Impact Of Climate Change On Food Security: Melbourne Versus India

Food security is a persons' ability to access food at all times. For a country to be food secure it has to have food accessibility, food availability and sustainability. Climate change is the process in which the whole climate's average temperature changes. This can be measured by specialists in atmospheric sciences such as climatologists and meteorologists. Over time, it has been discovered that Earth's average temperature is increasing. This phenomenon is known as "global warming". Climate change can have a number of consequences that have the potential to impact food security.

Figure 1: The Greenhouse Effect (NASA, 2017).

Part One - Melbourne

Causes of climate change

The greenhouse effect

Climate change is caused by the "greenhouse effect". This happens when gases stop heat from escaping the atmosphere. These gases include carbon dioxide, methane, nitrous oxide and chlorofluorocarbons. Carbon dioxide is produced naturally, for example, breathing or as a result of human actions, for example, burning fossil fuels. Methane is produced naturally, for example, livestock or as a result of human actions, for example, driving a car.

Impacts of climate change

Overall

The environmental, social and economic impacts of climate change are extensive.

Desertification

Arid or semi-arid areas are formed in a process known as desertification. For an area to be considered arid it has to receive less than 25 centimetres of rain each year. 70% of Australia's land is considered arid or semi-arid (Outback Australia, 2005). In these areas, it is difficult to sustain life. Flora and fauna have to undergo physical and behavioural adaptions to be able to survive. In relation to climate change, desertification happens because of the rising temperatures drying out the soil and increasing evaporation. It is a major problem for farmers because of desertification, urbanisation and over-population reduce the amount of land able to grow crops. It can ultimately affect Australia's food security and soil quality.

Droughts

Little precipitation will likely make droughts more frequent leading to water scarcity. Water restrictions are likely to become tighter which can have a big impact on our lifestyle. Farmers

will have limited water for crops and to quench the thirst of their livestock. This, in turn, will have an impact on our country's food security. We will not have enough water available to use for leisurely activities, for example, swimming.

Floods

The increase in temperature is already seen to be melting ice caps and glaciers. As a result, sea level is rising. This will impact the property market in these regions. It puts coastal cities at risk of turning into wetlands. Floods also put stress on agricultural production. It destroys crops leaving farmers with no way to make money.

Bushfires

Bushfires due to dried out plantations. Animals are forced to flee their habitats from flames and often are not able to escape. Fires can move into residential areas destroying homes. During winter, councils will encourage burn-offs and planned burns to remove dried wood that would easily catch alight in summer.

Health

Climate change is already starting to have a big impact on peoples physical and mental health. There will be more cases of illnesses due to heat. These include heat stroke, heat rash and fainting. Studies show that 8 in 10 Australians are dehydrated (Water Logic, 2017). If the temperature continues to rise, so will this number. Dehydration occurs when the body lacks the amount of fluid it needs. Dehydration can affect the way the body functions.

Population

There is predicted to be an increase in population due to the influx of refugees seeking a cooler climate and healthcare. This leads to another issue being discussed in government which is over-population. Over-population comes with a range of issues itself including limited jobs, urbanisation and pollution.

Adaption

The issue of climate change has arisen in the Australian government sparking concern because of the list of detrimental impacts. They are continuing to discover and invent new solutions to meet their climate change target. This is costing the government and taxpayers more money but is a good investment for the future.

Challenges for future food security

All of the impacts listed above will pose a threat to Australia's food security. Changing weather patterns will affect the growth of crops. Crops need to be grown in a certain environment. Queensland is Australia's main banana supplier. Recurring floods in the wet season destroy crops. Heatwaves will increase food prices as evident in the 2009 Victoria heatwave which destroyed a large fruit supply (Australian Government, 2017). If our country experiences disruptions in supply, this could damage our trade relationships with other countries. Overall, the

standard and accessibility of crops will be greatly affected.

Responsibility

Here is the big question many want to be answered, who is to blame? That question is not so easy to answer. Technically, everyone contributes to climate change and the emission of greenhouse gases in their everyday life. Recently in Melbourne, there have been strikes for climate change in the CBD. They want stricter laws enforced surrounding our policies.

Solutions

Renewable energy sources

In 1992, nations were presented with the Kyoto Climate Change Protocol. This protocol is a global agreement in which the signatories The “Renewable Energy Target” is introducing wind, solar and hydropower in replace of our non-renewable energy sources. Wind power uses the motion of wind turbines to create electricity. 33.5% of Australia’s overall clean energy produced in 2018 was from wind energy (Clean Energy Council, 2019). Solar power uses the suns rays to create affordable electricity. Hydropower uses the motion of water to propel a device and create electricity. The use of wind and solar energy are increasing, but hydropower being slower. The Australian government is dedicating a large portion of money from the climate solutions pack to get it into use and campaign the benefits for farmers. All of these sources of energy would decrease greenhouse gas emissions and save the population money.

Renewable bags

Plastic bags are often used once by consumers and then thrown away. We don’t often think about the environmental footprint the manufacturing and transportation leaves. Plastic bags are used for a very short period of time, but take roughly 1000 years to break down. They lead to the pollution and destruction of ecosystems that are essential for our world to continue to thrive. Australia’s stores are starting to “phase-out” plastic bags and are introducing renewable bags made of recycled materials. This

Part Two - India

Challenges for future food security

Climate change has challenged the already struggling food security in India. India is vulnerable to changes in weather patterns. Lack of precipitation dries out water-dependent crops, but no rice or other grains. This could increase the price of food for a country with a population of 1.34 billion. Multiple regions are already being exposed to extreme temperatures. Adaption strategies are required to combat climate change and to protect food security. Being a developing country, the government may not have enough money to invest in solutions. 14.5% of India’s population is already malnourished (India Food Banking Network, 2019). If food security continues to be affected, this number could increase dramatically. The population would not have the appropriate access and availability to food. This is likely to affect crime rates with people having to steal and scavenge for food.

Solutions

Replace coal with other resources

72% of India's electricity was generated from coal (Central Electricity Authority, 2019). Carbon dioxide is absorbed by trees and replaced with oxygen. Coal is made of wood. When it is burnt it releases all the stored carbon dioxide into the atmosphere. India is the biggest consumer and exporter of coal in the world. Stopping mining and converting to another energy resource would have an impact on India's economy. Being a developing country, the government may not have enough money to invest in changing to more renewable resources.

Figure 2: A graph showing the percentage of electricity that was produced by coal (The Conversation, 2019).

Packaging and processing food

The packaging and processing of food is a big contributor to greenhouse gas emissions in India. Think about the process a food item has to go through to get on the shelves of a supermarket. It has to go through manufacturing, packaging and transportation. In a factory, greenhouse gases are released by machinery to power it. The packaging of items, especially plastic, can leave an environmental footprint and can be a major contributor to climate change. Transportation releases methane gas that can contribute to global warming. India's population are helping to mitigate this problem. Because farming is one of the main practices in India, most citizens buy fresh food daily from the market. This involves no or little, greenhouse gas emission.

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