



DZUP EskweKalikasan Module 5

Climate Change





KAYANG-KAYA! PODCAST

Kayang-Kaya! is a 10-episode podcast in Filipino that follows the adventures of three senior high school students, Kali, Naya, and Alab, as they seek to understand and uncover issues confronting the environment. As an educational tool, the podcast serves to supplement classroom discussion using aural storytelling.

In ***Episode 5***, titled ***"Bakit kayâ summer na pero bumabagyo pa rin sa barangay namin?"***, the annual inter-barangay beach volleyball competition will not be pushing through next week due to an impending typhoon. Disappointed, Kali, Naya, and Alab decide to investigate why a typhoon has come in the middle of summer, with Kali thinking that climate change may be to blame. Kap Tina encourages the three friends' quest as they consult with experts to better understand climate change.



Sources:

Photo 1: Rosales, KJ. (n.d.). Filipinos have varying concerns on drought as Philippines experiences El Niño — study [Online image]. PhilStar Global. <https://www.philstar.com/headlines/2019/03/15/1901720/filipinos-have-varying-concerns-drought-philippines-experiences-el-nio-study>

Photo 2, 3: Flooding in the Philippines [Online images]. (n.d.). CNN. <https://edition.cnn.com/2012/08/07/world/asia/philippines-floods/index.html>

Photo 4: Getty Images. (2018). Sinking feeling: Philippine cities facing 'slow-motion disaster' [Online image]. Yahoo News. <https://ph.news.yahoo.com/sinking-feeling-philippine-cities-facing-slow-motion-disaster-152947137.html>

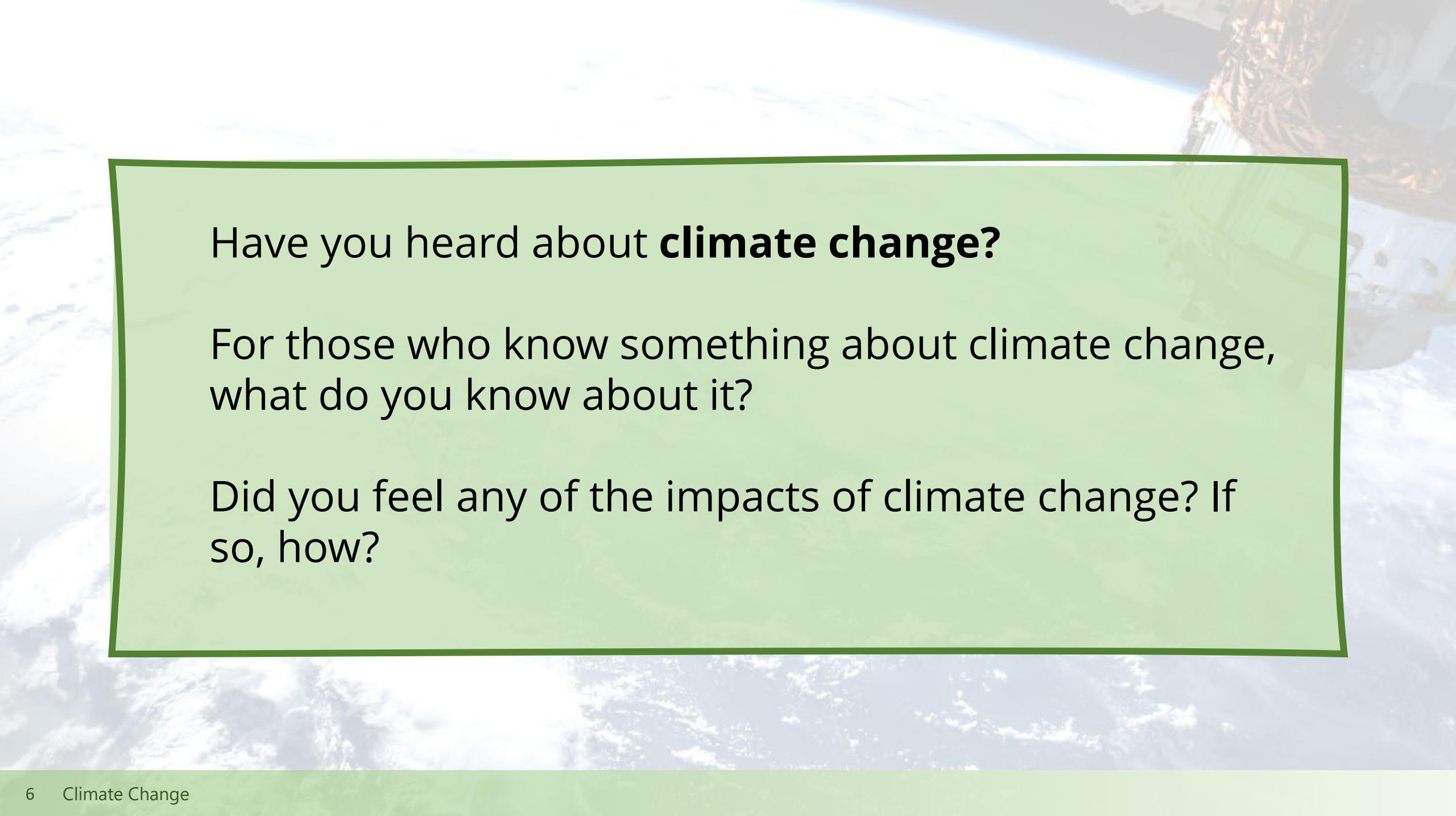


What different phenomena can you see in the photos?



What do you think is the relevance of the images in the discussion for today?





Have you heard about **climate change**?

For those who know something about climate change, what do you know about it?

Did you feel any of the impacts of climate change? If so, how?

a. Global rise of temperature

Global Mean Surface Temperature

As greenhouse gas concentrations rise, so does global mean surface temperature (GMST). GMST is measured using a combination of air temperature two meters over land, and sea surface temperature in ocean areas from various databases, typically expressed as an anomaly from a baseline period. (World Meteorological Organization, 2021)

a. Global rise of temperature

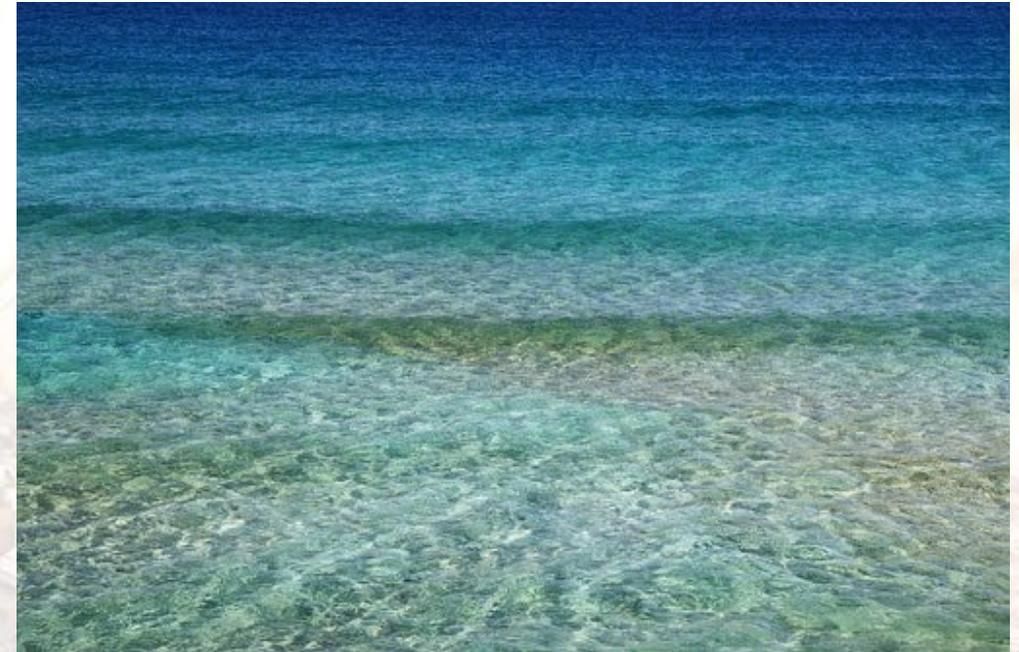
Based on the State of the Global Climate report:

- The global mean temperature for 2020 was 1.2 ± 0.1 °C above the 1850–1900 baseline (Figure 1), which places 2020 as one of the three warmest years on record globally.
- With 2020 being one of the three warmest years on record, the past six years, 2015–2020, were the six warmest on record. The last five-year (2016–2020) and 10-year (2011–2020) averages were also the warmest on record.

The full report is available here: <https://public.wmo.int/en/our-mandate/climate/wmo-statement-state-of-global-climate>

b. Warming oceans

Since 1969, the top 700 meters (about 2,300 feet) of the ocean have shown **warming of more than 0.4 degrees Fahrenheit** due to the absorption of increased heat from greenhouse gas emissions.



Source: Oceans of Climate Change [Online video]. (2009). NASA Jet Propulsion Laboratory. <https://www.jpl.nasa.gov/video/details.php?id=827>

c. Decreased snow cover

Over the past five decades, satellite observations reveal the **amount of spring snow cover in the Northern Hemisphere has decreased** and that the snow is melting earlier.



Source: Snow Cover [Online video]. (n.d.). NASA The Earth Observatory.
https://earthobservatory.nasa.gov/global-maps/MOD10C1_M_SNOW

d. Declining Arctic sea ice

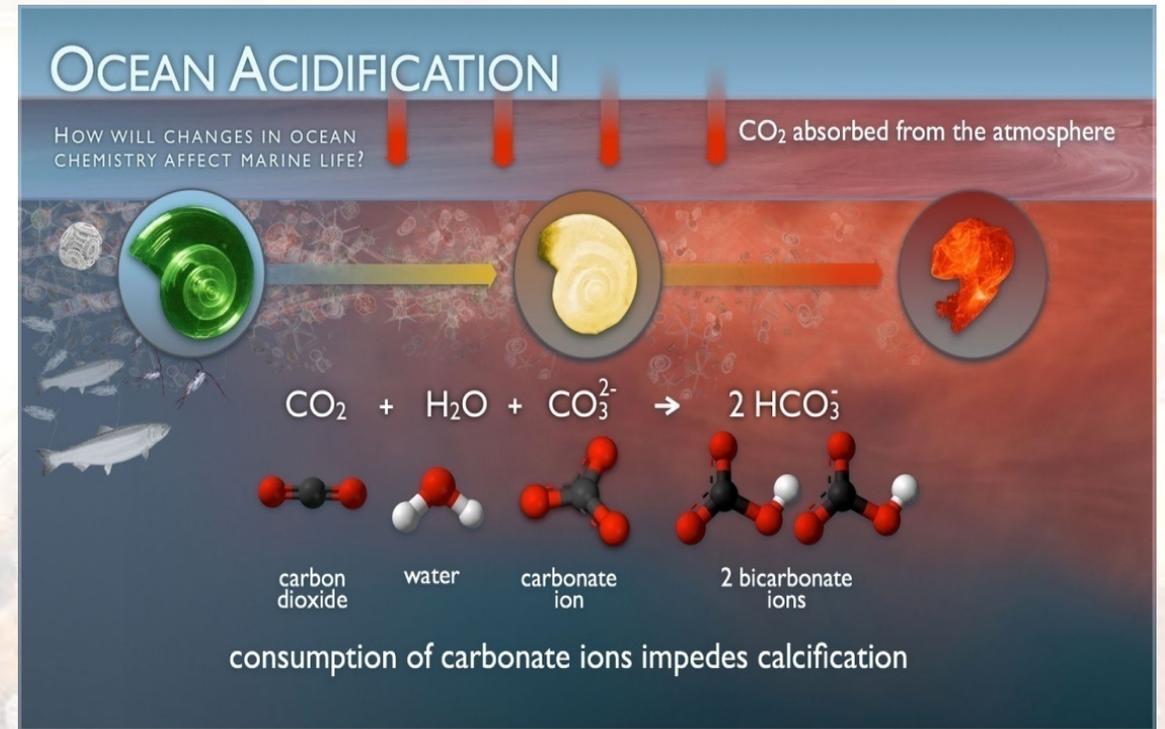
Over the last several decades, both the **extent and thickness of Arctic sea ice have declined rapidly**, which means the ice that survives year-round is thinner and more fragile than it used to be.



Source: Annual Arctic Sea Ice Minimum 1979-2015 with Area Graph [Online video]. (2016). NASA Scientific Visualization Studio. Retrieved from <https://svs.gsfc.nasa.gov/4435>

e. Ocean acidification

Since the beginning of the Industrial Revolution with human activity emitting more carbon dioxide into the atmosphere, the **acidity of surface ocean waters** has increased by about 30 percent. The amount of carbon dioxide absorbed by the upper layer of the oceans is increasing by about 2 billion tons each year.



Source: Ocean Acidification [Online image]. (n.d.). <https://www.pmel.noaa.gov/co2/files/pmel-aa-imageee.jpg>

f. Shrinking of ice sheets

The Greenland and Antarctic ice sheets have decreased in mass. Data from NASA's Gravity Recovery and Climate Experiment show Greenland **lost an average of 286 billion tons of ice per year between 1993 and 2016**, while **Antarctica lost about 127 billion tons of ice per year during the same period**. The rate of Antarctica ice mass loss has tripled in the last decade (NASA, Global Climate Change, n.d.).

g. Glacial retreat

Glaciers are retreating almost everywhere around the world, including in the Alps, Himalayas, Andes, Rockies, Alaska, and Africa (NASA, Global Climate Change, n.d.).

h. Extreme weather events

It can range **from a flood to drought, to a hurricane to a hailstorm**. In the United States, the number recorded high-temperature events has been increasing, while the number of recorded low-temperature events has been decreasing since 1950 (NASA, Global Climate Change, n.d.).

g. Sea level rise

Global sea level recorded about 8 inches rise in the last century. However, the rate in the last two decades is nearly doubled that of the last century and accelerating slightly every year (NASA, Global Climate Change, n.d.).



THREATS TO CORAL REEFS CLIMATE CHANGE

Increased greenhouse gases from human activities result in climate change and ocean acidification.

CLIMATE CHANGE = OCEAN CHANGE



CO₂

The world's ocean is a massive sink that absorbs carbon dioxide (CO₂). Although this has slowed global warming, it is also changing ocean chemistry.

HOW YOU CAN HELP

Shrink your carbon footprint to reduce greenhouse gases.



Drive less.



Reduce, reuse or recycle.

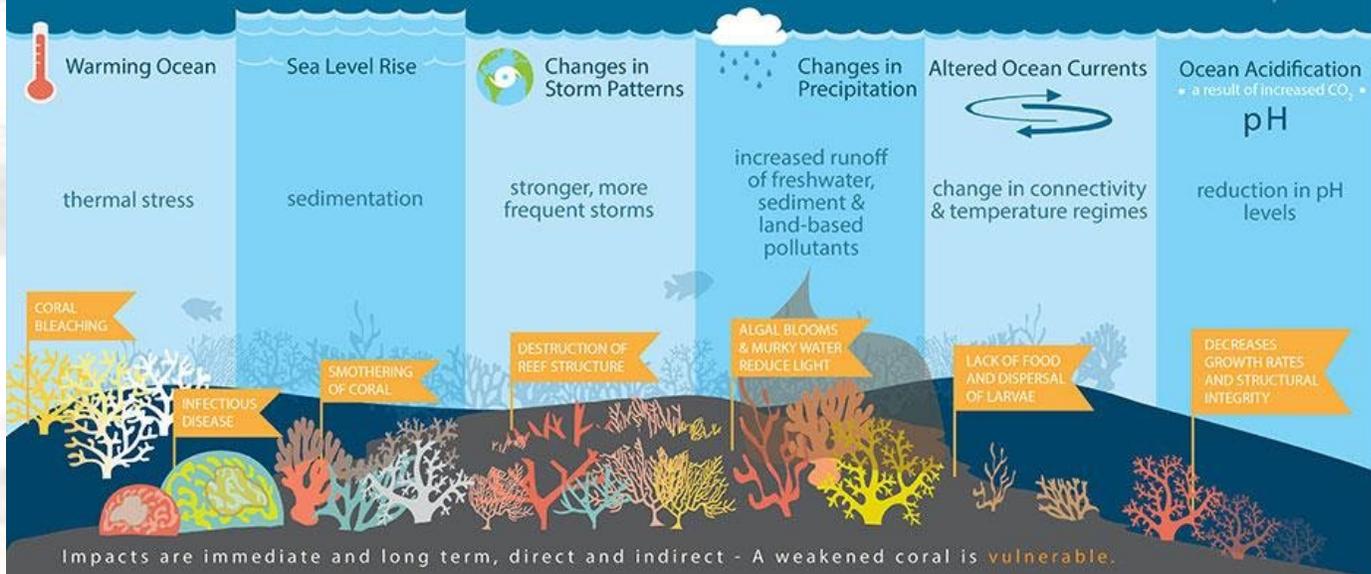


Purchase energy-efficient appliances and lightbulbs.



Print less. Download more. Use less water.

CLIMATE CHANGE dramatically affects CORAL REEF ECOSYSTEMS



Do your part to help improve overall coral reef condition.



Reduce the use of lawn and garden chemicals.



DO NOT dump household chemicals in storm drains.



Choose sustainable seafood.
www.FishWatch.gov



Learn about good reef etiquette and practice it when in the water.



Volunteer for beach and waterway clean ups.

Source: How does climate change affect coral reefs? [Online image]. (n.d.). NOAA National Ocean Service. <https://oceanservice.noaa.gov/facts/coralreef-climate.html>

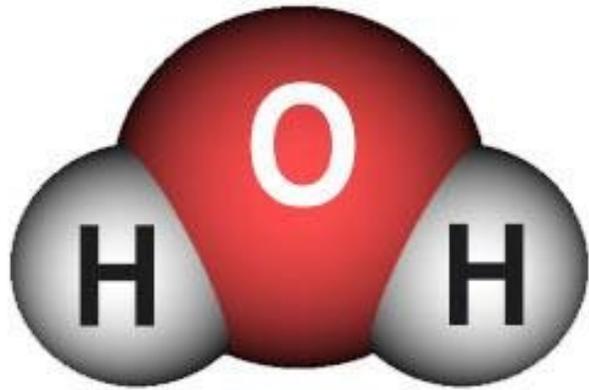
Based on the graph, how do you predict the global temperature in the coming decades?

Which among the pieces of evidence of climate change does the Philippines experience now?

What causes these **climate change events**, say for example, global warming?

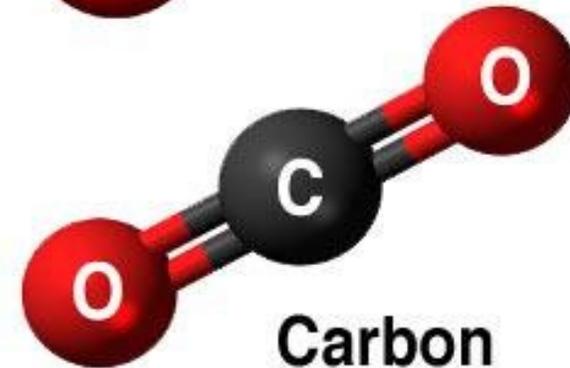
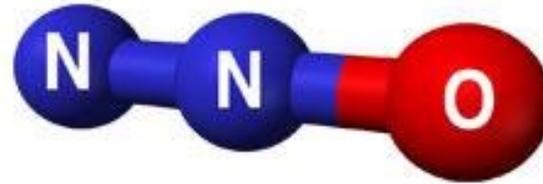
What is **the greenhouse effect**?

When you mention “greenhouse gases,” these are gases which block heat from escaping the Earth’s surface. Can you enumerate those gases?

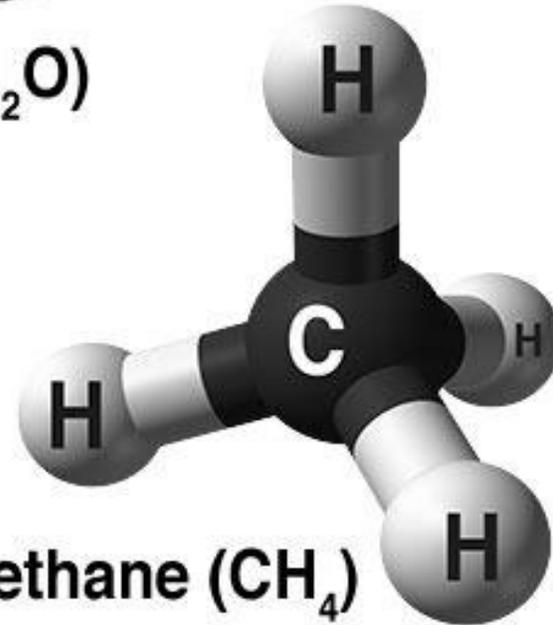


Water vapor (H_2O)

Nitrous oxide (N_2O)



Carbon dioxide (CO_2)



Methane (CH_4)

Source: The Causes of Climate Change [Online image]. (n.d.). NASA Global Climate Change. <https://climate.nasa.gov/causes/>

The Greenhouse Effect



Source: Source: NASA/JPL-Caltech. (n.d.). The Causes of Climate Change [Online GIF image]. NASA Global Climate Change. <https://climate.nasa.gov/causes/>

Who are mostly responsible for emitting these greenhouse gases? Why?

What are some of the actions that you do in your everyday lives that help mitigate **the onset of climate change?**



720417

CLIMATE ACTIONS
TAKEN AROUND
THE WORLD



ACT NOW ADVOCACY



5-Minute Showers



Bring Own Bag



Drive Less



Lights Off



Local Produce



Meat-free Meals



Recycle



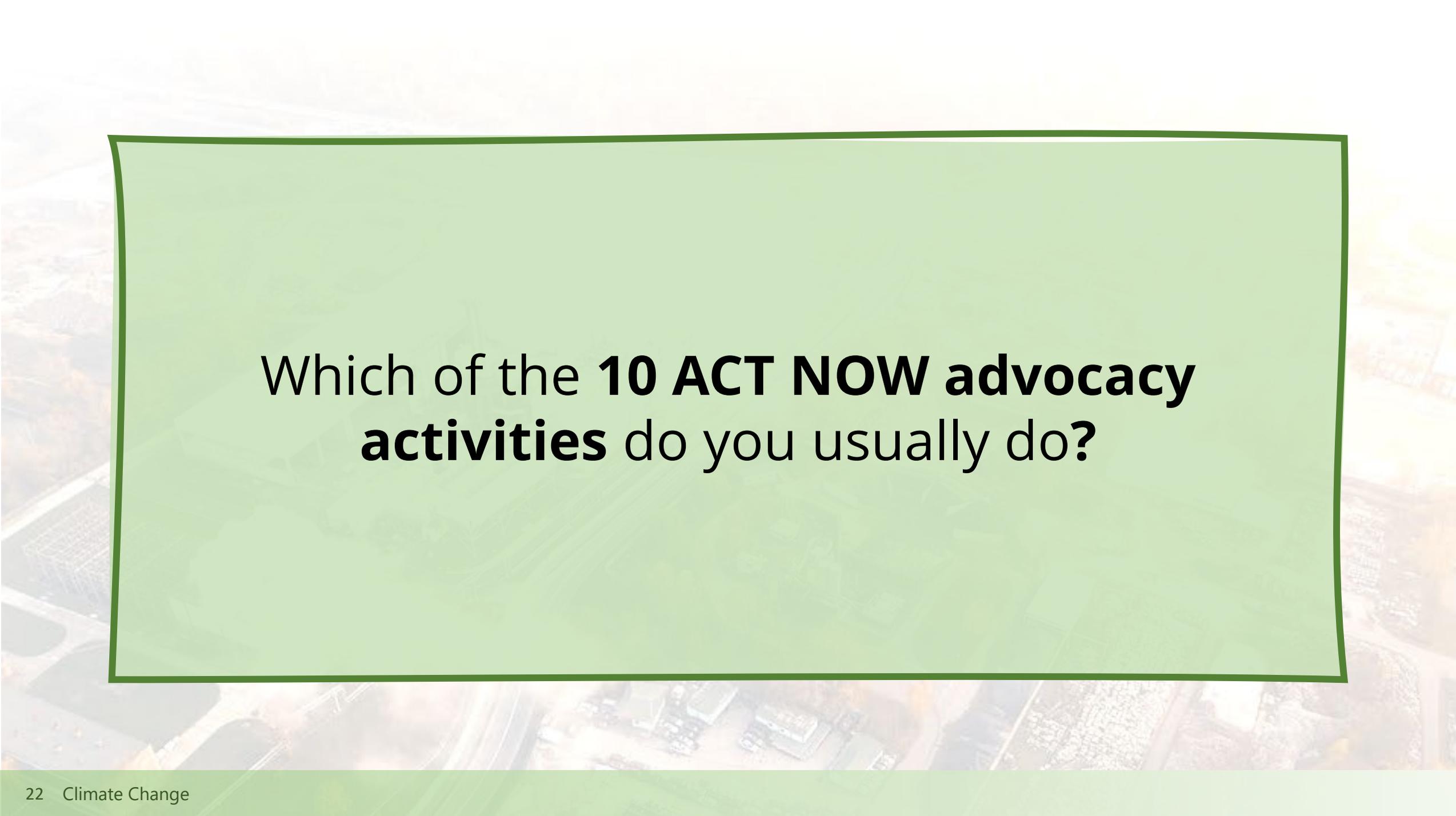
Refill and Reuse



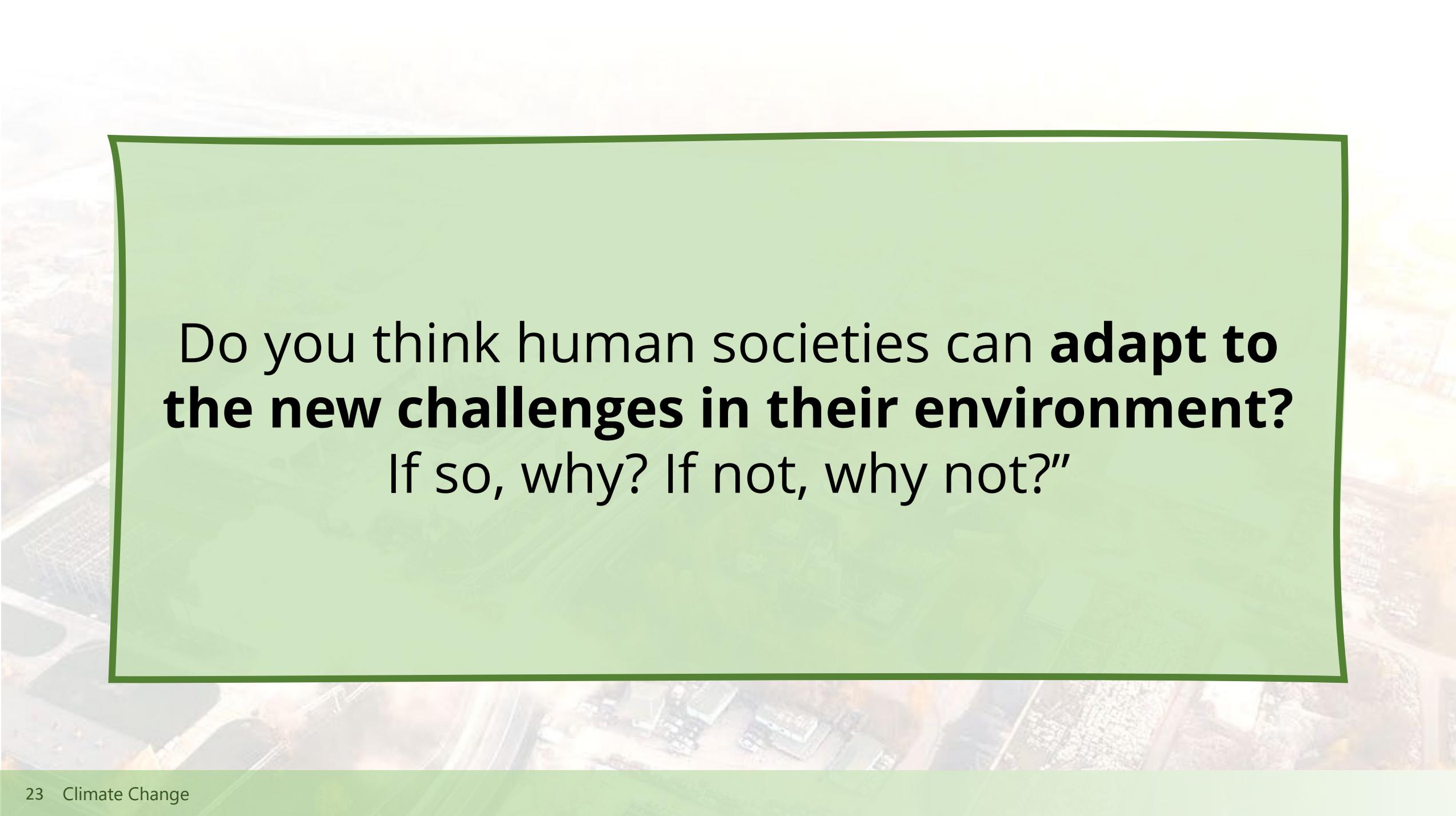
Unplug



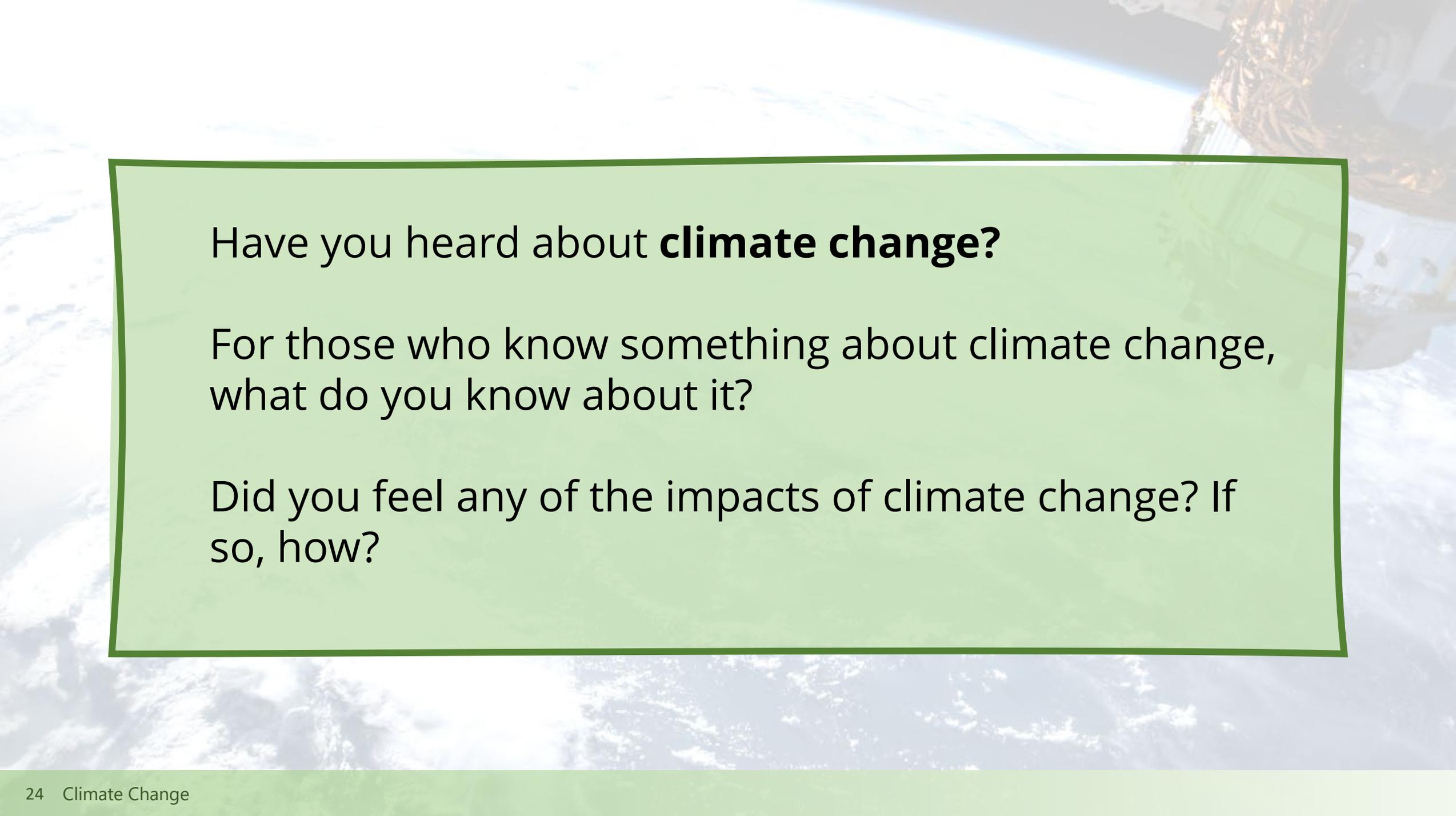
Zero-Waste Fashion

An aerial photograph of a city, showing streets, buildings, and green spaces, is visible in the background. A large, semi-transparent green rectangular box with a dark green border is centered on the page, containing the text.

Which of the **10 ACT NOW advocacy activities** do you usually do?

An aerial photograph of a city is visible in the background, showing streets, buildings, and green spaces. A large, semi-transparent green rectangular box with rounded corners is overlaid on the image, containing the text.

Do you think human societies can **adapt to the new challenges in their environment?**
If so, why? If not, why not?"



Have you heard about **climate change**?

For those who know something about climate change, what do you know about it?

Did you feel any of the impacts of climate change? If so, how?

Reflection:

Why is the participation of the youth important in addressing the causes and effects of extreme weather conditions?

Short Exploratory Essay Writing

As a youth, which of the primary aspects of extreme weather conditions would you like to focus on and take concrete steps in addressing its causes and impacts? Explain further as to why it would be, and how do you think the actual community where you belong can address it?



You may listen to this podcast episode at dzup.org/eskwekalikasan. Catch all ten episodes of *Kayang-kaya!* Podcast at dzup.org.

Episode 1: Ano ang carbon footprint?

Episode 2: Kakaunti na lang ba talaga ang mga isda natin sa Pilipinas?

Episode 3: Ano ang kahalagahan ng pagtanim ng punò sa tao at sa kapaligiran?

Episode 4: Ano ang epekto ng “fast fashion” sa ating kalikasan?

Episode 5: Bakit kayâ summer na pero bumabagyo pa rin sa barangay namin?

Episode 6: Mapupunô ba ng basura ang barangay namin?

Episode 7: Bakit walang lumalabas na tubig sa gripo?

Episode 8: Paano maghahanda ang buong barangay laban sa disaster?

Episode 9: Paano napapagana ang cellphone ng hangin at tubig?

Episode 10: Bakit kailangang lumahok ang kabataan sa environmental movement?

If you'd like to know more about climate change, you may listen to the radio episodes of DZUP EskweKalikasan's Module 4. Climate Change:

Radio Episode 1. Philippine policies and laws on Climate Change

Guest: Reginald Rex Barrer

Radio Episode 2. Climate Change and the Philippine Situation

Guests: Jefferson Estela and Smrz Kahlil Andrei Dancel

Radio Episode 3. Explaining Climate Change and Extreme Weather Conditions

Guest: Wilmer Agustin

Radio Episode 4. The Threat of Climate Change to the Island Nation and the Experience of Coastal Communities: How Should We Invest in Climate and Disaster Resilience

Guests: Pablo Rosales and Danilo Ramos

Radio Episode 5. Climate Change, Agriculture, and Food Security

Guest: Cathy Estavillo