

URBAN PLANNING AND ENVIRONMENTAL LAW QUARTERLY
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The earth’s ecosystems – already savaged by numerous forms of human activity – are now drowning under mountains of plastic waste. On a per capita basis, Hong Kong is a substantial contributor to such waste. Yet little is done by the government to address this serious environmental issue. In this edition, we look at aspects of plastic pollution and innovative proposals to address the problem – to fill the official vacuum.

The Editors

CONTENTS

| | |
|---|-------------|
| FEATURE: | Page |
| REDUCING PLASTIC USE AND WASTE IS NOW A CRITICAL ENVIRONMENTAL ISSUE | 1 |
| TOWN PLANNING | 4 |
| LEGISLATION DIGEST | 4 |
| WEST KOWLOON CULTURAL DISTRICT (WKCD) | 5 |
| HONG KONG BRIEFING | 5 |
| CLIMATE CHANGE | 6 |
| REGIONAL & INTERNATIONAL | 9 |

REDUCING PLASTIC USE AND WASTE IS NOW A CRITICAL ENVIRONMENTAL ISSUE

Pervasive plastic pollution

Today, most people, wherever they live, would accept that the world has a gigantic plastic waste problem - and that it is becoming decidedly worse. So we need not roll out too many facts or opinions to substantiate that statement. However, the following random statistics remind us of just how persuasive and dangerous our over-use, misuse and thoughtless disposal of plastic products has become.

- From 1950 to 2018, approximately 6.3 billion tonnes of plastic were produced and discarded; only 9% was recycled.
- Plastic production has increased from 5 million tonnes per annum in 1964 to 311 million tonnes in 2014 and is expected to double in 20 years.
- Approximately 2100 tonnes of plastic is disposed of each day in Hong Kong. Only 5% of discarded plastic was recycled in Hong Kong in 2014, compared with 25% in 2005
- Eight million tonnes of plastic waste end up in the ocean each year.
- Today, Hong Kong recycles less than 15% of plastic (the global average is 9%).
- Over the last ten years the world has produced more plastic than during the whole of the last century.
- 50% of plastic, is used only once and then thrown away.
- Enough plastic is discarded each year to circle the earth four times.
- The average American, for example, throws away approximately 80kg of plastic per year.
- Plastic accounts for approximately 10% of the world’s total waste.
- The production of plastic uses approximately 8% of the world’s oil production.
- Americans throw away 35 billion plastic water bottles every year.
- Plastic in the ocean breaks down into such small segments that pieces of plastic from a one litre bottle could end up on every kilometre of the world’s coastlines.
- Annually approximately 500 billion plastic bags are used worldwide; more than one million bags are used every minute.
- 46% of plastics float and can drift for years before eventually concentrating in the ocean gyres.

- It takes 500 – 1,000 years for plastic to degrade.
- Billions of kilogrammes of plastic can be found in swirling convergences in the oceans, making up about 40 % of the world's ocean surfaces; 80% of pollution enters the ocean from the land.
- The Great Pacific Garbage Patch is located in the North Pacific Gyre off the coast of California and is the largest ocean garbage site in the world. This floating mass of plastic is twice the size of Texas, with plastic pieces outnumbering sea life six to one.
- Plastic constitutes approximately 90% of all trash floating on the ocean's surface, with 46,000 pieces of plastic per square mile.
- One million sea birds and 100,000 marine mammals are killed annually from plastic in our oceans.
- Forty four percent of all seabird species, 22% of cetaceans, all sea turtle species and a growing list of fish species have been documented with plastic in or around their bodies.
- Virtually every piece of plastic that was ever made still exists in some shape or form (with the exception of the small amount that has been incinerated).

Hong Kong's lack of action

So plastic pollution is a mammoth problem for the world. Unfortunately, Hong Kong's government and businesses have been slow to implement measures to reduce our plastic footprint. [We recall writing to a major Hong Kong supermarket chain 10 or more years ago, providing information concerning an Australian company which had installed a machine to convert plastic waste to reusable plastic pellets. We did not receive even a reply.]

However, occasionally there are glimmers of hope, as illustrated by the following extracts from two of articles published in the South China Morning Post (17th August 2017 and 22nd July 2018).

Plastic to fuel

“In July 2018, Hong Kong had unusually high rainfall, which resulted in a visible increase in plastics washed into our waters. Several non-governmental organisations and community groups have been cleaning up beaches; much of the rubbish is plastic.

While their efforts are necessary and laudable, they are also futile. They have an insignificant impact on the total problem and create another - what to do with the collected plastic?

Hong Kong's recent attempts to reduce municipal solid waste and increase recycling make a sorry story. An Audit Commission report in 2015 noted that the government had failed to reach its targets and policy objectives in a range of project areas, including waste separation at source, waste charging and recycling.

The introduction of a charge for plastic shopping bags has started to change attitudes about the unnecessary use of plastic, yet the actual reduction in quantities delivered to landfills could not be adequately quantified.

In recent pieces in these pages, Edwin Lau, executive director of the Green Earth, noted a disappointing decline in plastic recycling – from 1.58 million tonnes in 2010 to 93,900 tonnes in 2015 – and warned that a serious waste crisis would hit Hong Kong within a few months, as the main market for Hong Kong recyclers – that is, the mainland – would be closed.

Hong Kong already discards 206 tonnes of PET (polyethylene terephthalate) plastic and non-PET plastic bottles every day. With recycling rates dropping, this would place even greater demands on the limited space in landfills.

In April 2018, Hong Kong legislators noted with “grave concern” the government's failure to meet waste targets and called on it to facilitate and increase the recovery of plastic recyclables, and promote the sustainable development of the waste plastic recycling industry.

The administration's response does not recognise the significance of the issue, and the inadequacy of their measures to meet the waste disposal catastrophe. Hong Kong has a huge challenge on its hands: massive growth in plastic production worldwide; minimal recycling of plastic; the closure of a major market for recycled plastic; and our only option – landfills – are reaching capacity with no alternatives in sight.

Hong Kong has a major crisis fast approaching regarding plastic and other waste. A new approach using advanced technology and high capacity solutions needs to be adopted quickly. The amount of waste going to landfills must be reduced dramatically.

We need a new approach.

Fundamentally, the use of plastic needs to be banned by law, where reasonable and other alternatives are available. It should be taxed to price it out of consideration for other uses.

The public must reduce plastic use, and organisations and companies must take steps to ensure that this happens. The simple banning of single-use plastic water bottles by some organisations has been effective in Hong Kong, as refillable alternatives for water can easily be provided.

However, the events of July have shown that these efforts, though necessary, are unlikely to have a significant impact. The market for recycling plastic is collapsing and an alternative must be found which can remove 90 percent of the plastic used in Hong Kong from the environment. In this, Hong Kong can be an innovation leader, using its financial, scientific and engineering expertise.

Under the new regulatory agreements the government reached with Hong Kong's two power suppliers recently, it is now possible for other generators of electricity to be paid for supplying power to the grid. This creates an opportunity for electricity to be supplied from waste plastic.

The use of gas plasma technology for the treatment of municipal solid waste has relatively long periods of operating success in Japan, China, Europe and the US. While there are mixed reviews of this technology on general waste, similar to that dumped in our landfills, it has proved to be more successful where the fuel source is of a consistent nature.

The use of plastic as a single fuel source, for example, has proved successful. This way, we can dispose of the plastic and generate energy as gas or electricity at the same time.

Gasification is not incineration, but is the use of extreme heat to convert the “feedstock” into their simplest molecules – carbon monoxide, hydrogen and methane – forming a synthetic gas which can then be used for generating electricity or producing valuable products. This “syngas” can be used in turbines to generate electricity or further processed to produce substitute natural gas, chemicals, fertilisers or transport fuels, such as ethanol.

A wide range of plastics cannot be recycled, or cannot be recycled any further, and end up in a landfill. Such plastics are an excellent, high energy “feedstock” for gasification.

Gasification can take place in relatively small regional plants, which could be located in our industrial areas or industrial parks. They have proven records of not producing pollutants that could affect surrounding neighbourhoods.

Since July, plastic can no longer be regarded as a waste material that can be recycled in the traditional ways. The economic model of using it as a material for new materials and products no longer works.

Plastic must now be seen as a fuel to generate energy. It should be bought like other fuel sources, creating a market demand. To eliminate the inestimable cost of having plastic polluting the seas, the land, and using up our landfills, the government should buy plastic as “feedstock” for plasma gasification plants.

The principle of government subsidising a recycling industry already exists. The difference is that the government needs to quickly approve several gasification plants and create a market for plastics as fuel, a consistent market which gives our collectors and recyclers certainty as to where they can sell their product.

Demand for energy from new sources which don't produce large amounts of carbon dioxide needs to be fully utilized. Plastics can provide that fuel while addressing a major pollution catastrophe.”

Youth-fuel action

“Young Boy Scout and environmentalist Vikram Krishna is determined to solve Hong Kong's plastic problem, one bottle at a time.

The 14-year-old Hong Kong International School student set up collection points for plastic bottles as part of his “Eagle Project” as a member of Boy Scouts of America, Troop One, Hong Kong. He collected bottles from his school, and from blocks of flats and neighbourhoods around the city. Vikram managed to amass an incredible 42 kilogrammes of plastic bottles. He had them converted into a polyester material, which he then used to make reusable bags.

He recently moved to Hong Kong from Japan, where he says citizens care a lot more about environment and have a far more extensive recycling programme. “Recycling is massive in Japan,” Vikram explained. “Everybody recycles without even thinking twice. In fact, at my school, there was a separate box just for bottle caps. Hong Kong is really lagging when it comes to recycling.”

After receiving the bottles, Vikram had them recycled locally and turned into plastic pellets. He then shipped the pellets to the mainland where they were made into polyester. “With this polyester, I designed a reusable bag for shopping and groceries. I then hired an elderly Hong Kong local to sew 200 of these bags using my designs.”

With more projects like these, Vikram believes Hong Kong can both reduce its plastic problem and help provide work for retired residents.

Vikram hopes to continue his work both with the Scouts and in his school next year, and plans to work with younger students to raise awareness of this issue. His projects will also be featured during the school's “zero plastic day”, a full day dedicated to fighting the problem of plastic waste.

“I've learned a lot from this project,” Vikram said. “I found it really cool how just four or five plastic bottles can be recycled to make one of these bags, and I plan to continue pushing this initiative – not only recycling, but more importantly, the minimization or even elimination of single-use plastic, which has become a menace to the environment.”

Conclusion

The very modest plastic bag charging scheme, which was recently introduced following the usual years of bureaucratic discussions, delays and digesting of numerous “reports”, was at least a small step in the right decision. But the government must be much bolder and more resolute if Hong Kong is to make any headway in resisting – or, perhaps, even turning back ubiquitous plastic pollution.

For instance, the government should implement a container deposit scheme, as so many more enlightened jurisdictions have, beginning 50 years ago!

Another relatively simple action to take would be a complete ban on the use of plastic straws. Other jurisdictions have done it. Straws are not only a prominent form of plastic waste, they also are especially lethal to marine life, such as turtles. Yet, as usual, no government agency has thought to initiate such a ban, or indeed any other worthwhile measure to reduce plastic waste!

TOWN PLANNING

Pok Fu Lam Zoning Plan Amended

The Town Planning Board on 27 September 2019 announced amendments to the approved Pok Fu Lam Outline Zoning Plan (OZP).

Amendments are:-

1. rezoning a site adjacent to Cyberport Arcade from area shown as "Road" with minor portions zoned as "Other Specified Uses" annotated "Cyber-Port" ("OU(Cyber-Port)") to "OU(Cyber-Port)(1)" to facilitate the Cyberport expansion
2. rezoning of an area occupied by Cyberport Waterfront Park from "OU(Cyber-Port)" and area shown as "Road" to "Open Space"
3. deletion of the outdated alignment of the proposed Route 7 (currently known as Route 4) with the associated adjustments to the planning scheme boundary and zoning amendments.

[Town Planning Board Press Release, 27/09/2019]

Mong Kok Outline Zoning Plan Approved

The Chief Executive in Council has approved the draft Mong Kok Outline Zoning Plan (OZP).

The planning scheme area ("the Area"), which covers an area of 147 hectares, is located in West Kowloon. It is surrounded by Boundary Street to the north, the MTR East Rail Line to the east, Dundas Street to the south, and Sham Mong Road and Ferry Street to the west.

The planning scheme arrangements are:-

1. 42.56 hectares is zoned "Residential (Group A)" for high-density residential developments.
2. 2.82 hectares in the Tai Kok Tsui area is zoned "Residential (Group E)" for residential purpose.
3. 12.93 hectares is zoned "Government, Institution or Community" for various government, institution or community (GIC) facilities.
 - a. Existing GIC facilities are: Mong Kok Stadium; Mong Kok Fire Station; Mong Kok Police Station and Tai Kok Tsui Municipal Services Building.
4. 10.56 hectares is zoned "Commercial" for commercial developments. Zone mainly covers both sides of Nathan Road, New Kowloon Plaza, Langham Place, the ex-Mong Kok Market site and a government site at Sai Yee Street.
5. 9.58 hectares is zoned "Other Specified Uses" ("OU") including "OU (Business)" zone and other "OU" sites designated for: the funeral parlour at Maple Street; petrol filling stations; railway station development; a commercial/office/hotel development at Mong Kok East Station; and the Lui Seng Chun building.
6. 8.74 hectares is zoned "Open Space" to provide active and passive recreational uses. open spaces are: Boundary Street Sports Ground; Macpherson Playground; Lok Kwan Street Park; and the playgrounds at Willow Street, Anchor Street, Tong Mi Road/Canton Road, Mong Kok Road, Thistle Street and Sai Yee Street.
7. 0.04 hectares "Comprehensive Development Area" to preserve Hung Shing Temple and the mature tree on the site. This site also allows redevelopment for residential/ commercial use.
8. 0.33 hectares are allocated for three Urban Renewal Authority Development Scheme Plan areas, including: the Anchor Street/Fuk Tsun Street Development Scheme Plan; the Prince Edward Road West/Yuen Ngai Street Development Scheme Plan; and the Shanghai Street/Argyle Street Development Scheme Plan.

[Town Planning Board Press Release, 18/10/2019]

LEGISLATION DIGEST

Fisheries Protection (Amendment) Bill 2019

The *Fisheries Protection (Amendment) Bill 2019* (the "Amendment Bill") was gazetted on 6 December 2019. The Amendment Bill amends the registration scheme introduced in 2012.

Under the registration scheme, local fishing vessels must be registered with the Agriculture, Fisheries and Conservation Department (the "Department") in order to fish in Hong Kong waters. The legislative intent was to cap the level of fishing efforts as at a cut-off date, i.e. 15 June 2012, and limit new entrants after that date. Local fishing vessels which had been operating up to immediately before the cut-off date could be registered only within a limited period.

Most rejections of registration applications were on the ground that the vessels concerned did not possess a valid operating licence on 15 June 2012. Most of these rejected applicants lodged appeals against the Department's Director's refusal with the Administrative Appeals Board (the "Board"), but all those appeals were dismissed. In handing down the rulings against the appellants, the Board's chairperson expressed sympathy for the appellants, but noted that the Director does not have any discretionary power under the Ordinance to consider the registration of unlicensed vessels.

The Amendment Bill amends the registration scheme to now confer on the Director discretion to consider registering local fishing vessels that did not possess a valid operating licence on 15 June 2012. Such amendment of the law is to allow registration of local fishing vessels the owners of which can show justifiable reasons for their failure to apply by the 15 June 2012 deadline.

[Legislative Council Brief, December 2019]

WEST KOWLOON CULTURAL DISTRICT

Appointment of Performing Arts Executive Director

The WKCDA announced on 1 November 2019 the appointment of Mr. Paul Tam to the position of Executive Director, Performing Arts. His appointment becomes effective in early 2020.

Prior to joining the WKCDA, Mr. Tam was the Executive Director of Hong Kong Ballet. In his new role as the Executive Director, Performing Arts, Mr. Tam will be responsible for planning performing art programmes for the several venues in the District, such as Xiqu Centre and Freespace. These programmes will cover dance, theatre, xiqu, music and arts learning and participation.

[*West Kowloon Cultural District Authority Press Release, 01/11/2019*]

The 86th Board Meeting of the West Kowloon Cultural District Authority

The M+ building is entering the final stages of mechanical, electrical and plumbing (MEP) installation prior to statutory inspections, which are expected to begin in January 2020. M+ building will be completed in March 2020. The museum itself will open nine to twelve months later.

Following the cofferdam leakage incident in July 2019 at the site of the Lyric Theatre Complex, construction of that complex resumed in August 2019. The WKCDA has now completed construction of about 75% of the lowest basement slab of the Lyric Theatre Complex and the extended basement area.

The summary of the report relating to the cofferdam leakage incident was presented in late November to the Legislative Council Joint Subcommittee to Monitor the Implementation of the West Kowloon Cultural District Project.

[*West Kowloon Cultural District Authority Press Release, 04/12/2019; SCMP, 26/08/2019*]

Director of the Palace Museum delivers his first lecture

On 16 December 2019, Dr. Wang Xudong, Director of the Palace Museum, delivered a lecture at the Freespace in West Kowloon Cultural District.

This was his first lecture in Hong Kong since he took up the directorship at the Palace Museum in April 2019, and also was the first scholarly programme the Hong Kong Palace Museum has organised in collaboration with the Palace Museum.

In his lecture, Dr. Wang offered new insight into how to connect Chinese traditional culture to people's lives today. He noted that the Palace Museum plays a crucial role in preserving and bringing forward the best of Chinese art and culture.

The Hong Kong Palace Museum is a collaborative project between the West Kowloon Cultural District Authority (WKCDA) and the Palace Museum. Scheduled to open in mid-2022, it will be a museum dedicated to showcasing the exquisite artefacts from the Palace Museum's collections.

The museum comprises 7,800 square metres of gallery space for standing and special exhibitions. Other museum facilities are an auditorium, atriums, educational spaces, gift shops, and dining areas.

[*West Kowloon Cultural District Authority Press Release, 17/12/2019*]

HONG KONG BRIEFING

Hong Kong to phase out fossil fuel cars

According to the city's environment chief, within the next 10 to 20 years Hong Kong plans to phase out of all fossil fuel vehicles and switch to electronic modes of commercial and public transportation (electric vehicles—Evs) to improve the quality of the air.

The Secretary for the Environment's ("SFE") also said that the government will provide HK \$2billion to old private estates to upgrade old parking facilities to provide more EV charging points.

This step forward will cover more than 60,000 car spaces across the city. The SFE states that in 3 years, a quarter of all parking spaces in Hong Kong would be compatible with electric vehicle charging requirements.

At the end of 2010 there were fewer than 100 EVs approved for road use. This number has increased to 12,195 by August 2019. Approximately 1.8 % of private cars in the city are EVs.

The government says it will consult the public on the exact time-frame for banning fossil fuel vehicles.

The government is also considering ways to help taxi and commercial truck operators move to EVs. In terms of taxis, this would require a network of quick-charging stations that can charge a car in less than two hours.

In mid-October, the Environmental Protection Department engaged a contract service to identify sites suitable for the quick charging stations, to assist in upgrading taxis into “e-taxis”.

The SFE also introduced the pilot Green Transport Fund which subsidises public transport and commercial vehicles owners to switch to lower-emission vehicles. Electric mini buses will also be part of the plan.

In terms of water vessels, the government is still in negotiations with ferry operators. Once that is settled, a pilot scheme for new –energy ferries will follow suit.

[SCMP, 29/10/2019]

Hong Kong waste at highest level since 1991

Since 1991, Hong Kong has hit a breaking high for rubbish disposal rates per person. According to the Environmental Protection Department, each Hongkonger disposes of an average of 1.53kg of municipal solid waste, including- domestic, commercial and industrial debris, to landfills every day last year. This number has escalated from 5.66 million tonnes in 2017 to 5.87 tonnes in 2018.

Last November, the government pushed forward a bill which would require a fee for the collection of municipal waste. However, the progress of the bill was stalled due to recent anti Hong Kong government activities. While Legislative Council meetings have resumed, there are no plans to implement the waste plan.

[SCMP, 25/11/2019]

Another air pollutant listed in regional monitoring network

Hong Kong, Guangdong and Macau will include an additional air pollutant in a regional monitoring network to cut smog levels.

Volatile organic compounds (“VOCs”) will be covered by the Pearl River Delta Regional Air Quality Monitoring Network, which collects data from 23 monitoring stations and is a joint effort of the three governments.

Prior to the inclusion of VOCs, the network also monitored five other air pollutants: sulphur dioxide; nitrogen dioxide; carbon monoxide; respirable suspended particulates; and fine suspended particulates.

Whilst preparations to monitor VOCS have started, the Environmental Protection Department did not give a timeline for when the data on VOCs would be released.

[SCMP, 13/12/2019]

CLIMATE CHANGE

Oceans and ice are absorbing the brunt of climate change

The UN’s Intergovernmental Panel on Climate Change released a major report on 25 September 2019. The report outlines the damage climate change has already done to the planet’s vast oceans and fragile ice sheets and forecasts the future for these crucial parts of the climate system.

The report finds that the oceans, polar ice caps, and high mountain glaciers have already absorbed so much extra heat from human-caused global warming that the very systems human existence depends on are already at stake. For example, Planpincieux glacier on the Italian side of Mount Blanc is expected to collapse at any time, prompting road closures and evacuations of structures in the area; many fisheries in the ocean have shifted and shrunken, impacting million-dollar businesses and subsistence fishers alike; and 27 percent of Earth’s human population that lives near coasts are bearing the brunt of higher seas and stronger storms; marine “heat waves” sweep across the ocean twice as often as they did only three decades ago.

In 2015, 187 nations reached the Paris Agreement, by which they agreed to try to limit planetary warming as at the end of the 21st century to an average of 2 degrees Celsius above pre-industrial temperatures, and to aim for a more ambitious goal of keeping warming under 1.5 degrees Celsius. At the time, 2 degrees Celsius was considered a reasonably “safe” target.

Since then, scientists found that the planet has already warmed about 1 degree Celsius on average and that even 1.5 degrees of warming could pose devastating environmental, social, and economic impacts. Further, it is rapidly becoming apparent that both the 1.5- and the 2-degree Celsius goals will be difficult, if not impossible, to achieve, as further research indicates that countries would have to aim for a “net-zero” greenhouse gas situation by 2050 in order to meet that target. However, we are currently heading towards 3.5 degrees Celsius or more of warming by the end of the century.

These challenges are only going to get worse unless countries make lightning-fast moves to eliminate greenhouse gas emissions. Strong, decisive action could still forestall or evade some of the worst impacts, the report says.

[National Geographic, 25/09/2019]

Big lifestyle changes are the only answer to climate change

We must eat less meat and dairy, swap cars for bikes, take fewer flights, and ditch gas boilers at home to tackle climate change, said researchers from Imperial College London.

Although UK has passed a law obliging the country to cut carbon emissions to net zero by 2050, researchers warned that major shifts in policy across huge areas of government activity are needed to keep the public onside. The researchers released a new report, called Behaviour Change, Public Engagement and Net Zero, that recommends changes of policies in four major aspects to cut emissions.

(1) Diet

Food currently accounts for 30% of a household's carbon footprint in UK. The report says we need to make a significant shift towards lower-carbon foods, particularly towards more plant-based diets, as producing food from animals uses more resources than food from plants.

The report proposes that the government put more effort into promoting the health benefits of a change in diets and giving people much more information on the environmental impact of different foods. The government is also advised to increase the price of foods that involve high emissions by cutting farm subsidies and by raising value-added tax on livestock products.

(2) Home heating

Home heating accounts for 21% of a household's carbon footprint in the UK and it is expected to be costly to bring it down.

The report recommends the promotion of low-carbon heating systems, in particular air-source heat pumps, which extract heat from air outside the home and remove cold air from inside.

The government is also advised to offer consumers a range of incentives to encourage the use of low-carbon technology, for example by removing the value-added tax on installation of insulation and low-carbon heating systems.

(3) Transport

Transport currently accounts for 34% of a household's carbon footprint in the UK. The report calls for a major programme of investment in the rail and bus network, with lower ticket prices.

It also advocates more investment in safer cycling infrastructure. The report recommends that the government promotes the health benefits brought by walking and cycling and provide greater subsidies for purchases of new electric cars, which produce fewer emissions.

Infrastructural changes should also be made to the country. The government is urged to introduce smart charging systems for electric vehicles, such that owners of electric cars can charge their vehicles at a lower expense.

(4) Aviation

The report also urges policy-makers to focus on the 15% of the population that are estimated to take 70% of flights.

It calls for an "Air Miles Levy" to discourage what it calls "excessive flying". The idea is to penalise frequent flyers, while not raising prices for people taking an annual holiday.

It also recommends that passengers be given much more information about the emissions generated by flights.

[BBC, 11/10/2019]

Climate change poses threats to children's health worldwide

According to a report in The Lancet published on 13 November 2019, the health impacts of climate change will be unevenly distributed and children will be among those particularly harmed.

Authors of the report found that failing to limit emissions would lead to health problems caused by increased incidence of infectious diseases, worsening air pollution, rising temperatures and malnutrition. In particular, the report found that the health and well-being of newborns, who are especially vulnerable because of their physiology, will be increasingly impacted by the realities and dangers with every degree of warming. Due to faster heart beats, higher breathing rates and smaller body size, children absorb more air pollution than an adult would in the same situation.

The report warned that unless nations come together to halt emissions, air pollution will quite likely increase. The burning of fossil fuels, such as coal and gas, also releases a type of fine air pollution called PM 2.5 that can damage the heart and lungs when inhaled. Exposure to PM 2.5 air pollution correlates with health problems, such as low birth weight and chronic respiratory diseases like asthma.

Wildfires are also an increasing source of pollution. As temperatures rise, wildfires are becoming more frequent in part because hotter temperatures dry out vegetation, making it easier to ignite. The smoke, like the smoke that comes from burning fossil fuels, has negative health effects. According to the report, there has been a 77 percent increase in the number of people exposed to wildfire smoke worldwide. Children are found to be more susceptible to fine particulate pollution, because of their differing physiology and the fact that they generally spend more time outdoor than adults.

Children are also more vulnerable to heat waves, which are becoming more severe in recent years. It was reported that heat related illnesses were the leading cause of death and disability in young athletes.

This is the first time The Lancet has weighed in on the health impacts of climate change, with a focus on children.

[*The New York Times*, 13/11/2019]

Hundreds of thousands of students join global climate strikes

On 29 November 2019, hundreds of thousands of students took to the streets from Manila to Copenhagen as part of the latest student climate strikes to demand radical action on the unfolding ecological emergency.

Greta Thunberg, the Swedish teenager who inspired the movement when she staged a solo protest outside the Swedish parliament last year, said that despite millions protesting, governments had taken no meaningful action.

Students at schools and universities around the world walked out of lessons:

- in Madrid, world leaders will gather for the latest UN climate summit;
- in Sydney, protests demanded action following devastating wildfires;
- in London, crowds called for the climate crisis to take centre stage in next month's election and condemned Boris Johnson for not taking part in a televised climate debate;
- in Manchester, several hundred young people gathered outside the Central Library at St Peter's Square, accompanied by lecturers on strike from Manchester University.

[*The Guardian*, 29/11/2019]

Greta Thunberg arrives in Lisbon by catamaran

Greta Thunberg arrived in the port of Lisbon by catamaran after a three-week voyage across the Atlantic Ocean from the United States. She sailed to Lisbon, Portugal, to attend the UN Climate Change Conference taking place in Madrid, Spain.

Thunberg wanted a low-carbon form of transport to get to the climate meeting. The yacht, named *La Vagabonde*, leaves little or no carbon footprint when its sails are up; it uses solar panels and hydro-generators for electricity.

Meanwhile, her arrival coincided with a new scientific report which concludes that there is mounting evidence that the world is getting even hotter than previously estimated. A report by the UN weather agency released on the sidelines of the climate talks revealed that the current decade is likely to set a new 10-year temperature record.

The World Meteorological Organisation has said that preliminary temperature measurements show the years from 2015 to 2019 and from 2010 to 2019 are respectively almost certain to be the warmest five-year period and decade on record. The record also revealed that each successive decade has been warmer than the last since the 1980s and 2019 was hotter than average in most parts of the world, including the Arctic.

[*Associated Press*, 03/12/2019]

Extreme weather patterns are raising the risk of a global food crisis

According to recent studies, extreme weather patterns associated with heat waves and droughts are raising the risks of simultaneous harvest failures of vital crops worldwide, such as wheat, maize and soybeans, and are pushing the world closer to the edge of potential food price spikes, associated social unrest and food shortages.

The studies, published in the journal *Nature Climate Change*, found that in an increasingly interconnected world, there's a greater chance that extreme weather events can have ripple effects in more than one region at once. In other words, simultaneous heat extremes and resulting decreases in food production are possible in locations separated by thousands of miles.

According to the studies, if two or more weeks of a summer are spent locked into one of these weather patterns, regional crop production could see decreases of up to 11 percent or 4 percent when averaged across all of the affected areas.

Before these studies, scientists once believed that low harvests in one location tend to be balanced out (through trade) by plentiful harvests elsewhere in the world. However, new studies indicate that there is a real possibility that extreme weather patterns can cut the productivity of several of the world's "breadbasket" (i.e. major crop producing) regions simultaneously.

Scientists also believe that global warming leads to stronger extreme weather patterns and increases the likelihood that extremes will occur simultaneously, as it adversely affects air circulation and potentially makes heat waves more persistent or provides more favourable conditions for heat waves to recur.

The studies also revealed that food price spikes in recent years have led to social unrest, including the pronounced spike during 2007-2008, which preceded the Arab Spring. Researchers have also identified climate extremes in Syria as one of the contributors to civil unrest and forced migration.

[*The Washington Post*, 09/12/2019]

Greta Thunberg named Time's person of the year

Greta Thunberg, the teen activist from Sweden who has urged immediate action to address a global climate crisis, was named Time magazine's person of the year for 2019. At 16 years of age, she is the youngest person to have ever received the accolade.

Thunberg began an environmental campaign in August 2018 which became a global movement. Activists, the majority of whom were young students, initially skipped school and camped out in front of the Swedish parliament to demand immediate action.

In the 16 months since, Thunberg has addressed heads of state at the UN, met with the Pope, sparred with the President of the United States and inspired 4 million people to join the global climate strike on 20 September 2019, which was probably the largest climate demonstration in human history.

Thunberg recently criticised politicians for failing to take any action despite the voices of climate strikers are being heard clearly. She castigated world leaders for "negotiating loopholes" and using PR to make it appear they are achieving bold climate targets.

[*The Guardian*, 11/12/2019]

REGIONAL & INTERNATIONAL

USA

Thirty US states have cut their environmental budgets

A new study found that a majority of U.S. states cut their budgets for environmental programs by more than 10% when adjusted for inflation between 2008 and 2018. During the decades, state environmental protection agencies shed more than 4,400 jobs.

For example, in Pennsylvania, during a decade of growth in natural gas production in the Marcellus shale formation, state officials slashed funding for pollution control efforts by 16% even as the overall state budget grew by 18%.

Similarly, in Texas there was a boom in oil and gas extraction in the Permian Basin in the western half of the state, but lawmakers cut funding at its Commission of Environmental Quality by 35%, although total state spending grew by 41%.

These findings are important, given that leaders at the federal Environmental Protection Agency (the "EPA") under President Trump have said they want to grant states more enforcement responsibilities and support them when needed.

One of the few states to increasing its environmental spending since 2008 was California. The nation's most populous state almost doubled funding for the California Environmental Protection Agency over the decade, from \$2.4 billion to \$4.2 billion, to both implement a new recycling law and launch a cap-and-trade program for reducing greenhouse gas emissions.

In respect of California, the Trump administration has been less keen on protecting states' rights. In September, the EPA revoked California's long standing authority to set stricter air pollution standards for cars and light trucks. The EPA has even accused California of failing to meet its obligations to protect the environment because of the large homeless populations in Los Angeles and San Francisco.

[*The Washington Post*, 09/12/2019]

AUSTRALIA

Bushfires ravage Blue Mountains world heritage area

Even at this very early stage of summer, more than 10% of the area covered by New South Wales national parks has been wiped out by bushfires, including 20% of the Blue Mountains world heritage area. The amount of bushland destroyed within New South Wales' national parks dwarfs that of the entire previous fire season, when 80,000 hectares were lost.

A Nature Conservation Council ecologist said the damage caused by fire in the Gondwana rainforest world heritage area in the north of the state is a 'global tragedy' and an 'absolute crisis'. The Council also said the loss of 800,000 hectares in New South Wales national parks, out of a total of 1.9m hectares burnt in the state since 1 July, altered the momentum of nature conservation in the state.

Besides the losses in the Blue Mountains, there was concern for the Gondwana rainforest world heritage area, a collection of reserves of subtropical rainforest that span 366,500 hectares across New South Wales and Queensland. Twelve of 28 New South Wales heritage reserves have been at least partly affected by fire.

A spokeswoman for the New South Wales Planning, Industry and Environment Department said the environmental conditions, combined with strong winds and extremely low humidity, make fire fighting extremely difficult and dangerous.

The Blue Mountains area is a landscape adapted to recover after fire, and more detailed assessments of the impact would occur when conditions were safer.

[*The Guardian*, 03/12/2019]

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Convictions under environmental legislation: October to December 2019

[Note: the EPD no longer classifies second (and subsequent) offences.]

The EPD's summary of convictions recorded and fines imposed during the above period is as follows:

October 2019

Sixty-two convictions were recorded in October 2019 for breaches of legislation enforced by the Environmental Protection Department (EPD).

Eleven of the convictions were under the Air Pollution Control Ordinance, 24 were under the Noise Control Ordinance, 3 were under the Public Cleansing and Prevention of Nuisances Regulation, 4 were under the Product Eco-responsibility Ordinance, 19 were under the Waste Disposal Ordinance, and one was under the Water Pollution Control Ordinance.

A company was fined \$50,000, which was the heaviest fine in October, for using powered mechanical equipment without a valid construction noise permit.

November 2019

Seventy convictions were recorded in November 2019 for breaches of legislation enforced by the Environmental Protection Department (EPD).

Ten of the convictions were under the Air Pollution Control Ordinance, 2 were under the Environmental Impact Assessment Ordinance, 5 were under the Noise Control Ordinance, 30 were under the Public Cleansing and Prevention of Nuisances Regulation, 18 were under the Waste Disposal Ordinance, and 5 were under the Water Pollution Control Ordinance.

A company was fined \$60,000, which was the heaviest fine in November, for using powered mechanical equipment otherwise than in accordance with construction noise permit conditions.

December 2019

Thirty-eight convictions were recorded in December 2018 for breaches of legislation enforced by the Environmental Protection Department (EPD).

Five of the convictions were under the Air Pollution Control Ordinance, 4 were under the Noise Control Ordinance, 3 were under the Public Cleansing and Prevention of Nuisances Regulation, 24 were under the Waste Disposal Ordinance, and 2 were under the Water Pollution Control Ordinance.

The heaviest fine in December was \$10,000, assessed against a person who imported controlled waste without a permit and three companies which installed or altered furnaces/chimney without authorisation, deposited waste unlawfully and contravened the provisions of a licence respectively.

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