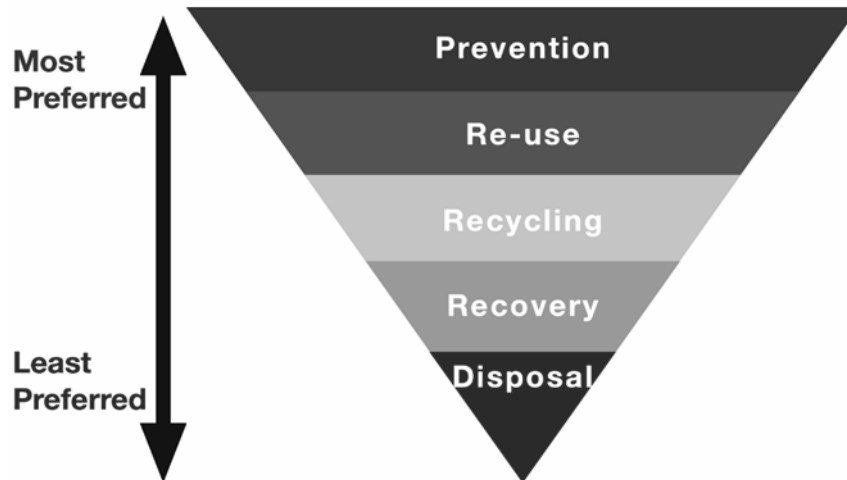


Figure 1 (Waste hierarchy)

Therefore, the most preferred action to handle waste should be minimizing waste at the source. Apart from placing all the emphasis on improving recycling, the government should bear the responsibility to promote the reduction in consumption.

One potential way of facilitating this is to encourage research and development of innovative business models such as “Product-as-a-service” (“PAAS”) (e.g., rental and sharing). In the conventional product-oriented business model, businesses earn profits through selling products. They are motivated to maximize the quantity of production and often have “planned obsolescence” for products which are no longer functional after a predetermined period to encourage consumption (Zeeuw van der Laan and Aurisicchio, 2020).

Whereas in the PAAS model, businesses no longer make profits from selling products but through the service offered instead. Materials used in producing products and consumables which are provided under the service model become the manufacturers’ costs that they are motivated to minimize in the long run. This encourages businesses to make products that last and reuse the components after the end of the product’s life, thus can narrow and slow down the material flows while maximizing service output (Tukker, 2015).

This model aligns businesses’ interests to that of the consumers, as well as of the environment, and results in a “Win-Win-Win” scenario for all the stakeholders. The PAAS model also has great potential to be implemented in Hong Kong, since the service industry is a dominant contributor to the gross domestic product (GDP) index.

Raise awareness among citizens and end-users

The government should organize education campaigns to educate the public about behaviors that contribute to sustainable and responsible consumption.

“Transparency Act” should also be established to require corporations or manufacturers to disclose “green”

information relating to the manufacturing process, such as the percentage of recycled materials used to produce each product.

Conclusion

In short, the government needs to reallocate resources for waste management from disposal to recycling to address the problem in immediate terms. However, the government should also shift the focus from “recycling” to “reducing” consumption by restructuring the economic and development model of the city in the long term. Hong Kong needs to transform from a linear economic model to a circular economic model, which decouples economic growth from resource consumption.

4. Climate Adaptation, Resilience and Health

By Nash Lai, Evangeline Leung, Mandy To and Manson

While we work towards alleviating the human-induced change of climate, abnormal and extreme weather conditions are already impacting all walks of life. People and other habitats are forced to adjust their ways of living in response to climate change - mainly by adapting or strengthening resilience. Climate adaptation concerns the readiness and ability to respond to existing or future consequences of climate change while climate resilience looks at the ability to forecast and respond to abnormal weather events. In Hong Kong, we experienced 21 “Very Hot” Days and 25 “Hot” Nights in July 2022, breaking historical data recorded since 1884 (Cheung, 2022). On September 13, 2022, another record was broken for the highest temperature recorded in the month of September since 1884 (The Standard, 2022). According to research by the Chinese University of Hong Kong, climate change-intensified typhoons could be twice as destructive by the end of the 21st century (CUHK, 2022).

The urgency for climate adaptation and resilience is alarming as the change of climate has already been adversely impacting people’s health conditions, including physical fitness, mental health, and social well-being. To manage and minimize the effects brought by climate change, adaptation and resilience are crucial to endure and overcome this unprecedented challenge. Therefore, the Hong Kong Government, non-governmental organizations, and the private sector should work hand in hand to make Hong Kong better adapt and more resilient to climate change.

A survey conducted by the Society for Community Organisation (SoCO) discovered that the indoor temperature for 70% of families living in inadequate housing is higher than that of outdoor for 1.3-5.4°C. People living in inadequate housing are also more likely to be directly exposed to extreme weather conditions. With heat, poor ventilation and adverse weather conditions, their homes are hardly desirable for living, or even habitable (SoCO, 2018).

As reflected in the 2020 Sustainability Leaders survey from GlobeScan, national governments lack leadership when it comes to contributions to the progress of sustainable development. We call on governments to lead fundamental transformations of all sectors, especially in the energy, manufacturing, transport, infrastructure, and agriculture industries (GlobeScan, 2020).

Resource allocation

The gap between actual and necessary climate crisis spending sits at over USD3.5 trillion per year (Citi, 2021). In order to fill the gap to help the victims of climate change, governments should implement better budget plans, and enforce sector-specific policies, regulations, and plans that underpin environmental pledges.

Besides, the producer responsibility scheme (PRS) should be expanded and adopted in a more effective manner in Hong Kong. With reference to New York’s Low Embodied Carbon Concrete Leadership Act (LECCCLA) 2019, it imposes specific tax credits on concrete manufacturers. The LECCCLA stipulated that concrete producers bidding on public projects in New York will be ranked based on the global warming potential (GWP) value of their concrete, in addition to the cost (CarbonCure, 2020). Concrete producers that adopted carbon capture, utilization, or storage technology, can enjoy an additional 3% discount. This

incentivizes the innovation and adoption of more climate adaptation solutions in the city. In this case, by capturing carbon in metropolises, the heat island effect could be less severe and will help mitigate health risks caused by rising temperatures.

To take a step further, the manufacturers should allocate a portion of the 3% discount enjoyed to assist the underprivileged with climate adaptation and resilience. NGOs focusing on serving the underprivileged could assist and advise manufacturers on the allocation of resources.

Health of Outdoor Workers

With reference to a survey by Greenpeace Hong Kong, over 60% of outdoor workers interviewed expressed that rising temperatures would negatively impact their work to “a large extent” or “a very large extent”. Over half of the workers interviewed also expressed they have experienced heat-related illness in the latest summer, such as dizziness, difficulty in breathing, headache and physical weakness. The survey also found that more than 60% of the workers were not given wide-brimmed sun hats, and nearly one-third of the respondents said that their employers did not provide enough drinking water (Greenpeace, 2022b).

While the Labour Department issued various guidelines, including the "Risk Assessment for the Prevention of Heat Stroke at Work" and the “Prevention of Heat Stroke at Work in a Hot Environment, employers are not obliged to follow these guidelines. The current version of the Occupational Safety and Health Ordinance also does not require employers to make related assessments. The safety and health of outdoor workers are not well protected. With rising temperatures as a result of climate change, the health of outdoor workers has become a higher risk (ISD, 2022b).

Therefore, we call on the government to add provisions on heat stroke and other heat-related illnesses to the Occupational Safety and Health Ordinance. These illnesses should also be covered as part of the compensable occupational diseases of various insurance programs. More wet bulb and black bulb temperature monitoring points should also be established in Hong Kong to better inform outdoor workers and employers regarding the real-time outdoor working environment. This would help them to make safety precautions correspondingly.

We also call for the government to look into "Heat Governance". A research team from the UCLA Luskin Center for Innovation has proposed sound heat governance should (1) advance heat equity, (2) mitigate heat, (3) manage risks, (4) develop metrics, (5) coordinate heat management initiatives, and (6) establish heat institutes and dedicate the “heat sector” to deal with the growing consequences and inequities of high temperatures (LCI, 2021).

Resource identification

A “resource map” should be made for the people to refer to. The content can include where the heat and cold shelters are, where people can apply for subsidies (adaptation funds), where can people know more about climate change and where can people join to take action and voice out etc.

In adapting to the extreme weather, the existing alarm system from the government should be well utilized. For instance, flooding warnings for specific areas or underground parking lots should be listed and alarm people to evacuate.

With the poor air quality conditions in the past decade, we call on the government to expedite the implementation of policies for a cleaner sky. While existing policies, such as the phasing out of diesel vehicles, are underway, some vehicle owners remain reluctant to make the shift as they are of the view that diesel vehicles are more convenient and lower in price. What the government can do is encourage the gradual adoption of electric vehicles by providing incentives and subsidies for end users.

Recommendations

1. Urging the Hong Kong Observatory to issue warning signals and messages earlier so residents can get ready and prepared for situations associated with extreme weather conditions as soon as possible (e.g., move to temporary shelter during very cold and very hot days, use sandbags to block doorways before flooding, prepare reinforcement tools/ necessities before the typhoon, etc.).
2. Calling for the government to form and provide more training to the auxiliary force specializes in assisting in evacuation work (on top of the existing rescue force).
3. Basic infrastructure and buildings should be inspected and maintained regularly so as to ensure they can offset the effects caused by extreme weather conditions (e.g., water-proof structure, heat-proof materials, proper drainage systems, elevating railways from the ground so public transport may still operate in certain circumstances).
4. Build a more temporary shelter in preparation for extreme weather conditions, so those who live in the undesirable environment can still manage to have a decent living during hard times.

5. Climate Finance

By Anson Chan, Charles Lam, Tsang Ching Man and Victor Pang

In Hong Kong, there is a lack of transparency and cohesion of government income and expenditure from green products, as well as the expenditure and investment in green finance.

Capital collected from charging and taxing non-environmentally friendly practices - such as fuel tax, over-emitted pollutants or the illegal dumping of sewage - all go into a general tax pool and are not directly contributing back to green and sustainable initiatives. Worse, surcharges on plastic bags simply go back to retailers' pockets with no rules on the use of the surcharges. With no incentives for the retailers to invest this additional income to compensate for the carbon footprint of single-use plastic bags, retailers shoulder little responsibility in this regard in the use of single-use plastic bags.

On the other hand, existing government-funded green projects are paid out of the general tax pool, which is considered one out of many governmental expenditures. While support for green projects is often considered an "expense" rather than an investment opportunity, governmental support could potentially be withdrawn at any time. Such uncertainty hampers new investment and launching of new projects.

Under the Pollution-Pay Principle, parties emitting a higher carbon footprint need to be liable for their environmental impacts by paying more tax. Therefore, a mechanism to better match the tax income collected to support relevant green projects that encourages a circular economy is recommended. This could also raise transparency in the allocation of green funds.

Meanwhile, taxation is seen as a relatively stable and ongoing income source with considerable flexibility to adjust in accordance with different circumstances. For example, a carbon tax can be levied more aggressively on fossil fuel vehicles if the transition to electric vehicles is subpar, especially during a later stage when the majority of fossil fuel cars have made the switch.

Recommendation - Green Matching Fund

In light of the above considerations, we call for the establishment of the Green Matching Fund (GMF) in Hong Kong. Depending on the landscape of individual industries, tax collected could be partitioned into downstream matching, upstream matching, stakeholder matching, and tax rebate.

Downstream matching

Downstream matching can ensure the pool of money from GMF is obtained from taxing non-environmentally friendly practices and is diverted to fund downstream recyclers and green initiatives, which, despite tremendous effort to upcycle and create values from disposed waste, usually face high operating costs and enjoy slim profit margins. Supporting downstream recyclers and upcyclers helps minimize waste that is disposed of to the landfill and promotes a zero-waste and circular economy.

Upstream matching

Part of the GMF may also be used to support R&D work at the manufacturers' level – educating manufacturers and driving technological breakthroughs to achieve more waste reduction on the production level.

Stakeholder matching

Some of the taxable projects or practices may inevitably damage the ecology and cause negative impacts on existing incumbents' quality of life. For instance, a construction project may result in losses of trees or greenery, it may also reduce the rate and amount of airflow in the region and block the scene of neighboring residents. Portions of GMF should be allocated to restore the change, or at the very least, reduce the stress caused by the new project.

Tax rebate

Apart from penalty-style negative reinforcement, positive reinforcement can be induced by introducing tax relief or rebates to promote practices or materials that are more environmentally-friendly. Taking domestic waste management as an example, while the government imposes a more aggressive taxation policy on the bags of garbage disposed of, it should also provide cash rebates and/or credits to each kilogram of recyclable items that goes to recycling facilities.

A mandatory and standardized reporting framework for the GMF, in addition to regular independent auditing, is vital to ensure that the fund cycle, as well as the green initiatives supported by GMF, are functioning as intended, instead of becoming another facade of greenwashing.

Besides having an internal environmental, social, and governance (ESG) audit and independent and unbiased ESG Rating agencies, an international third-party regulator should be formed to spot-check companies to avoid chances of greenwashing. Regulators worldwide should work together to initiate, facilitate and supervise benchmarks and the frameworks that are most appropriate to cover all primary industries.

Conclusion

Green initiatives usually require initial and ongoing capital investment and may have a long investment horizon. Instead of placing sole reliance on government one-off and short-term sponsors that may be insecure, the Green Matching Fund (GMF) enables a relatively stable and ongoing source of income to fund and power green projects on a continuing basis, which in turn helps the society to achieve long term sustainability goals. To prevent greenwashing, third-party regulators worldwide are needed to develop benchmarks and maintain proper supervision.

6. Food and Agriculture

By Fu Hoi Man and Yu Hoi Wan

Food self-sufficiency has gained popularity on the policy agenda all over the world when food prices became extremely volatile during the 2007–08 food price crisis (Clapp, 2017). Countries of all sizes have expressed plans to improve their food self-sufficiency. Food self-sufficiency can be broadly interpreted as the extent to which a place can satisfy its food needs from its local production (FAO, 1999).

Current Situation

Around 2500 farms, using only 0.6% of Hong Kong’s land, are used for active farming (AFCD, 2022a). Meanwhile, the local daily fresh vegetables consumption is up to 2605 tons daily, among which 2% comes from local producers (AFCD, 2022a). Despite heavily reliant on imports for fresh food, many fruits (e.g., lychees, longans and citrus) and vegetables (e.g., cabbages, lettuces, radishes, spring onions) can be grown locally throughout the year on hilly slopes (AFCD, 2022a). Most common crops grown in Hong Kong are leafy vegetables and cut flowers that can be sold for a higher value (AFCD, 2022b).

Hong Kong’s heavy dependency on imported food has adversely affected the city’s development during supply chain disruption (e.g., outbreak of the fifth wave of COVID-19) owing to pandemic-related policies and logistics delays (Now, 2022).

International and Regional Targets and Actions

Singapore

Singapore launched the “30 by 30” initiative in 2019, proposing that local produce shall support 30% of the national food support by 2030 (SFA, 2022). Singapore has implemented various farmer-friendly policies to achieve this vision (e.g., providing financial support to farmers, enhancing their farming capacity and capability, assisting the farmers to brand their produce). Singapore has been actively utilizing floorspace (e.g., rooftops, indoor space and other empty spaces at schools, hospitals and shopping centers) to increase farming areas (van Wijkvliet, 2021).

Taiwan

Taiwan, on the other hand, has proactively implemented the Smart Agricultural Promotion Policy (Tari, 2022). It aims to assist farmers in optimizing their farming facilities, enhancing production efficiency and quantity, and marketing their produce. By adopting smart technologies (e.g., big data analysis, GIS position, robotic assistive device and sensor), farmers can make strategic farming decisions to efficiently farm in both outdoor and indoor multi-story farmlands.

Existing Local Targets and Policies in Hong Kong

In the Policy Address in 2016, agriculture plans have been included as follows: “The value of agriculture goes beyond its economic contribution. Developing local agriculture not only increases choices in terms of origin of food, but it also helps optimize land use, improve the environment and hygiene in rural areas, and conserve the natural ecology. The Government has decided to implement the New Agriculture Policy. Major measures include establishing an Agricultural Park, exploring the feasibility of designating agricultural priority areas, setting up a \$500 million Sustainable Agricultural Development Fund, providing better support and assistance to help farmers move up the value chain, in areas such as product marketing and

brand building, and developing leisure and educational activities related to agriculture" (CEO, 2016; AFCD, 2022c).

Yet, it is mentioned explicitly in official government documents that "local production is geared to complement rather than compete with other major suppliers" (AFCD, 2022a). The Agriculture, Fisheries and Conservation Department (AFCD) in Hong Kong provides support for infrastructure and technical services to the industry (e.g., crop specialists conduct studies on pest control and the feasibility of bringing in new production technologies and techniques locally) (AFCD, 2022a). Some success has been seen in the growing of new varieties of strawberries and super sweet corn.

Shortfalls of existing policies

Similar to many economic policies in Hong Kong, allocation of resources are left to the forces of free market with very little government intervention (AFCD, 2022b). Other than basic infrastructure and technical support, the industry has been left to compete with the low cost of imported goods. Guidelines were provided to 334 farms on production standards to organic farmers since 2000 and registered 1943 vegetable farms since 2006 to enhance their awareness on good practices, quality control and safety issues (AFCD, 2022a). The support provided through these services are superficial and may impede rather than incentivify the development of the agriculture industry in Hong Kong by putting up bureaucratic hurdles.

The Government has several funds relevant to agricultural development, amongst which the Sustainable Agricultural Development Fund (SADF) established in 2016 is aimed at "fostering sustainable development and enhancing the overall competitiveness of the agriculture industry" (FEHD, 2020). Although local registered agricultural co-operatives, NGOs, and individual farmers seeking grants under Farm Improvement Scheme are eligible to apply for this fund, nine of the 14 approved projects were submitted by tertiary institutions (AFCD, 2022c). Besides, the fund requires the completion of a 20-page application form.

We cannot help but wonder how much financial assistance is actually provided to farmers directly and effectively. Apart from the SADF, the AFCD also provided low-interest loans to farmers (e.g., Kadoorie Agricultural Aid Loan Fund, Vegetable Marketing Organisation Loan Fund), which required farmers to pay back to the Government.

Recommendations

'Community Farming Network' Initiative

A new policy initiative called "Community Farming Network" is recommended. This initiative features efficient government support, increased farming spaces in corporations and change in local customers' buying behaviors.

Government

The role of the government can streamline its support to agricultural developments and fund the farmers more efficiently. The current SADF application procedures are too complicated and should make reference to the simpler processes (e.g., distribution of consumption vouchers) and make use of existing farmer registers to connect with individual farmers directly.

Corporations and NGOs

Corporations and NGOs can provide more floor space (e.g., vertical spaces including rooftops, balconies

and indoor spaces, for farming mushrooms). The existing trend of setting up urban farms on shopping mall rooftops can continue to expand. Being a highly populated city with competing needs for ground-level space, urban rooftop farms can provide opportunities for the public to interact and appreciate nature, increasing their awareness of the environment and its relation to human life (AIPH, 2020). Meanwhile, corporations and NGOs should explore the growing of mushrooms in air-conditioned indoor areas (e.g., nooks and crannies of their office buildings) using aerated and disinfected organic waste (e.g., mixture of coffee grounds, wood chips and lime) (雨兒, 2021).

Individuals

Individuals can change consumption behaviors and support local produce. While purchasing mass-produced imported goods are cheaper, they have a higher carbon footprint and are more difficult for consumers to trace the production source. Purchasing local produce from farmers can enhance food security and satisfaction. The financial cost that the public can learn to bear for a greater good. Moreover, when the demand for local produce is increased, a greater force to shift existing policies (e.g., government taxation) could be seen.

Conclusion

Land use competition is a never-ending problem in Hong Kong. The priority for the majority of the population would be affordable housing instead of local agriculture. However, food and shelter are basic human needs and should not be overlooked. We often are used to our comfort zone and omitted questions (e.g., food shortages in mainland China due to extreme weather). Therefore, being self-sufficient should be considered. Indeed, changing other's mindset is difficult. Fortunately, but sadly, nature is making its own case with the most vivid and grim colors one can imagine. It would be too late for mankind if we (as individuals, companies, the government) do not act now and take into account the environment during decision making.

7. Nature and Biodiversity

*By Cheung Wing Yin, Leung Cheuk Yin, Mak Ching Sum,
Mak Sze Ching, Suen Hau Tung and Wan Nok Yiu*

As Hong Kong's three-year coronavirus lockdown is still implemented, some of the “trapped” citizens who would like to travel to foreign countries have turned to going to local suburban areas. A survey found that 40% of the respondents visited the countryside more frequently than before (Green Power, 2020). The average number of visits to the countryside per month has increased 2.8 times from 2019 to 2020. Of the 6.4 trips, about half of them replaced traveling and leisure activities due to the pandemic. Wildlife habitats are greatly affected as the number of people visiting the countryside and beaches around Hong Kong increases. Activities that caused pollution (e.g., litter including masks, plastic bottles and even camping tents and water pollution) and disruption to wildlife (e.g., feeding the wild animals) were observed. These actions affect wildlife as their food sources and habitats are damaged by human activities.

Human-wildlife conflicts (e.g., disturbance due to increasing number of Eurasian Wild Pig roaming in urban areas or attacks, local farmers view them a nuisance due to crop destruction) are caused by urbanization, changing dieting routines due to feeding activities and city dwellers not used to encountering wild animals.

In order to achieve “zero-carbon” proposed by the Hong Kong Government in the Hong Kong's Climate Action Plan 2050, public conservation awareness of protecting the local nature and biodiversity should be increased to reduce the conflicts between urban and suburban areas.

Nature and carbon cycle

Biodiversity and carbon sequestration

Nature and biodiversity have important roles in climate crisis alleviation such as carbon sequestration. The current decline rate of greenhouse gas emissions (e.g., CO₂) due to combustion of fossil fuels is insufficient to contain the temperature rise within 1.5°C. Reduction of emissions and increasing carbon sinks are therefore necessary (Stocker et al., 2013).

Blue carbon

The ocean has a strong impact on reducing carbon emissions. $\frac{1}{3}$ of the total annual CO₂ emissions are absorbed through natural exchange processes through sea-air interface (Adams and Caldeira, 2008). It also has strong potential and obvious advantages for the development of new carbon sequestration technology (Wang et al., 2015). Coastal wetland habitats and flora (e.g., algae, seagrass, mangroves, salt marshes) absorb and capture CO₂ during growth (Godin, 2022). Over half of the sequestered carbon on the seafloor is due to coastal forests, which capture carbon dioxide four times faster than conventional forests because most of the carbon goes into moist soils several meters deep, reducing the overall atmospheric CO₂ levels. A hectare of mangrove forest can capture up to eight tons of CO₂ annually, much more than a tropical forest equivalent in size (Godin, 2022).

Land and soil

CO₂ can dissolve in solvents (e.g., crude oil, water) or react with ions (e.g., calcium, magnesium, potassium) to mineralize into stable compounds for long term underground storage (Wilkinson et al., 2009). Soil organic matter (SOM), where organic refers to the presence of large amounts of carbon (e.g., typically 50%

carbon) are carbon sinks. Degraded plant materials (e.g., leaves or stems) are broken down by soil microorganisms and converted to carbon and organic matter to be stored within the soil (Godin, 2022).

Biodiversity in Hong Kong

Flora diversity

Located between the tropics and temperate zones, Hong Kong is located at the northernmost edge where Southeast Asian tropical plants can be found. Evergreen broad-leaved forests are found naturally. Home to over 3300 vascular plant species, where over 2100 are native (including 120 orchid species, 300 native tree species) (WWF, 2013; AFCD, 2020a). About 100 local plant species are rare and fragile including some orchids for conservation purposes (AFCD, 2020a).

Fauna diversity

There are 2,000 moth species, 110 odonata species and 230 butterfly species and over 500 avifauna species in Hong Kong (WWF, 2013). The fauna species diversity in Hong Kong is quite high (e.g., a third of all avifauna species in China can be found within Hong Kong, 1,000 fish species and over 80 stony coral species can be found within Hong Kong, more than the entire Caribbean Sea) (WWF, 2013). Endemic species (e.g., Romer's Tree Frog, Bogadek's Burrowing Lizard) and endangered species (e.g., Black-faced Spoonbill, where about a fifth of them winter in Mai Po and Deep Bay area) can also be found. Many wildlife species and potential breeding grounds are recorded in Hong Kong due to the diverse ecological environment. However, the number of mammals are in decline due to habitat destruction and urban development (AFCD, 2020b).

Sites of conservation importance

Recognized sites of conservation importance (e.g., Country parks, special areas and Sites of Special Scientific Interest (SSSIs)) are to protect the rare habitats and endangered species. Some SSSIs have endemic and rare flora habitats and species (AFCD, 2020a). The Shing Mun Arboretum has over 300 flora species, which include rare plants in southern China, and are planted for ex situ conservation and education (AFCD, 2020a).

Habitat degradation and pollution

Medical Waste

Medical staff and the public are required to wear masks to prevent COVID-19 infection, producing an estimated 225 million masks a month (Plastic Free Seas, 2021). A study found that 90% of the respondents noticed an increase in the medical waste (e.g., face masks, disinfectant wipes) during the pandemic, where each outing produces an average of about one and a half disposable masks and two disinfecting wipes (Green Power, 2020). Some environmentalists believed that inappropriately disposed masks not only increased the risk of virus transmission, but also pollutes the environment due to difficulty to degrade (e.g., materials such as non-woven fabric, filter layer, elastic band in N95 and surgical masks are difficult to degrade, disassemble and recycle) (ISD, 2020).

Plastic waste

Plastic waste drifts into the ocean and other natural environments, becoming a chronic poison for animals (Greenpeace, 2021c). Seabirds (e.g., albatross, water nymphs) often ingest plastics when searching for food (e.g., fish eggs, squid, and krill floating) on the surface. Besides, birds are often entangled in plastic, resulting in undesirable consequences (e.g., affecting movement, hindering blood circulation and growth)

(Greenpeace, 2021c). A case study in 2020 has revealed that a large variety of waste (e.g., rubber gloves, fishing line, plastic bags, packaging) were found within the carcasses of two endangered Green Turtle individuals. The majority of the content within the digestive system was marine debris. The mortality rate of sea turtles after ingesting one piece and 14 pieces of plastic waste is 22% and 50% respectively (Greenpeace, 2021c).

The Education University of Hong Kong has inspected 30 local captive and 30 wild Mullet and found that 60% of the wild Mullet samples contained microplastics and an average of 4.3 pieces of plastic fragments per individual, and one of them had as many as 80 pieces (Greenpeace, 2021c). Half of the 200 straws had obvious signs of being bitten by fish during a beach cleanup (Plastic Free Seas, 2021).

Wild cattle (e.g., Domestic Ox) in Hong Kong have been threatened by plastic waste recently due to human interaction (e.g., tourists feeding and associating plastic bags as food). Wild animals are therefore sometimes accidentally killed due to ingesting plastic (e.g., death due to clogging of intestines by plastics of a Domestic Ox) (Greenpeace, 2021c).

Forest fire

When a forest fire occurs, the burning of trees releases a lot of carbon dioxide, which contributes to the warming of the climate (Pellegrini et al., 2021).

Shortfalls of existing policies

AFCD patrolling staff will ask hikers to take away their own trash at country trails. Appropriate enforcement actions will be taken if littering is found. However, such enforcement rarely reaches those who litter. Water refilling stations and dispensers were added at picnic locations in 2019 to encourage citizens to bring their own bottles and reduce the purchase of disposable beverages. Lui, who works for Green Power, suggested that the authorities should pay attention to the hygiene of the facilities to ensure citizens can use them with confidence (Green Power, 2020).

Case Study of Lung Mei Beach, Tai Po

Lung Mei Beach is a mudflat with high ecological value and adjacent to the Ting Kok SSSI, where over 400 marine species were recorded (e.g., seahorses, spotted sand starfish, manatees). Dr. Billy Hau, a program director in Environmental Management at the University of Hong Kong, has opposed the construction of artificial beaches on mudflats. Other concerns include the general public being hurt by certain species during low tide (e.g., 90 cases of swimmers got hurt during the first five days by sea urchin and jellyfish). The lack of conservation awareness among beachgoers (e.g., children throwing starfish as darts) were also found.

Government agencies and Environmental Impact Assessment (EIA) showed insufficient conservation effort, lack of knowledge and research to minimize environmental impact. The EIA underestimated the ecological value (e.g., the report mentioned that the ecological value of Lung Mei Beach was low and recorded three kinds of crab while other ecological investigations found over ten crab species and other rare fish species unmentioned).

Recommendations

Leave no trace

Individuals are recommended to reduce distractions to wildlife and practice 'leave no trace' when having outdoor activities. Echoing the study mentioned in section 1.1, the top three types of waste produced by the public during outings were paper towels, food packaging and plastic bags, accounting for 60%, 50% and 40% respectively, with an average of one to two pieces of each type of garbage per person per outing (Green Power, 2020). Using reusable items is also recommended as over 40% of the global plastic produced is used in packaging (Plastic Free Seas, 2021). Many citizens who are not regular hikers have been to the countryside this year and some failed to properly dispose of their rubbish (Green Power, 2020). Education is essential for these hikers.

Innovative promotion

The "healing mascot" of a local Japanese government is replacing the governor as the protagonist of the top salesman. Healing mascots in Japan have high publicity (e.g., 40% of the healing mascots in Japan have higher publicity on social networking sites than governors) and bring huge economic benefits (e.g., annual sales related to "Kumamon" in Kumamoto reaching 170 billion Japanese yen). The use of mascots could attract tourism and improve productivity (Nikkei, 2022). Hong Kong can make reference to this idea and create our locally unique mascots for common species (e.g., Romer's Tree Frog, Bogadek's Burrowing Lizard, Black-faced Spoonbill, Chinese Pangolin, Red Muntjac, Chinese White dolphin).

Volunteering

More than 10% of the interviewees had participated in cleanup activities during the pandemic, in which around half of them had cleanup while doing other outdoor activities. Lui, who worked for Green Power, believed the results showed public concern on countryside waste and were willing to take action (Green Power, 2020).

Promoting ecotourism

Ecotourism is an active and practical education method to let the public understand the relationship between ecology and humanity. Although there are some NGOs (e.g., V'air) which organizes local ecotours for schools and corporations, the Hong Kong Government does not provide these services. It would be much easier to promote ecotourism publicly by the government. Research by the University of East Anglia found a US\$ 29 billion of annual revenue flow in developing countries (e.g., scuba diving tours in Sri Lanka), which showed ecotourism has economic potential (Kirkby et al., 2011). AFCD is experienced in ecology and should take more responsibility for public education. Organizing ecotour could increase public awareness of the conservation of the local natural and ecological environment.

Beyond personal changes

Climate change affects the ecosystem and reduces biodiversity. During the pandemic, an increase in human activities in the local natural environment has degraded the local ecosystem, affecting food sources and habitats. Urbanization and feeding wildlife also changed their dieting routines.

Students and the public should be educated. Ecotourism, mentioned in section 6.4, when promoted and organized by the government, could increase awareness of conserving Hong Kong's local natural ecological environment.

The lack of creative promotion of the Hong Kong Government will affect the levels of interest and motivation of the public to care about the local nature and biodiversity. Selecting endemic and popular species (e.g., some local successful mascots) can enhance awareness for protecting nature and inducing behavioral changes.

8. Politics, Policymaking, and Governance

By Chan Hok Lam, Lai Sze Kui, Lam Wai Ling and Wong Ning Him

Comprehensive government policy is one important means of driving system change to combat climate change. However, it is observed that there are different kinds of problems in HK government policymaking process, from research, public opinion collection, implementation to stakeholder engagement. The following will evaluate 3 main policies - disaster prevention, net zero target and recycling and provide suggestions for the HK government to improve.

Policy on Disaster Prevention

Current status

Disaster crisis is not prioritized and realized by the government. The government has failed to identify and prevent the loss and damage of increasing disasters under climate change. The lack of vision is putting local communities at risk, for instance, coastal villages like Tai O are vulnerable to flooding due to extreme weather.

The Emergency Alert System developed by the Government had only been used once in March 2022. The system should be used for disseminating time-crucial messages like extreme weather conditions, which can let the public adopt contingency measures quickly.

Ideal policies

The government should plan ahead and include disaster prevention in policy making. Identify the communities and areas at higher risk and the impacts brought by climate change. Lateral and horizontal collaborations within departments such as the Security Bureau, and with NGOs and local organizations. Make good use of the emergency alert system or warning system.

Challenges

Reliable simulation and modeling of disasters that may occur to assure the public. Possible mitigations for affected residents, taking post-flooding as an example, besides monetary compensation, long term relocation may be needed.

Policy supporting Net-zero target

Current status

Having a net-zero target is a good first step for HK, but at present, it is not very stretching and demands greater attention from policymakers. For instance, HK's economy is predominantly a tertiary industry without major energy-intensive industries.

We urge the HK government to explore the prospect of bringing its net-zero deadline forward, from the present 2050 to earlier. While we recognize that many fundamental differences between Hong Kong and other more ambitious countries who have committed to achieve net-zero by 2030 (such as the Maldives), we believe Hong Kong - with the right governance and policies - can achieve this as well. Hong Kong already has some of the best infrastructures to facilitate this initiative, for instance, its sophisticated transport network allows for over 90% of daily journeys being made on public transport - the highest in the world. But much more is to be done around policies and citizen education, such as how best to leverage this

extant infrastructure even more so than at present. A closer look at the source of carbon emission in HK shifts our focus from the obvious to less obvious. Only about 20% of HK's carbon emission is from transport. Instead, over 60% of HK's carbon emission is from electricity generation, and buildings account for 90% of this electricity consumption.

Ideal policies

There are various interesting avenues that the HK government could explore. As mentioned, improving energy efficiency of buildings to reduce energy demands is our top priority. In order to further improve uptake of public transportation by citizens, authorities should subsidize public transport even further. Corporates wishing to continue with their operation in HK should shoulder more responsibilities towards the collective benefit of a greener future for the territory. Authorities should set mandatory stretching but realistic ESG goals for corporations operating in HK. A reward/ penalty system (such as tax relief) can be put in place to better encourage corporations to actively act in an environmentally sustainable manner. Senior officials should be elected on a competency-basis. Citizen science and education are effective and important tools for change. Citizens need to be aware of what really affects them and how they have the right to know and the government needs to be transparent.

Policy on Recycling

Current status

In Hong Kong, there are 3.37 pounds of municipal solid waste polluted to landfills every single day in 2018 each person. It results in 5.87 million tons per day of solid waste polluted per day, which is a massive amount of pollution. Although Hong Kong has set up and subsidized the construction and the operation of recycling parks mainly T Park and Mil Mill recently, the rate of utilization is only around 40%. Besides, the recycle rate of Hong Kong is comparatively low compared to the European countries (10% of Plastic waste, 30% of Solid waste and 2.8% of Food waste are recycled in Hong Kong but Germany has a 68% recycling rate in solid waste). In fact, environmental education in Hong Kong is not popularized and the education bureau is not supportive enough for the promotion of environmental education.

Ideal policies

We recall the government of Hong Kong to set up a mandatory environmental and climate change initiative curriculum education to promote green life in the next generations. A regular set up of public forums referring to climate change is needed in all districts to raise the awareness of people to climate change and engage them to take action in green life. Also, the government should implement the polluter-pay principle (taxation) on solid waste. The government should monitor and regulate the ESG disclosure of the limited companies. Moreover, the government can subsidize or cut taxation for different industries and sectors, recycle their waste and transport their solid waste to the recycling facilities, as to reduce their logistics cost. The subsidies can be provided to dining sectors for them to reduce the purchase of plastic utensils and lunch boxes. In addition, the government can engage the dining sectors to support the scheme of self-bringing lunch boxes.

Challenges

It could be time-consuming for the government to consult and gain support from the business sector to agree on the polluter-pay principle among enterprises and limited companies. They might be against the government for monitoring and regulating their ESG disclosure. Besides, an effective environmental

education will require time to set up and cannot be monitored, as the standard is hard to define. The effectiveness of environmental education depends on the engagement and participation of the public.

Conclusion

It is high time that HK government should evaluate its policymaking process to better achieve carbon neutrality by 2050 and ensure HK to be adaptable to climate change.

9. Reimagining and Transforming Economies

By *Bathany Ma*

As one of the most advanced economies in the world, Hong Kong has undergone several economic transformations to become the financial hub in the Asia Pacific region. From entrepôt to manufacturing center in 1950-60s; service-oriented industry in 1970-80s to the emergence of knowledge-based economy in 2000s, Hong Kong's economic structure has evolved to be dominated by “four pillar industries” - namely financial services, tourism, trading & logistics, and professional services.

Despite the government's attempt to diversify local industrial structure through promoting “six major industries” (medical services, education services, environmental industries, innovation & technology, testing & certification, and cultural & creative industries) in the 2009-10 Policy Address, financing and insurance sector remains as the largest contributor to Hong Kong's GDP. The heavy reliance on one single industry has thus placed Hong Kong at a vulnerable position amidst economic downturn and global climate crisis.

Current Economic Structure Hinders Sustainable Development

Environmental: Lack of comprehensive policies and education that support environmental services industry

While the environmental industry is one of the “six major industries” highlighted by the government to increase the city's competitive advantages, its value added is only 0.4% of Hong Kong's GDP, with the coverage of business areas concentrating at waste management and pollution control. This reveals that the direction of policymaking and business development are more on mitigation than environmental risk prevention.

Since the “four pillar industries” (financial services in particular) are prioritized by the government with loose regulations that monitor the negative externalities (wastes and pollution) generated by their business activities, the environmental industry is acting as a cleaner to “clean up their mess”, instead of being actively involved in the strategic planning process to avoid sustainability risks in the very first place. And because of its insignificance, the green technology and environmental services industry is short of resources and public support to stimulate growth and expansion. The insufficiency in environmental education and awareness is arguably the root cause underneath.

Economic: Immature development of the “six major industries”

Over-emphasis in one specific sector would lead to the inability to diversify economic risks across industries, thereby obstructing Hong Kong's economic resilience and development in the long run.

Slipping into technical recession, Hong Kong's economic growth has shown a weakening trend over the past decade. Facing fierce competition from Singapore, Shanghai and Shenzhen, coupled with talent shortage, Hong Kong's leading position as the international financial hub and gateway between mainland China and foreign countries is being questioned. Nevertheless, the financial and insurance sector shared 23.3% of Hong Kong's GDP in 2020, which is 2.6 times the total aggregate output of the aforementioned six industries in 2019.

A decade after the recommendations raised by the Task Force on Economic Challenges in 2009, the

potentials and competitive advantages of these major industries are still unable to be captured and realized as the driving force to Hong Kong's economy.

Social: Rising inequality and widening income gap induced by reliance in financial industry

Housing crisis and income inequality have long been pressing issues faced by Hong Kong citizens. The situation has further been intensified by the imbalance in economic structure and developmental objectives.

Since Hong Kong's last economic transformation, the abundance in favorable policies and infrastructure towards the financial services sector has helped create 273,700 job opportunities in 2020 - a 26.3% surge from 2010's employment figure. However, in advanced economies like Hong Kong, research has shown a positive relationship between financial development and income inequality.

According to Oxfam's latest report, Hong Kong's richest residents are earning 47 times more than its poorest. The rapid rise in poverty rate triggered by pandemic-induced unemployment has led to increasingly complicated family conflicts and social alienation, which gradually intensifies cross-generation poverty.

If the existing economic structure remains untransformed without taking interests of the marginalized groups into consideration, a weakened social stability will eventually create implacable hurdles for Hong Kong to build resilience, achieve sustainability and position itself as the APAC market leader.

Recommendations

Innovation & Circular-based Re-industrialization

Economic transformation through re-industrialization has widely been discussed and supported since its appearance in the 2016 Hong Kong Policy Address. Can re-industrialization act as a bridge to link and drive the development of these diverse industries - medical services, education services, environmental industries, innovation & technology, testing & certification, and cultural & creative industries all together?

"Made in Hong Kong" is a tag proudly embraced by local citizens with confidence in the quality control and authenticity of locally produced goods. This provides a high level of social acceptance and readiness for the strategic transformation. More importantly, Hong Kong has available soft and hard infrastructure - technology know-how and vacant industrial buildings respectively - to revitalize its manufacturing and processing industry.

For instance, in contrast to the prosperous watch assembling hub in 1960s, a locally manufactured smart health watch with blood pressure monitoring function and made by up-cycled ocean plastics would be an example of sustainable product adopting circular material design principle; tackling public health issue; creating job opportunities, at the same time fulfilling latest market demand, thereby adhering to the triple-bottom-line sustainability framework.

Leveraging on existing building facilities and talent pool, the capital expenditure to set up this technology-intensive light-weight industry could be minimized. And this is just one of the many innovative possibilities that can combine the features of all six major industries together - it carries medical purpose;

contains educational value (encourages research through data analysis); generates less GHG emission (compared with heavy industrialization); applies IoT technologies; involves testing mechanism; and demands aesthetic product design to be marketable.

For the post-production part, the adoption of modular design would be able to lengthen the product life cycle through the ease of repairing watch components. This allows further creation of job opportunities through setting up “repair cafes” in local communities, which can minimize environmental impacts by adopting circular economy principles.

What’s more, revitalization of small to medium-sized factories and repairing centers would lead to increased opportunities of vocational training and continual education for low-skill workers to equip themselves with essential knowledge that support local industries or even foreign demand when it is maturely developed in the future.

In a nutshell, to foster a thriving sustainable development of the “six major industries”, cross-sector collaboration is the key to unlock Hong Kong’s competitiveness, as well as to enable smart re-industrialization through innovating circular products.

10. Technology and Innovation

By Lee Cheuk Yan

With the commitment for net zero in 2050 mentioned at the Paris Agreement, the Hong Kong government has also announced the vision of becoming carbon neutral by 2050 in the latest Climate Action Plan (Guterres, 2020; ISD, 2021b). The wider and rapid application of technology and innovation (T&I) could not only enable Hong Kong to achieve carbon neutrality but also have better preparation for climate induced extreme weather.

Current issues

Technology and innovation and carbon neutrality

Currently, T&I in both carbon neutrality and climate adaptation are insufficient due to two issues. First, inadequate resources were provided to the research and development (R&D) in green T&I by the government. T&I focused on digital infrastructure and financial technology has been widely promoted in various schemes (e.g., Innovation and Technology Fund by the Innovation and Technology Commission), only around 4.5% of the approved projects were dedicated to the environmental sector (ITF, 2022). Green T&I funding (e.g., Green Tech Fund in 2020 approved about 14 green projects, Recycling Fund has approved less than 30 enterprise projects up to 2022) has been encouraging, the number of approved applications were not high (ISD, 2021c; GTF, 2022; Recycling Fund, 2022). Resources and support provided by the government funding and support is crucial for green industries (e.g., especially those that might not show obvious financial gains including plastic recycling).

Technology and innovation and planning

Besides, the lack of long-term and comprehensive policy planning with T&I was observed. Local private green industries have not always been welcomed (e.g., Local paper and carton recycler Mil Mill, local timber repurposing industry Chi Kee Sawmill and Timber) under land use conflicts and competing priorities (May, 2022; Mok, 2022b). For example, the complete phase-out of internal combustion engine vehicles (ICEV) with electric vehicles (EVs) needs to be accompanied by adequate charging facilities (e.g., charging stations, low carbon electricity generation methods). Rapid policy shifts (e.g. the cancellation of first registration tax (FRT) concessions for EVs back in 2017 discouraged owners to purchase EVs, where some models see price hikes of over 50%) and changes (e.g. introduction of a one-for-one replacement scheme for ICEVs to EVs with higher FRT up till 2024) often discourage users to take action in new T&I (ISD, 2017; TD, 2022).

Recommendations

Technology and innovation and climate change

Technology and innovation (T&I) (e.g., electricity generation and green transport) could provide a pathway mitigating climate change and achieving carbon neutrality. T&I also provides opportunities and solutions for climate adaptation technologies (e.g., weather warning systems, landslip prevention warning systems and climate resilient infrastructure).

Increase in technology and innovation resource

Attractive incentives (e.g., increasing rebate for reverse vending machines, to increase the use of new green technologies (EPD, 2022b). Resources and allocation in the T&I funds focusing on environmental aspects

and carbon neutrality should be increased significantly in both numbers and proportion.

Comprehensive planning in technology and innovation

Challenges for implementing green T&I would be popularity and potential problems embedded. The initial public's receptiveness to new T&I could be hindered due to inconvenience and unfamiliarity (e.g., long charging times of EVs, uncertain payback period of solar panels). Therefore, comprehensive planning (e.g., non-conflicting policies, well-planned land allocation for green T&I) should be implemented.

11. Water

By Chen Jie, Fan Wing Man and Wu Yun Ling

Water, a blue gold, is indispensable for all life including humans. Yet, less than 2.5% of the water on the Earth is freshwater and only 0.3% of freshwater is found in lakes, swamps, rivers, and streams, to which more than 2 billion people do not have direct access (UN Water, 2001). With the increasing global population, urbanization, and shifting consumption patterns, freshwater scarcity is one of the imperative challenges we have to encounter. While climate change has further aggravated the situation together with the increasing frequency and magnitude of extreme weather conditions. Hong Kong, in line with the global trend, has been experiencing more hot nights and days, torrential rains, and severe typhoons as a result of climate change.

With low water tariffs and a relatively stable water supply from Dongjiang water and local rainfall catchments (local yield), Hong Kong citizens become one of the highest per capita water users in the world. Hong Kong's per capita domestic freshwater consumption is 130 L/day, 18% higher than the world average of 110 L/day (IWA, 2014). According to the information released by the Water Supplies Department (WSD), in 2021/22, the average daily consumption of fresh water in Hong Kong will reach 2.89 million cubic meters, while the average annual rainfall is only 2431.2 mm, which is not enough to meet the current huge demand (WSD, 2022a). In addition to collecting rainwater, Hong Kong's main water source mostly relies on water from the Dongjiang River in Guangdong Province. However, in recent years, the waste of water resources has become increasingly serious, and Dongjiang water has also faced a severe drought. We need to act immediately to help ourselves and cherish freshwater resources. According to the United Nations (UN, n.d.), it is deemed a human right for everyone to have access to water and sanitation.

Current measures & policies toward freshwater storage and conservation

Water resource

In 1950, Hong Kong started to use seawater for flushing toilets. The extensiveness of this policy has saved Hong Kong about 300 million cubic meters of freshwater, equivalent to about 20% of Hong Kong's total water consumption. And in 2015, WSD extended the flushing seawater supply coverage (WSD, 2022b).

Hong Kong has been enjoying uninterrupted water supply since the 1980s, attributable to Dongjiang water bought from Guangdong Province, rainfall collected from local catchments, and seawater for toilet flushing, accounting for 59%, 17%, and 24% respectively of the total water consumption of 1,345 million m³ in 2020. Also, a desalination plant phase I will have a production capacity of potable water of 135 million liters per day, equivalent to 5% of daily freshwater consumption in Hong Kong upon commissioning in 2023, with the future expansion to ultimately meet 10% of daily freshwater consumption.

Water tariff structure

Hong Kong's water tariff has remained unchanged since the 1990s, much lower than other cities. Domestic freshwater and seawater charges payable are calculated on a tariff structure at four-month intervals while non-domestic freshwater charges payable are calculated at a flat rate depending on usage. An increased proportion of the government funding has been used to cover the costs of the Dongjiang water (e.g., raw water treatment and processing) in the past two decades.

Developments for adapting climate change

The adoption of the “Sponge city” in Hong Kong in new developments allows more effective drainage and rainwater reuse (e.g., collecting torrential rainfall through the natural drainage and using the water when needed). Other measures (e.g., green roofs, porous pavements) are implemented to facilitate infiltration and reduce surface runoff.

Stormwater interception, flood storage, and drainage improvement are the three main tactics used to reduce the risk of flooding in low-lying areas. Drainage tunnels and underground stormwater storage tanks have been built to intercept and divert upstream stormwater for direct discharge to the sea or rivers or to store stormwater temporarily during heavy rainstorms and thus relieve the burden of the downstream drainage system.

Education

Moreover, WSD has set up a water resources education center to raise public awareness of water resources (WSD, 2021). Further, the Drainage Services Department has turned some drainage facilities into a leisure space with ecological conservation value that promote water friendly activities and hence providing a brand-new experience for the public.

Recommendations

Raising water tariff depending on water consumption

Water tariff reform is a necessary step in creating incentives. Seawater and domestic freshwater pricing are so low that production costs of Dongjiang water cannot be reflected, not to mention the rate of the fourth tier cannot act punitively. Further, a tiered non-domestic freshwater pricing scheme should be set, in order to provide a progressively increasing price structure and discourage unnecessary use of water.

Enhancing local yield by rainwater reuse

Rainwater and floodwater should be collected and utilized instead of discharging to the sea. They can be filtered, treated (e.g., waste removal) and stored. Public safety risks (e.g., flooding and injuries) may be an issue during high water levels and require regular maintenance (e.g., dredging). Pipes can be installed to transport rainwater and floodwater for reuse (e.g., flushing toilets) to reduce water consumption.

Raising public awareness of water conservation through education

The Hong Kong Government should increase its promotion of the water conservation and management measures (e.g., water footprint, which is a concept of water conservation and limited freshwater resources). Public awareness can be increased through the use of media (e.g., TV advertisements, posters) to promote the knowledge and importance of freshwater resources. As the development narrative of short videos has risen in recent years, the activities organized by WSD can also start water conservation campaigns (e.g., hiring celebrities) to promote awareness. With knowledge, the next step is to know how to take action and finally achieve awareness of protecting freshwater resources.

Other than river revitalization, the government could help reconnect the relationship between water and citizens (e.g., organizing water-friendly activities). Further, rebuilding the freshwater ecosystem could also enable citizens to understand the environment and thus raise public awareness of sustainability and water conservation.

Conclusion

With the skyrocketing global population, urbanization, and demand in freshwater impacted by climate change, it is evident that the availability of freshwater and natural storage reservoir sites is dwindling.

Acknowledging that coastal cities like Hong Kong is disproportionately impacted by high humidity and heavy rainfall patterns exacerbated by climate change, along with the lack of resilient and healthy ecosystems to store rainwater, this serves as a wakeup call that mere reliance on Dongjiang water should not be considered as a sustainable approach to tackle water scarcity and drought. Hence, a robust and ambitious water management strategy is necessary to ensure and safeguard steady freshwater supply for the Hong Kong population.

In face of various challenges amid the climate crisis, immediate and appropriate measures have to be taken to call for Hong Kong citizens' awareness and address the pretense that the current local water supply and its system are adequate and sustainable enough to support its population.

Freshwater resources are vital to our existence and survival, and governments should pay attention to how to protect it and make it sustainable. Only human beings can save humanity, don't wait and see, act immediately. Countries who have a larger responsibility in water pollution (e.g., developed nations) should not only bear responsibility for the problem but also assist those (e.g., less developed nations) affected to achieve climate justice.

12. About LCOY HK 2022 Organisers

CarbonCare InnoLab

CarbonCare InnoLab (CCIL) is an independent non-government organisation dedicated to the nurturing and development of innovative solutions in response to today's climate change and sustainability challenges. We put special emphasis on multi-stakeholder engagement and solution-oriented processes, as well as awareness-building across the community in Hong Kong. There is a need to motivate communities, and especially young people, to view the transition to a zero-carbon economy as an exciting opportunity rather than a disturbing threat. CCIL turns pessimism about climate change into an optimistic vision of a more engaged and participatory society, and a more resilient and sustainable economy in Hong Kong. There is a scope to promote a picture of the future which contains an array of possibilities and opportunities. CCIL carries the news that people can be part of the solution to climate change, not part of the problem.

Our mission is to encourage innovation that is both relevant to local needs and which contributes to solving global climate change challenges. This includes climate justice, carbon reduction, resource conservation and action that will assist adaptation and resilience building. CCIL is a charitable body registered in Hong Kong, enjoying tax exemption status under Section 88 of the Inland Revenue Ordinance.

Hong Kong Youth for Climate Action

Founded in 2020, Hong Kong Youth for Climate Action (HKYCA) is a youth climate action network to empower young people in Hong Kong to advocate and build creative solutions for climate issues. HKYCA's vision is to mobilize Hong Kong youth to take climate action in achieving Paris Agreement Goals. We provide a youth-led dedicated platform for young advocates to discuss and inspire original insights on climate issues that matter most to them. HKYCA's works revolve around 3 pillars of advocacy, empowerment, and youth action.

Jockey Club Museum of Climate Change

The Jockey Club Museum of Climate Change (MoCC), funded by the Hong Kong Jockey Club Charities Trust, was established in December 2013 at the Chinese University of Hong Kong (CUHK). It is the first museum of its kind in the world, offering an interactive, multimedia exhibition that showcases valuable collections and information about climate change. It is the ideal venue for the public, especially students and teachers, to champion the cause of environmental stewardship and keep themselves abreast of the latest developments on environmental conservation and sustainability. Extended activities of the museum exhibition include an eco-tour of the prime ecological sites and green facilities on CUHK campus, and a variety of workshops and activities that promote green living.

Network of Environmental Student Societies

Founded in June 2021, Network of Environmental Student Societies (NESS) is a youth-led climate-focus organisation based in Hong Kong. NESS aims to provide a one-stop platform for awareness raising, capacity building, connection development and driving policy changes. With a focus on the interdisciplinary nature of climate change and all things environmental, NESS hopes to inspire youth from all kinds of backgrounds to take solid actions. NESS's works currently revolve around 3 pillars - communication, partnership and events, and policy advocacy.

V'air Hong Kong

V'air Hong Kong is the first climate-focused youth organisation in Hong Kong, established in 2015. Our mission is to reduce the per capita carbon footprint of Hong Kong people from aviation emissions, and to deepen the public's knowledge on the ecology, culture and history of the city. V'air has organised over 200 ecotours, seminars and workshops for schools and corporate, instilling environmentalism in the minds of many to steer behavioral change. Our digital platform has a large volume of traffic, disseminating tailored travel information to the mass public in Hong Kong, educating tourists with the "Leave No Trace" principles to travel sustainably. Youth empowerment is another core mission of V'air. V'air have trained over 50 youths in the past six years, resulting in over 10 spin-off environmental campaigns.

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