主辦機構 Organiser

OPCF Hong Kong
香港海洋公園保育基金
Ocean Park Conservation Foundation Hong Kong

一個地球：氣候變化與生態危機

ONE PLANET: CLIMATE CHANGE AND ECOLOGICAL CRISIS

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劉鑾雄慈善基金

香港海洋公園保育基金（保育基金）承諾透過協作籌款、科研與教育，致力提倡、促進及參與亞洲區內務實有效的野生生態保育工作，並重點保育中華白海豚與大熊貓以及其棲息地。保育基金展望各界無私合作，攜手保護亞洲野生生態長久繁盛豐饒。

保育基金自 2005 年擴展以來，已撥款資助超過 550 項研究，研究物種包括鯨豚、大熊貓以及其他物種，資助總額逾港幣 1 億元。在 2021/22 年度，保育基金資助的項目主題包括：氣候變化、受威脅的陸地及淡水野生動物、海洋保育及打擊瀕危物種的非法貿易。2006 年成立的「鯨豚擱淺行動組」亦於 2016 年將工作範疇延伸至其他瀕危的鯊魚和鰩魚物種。保育基金亦積極參與本地馬蹄蟹及淡水龜的保育及研究工作。

保育基金亦繼續透過「野外生態保育大學生贊助計劃」，啟迪大學生參與野外研究工作，而「馬蹄蟹保母計劃」則為中小學生及企業員工提供參與本地馬蹄蟹保育工作的機會。

為承傳 2017 年首次推行的「無飲筒日」，保育基金於 2018 年 6 月進一步推展「無飲管運動」，更增設了三個不同的參與方法：無飲管伙伴（每日不主動提供飲管）、無飲管星期五（每週五不主動提供飲管）、無飲管 8 號（每月 8 號不主動提供飲管），以更廣泛及持續的方式鼓勵全港市民減用即棄塑膠飲管，以至其他一次性塑膠製品，為保育海洋生態踏出重要一步。截至去年，共有超過 1,800 間食肆、學校、企業及政府部門等參與，成為此運動的「伙伴」。

保育基金作為支援亞洲區保育工作的慈善信託基金，極需要社會各界的支持。請以捐款支持，加入「基金之友」成為會員，與保育基金攜手為亞洲生態出一分力！詳情請瀏覽：

前言
INTRODUCTION

近年各地出現極端天氣，有指全球三分之一的物種或於五十年內滅絕，可見全球暖化確已造成生態危機。我們身為地球公民，眼見各種因氣候變化造成的災難，更應立即行動，及早解決問題。

香港海洋公園保育基金（保育基金）深明從小培養保育意識，是推動環境保育的關鍵。有見及此，在劉鑾雄慈善基金的支持下，保育基金舉辦為期五年的「自然保育小先鋒」培訓計劃，以 1,500 名小四至小六學生為對象，讓他們參與跟氣候變化及生物多樣性有關的保育活動及專題研習，學習多角度了解和思考保育及環境議題。

此教育手冊特別為本計劃而編寫，題為《一個地球：氣候變化和生態危機》，就是要讓學生了解到我們與其他物種同住在一個地球，亦只有我們才能夠扭轉當前的危機。本書提及的應對方案，乃拋磚引玉，期望引發學生多了解、多想像，為氣候變化及保育議題提出創新的改善建議和解決辦法。

In recent years, extreme weather has occurred across the globe, one-third of the world's animals and plant species may face extinction in 50 years, given this, global warming is recongnised as a major threat to the ecosystem. As one of the global citizens, we can help to reduce the severity of climate change by taking immediate action in daily living.

The Ocean Park Conservation Foundation, Hong Kong (OPCFHK) understands that cultivating conservation awareness from an early age is the key to promoting environmental conservation. In view of this, OPCFHK has organised a five-year "Conservation Education Experience Programme for Youth" with the strong support from The Joseph Lau Luen Hung Charitable Trust for 1,500 Primary 4 to 6 students. Through these theme-based activities and special workshops, they can learn and better understand the critical conservation and environmental issues we are now facing from multiple perspectives.

This educational booklet entitled ''One Planet: Climate Change and the Ecological Crisis" has been written especially for this program to teach students a key concept: we live on the same planet as other species, and we are the only ones who can fight and reverse the climate crisis. The measures mentioned in this booklet are intended to encourage students to explore more and promote creativity in delivering innovative suggestions and solutions to remedy climate change and resolve conservation-related issues.

聯絡我們
CONTACT US

如對本教育手冊有任何疑問，
歡迎電郵至 **opcf@oceanpark.com.hk**。

If you have any questions about this educational booklet,
please contact us by sending an email to **opcf@oceanpark.com.hk**.

目錄
CONTENT

P.01 前言 INTRODUCTION

P.04-05
氣候變化正常嗎？
IS CLIMATE CHANGE NATURAL?

P.06-07
冰川與冰蓋
GLACIERS AND ICE SHEETS

P.08-09
海平面上升
SEA-LEVEL IS RISING

P.10-11
極端天氣
EXTREME WEATHER

P.12-13
農業與糧食供應
AGRICULTURE AND FOOD SUPPLY

P.14-17
保育生物多樣性
BIODIVERSITY CONSERVATION

P.18-19
由地區至國際的應對方案
FROM REGIONAL TO INTERNATIONAL RESPONSES

P.20-21
活在氣候變化中的未來
LIVING IN THE FUTURE OF CLIMATE CHANGE

P.22-23
我們的選擇與行動
OUR CHOICES AND ACTIONS

P.24 參考資料 REFERENCES

氣候變化正常嗎？
IS CLIMATE CHANGE NATURAL?

氣候變化原是最自然不過的現象，每一個地區的氣溫、降雨量、風力等的平均值會隨着時間（數年至數百年）而產生變化。然而，在工業革命後，人類活動令溫室氣體的排放量大增，當中二氧化碳就佔全球溫室氣體總排放量約八成，直接導致氣候暖化。自然界與人類所受到的威脅已是不可逆轉。

With no doubt, climate change is a natural phenomenon that the average temperature, rainfall and wind in each region change over time (from several years to hundreds of years). However, after the Industrial Revolution, human activities cause a serious increase in greenhouse gas emissions, of which carbon dioxide accounts for about 80% of the global greenhouse gas emissions, and directly lead to climate warming. The threats to the nature and humanity are irreversible.

自然因素 VS 人為因素
NATURAL VS MAN-MADE FACTORS

從前氣候變化主要由自然因素形成，例如大氣中的溫室氣體吸收輻射熱能、火山活動排放的熱能及氣體等因素而出現的溫度變化；自工業革命(~1750 年)，人類活動如使用化石燃料、砍伐樹林等均排放大量二氧化碳。至 2020 年，二氧化碳的濃度已經高達 414.24ppm*，加劇全球暖化。

* ppm (parts per million) 是百萬分之一。

In the past, climate change was mainly varied due to natural process, such as the absorption of solar radiation by greenhouse gases in the atmosphere, heat energy and gases released during volcanic eruptions causing the change of temperature. Since the start of Industrial Revolution (~1750), increasing of burning fossil fuels and deforestation have produced tremendous amount of carbon dioxide. By 2020, the concentration of carbon dioxide has already reached 414.24ppm*, thus intensifying the global warming effects.

* ppm (parts per million) is one part per million.

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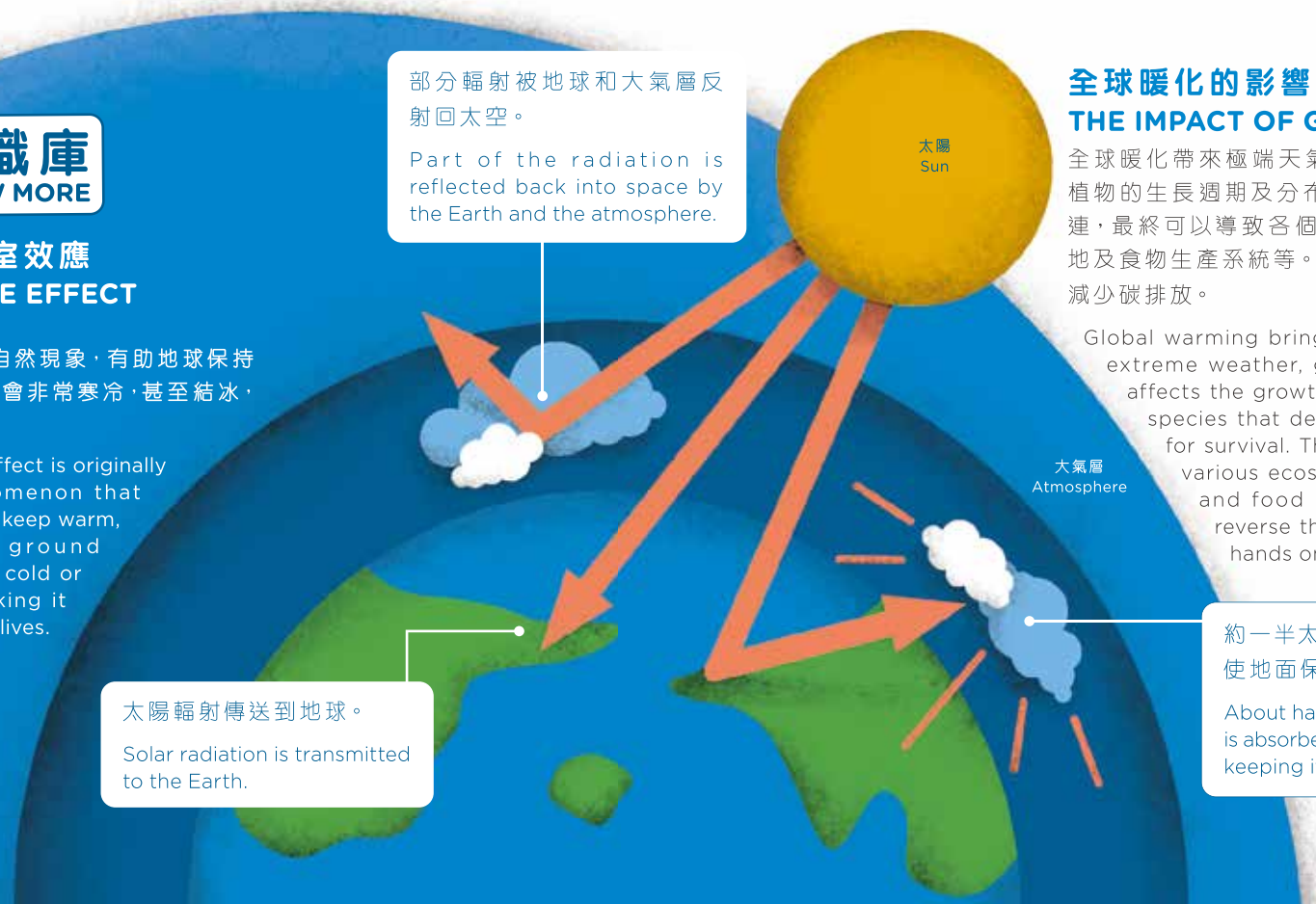
KNOW MORE

自然界的溫室效應
GREENHOUSE EFFECT IN NATURE

溫室效應本來是自然現象，有助地球保持溫暖，否則地平面會非常寒冷，甚至結冰，不適合生物生存。

The greenhouse effect is originally a natural phenomenon that helps the Earth to keep warm, otherwise the ground level will be very cold or even frozen, making it unsuitable for any lives.



全球暖化的影響
THE IMPACT OF GLOBAL WARMING

全球暖化帶來極端天氣、冰川融化、海平面上升等問題，不但影響到植物的生長週期及分布，依賴陸地及海洋環境生存的物種亦受到牽連，最終可以導致各個生態系統失衡或崩潰，當中更包括人類的居住地及食物生產系統等。若要緩減甚至扭轉全球暖化的影響，就要著手減少碳排放。

Global warming brings about many environmental issues, such as extreme weather, glaciers melting, and sea level rise, not only affects the growth cycle and distribution of plants, but also the species that depends on terrestrial and marine environments for survival. This eventually leads to imbalance or collapse of various ecosystems, which also includes human habitation and food production systems. To slow down or even reverse the effects of global warming, we should lay our hands on reducing our carbon emissions.

冰川與冰蓋
GLACIERS AND ICE SHEETS

冰川由降雪到高山或極地堆積而成，遍布地球多個角落。部分冰川會自然融化，流入河溪、湖泊，成為淡水來源之一。在極地，大量的冰川匯集起來，長年累月下形成冰蓋，覆蓋一大片陸地和海洋。可是，隨着全球溫度上升，極地的冰川和冰蓋亦開始融化，不但影響棲息於極地的物種，甚至對人類的存亡構成威脅。

Glaciers are formed from snowfalls to mountains or polar and cover many places around the world. Glacier meltwater flows into rivers and lakes, is one of the major source of freshwater. At the poles, large masses of glaciers come together to form ice sheets that cover large areas of land and the ocean over a long period of time. However, as global temperatures rise, glaciers and ice sheets in the polar regions are beginning to melt. It not only affects the species that inhabit the regions, but also threatens human existence.

© Randolph Glacier Inventory, GLIMS

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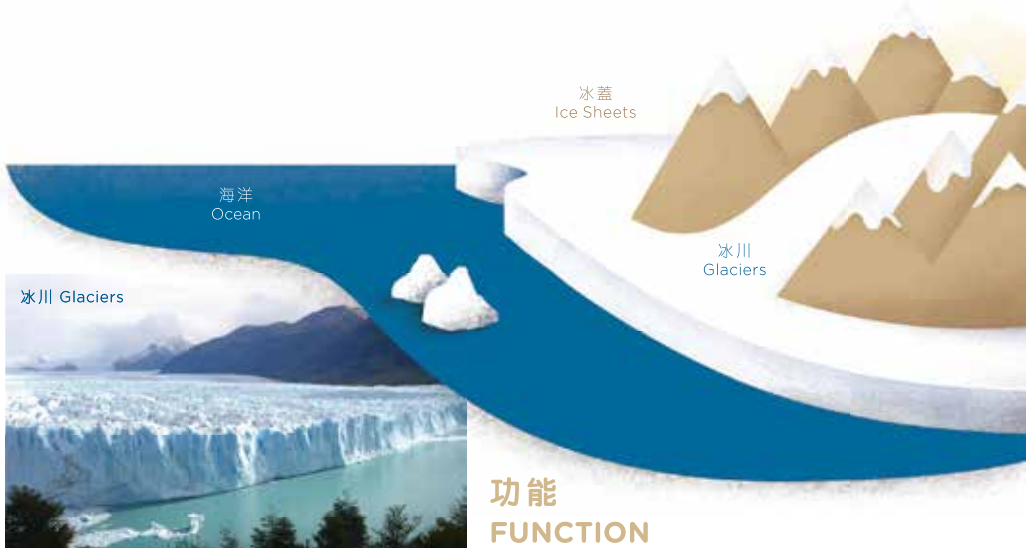
據統計，喜馬拉雅山冰川在過去四十多年已消失達四分之一，直接影響下游八億人的用水問題。冰川快速融化導致洪水氾濫，長遠卻會帶來缺水問題。

According to the statistics, a quarter of the glaciers in the Himalayas has already disappeared in the past four decades, directly affecting the water supply of 800 million people downstream. Rapid melting of glaciers leads to flooding and also water shortages in long term.



功能
FUNCTION

白皚皚的冰川和冰蓋能有效把過多的太陽熱力反射到太空，有助地球降溫，這也解釋了極地能長年維持低溫的原因。

White glaciers and ice sheets can effectively reflect excess solar heat back into space, helping to cool the Earth, which also explains why the poles remain at low temperatures for years.

全球危機
GLOBAL CRISIS

全球暖化致海冰融化，有研究指，在未來八十年內，棲息在海冰的北極熊將會絕種，而皇帝企鵝則有逾八成機會滅絕，對極地生態系統造成嚴重影響。同時，極地的消失更會擾亂地球氣候系統和天氣模式，令極端天氣更加頻繁。

Global warming has caused sea ice melting. Some studies have pointed out that in the next 80 years, polar bears living on sea ice could face extinction, while emperor penguins have more than 80% chance of extinction, which will have a serious impact on polar ecosystem. At the same time, the disappearance of polar regions will disrupt the Earth's climate system and weather patterns, making extreme weather situation more frequent.

位於冰島的奧克冰川（Okjökull），比較 1986 年（左圖）和 2019 年（右圖）的情況，可見冰川近年接近完全消失。
By comparing the Okjökull in Iceland in 1986 (left) and 2019 (right), it is clearly seen that the glacier has almost disappeared.

海平面上升
SEA-LEVEL IS RISING

由於全球氣候變暖，海洋儲存多餘熱量而受熱膨脹，加上極地冰川和冰蓋融化，海平面上升的速度已由每年 1.3 毫米增加至 3.7 毫米。在過去五十年，香港維多利亞港的海平面亦上升了 12 厘米，或增加沿岸地區於風暴潮受海水淹浸的機會，造成人命或經濟損失。

Due to global warming, the excess heat cause the thermal expansion of ocean and also the continuous melting of polar glaciers and ice sheets, the sea level has been rising by 1.3mm to 3.7mm per year. Over the past 50 years, the sea level of Hong Kong's Victoria Harbour has also risen by 12cm, which may increase the chance of coastal areas being flooded by storm surges, and putting human lives in danger or leading to severe economic losses.

融冰現象
ICE MELTING

地球上有大量的淡水資源以冰川和冰蓋的形態存在，陸地上的冰因全球變暖而開始融化，這稱之為融冰現象。融冰後的水流入大海，增加海平面的高度，令低窪地區嚴重水浸。有研究指出，在 2000 年至 2019 年間，全球冰川平均每年減少百分之四，融化的水量足以把英格蘭淹浸至兩米深。

There is a large amount of freshwater resources on the Earth stored in glaciers and ice sheets, when the ice on the land begins to melt because of global warming, also known as ice melting. Water from the melting ice flows into the sea, raising sea levels and causing severe flooding in low-lying areas. Between 2000 and 2019, the world's glaciers lost an average of 4% a year, and the amount of meltwater suffice to flood all over England to the depth of two metres, according to a research study.

熱膨脹
THERMAL EXPANSION

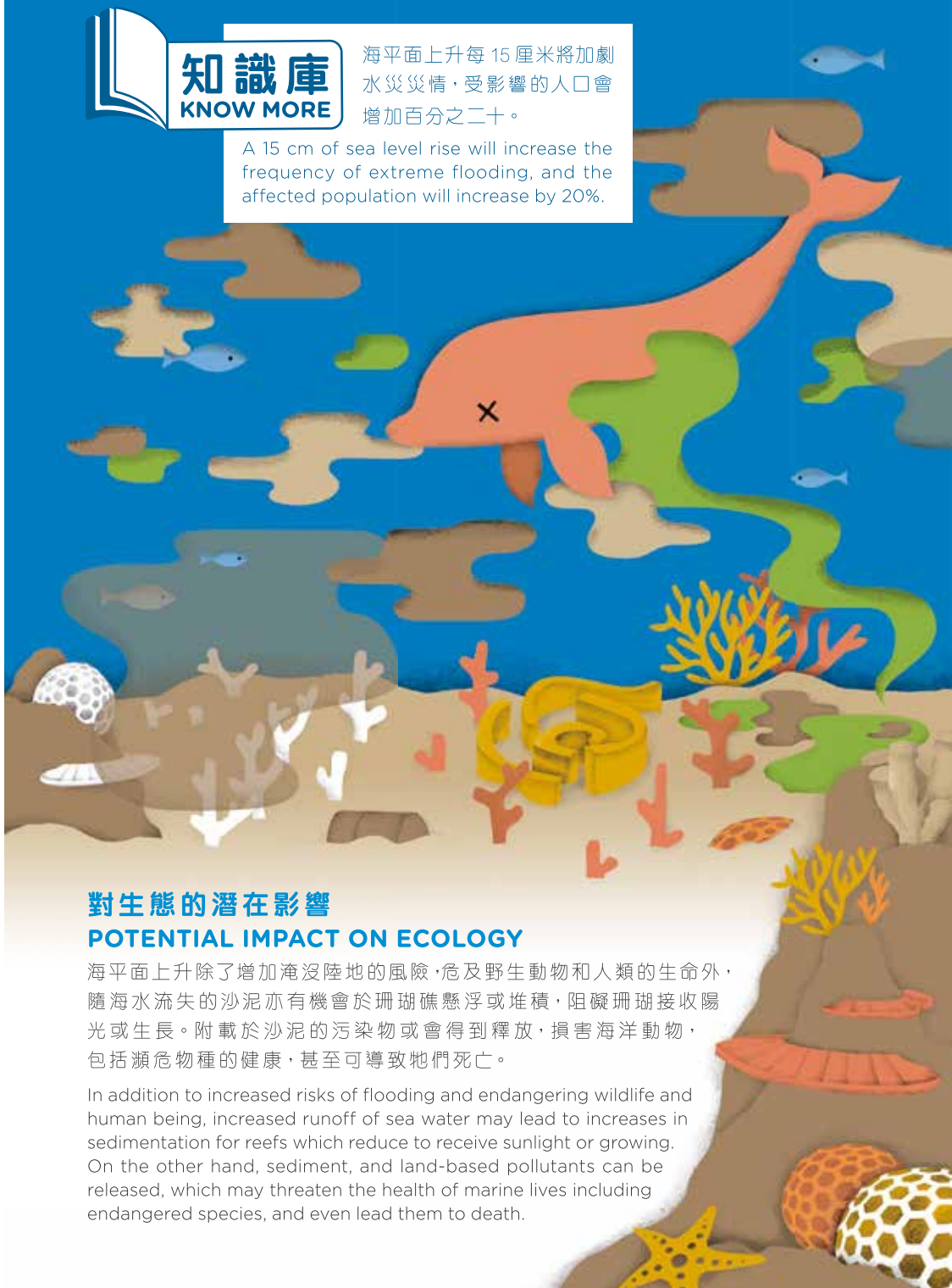
當水受熱時，其體積會膨脹，此現象稱為熱膨脹。在全球暖化下，地球溫度持續上升，海水在熱膨脹影響下，體積亦隨之增加，導致海平面進一步上升。

When water is heated, its volume expands, this is called thermal expansion. Under the influence of global warming, the temperature of the Earth continues to rise, and sea water also increases its volume due to thermal expansion, contributing to a further rise in sea level.

知識庫 KNOW MORE

海平面上升每 15 厘米將加劇水災災情，受影響的人口會增加百分之二十。

A 15 cm of sea level rise will increase the frequency of extreme flooding, and the affected population will increase by 20%.



對生態的潛在影響
POTENTIAL IMPACT ON ECOLOGY

海平面上升除了增加淹沒陸地的風險，危及野生動物和人類的生命外，隨海水流失的沙泥亦有機會於珊瑚礁懸浮或堆積，阻礙珊瑚接收陽光或生長。附載於沙泥的污染物或會得到釋放，損害海洋動物，包括瀕危物種的健康，甚至可導致牠們死亡。

In addition to increased risks of flooding and endangering wildlife and human being, increased runoff of sea water may lead to increases in sedimentation for reefs which reduce to receive sunlight or growing. On the other hand, sediment, and land-based pollutants can be released, which may threaten the health of marine lives including endangered species, and even lead them to death.

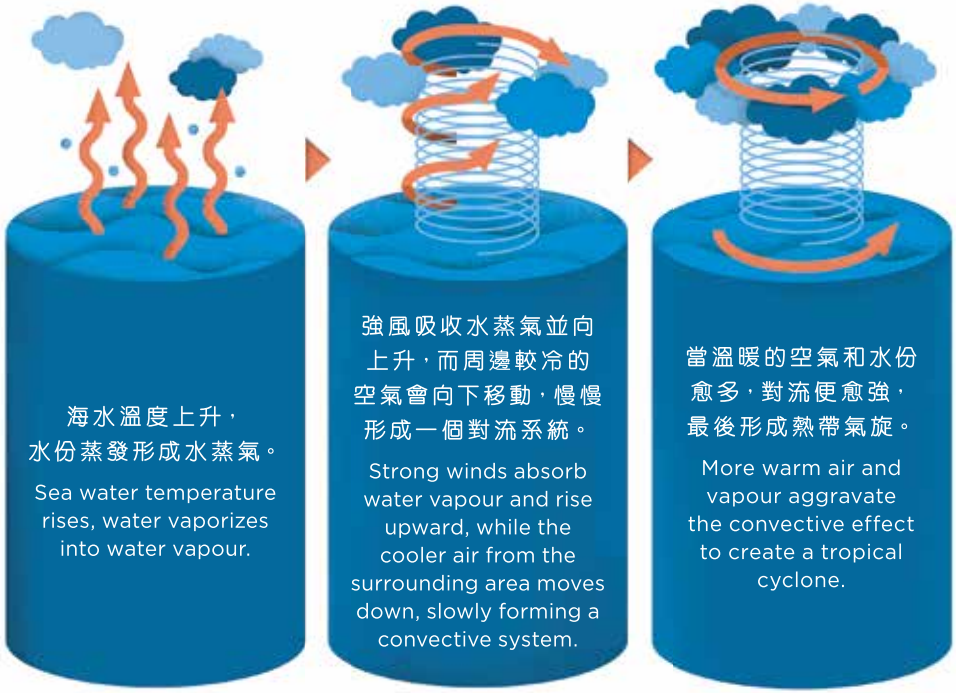
極端天氣
EXTREME WEATHER

因為全球暖化，極端天氣變得更加頻繁，我們不難遇上持久的乾旱、嚴重的暴雨等。海洋暖化亦有利熱帶氣旋發展，加強其破壞力。2018 年 9 月，超強颱風「山竹」吹襲香港，其風力是 1983 年以來最強烈，破紀錄的風暴潮令香港水位普遍上升超過兩米，造成近四百人受傷，香港多處地方遭受破壞。

The occurrence of extreme weather has becoming more often with global warming. Long drought and extreme rainfall are likley to be enocountered. Ocean warming also favours the development of tropical cyclones, heightening their destructive power. In September 2018, the super typhoon "Mangkhut" struck Hong Kong with the highest wind speed since 1983.

The record-breaking storm surge generally rendered the water level in Hong Kong to exceed two metres, with nearly 400 people being injured and many parts of the city seriously damaged.

熱帶氣旋怎樣形成？
HOW DO TROPICAL CYCLONE FORM?



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洋流減慢
CURRENT SLOW DOWN

洋流負責分配地球的熱量，以及調節各地的天氣模式。當大量融冰流入海洋，便會改變海水的溫度和濃度，導致洋流減慢，繼而影響海洋生物以至全球氣候。

By moving heat from the equator toward the poles, ocean currents play an important role in regulating the climate. When a large mass of melted ice flows into the ocean, it changes the temperature and concentration of seawater, thus slowing down the currents and further affecting marine life and the climate.

水浸與風暴潮
FLOODS AND STORM SURGES

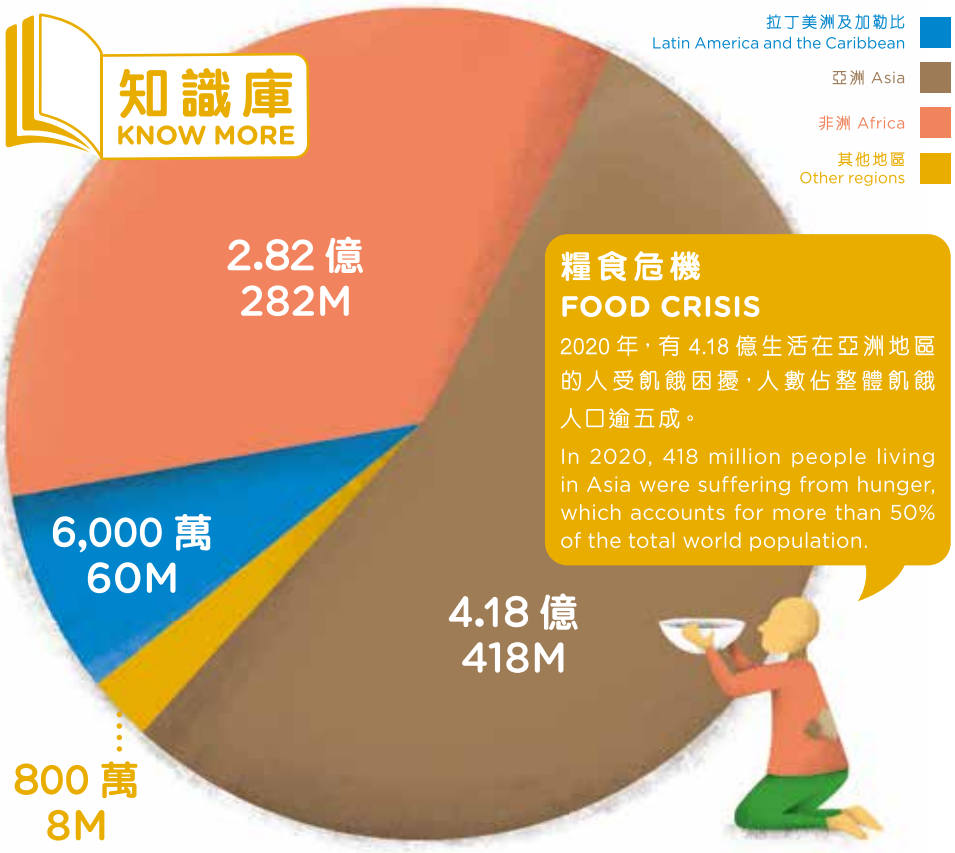
在全球暖化影響下，熱帶氣旋的威力變得更強，令山洪暴發、沿岸地區被淹浸的情況更常發生。此外，因海平面上升，與熱帶氣旋相關的低氣壓及大風引起的風暴潮更為嚴重，受海水淹浸的範圍更廣。

Tropical cyclones get stronger in intensity under the influence of global warming. As a result, sudden flash floods and coastal floods are becoming more frequent. In addition, sea level rising has made tropical cyclone-related depressions and storm surges more damaging, extending the flood risk to more coastal areas.

農業與糧食供應
AGRICULTURE AND FOOD SUPPLY

農作物的生長與氣候的穩定性有很大關係，其中溫度、二氧化碳的濃度等因素更是關鍵。高溫會影響作物的生長期，減少產量；高濃度二氧化碳損害作物的品質，降低營養含量。氣候變化正在影響地球的天氣模式及生物周期，帶來極端天氣和蟲害、植物性病害等惡果。聯合國糧食及農業組織估計主要糧食作物會因此遭受嚴重損失，引發糧食危機。

Crop production relies highly on stable weather conditions. Temperature and carbon dioxide concentration are the most critical factors. High temperature affects crop growth and yield; while high concentration of carbon dioxide also damages the quality of crops and affects their nutritional contents. With no doubt, climate change is affecting the Earth's weather patterns and biological cycles, increasing risks of extreme weather, pests and plant diseases. The Food and Agriculture Organisation of the United Nations (the 'FAO') suggested that climate change would severely affect the production of major food crops and give rise to food shortage problems.



耕種土地的影響
IMPACT OF CULTIVATED LAND

頻繁的旱災或暴雨足以改變耕種用地的土地結構，變得不再適合種植。全球暖化導致超過百分之五十的土地荒漠化，範圍更逐漸擴大，對全球人口的生計造成影響。

Frequent droughts or torrential rains alter the structure of cultivated land, which in turn become unsuitable for growing crops. In associated to global warming, over half of the land and even more are harmed by desertification, devastating the food supply to people.

氣候變化加速蟲害
CLIMATE CHANGE ACCELERATES PEST INFESTATIONS

氣候變化可直接影響害蟲的分布、繁殖及成長速度，高溫及潮濕的氣候會助長害蟲繁殖。隨着各地區的氣候發生改變，一些具遷徙性的害蟲可能改變原來的遷徙路線及範圍，兩者共同作用下，原來不受蟲害的地區或會受災，減少農作物收成。據科學家估計，氣溫每上升攝氏 1 度，昆蟲的種群分布將向高緯度地區移動約二百公里。

2020 年非洲的蝗蟲大爆發，每天消耗掉三萬五千人的糧食。

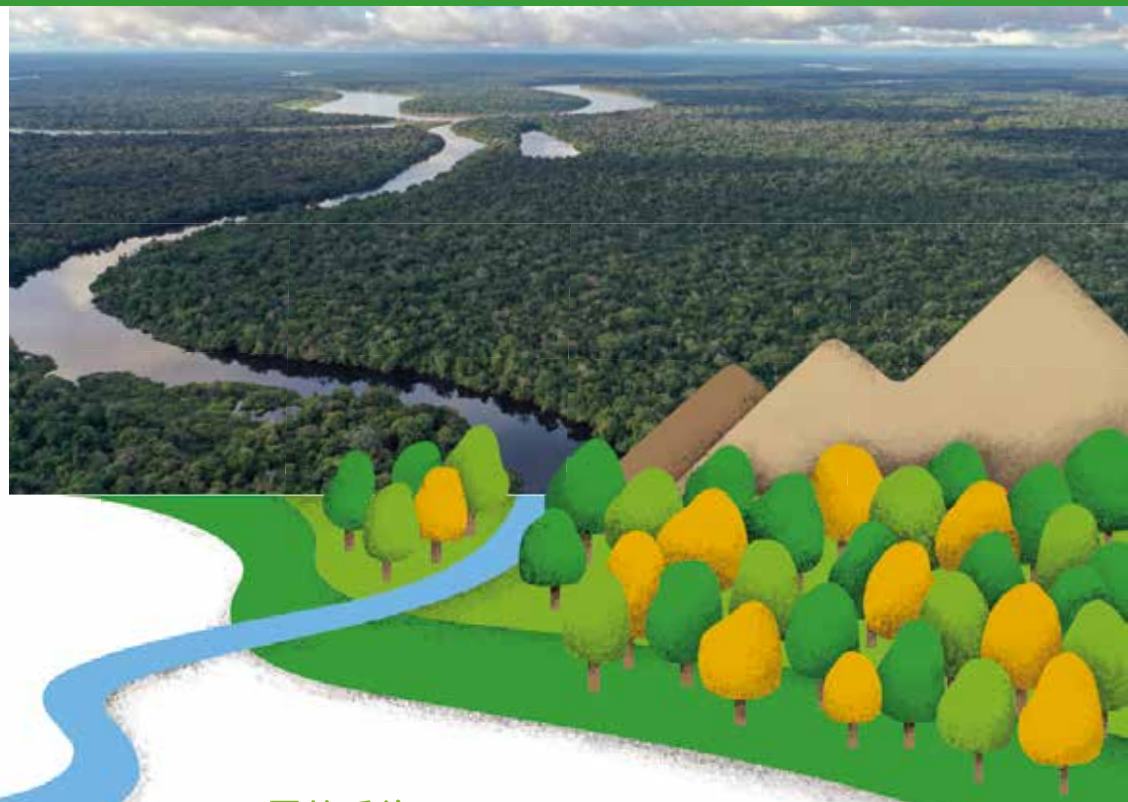
Climate change impose impact on the distribution, reproduction and growth rate of pests directly. High temperature and humidity may favour pest reproduction. Climate changes have forced some migratory pests to change their original migration routes and ranges. With the combined effects of these two factors, the areas that were previously unaffected may also suffer from pest infestations and reduce crop yields. Scientists predict that, insect populations will move about 200 kilometres to higher latitudes for every 1°C rise in temperature.

The unprecedented locust plague in Africa in 2020 consumed the amount of food as 35,000 people a day.

保育生物多樣性
BIODIVERSITY CONSERVATION

我們日常所需的食物、藥物、燃料等來自各種生物及生態系統，統稱為生物資源。生物多樣性愈高，我們可獲得的生物資源便愈豐富，當環境出現變化時，有助維持生態平衡。可是若「轉變」的衝擊力強，例如過渡耗用或極端天氣出現，便會造成嚴重影響。因此，緩減氣候變化有助保育生物多樣性，讓人類可繼續在地球生活。

As a matter of fact, the food, medicines and fuels that we consume every day are derived from various organisms and ecosystems, which are collectively regarded as 'biological resources'. The higher the biodiversity, the more abundant biological resources we can obtain, which can help sustain the ecological balance even when the environment changes. However, if the effect of the "change" is too strong, such as over exploitation or occurrence of extreme weather, the impact of losing ecological balance will be severe. Therefore, mitigating climate change can help preserve biodiversity so that humans can continue to live on the Earth.



海洋生態系統
MARINE ECOSYSTEM

全球百分之二十五的海洋生物棲息在珊瑚礁區，豐富的生物多樣性有助淨化海水，養育更多海洋生物，也能保護海岸線免受大浪侵蝕，滿足人類生存的各種需要。

若海水溫度上升，大量二氧化碳會溶於水中致海洋酸化，令藻類脫離珊瑚或死亡，導致珊瑚白化。如此一來，不但生物失去棲息地，珊瑚礁區的生物多樣性下降、水質變差，連人們可用的生物資源亦會大為減少。


健康珊瑚 Healthy Corals


珊瑚白化 Coral Bleaching

Around one quarter of the world's marine life lives in coral reef regions. Such richness in biodiversity helps to purify the sea water, nurture more marine organisms, protect coastlines from erosion, as well as to satisfy the livelihood for human.

When sea temperature increases, more carbon dioxide will be absorbed by the ocean which leads to ocean acidification. The acidified environment makes the algae detach from the coral or die and eventually coral bleaching appeared. As a result, not only marine organisms lose their habitats, but also decline the biodiversity of coral reef, deteriorating the water quality and significantly reducing available biological resources.

雨林系統
RAINFOREST ECOSYSTEM

雨林只佔地球百分之六的土地，卻養育了全球約百分之五十的陸生植物和動物，是生物多樣性最豐富的地區。雨林除了提供食物及原材料，更與現代藥物息息相關，因為當中四分之一的藥物都是由熱帶雨林的植物提煉而成。此外，雨林更有着淨化空氣、調節氣候等功能。

然而，人類對雨林資源的苛索導致大量林木被砍伐，土壤因失去樹木保護而流失；地面失去植被吸收、反射太陽熱能，導致地面增溫或造成乾旱；二氧化碳吸收量因此大減，加劇溫室效應。

Rainforests now only make up to 6% of land on the Earth, but they nurture about 50% of the world's terrestrial plants and animals, representing the most biologically diverse areas in the world. In addition to providing food and raw materials, rainforests are also closely related to modern medicine as a quarter of our medicines is extracted from plants in tropical rainforests. Besides, rainforests also play a vital role in air purification and climate regulation.

However, growing human demands for rainforest resources have led to massive deforestation, thus running off soil due to lack of tree support; without vegetation to absorb and reflect solar heat, the ground is heated up or even dried up. As a result, the absorption of carbon dioxide is greatly reduced that intensifies the greenhouse effect.

物種消失於氣候變化下
SPECIES LOSS UNDER CLIMATE CHANGE

氣候變化正影響着地球各種動植物。因應全球暖化、海平面上升和極端天氣的出現，對動植物的生存帶來挑戰，例如棲息地消失、食物來源減少等。面對這些威脅，野生生物又如何面對呢？

Climate change is affecting all kinds of plants and animals on the Earth. Global warming, rising sea levels and the occurrence of extreme weather are posing challenges to the survival of all lives, such as habitat loss and reducing food resources. What are the threats faced by wildlife?

大熊貓
GIANT PANDAS

竹林是大熊貓休息和繁殖的地方，竹子更是牠們的主要食糧，但氣候變化正減少大熊貓棲息地的竹子數量，令牠們在野外更難覓食和生存。

Giant pandas live in bamboo forests for food and breeding. However, climate change is now reducing the growth of bamboo in their habitats, making it harder for them to search for food or survive in the wild.

綠海龜
GREEN TURTLES

海水溫度上升導致珊瑚白化，令綠海龜失去棲息和覓食的地方；海平面上升淹浸了綠海龜產卵的岸灘，令牠們的數量持續下降，已達瀕危程度。

Rising ocean temperatures have led to coral bleaching, causing green turtles to lose their habitats and foraging sites. At the same time, the rise of sea level has also flooded coastal beaches where green turtles lay their eggs, dwindling their numbers to the verge of extinction.

蜜蜂
BEES

氣候變化、季節異常的現象漸趨普遍，令蜜蜂因冬季延長或極端寒冷導致壽命縮短。此外，植物花期亦隨之改變，令蜜蜂錯過花期而影響覓食，繼而影響其繁衍及生存。蜜蜂是其中一種傳粉動物，若傳粉數量減少，便會影響植物繁殖，不但減少農作物收成，更足以影響整個生態系統。

Climate change and changes in seasonal period are becoming more common nowadays, shortening bees' lifespans due to prolonged winters or extreme cold weather. Accordingly, the flowering period of plants also changes. Bees might miss the flowering period, which in turn affects their reproduction and survival. Bees are one of the pollinators, if the number of pollinators decreases, it will affect plant reproduction, which will not only reduce crop yields but also affect the entire ecosystem.

由地區至國際的應對方案
FROM REGIONAL TO INTERNATIONAL RESPONSES

	氣候變化 CLIMATE CHANGE	生物多樣性 BIODIVERSITY
國際層面 GLOBAL	聯合國每年均會舉辦氣候變化大會，為國際提供討論氣候問題及解決方案的平台。當中更達成《巴黎協定》，由 195 個成員國共同簽署，力求將全球平均氣溫升幅，控制在工業化前的水平少於攝氏 2 度內，表達了各國對延緩氣候變化的決心。 The United Nations holds a climate change conference (COP – Conference of the Parties) every year, which provides a platform for the international community to discuss climate issues and solutions. The "Paris Agreement" was adopted by 195 parties at COP, aiming to limit the global average temperature rise to well below 2°C above pre-industrial levels, showing the determination of all nations to combat climate change.	聯合國《生物多樣性公約》是一項保護全球生物資源的國際性公約，每兩年舉辦一次大會。在 2021 年會議通過的《昆明宣言》，由 196 個簽署國承諾將制定、通過和實施有效的「2020 年後全球生物多樣性框架」，確保最遲在 2030 年讓生物多樣性逐步恢復，並且在 2050 年全面實現「人類與自然和諧相處」的願景。 The United Nations Convention on Biological Diversity (CBD) is an international convention to protect the world's biological resources. It holds a conference every two years. By the ratification of the Kunming Declaration at the 2021 conference, 196 signatories committed to develop, adopt and implement an effective "Post-2020 Global Biodiversity Framework", ensuring a gradual recovery of biodiversity by 2030 at the latest, and fully realizing the vision of "harmonious coexistence between human being and nature" by 2050.
地區層面 REGIONAL	歐盟在 2021 年公布了「Fit for 55」方案，目標於 2050 年達成溫室氣體淨零排放。 同年，中國亦發布《中國應對氣候變化的政策與行動》白皮書和《2030 年前碳達峰行動方案》，將以構建綠色低碳交通系統等措施，在 2060 年前達致碳中和。 The European Union announced the "Fit for 55" plan in 2021, aiming to achieve net-zero greenhouse gas emissions by 2050. In the same year, China also released the white paper "China's Policies and Actions on Climate Change" and the "Carbon Peak Action Plan before 2030" to achieve carbon neutrality by 2060 through various measures, such as building a green and low-carbon transportation system.	中國在 2021 成立「昆明生物多樣性基金」，以協助發展中國家推行保護生物多樣性的工作，同時亦發布《中國的生物多樣性保護》白皮書，內容包括加大執法監督力度等措施。 同年，七大工業國集團簽署「大自然協定」，承諾在 2030 年前停止並扭轉生物多樣性的損失，保護全球至少三成的陸地和海洋環境。 In 2021, China established the "Kunming Biodiversity Fund" to help developing countries better protect their ecology. At the same time, China also released a white paper entitled "Biodiversity Conservation in China", including measures concerning the degree of law enforcement and monitoring. In the same year, the Group of Seven (G7) signed the "Nature Compact", pledging to stop and reverse biodiversity loss by 2030 and to protect at least 30% of the world's terrestrial and marine environment.
本港層面 LOCAL	 於 2021 年公布的《香港氣候行動藍圖 2050》以「零碳排放 · 綠色宜居 · 持續發展」為願景，減碳目標是在 2030 年把本港的碳強度，由 2005 年的水平降低最多百分之七十，並在 2050 年前實現碳中和。 The "Hong Kong Climate Action Plan 2050" has been announced in 2021, setting out the vision of "Zero-carbon Emissions · Liveable City · Sustainable Development" and outlining the strategies and targets for reducing Hong Kong's carbon footprints. The carbon reduction target is to reduce Hong Kong's carbon intensity up to 70% from the level in the year of 2005 by 2030 and achieve carbon neutrality by 2050.	首份《香港生物多樣性策略及行動計劃》於 2016 年公布，每五年檢視一次，措施包括制訂外來物種風險評估機制，以免為本地生態帶來不良影響。在 2022 年，「香港生物多樣性資訊網站」推出，有助宣傳生物多樣性的知識，增加大眾對此議題的認識。 The first city-level "Hong Kong Biodiversity Strategy and Action Plan" was announced in 2016 and set to be reviewed every five years. Measures include developing a risk assessment mechanism for introduced species to avoid adverse impacts on the local ecology. In 2022, the "Hong Kong Biodiversity Information Hub" has been launched to promote the knowledge of biodiversity and increase public awareness on the subject.

活在氣候變化中的未來
LIVING IN THE FUTURE OF CLIMATE CHANGE

低碳城市規劃
LOW CARBON CITY PLANNING

香港政府早年已實施「強制性能源效益標籤」計劃和其他節能措施，在 2015 年至 2020 年間減少一百四十五萬噸碳排放，佔香港碳排放總量約百分之三點六。此外，多個政府設施已加裝可再生能源系統，更與電力公司合作，力爭在 2035 年前把可再生能源發電機組由現時的不多於百分之一，提升至最多百分之十。

The Hong Kong government has implemented the "Mandatory Energy Efficiency Labelling Scheme" and other energy-saving measures in the early years, which helped reduce carbon emissions by 1.45 million tons between 2015 and 2020, accounting for about 3.6% of Hong Kong's total carbon emissions. In addition, renewable energy systems have already been installed in many government facilities, and continue working closely with power companies to increase renewable energy generating units from no more than 1% at present to a maximum of 10% by 2035.

位於新田雨水泵房的浮式太陽能發電系統
Floating photovoltaic (FPV) system at the San Tin Stormwater Pumping Station

可再生能源
RENEWABLE ENERGY

各國積極落實進取的減碳策略，發展可再生能源，常見的包括太陽能、風力等。截至 2020 年，可再生能源佔全球總發電量的百分之二十九。據國際能源署推算，至 2050 年，全球接近百分之七十的電量將由太陽能和風力發電產生。

Countries around the world are actively implementing aggressive strategies to reduce carbon emissions and develop renewable energy resources, such as solar energy and wind power. As of 2020, renewable energy accounts for 29% of total global electricity generation. According to the International Energy Agency (IEA), nearly 70% of the world's electricity will be generated by solar and wind power by 2050.

氣候智能型農業
CLIMATE-SMART AGRICULTURE

由農業所排放的溫室氣體量所佔的比例為全球最多，達百分之三十九。為保護環境及增加生產力，聯合國糧食及農業組織致力發展氣候智能型農業，期望在維護糧食安全、適應氣候變遷、永續天然資源三方面達至「三贏」。中國也於河北、遼寧、黑龍江等糧食主產區試行「氣候智慧型主要糧食作物生產項目」，以智能化監測系統管理農業資源，期望在提高產量的同時減少農業系統碳排放。

Agriculture is the largest greenhouse gas emitter in the world, accounting for 39% of the whole. In order to protect the environment and increase productivity, the FAO is committed to developing climate-smart agriculture, hoping to achieve a "triple win" in terms of maintaining food security, adapting to climate change, and sustaining natural resources. China has also piloted the "Climate Smart Staple Crop Production Project Granted " in major grain-producing regions, which are Hebei, Liaoning, and Heilongjiang, to manage agricultural resources using an intelligent monitoring system to increase production and reduce carbon emissions in the agricultural system at the same time.

我們的選擇與行動
OUR CHOICES AND ACTIONS

不要少看個人的影響力，每一個減碳的決定都能有助緩減氣候變化。

拿出骰子，來玩一下這個「低碳康樂棋」，認識更多容易實行的低碳習慣吧！

Never underestimate your power of influence! Every decision to reduce carbon emission can help slow down climate change.

Take out the dice and play this "Low-Carbon Board Game" to learn more about low-carbon habits that are easy to follow!

起點 START

以自然風來代替乾衣機晾乾衣物，前進一格。

Air-dry your wet laundry instead of tumble drying – move forward one.

1

2

儲滿一機衣服才使用洗衣機。

Use the washing machine only when you have a full load of clothes.

3

4

5

選擇「多肉少菜」的餐單，退回起點。

Choose "more meat and less vegetables" dishes – go back to start.

6

南跳岩企鵝（易危）
SOUTHERN ROCKHOPPER PENGUIN (VU)

氣候變化改變了海洋食物網的結構，致數量迅速下降。

Climate change has altered the structure of ocean food webs, causing rapid declines in numbers.

7

減少使用塑膠產品，前進一格。

Use less plastic products – move forward one.

8

9

以淋浴代替浸浴，節省能源和水資源。

Take showers instead of baths to save water and energy.

10

11

天氣炎熱，把冷氣溫度設定於攝氏20度，退後一格。

The air conditioner set at 20°C in hot days – move back one.

12

13

外出或離開房間時關掉電燈、投影機等不需使用的電器。

Turn off lights, projectors, and other appliances that are not in use when leaving the room.

14

15

馬蹄蟹（瀕危）
HORSESHOE CRAB (EN)

大量馬蹄蟹被活捉以提取藍色的血液應用於醫藥檢測。

Large numbers of horseshoe crabs are caught for their blood to be used in drugs testing.

16

以行樓梯代替乘搭升降機。

Using stairs instead of elevator.

17

離目的地不遠，以步行代替乘車，前進兩格。

Walk a short journey instead of travelling by car - move forward two.

18

眼斑水龜（瀕危）
BEALE'S-EYED TURTLE (EN)

食用果實後的種子可經排泄物散落林間，是植林高手；但因獨特的外型而被非法捕捉作寵物銷售。

Seeds are dispersed after consumption makes them be the master of planting. They are prone to be caught in the wild for illegal selling as pet.

19

終點 FINISH

20

電子版本康樂棋：
E-version of this board game:

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The Ocean Park Conservation Foundation, Hong Kong (OPCFHK) is committed to advocating, facilitating and participating in effective conservation of Asian wildlife, with an emphasis on Chinese white dolphins and giant pandas, as well as their habitats, through partnerships, fundraising, research and education. It envisions a world where Asian wildlife remains biologically diverse under the stewardship of humans, corporations and governments.

Since its expansion in 2005, the Ocean Park Conservation Foundation, Hong Kong (OPCFHK) has allocated over HK$100 million to fund 550 research projects on cetaceans, giant pandas and many other species. The four themes for 2021/22 include climate change, endangered terrestrial and freshwater wildlife, marine conservation, and combating illegal trade of threatened species. Whilst continuing the operation of the Marine Mammal Stranding Response Team in Hong Kong since 2006, the Foundation had extended the Stranding Response Programme to threatened species of sharks and rays in 2016. OPCFHK also participates in the conservation and research of local horseshoe crab and freshwater turtles.

OPCFHK continues to inspire university students to engage in fieldwork as part of its University Student Sponsorship Programme in Wildlife Conservation and connects primary and secondary school students as well as corporations to horseshoe crab conservation efforts in Hong Kong through the rearing and fostering programme.

Following the success of the first “No Straw Day” in 2017, OPCFHK also launched the "No Straw Campaign" - a wider and ongoing movement to further encourage a reduction in the use of disposable straws and other plastics in Hong Kong in June 2018, taking a significant step towards helping to safeguard our marine eco-system. OPCFHK has teamed up with more than 1,800 (until last year) restaurant outlets, educational institutions, corporations, as well as government departments to draw the public to action through the launch of the “No Straw the Eighth”, “No Straw Friday” and “No Straw Partner” schemes. These schemes mean that restaurants and schools will not provide straws to their customers or students unless upon request on either the eighth day of every month, every Friday, or in the case of partners, every day of the year – essentially never.

As a conservation charitable trust supporting conservation across the Asian region, OPCFHK needs your support to sustain these efforts. Donate and join the Friends of the Foundation membership club now to make a difference! For details, please visit

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