Topic A : ***Addressing Bushfires in Australia***

Introduction to the topic

Bushfires have been a major crisis in Australia ever since in mid year of 2019 and 2020. This has been a concern only to the government but also a concern to citizens of Australia. Bushfire is very common around Australia because it is known to be a "solution" for getting rid of unwanted natural use materials in the agriculture field. Australia's deadly bushfires sparked in September 2019 and have been blazing ever since. A prolonged drought that began in 2017 made this year's bushfire season more devastating than ever. Although Australia has experienced fires of this size before, they are by no means normal conditions. In NSW, they experienced larger fires during the range between 1974 and 1984. There are many record-breaking temperatures and months of severe drought have fuelled a series of massive bushfires across Australia. Although recent cooler conditions and rain have brought some respite, more than 50 fires are still burning in the states of New South Wales and Victoria. Hot and windy conditions are forecast to return to many parts of New South Wales this weekend and authorities in the Australian Capital Territory (ACT) have declared a state of emergency as massive bushfires rage south of Canberra. At least 33 people have been killed, including four firefighters and more than 11 million hectares (110,000 sq km or 27.2 million acres) of bush, forest and parks across Australia have burned.

Cause of the Bushfire in Australia

Pyrocumulonimbus clouds

Humans are sometimes to blame for starting the fires, but they are also often sparked by natural causes, such as lightning striking dry vegetation. Once fires have started, other areas are at risk, with embers blown by the wind causing blazes to spread to new areas. Bush fires themselves can also drive thunderstorms, increasing the risk of lightning strikes and further fires. The bushfires in Australia are now so big that they are generating their own weather, in the form of giant thunderstorms that start more fires, according to the Bureau of Meteorology in Victoria.

Intense fires generate smoke but their heat can also create a localized updraft powerful enough to create its own changes in the atmosphere above. As the heat and smoke rise, the cloud plume can cool off, generating a large, puffy cloud full of potential rain. The plume can also scatter embers and hot ash over a wider area. Eventually, water droplets in the cloud condense, generating a downburst of rain — maybe. But the "front" between the calm air outside the fire zone and a pyrocumulonimbus storm cloud is so sharp that it also generates lightning — and that can start new fires.

If powerful enough, a pyrocumulonimbus storm can generate a fire tornado, which happened during the Canberra bushfires in 2003. Scientists worry that "pyroCbs" are on the rise around the world, driven by warmer temperatures and more intense fires, Yale E360 reported. Their plumes are so strong that they can even shoot smoke into the stratosphere, 6 to 30 miles above the Earth's surface.

Dry fuel moisture

Dead fuels can be further classified based on their environmental response times, into dead fine fuels with a 1–10 h response time, and dead coarse fuels with a 100–1000 h response time. The response time represents the time required for the FMC of respective fuel particles to equilibrate in response to changes in environmental conditions. The response time of fuel is a function of fuel size and density. The 1, 10, 100, and 1000-h fuels correspond to sizes of less than 6.35, 6.35 to 25.4, 25.4 to 76.2, and greater than 76.2 mm in diameter, respectively. Dead fine fuels are specifically considered in fire management due to their importance in governing the ignition and the early spread rate of fires. The FMC of dead fine fuels is also an important indicator of lightning-induced fire ignition.

The FMC of dead fuel particles is mainly dependent on the size of the fuel, rainfall, and surrounding atmospheric conditions. Dead FMC varies with physical processes like vapour exchange, precipitation, and latent heat. On non-rainy days, dead fuel moisture content responds to the local weather conditions via water vapour exchange processes , which are mainly governed by the vapour pressure deficit of surrounding air. The vapour pressure deficit of air represents the atmospheric aridity and is linked with land-atmosphere feedback. Positive land-atmosphere feedback, which is correlated with atmospheric aridity, also strongly influences heatwave conditions.

The ongoing droughts

During drought, agricultural ecosystems suffer major damage. There is much loss of livestock and the growing of crops is disrupted. Declining productivity affects not only rural Australia but also the national economy. The impact of a drought may be felt for many years. Drought degrades the land and water quality and affects the way the land is used in the future. The loss of breeding stock means that it takes a long time to replace livestock that perished in the drought and there is often less money to start again. There is less vegetation so the soil is more vulnerable to erosion and there is often an increase in bushfires and dust storms. This has long-term implications for the sustainability of agricultural industries.

The drought also affects the natural ecosystems. Creeks and rivers dry up causing the organisms that rely on the water to perish. This in turn causes food shortages for animals higher up in the food chain. While farmers are able to hand-feed some livestock to keep them alive, much of the wildlife is left to starve. The risk of serious environmental damage, particularly through the loss of vegetation and soil erosion, has long-term implications for the sustainability of the agricultural industries as well as for the natural ecosystems.

Burning fossil fuels

the same day that the Australian Bureau of Meteorology announced that the country was experiencing its hottest day on record. The Australian government continues to believe that the nation's future remains within the rich coal deposits that lie under Australian soil, and is not being challenged on that position.

The impact that fossil fuels are having on the country's climate are plain: they are contributing to prolonged heat waves, droughts and wildfires that have destroyed Australian ecosystems and communities. Echoing the government's position, however, the country's national paper argued in its own editorial column that those attributing the country's bushfires to climate change were suffering from an "attention-clamour disorder" and creating a "faux climate emergency".

Deforestation & Tree-Clearing

The impact of deforestation on the environment and ecosystems includes loss of biodiversity, climate change and decline in soil fertility. Australia has lost almost 40 percent of its forests and some of the remaining forests are fragmented. Most of Australia's forests are in the coastal regions with much of the rest of the continent covered by deserts and dry land. The Australian coastal regions are the most fertile, and since colonial times, the coastal forests were cleared mostly for agricultural use. Australia is a forest-poor country and extensive efforts are required to stop the ecological impact of deforestation.

Clearing of forests affects local temperature and precipitation patterns; it increases temperatures and reduces rainfall. Cutting down trees disrupts the natural water cycle, during which trees maintain soil moisture and release water vapor back into the atmosphere. Over the last century, Australia has warmed about 1.0 degree Centigrade (1.8 degrees Fahrenheit). The physical process of cutting down forests affects climate by releasing large amounts of the greenhouse gas carbon dioxide into the air. Trees take up atmospheric carbon dioxide and convert it to energy and oxygen. Deforestation causes the loss of tree-mediated carbon dioxide uptake and increases heat-retaining carbon dioxide concentrations in the atmosphere. Recently, the Australian legislature has implemented anti-clearing strategies, decreasing carbon dioxide emissions.

Effect of the Bushfire in Australia

Heat and drought

Australia broke its all-time temperature record twice in December. An average maximum of 40.9C was recorded on 17 December, broken a day later by 41.9C, both beating 2013's record of 40.3C.By the end of the month every state had measured temperatures above 40C - including Tasmania, which is usually much cooler than the mainland.

The main climate driver behind the heat has been a positive Indian Ocean Dipole (IOD) , an event where sea surface temperatures are warmer in the western half of the ocean, cooler in the east. The difference between the two temperatures is currently the strongest in 60 years. As a result, there has been higher-than-average rainfall and floods in eastern Africa and droughts in south-east Asia and Australia.

Andrew Watkins, head of long-range forecasts at the bureau, said the dipole was crucial to understanding the heatwave. “The key culprit of our current and expected conditions is one of the strongest positive Indian Ocean dipole events on record,” he says. “A positive IOD means we have cooler than average water pooling off Indonesia, and this means we see less rain-bearing weather systems, and warmer than average temperatures for large parts of the country.”

Area Burned

Since September, the fires have killed at least 25 people, including three firefighters, left entire towns in ruins and destroyed almost 2,000 homes. As of 2 January, more than 12 million acres had burned – an area six times the size of the 2018 California wildfires.

That estimate has since increased to nearly 15 million acres, or around twice the size of Belgium, according to some media outlets. In NSW, the massive Gospers Mountain fire alone has burned more than 1.2 million acres, making it the biggest forest fire in Australian history. One-third of the vineyards in South Australia’s Adelaide Hills have been lost.

Loss of Wildlife

The damage to the environment and native Australian fauna is colossal. One study estimated that 480 million animals in NSW may have been killed already, either during blazes or afterwards from lack of food, water and shelter and increased risk of predation. This figure only includes mammals, birds and reptiles and does not consider insects, bats or frogs.

Sussan Ley, Australia’s environment minister, has said that up to 30% of koalas on the NSW mid-north coast may have perished because “up to 30% of their habitat has been destroyed”. She added that the true impact on threatened koala populations won’t be fully understood until the fires stop and “a proper assessment can be made”. The National Farmers' Federation estimates more than 100,000 sheep and cattle have been lost. Army reservists have been brought in to help bury their carcasses.

Choking on smoke

For months, hazardous bushfire smoke has intermittently blanketed heavily populated areas, including Sydney, Melbourne and Canberra.In Canberra on 1 January, air quality was more than 20 times above hazardous levels, leading to a shutdown of restaurants, shops, childcare centres, museums and government departments.

Plumes of smoke, dust and ash are visible from space and have even drifted thousands of kilometres east to New Zealand, causing skies to turn orange and glaciers brown.

CO2 emissions

The bush fires are estimated to have pumped 350 million tonnes of CO2 into the atmosphere – roughly two-thirds of Australia's annual emissions budget in 2018-19, according to NASA data. It may take a century or more for forests to absorb the CO2 released so far during this season's fires, one expert told the Sydney Morning Herald.

Attempt Solutions

Each state runs its own emergency operation, but Prime Minister Scott Morrison has promised better funding for firefighting and payouts for volunteer firefighters, and an additional A$2bn ($1.4bn; £1bn) for the recovery. But the national government has come under strong criticism from its opponents that it's not been doing enough against climate change. The country is one of the world's biggest per capita greenhouse gas emitters but under international agreements it has committed itself to reduction targets. A funding agreement between the states and the commonwealth for the National Aerial Firefighting Agency was reached in 2003 after a particularly fierce bushfire season. The Howard government agreed the commonwealth would provide 50% of the funds each year. But by 2017, the federal share of funding had fallen to 23%. Despite a formal request in 2017 from the national agency to permanently increase its budget, the federal Coalition chose to offer an $11m "one-off" top-up to the centre's $14.8m funding in 2018. That was renewed on 12 December 2019. But by then the east coast was already ablaze.

Questions to think about

1. What are the decisions the government makes for the sake of the bushfire?

2. What can the local citizens do in order to make a little bit of a difference for the forest reservation?
3. How did the bushfire affect the economy as a whole?
4. What are the alternative choices for the agricultural industry to get rid of extra materials besides burning?
5. What are the impacts of bushfires on human and animal life, agricultural land, the environment, public and private assets and local communities?

Reference list for further information

1. *https://createdigital.org.au/australian-bushfires-a-timeline-of-whats-happened-so-far/*
2. *https://www.bbc.com/news/world-australia-50951043*
3. *https://www.insider.com/when-how-australia-bushfires-started-in-2019-2020-1#december-21-2019-a-bushfire-in-the-east-gippsland-region-of-victoria-begins-creating-its-own-weather-the-smoke-generates-clouds-that-create-thunderstorms-ultimately-leading-to-more-fires-10*
4. *https://www.weforum.org/agenda/2020/01/australia-bushfires-size-impact-wildlife-emissions/*
5. *https://www.bbc.com/news/world-australia-50980386*
6. *https://onetreeplanted.org/blogs/stories/australia-bushfires*

TOPIC B : Combating the Detrimental Effects of Fast Fashion

Introduction of the topic

The term ‘fast fashion’ has become more prominent in conversations surrounding fashion, sustainability and environmental consciousness. The term refers to ‘cheaply produced and priced garments that copy the latest catwalk styles and get pumped quickly through stores in order to maximise on current trends’.Fast fashion is the cheap mass production of trendy clothing. Companies use cheap materials and labor in foreign countries to produce clothing following the latest trends. In recent years, fashion trends started coming and going at a much faster rate. People want to keep up to date with all of

the trends but couldn't afford to until this new industry started. As a result, people are able to wear clothes for a short period of time before moving onto the next new thing. While this can seem beneficial the negative effects of fast fashion are overwhelming. There is the environmental impact and human impact that we need to consider. As consumers we are so far removed from the entire production process that it has little to no impact on us. All we know is that shopping makes us feel good for a while. Fashion has the ability to fill that empty void in our life. For each item we buy, we get a sense that our own lives are starting to resemble those glamorous look books and billboards which sell us a distorted illusion of *'the happy or perfect life'.* As consumers we all have a duty of care to educate ourselves on the impact our purchases are having. The entire process of fast fashion is very complex and very ugly. For most of us, if we knew the truth behind what we wear, we would choose different clothing.

Effects

Pollution

Fast fashion accounts for 10% of all carbon emissions in the world and is the second largest industry when it comes to pollution behind the oil industry. Fast fashion companies put out 150 billion clothing items every year. Since the materials of the clothes are cheap, people throw them away after only a few uses in exchange for new clothing.

Among the environmental impacts of fast fashion are the depletion of non-renewable sources, emission of greenhouse gases and the use of massive amounts of water and energy. The fashion industry is the second largest consumer industry of water, requiring about 700 gallons to produce one cotton shirt and 2 000 gallons of water to produce a pair of jeans. Business Insider also cautions that textile dyeing is the world's second-largest polluter of water, since the water leftover from the dyeing process is often dumped into ditches, streams or rivers.

Worker's Rights

Fast fashion companies also exploit their overseas workers to maximize profits. Fast fashion is bad for workers, especially young and underage women. These women work

long hours with minimal pay and they work in unsafe working conditions. Many women start working underage because they need a way to support themselves.

These workers get paid measly wages, but they are also subjected to dangerous working conditions with no benefits or protection. There are instances throughout history, such as when the Rana Plaza workshop collapsed in 2013 killing over 1000 workers. The combination of working long hours, underpayment and extremely unsafe conditions are just some ways companies exploit their workers. And this exploitation is just another one of the negative effects of fast fashion.

A significant portion of the labour used in the production of fashion products is based in countries within the developing world where work regulations and minimum wage are virtually non-existent. As the manufacturing process does not require high level skills, workers accept low wages due to being desperate for any kind of income which will help put food on the table for their family. Over 80% of the employees within the fast fashion industry don't even earn a living wage – this then locks them in a channel of poverty.

In her project, An Analysis of the Fast Fashion Industry, Annie Radner Linden suggests that 'the garment industry has always been a low-capital and labour intensive industry'. In her book, No Logo, Naomi Klein argues that developing nations are viable for garment industries due to 'cheap labour, vast tax breaks, and lenient laws and regulations'. According to The True Cost, one in six people work in some part of the global fashion industry, making it the most labour-dependent industry. These developing nations also rarely follow environmental regulations; China, for example, is a major producer of fast fashion but is notorious for land degradation and air and water pollution.

Microplastic

Brands use synthetic fibres like polyester, nylon and acrylic which take hundreds of years to biodegrade. A 2017 report from the International Union for Conservation of Nature (IUCN) estimated that 35% of all microplastics- tiny pieces of non-biodegradable plastic- in the ocean come from the laundering of synthetic textiles like polyester.
The production of making plastic fibers into textiles is an energy-intensive process that requires large amounts of petroleum and releases volatile particulate matter and acids like hydrogen chloride. Additionally, cotton, which is in a large amount of fast fashion

products, is also not environmentally friendly to manufacture. Pesticides deemed necessary for the growth of cotton presents health risks to farmers.

Energy

The production of making plastic fibres into textiles is an energy-intensive process that requires large amounts of petroleum and releases volatile particulate matter and acids like hydrogen chloride. Additionally, cotton, which is in a large amount of fast fashion products, is also not environmentally friendly to manufacture. Pesticides deemed necessary for the growth of cotton presents health risks to farmers.

To counter this waste caused by fast fashion, more sustainable fabrics that can be used in clothing include wild silk, organic cotton, linen, hemp and lyocell.

Solutions

The World Resources Institute suggests that companies need to design, test and invest in business models that reuse clothes and maximise their useful life. The UN has launched the Alliance for Sustainable Fashion to address the damages caused by fast fashion. It is seeking to 'halt the environmentally and socially destructive practices of fashion'. One way that shoppers are reducing their consumption of fast fashion is by buying from secondhand sellers like ThredUp Inc. and Poshmark, both based in California, USA; shoppers send their unwanted clothes to these websites and people buy those clothes at a lower price than the original. Another solution is renting clothes, like the US-based Rent the Runway and Gwynnie Bee, the UK based Girl Meets Dress, and the Dutch firm Mud Jeans that leases organic jeans which can be kept, swapped or returned.

Other retailers like Adidas are experimenting with personalised gear to cut down on returns, increase customer satisfaction and reduce inventory. Ralph Lauren has announced that it will use 100% sustainably-sourced key materials by 2025.

Question to think about

1. What can you do if this situation happens in your country?

2. How can the UNEP solve this without disturbing the economy of countries as whole?
3. How did “fast fashion” be considered as one of the main problems of climate change?
4. What are the alternative choices for branded clothes other than using the concept of fast fashion?
5. How can we stop people, especially refugees from getting exploited in this industry?

Reference list for more further information

1. https://www.borgenmagazine.com/the-negative-effects-of-fast-fashion/#:~:text=The%20Negative%20Effects%20of%20Fast%20Fashion%3A%20Pollution&text=Since%20the%20materials%20of%20the,environment%20after%20being%20thrown%20out.

2. https://impakter.com/fast-fashion-effect-on-the-environment/

3. https://www.weekendinspirations.com/the-negative-impact-of-fast-fashion/

4. https://earth.org/fast-fashions-detrimental-effect-on-the-environment/

5. https://www.klow.co/blogs/klow/consequences-of-fast-fashion-on-health-and-the-environment

6. https://www.elle.com.au/fashion/problem-with-fashion-hauls-25078

7. http://thewellesleynews.com/2021/03/28/its-time-to-break-down-the-fast-fashion-industry/