




MODULE1

Training Package 1.1

Climate change: causes and consequences

	<p>Lesson's description</p>	<p>This lesson presents the phenomenon of climate change and explains its causes and consequences</p>
	<p>Goal</p>	<p>The aim of this lesson is to raise awareness on climate change by providing you with full knowledge about its causes and consequences</p>
	<p>Learning outcomes</p>	<p>Knowledge:</p> <ul style="list-style-type: none"> • Definition of climate change • Causes and consequences of climate change <p>Skills:</p> <ul style="list-style-type: none"> • Ability to understand and explain the causes and consequences of climate change • Ability to act in an environmental- friendly way <p>Attitudes:</p> <ul style="list-style-type: none"> • Take initiatives to fight against climate change • Follow and promote a lifestyle that isn't harmful for the planet

1. Environment and quality of life

The sustainable development definition and the Sustainable Development Goals (SDGs) of the United Nations recognize the environment' importance for the quality of life. Sustainable development is defined as the kind of development which meets the needs of the present without compromising the ability of the future generations to meet their own needs. The loss of environmental resources has far-reaching implications for the welfare of the current generation and for the ability of future generations to maintain and improve the welfare and living conditions of human beings (Keles, 2011)



2. Definition of climate change

Climate change is the phenomenon of increasing global temperature leading to changing global and regional climate patterns, apparent from the late 20th century. Climate change is also called the greenhouse effect because some gases in the Earth's atmosphere act like the glass in a greenhouse, trapping the sun's heat and stopping it from leaking back into space and causing global warming (EC, n.d.). The greenhouse effect not by itself a harmful phenomenon, since it is necessary to keep global temperature high enough (about 15°C), so that life can be sustained on Earth (Nasa, n.d.). However, due to higher than normal concentration of greenhouse gases, global temperature is increasing by 0.2°C per decade, which undermines natural balance.

3. Causes of climate change

The main cause of climate change is the impact of human activities on nature. Even though greenhouse gases occur naturally, human activities are increasing the concentrations of some of them in the atmosphere:

- Carbon dioxide (CO₂)
- Methane
- Nitrous oxide
- Fluorinated gases

Among greenhouse gases, CO₂ is the largest contributor to global warming. By 2020, its concentration in the atmosphere had risen to 48% above its pre-industrial level (before 1750). The other greenhouse gases are emitted by human activities in smaller quantities. Non-greenhouse gas pollutants, including aerosols like soot, have different warming and cooling effects and are also associated with other issues such as poor air quality (EC, n.d.).

Human activities contributing to an increased concentration of greenhouse gas are:

- Burning coal, oil and gas, which produces carbon dioxide and nitrous oxide.
- Deforestation, since trees help to regulate the climate by absorbing CO₂ from the atmosphere. When they are cut down, that beneficial effect is lost and the carbon stored in the trees is released into the atmosphere, adding to the greenhouse effect.
- Increasing livestock farming, since cows and sheep produce large amounts of methane when they digest their food.
- Fertilizers containing nitrogen producing nitrous oxide emissions.
- Fluorinated gases, which are emitted from equipment and products using these gases. Such emissions have a very strong warming effect, up to 23 000 times greater than CO₂.



Natural causes, such as changes in solar radiation or volcanic activity are estimated to have contributed less than plus or minus 0.1°C to total warming between 1890 and 2010 (EC, n.d.).

4. Consequences of climate change

The consequences of an increasing global temperature include higher temperatures, droughts and floods, wildfires, reduction of water resources, rising sea level, loss of biodiversity, soils, inland water, and marine environmental changes. The impact of these environmental changes is translated as loss in business, tourism, energy, infrastructure, agriculture, and the economy in general (Holme & Rocha, 2021).

Climate change is already having negative effects on various aspects of people's life because it affects the environment, the food supply, and health issues. It is expected that climate change will cause hundreds of thousands of deaths each year by 2050. According to experts, rising temperatures are expected to increase the frequency of extreme weather events, cause severe food shortages, increase the number of people living with diseases such as malaria and diarrhoea and bring new diseases. Some of the most vulnerable individuals are children, women, and ethnic minorities (EC, n.d.).

Although it is clear that climate change has an influence on human health, it is still difficult to predict the scope and severity of many climate-sensitive health hazards. The susceptibility of populations, their resistance to the current rate of climate change, the breadth and pace of adaptation will all play a significant role in determining the health implications of climate change in the short- to medium-term. Over the past few decades, environmental quality has increased substantially throughout Europe.

However, environmental health risks still have an impact on Europeans. In recent years, heatwaves across Europe have claimed thousands of lives, while cold snaps are associated with ill health and excess mortality. Droughts are also a problem because they negatively affect transportation infrastructure, forestry, agriculture, water, and biodiversity. The lower river and groundwater levels impede plant and tree development, intensify insect infestations, and ignite wildfires. The duration and intensity of the wildfire season will lengthen with more frequent and severe droughts, especially in the Mediterranean area. The region that is at risk from wildfires is growing as a result of climate change (EC, n.d.). The availability of fresh water is also affected due to changes in rainfall patterns, sea level rise, increased evaporation and melting of ice. A decline in water quality is anticipated to be brought on by more frequent and severe droughts as well as rising water temperatures. Such circumstances promote the development of harmful bacteria and algae, which will exacerbate the water quality issue (EC, n.d.).



In the upcoming years, flooding is probably going to happen more often in Europe due to climate change. Due to increasing temperatures, it is predicted that heavy rainstorms will occur more frequently and will be more powerful; flash floods will also occur more frequently over Europe. Less winter snowfall in some locations may reduce some dangers, such as early spring floods, in the short run, but the increased risk of flash flooding in mountain areas, which overloads the river system, may counteract those impacts in the long term (“Consequences of climate change”, 2022).

Throughout the 20th century, sea levels increased, and in more recent years, the trend has accelerated. The rise is mostly caused by the seas’ thermal expansion as a result of global warming. However, the Antarctic ice sheet and glaciers’ melting ice also contribute. By the end of the century, it is anticipated that Europe would see an average sea level increase of 60 to 80 cm, mostly dependent on how quickly the Antarctic ice sheet melts. Additional saltwater intrusion into freshwater bodies is also anticipated to result from this, which will have an impact on agriculture and the availability of drinking water. Additionally, it will have an impact on the natural resources and services that coastal ecosystems and biodiversity supply. The loss of several wetlands threatens rare bird and plant species and eliminates the storm surge protection that these regions naturally offer (EC, n.d.).