



WASTE MANAGEMENT

Climate Changes



WHAT IS CLIMATE CHANGE?

- The planet's climate has been constantly changing over geological time.
- The global average temperature today is about 15 °C though geological evidence suggests it has been much higher and lower in the past.
- The current period of “global warming” is occurring more rapidly than many past events.



WHAT IS CLIMATE CHANGE?

- Scientists are concerned that natural fluctuations in the climate are being overtaken by rapid, human-induced warming that has serious implications for the stability of the planet's climate.
- Evidence of rising temperatures is striking: thermometer records kept over the past century and a half show Earth's average temperatures have risen more than 0,9 °C and about twice that in parts of the Arctic.



HOW WE MEASURE CLIMATE CHANGE?

- And how do we know climate change is real?
- We did not have technology in the past to measure.
- Climate change is measured for example by trees storing information about the climate in the place they´re rooted.
- Each year trees grow thicker and form new rings. In warmer and wetter years, the rings are thicker.



HOW WE MEASURE CLIMATE CHANGE?

- Old trees and wood can tell us about conditions hundreds or even thousands of years ago.
- Also, windows on the past are buried in lakes and oceans.
- Dead creatures fall to the bottom of oceans forming sediments.
- Sediments contain information about what was in the air and water when they fell.



HOW WE MEASURE CLIMATE CHANGE?

- For a direct look at the atmosphere of the past, scientists drill cores through the Earth's polar ice sheets.
- Tiny bubbles trapped in the ice are samples from Earth's past atmosphere, frozen in time.
- That is how we know that the concentrations of greenhouse gases since the Industrial
- Revolution are higher than they've been for hundreds of thousands of years.



TO HELP BETTER UNDERSTAND THE EARTH'S CLIMATE..

- Scientists use computer models.
- These models also allow scientists to make predictions about climate by simulating how the atmosphere and oceans absorb energy from the sun and transport it around the globe.



TO HELP BETTER UNDERSTAND THE EARTH'S CLIMATE..

- These climate models are designed to take such factors into account.
- Models have found that changes in solar irradiance and volcanic aerosols have contributed only about 2% of the recent warming effect over 250 years.
- The balance comes from greenhouse gases and other human-caused factors, such as land-use changes.



LAND-COVER CHANGE PROVIDES AN ADDITIONAL MAJOR FORCING ON CLIMATE

- Through changes in the physical properties of the land surface.
- The global radiative forcing by surface albedo (purpose of reflectance of the surface) change can be compared with greenhouse-gas emissions through the concept of radiative forcing.



LAND-COVER CHANGE PROVIDES AN ADDITIONAL MAJOR FORCING ON CLIMATE

- Compacted soils for human activities do not catch water cause lightning floods.
- Water that would otherwise soak up disappears, drains and rivers dry up.



LAND-COVER CHANGE PROVIDES AN ADDITIONAL MAJOR FORCING ON CLIMATE

- The groundwater level decreases.
- The drained continents get dry and overheated by solar energy.
- Earth's atmosphere is then heated by dry overheated compacted soils.



LAND-COVER CHANGE PROVIDES AN ADDITIONAL MAJOR FORCING ON CLIMATE

- Soils are the basic reservoirs of water in nature.
- One meter cubic of undamaged soil holds from 200 to 500 liters of water.



WHAT IS “GREENHOUSE EFFECT”?

- Earth’s atmosphere traps some of the energy from the Sun.
- Solar energy radiating back out to space from the Earth’s surface is absorbed by atmospheric greenhouse gasses caught in water steam and re-emitted in all directions.



WHAT IS “GREENHOUSE EFFECT”?

- The energy that radiates back down to the planet heats both the lower atmosphere and the surface.
- Without this effect, the Earth would be 30°C colder. This making our planet hostile to life.



WHAT IS “GREENHOUSE EFFECT”?

- Human activities are adding to the natural greenhouse effect with gases released from Industry coughed in water steam caused by compacting soils and low water retention.
- This is trapping more energy and increasing the temperature. The effect is commonly referred to as global warming or climate change.



THE IMPACT OF CLIMATE CHANGE

- Ice is melting worldwide, especially at the Earth's poles.
- This includes mountain glaciers, ice sheets covering West Antarctica and Greenland, and Arctic sea ice.
- Melting ice contributes to sea-level rise.
- Global sea levels are rising 3, 2 millimeters a year and a rise is occurring faster in recent years.



THE IMPACT OF CLIMATE CHANGE

- Rising temperatures are affecting wildlife and their habitats.
- Many species are on the move and migrate farther north or higher to the cooler areas.
- With climate change, scientists expect that some diseases will spread such as mosquito-borne malaria, Zika virus.
- The ecosystem will continue and some species such as polar bears won't be able to adapt and could become extinct.



THE IMPACT OF CLIMATE CHANGE

- Temperature increase affect also permafrost. This area covers 20% of Earth ´s surface is slowly melting.
- Permafrost is a remnant of the Ice age and it is estimated to contain 1600 billion tons of total organic carbon released in the form of greenhouse gases – carbon dioxide and methane. In addition to intensifying the greenhouse effect, carbon dioxide lowers the pH of the waters of the oceans and seas, making seawater more acidic and thus naturally disrupting marine ecosystems.