1. Human Transformation of the Natural Environment

Human transformation of the natural environment refers to the significant changes made to natural ecosystems and landscapes by human activities, including cutting down trees (deforestation), also remove soil to extract mineral resources, building often leading to biodiversity loss, pollution, and climate change.

The IPAT equation helps us understand how different things people do can affect the environment.

$I=P\,A\,T$

- *I*= the amount of pressure / impact on environment by human
- *P* is the number of people
- *A*= the wealth (or demand on resources/ person)
- *T*= a technological factor (the power that humans can exert through technological change).

To Know how human impact on small islands through the history, a study by Takacs-Santa (2004) maintains the effects of human activities on the environment, with a focus on:

1. The use of fire
2. The development of language
3. The Islamic civilization (This is not included with Takacs-Santa)
4. The birth of agriculture
5. The development of cities and states
6. European colonialism
7. The technological –Scientific revolution

2- Negative Environmental Impacts

Negative environmental impacts are the detrimental effects on the natural environment resulting from human activities that is mean (harmful both the natural environment and human health). Therefore, the main consequences are:

1- Pollution of the planet (land, water, and air). Pollution is the introduction of harmful materials into the environment. These harmful materials are called pollutants. Pollutants can be natural, such as volcanic ash. They can also be created by human activity, such as trash or runoff produced by factories. Pollutants damage the quality of air, water, and land. Pollution led to the loss of biodiversity and the increase in diseases and health problems (fig.1).

Figure 1: Environmental waste

Although urban areas are usually more polluted than the countryside, pollution can spread to remote places where no people live. For example, pesticides (المبيدات) and other chemicals have been found in the Antarctic ice sheet. In the middle of the northern Pacific Ocean, a huge collection of microscopic plastic particles forms what is known as the Great Pacific Garbage Patch (بقعة نفايات المحيط الهادي الكبيرة) (fig. 2).

Figure.2: Great Pacific Garbage Patch

- Air pollution is mainly caused by the emission of harmful gases from stationary sources (industries, homes, etc.) and mobile sources (cars). The consequences of this effect are the loss of the ozone layer, the greenhouse effect such as acid rain or smog (is air pollution that reduces visibilitys composed of toxic gases) such as CO2, CO or sulfur gases (fig.3).

Figure. 3: Air pollution

Shanghai Towers above the Smog: The tallest towers of Shanghai, China, rise above the cloud. Shanghai's smog is a mixture of pollution from coal, the primary source of energy for most homes and businesses in the region, as well as emissions from vehicles (fig. 4).

Figure, 4: Shanghai's smog

2- War: Throughout history, especially since the world wars, chemical and biological weapons and nuclear bombs have caused a lot of damage. Wars have killed millions of people and badly hurt the environment. In some places, this has made life impossible.

In 1960, the African country Mozambique created Gorongosa National Park to preserve the region's spectacular beauty and wildlife. Lions, zebras, elephants, cheetahs, and hippos called this place home. Then, in 1977, this African paradise became a battleground in a raging civil war that lasted 16 years and wiped out most of its inhabitants. Since war's end, conservationists like park warden Mateus Mutemba, a National Geographic Emerging Explorer, have worked tirelessly to protect Gorongosa and replenish its animal populations (fig.5).

Figure. 5: Mozambique Gorongosa National Park

3- Deforestation, is the removal of tree that naturally grows on an area of land.

4- Urban development: Throughout history Its leads to soil loss and deforestation due to building requires for human living.

5- Population increases: Population growth leads to increased demand for resources, resulting in habitat damaging, pollution and deforestation. This growth puts pressure on the environment and contributes to biodiversity loss, climate change and ecosystem degradation.
For example, Iraqi population increases rate.

1.The current population of Iraq in 2023 is 45,504,560, a 2.27% increase from 2022.
2. The population of Iraq in 2022 was 44,496,122, a 2.21% increase from 2021.
3. The population of Iraq in 2021 was 43,533,592, a 2.29% increase from 2020.
4. The population of Iraq in 2020 was 42,556,984, a 2.39% increase from 2019.

6- Noise and bad smells that can alter the behavior of animals and cause discomfort and health problems

Types of Habitats

1- Natural habitats: areas that occur naturally without human impact.
2- Degraded habitats: Places affected by occasional but incomplete, disturbances; for example, the cutting of a forest, burning, and the non- intensive grazing of natural grassland.
3- Cultivated habitats: environments where there is continuous degradation due to the intentional planting of crops.
4- Artificial habitats: places where people modify the environment, such as greenhouses, by changing climate and soil conditions.