Al-Mustaqbal University

College of Science

Department of Medical physics

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Environmental Pollution

7th Lecture

Light Pollution

Definition of Light Pollution

Light pollution is the excessive or improper use of artificial lighting during the night, which leads to negative effects on humans, living organisms, and the environment.

In simple terms, light pollution occurs when light is used in greater amounts than necessary or in inappropriate places, causing it to spread in the environment in an unnatural way.

History of Light Pollution

Light pollution was not a clear problem in the past because lighting sources were limited and depended on simple means such as oil lamps.

However, with industrial development, the expansion of cities, and the widespread use of electric lighting, the amount of artificial lighting increased significantly. This led to the emergence of light pollution, especially in large cities.

At present, it has become difficult to see stars clearly in cities due to the large amount of lighting at night.

Sources of Light Pollution

There are several sources of light pollution, including:

1. Strong street lighting, especially when it is not properly directed.
2. Illuminated advertising billboards on roads and in markets.
3. Shopping malls and large commercial centers that remain lit throughout the night.
4. Lighting in sports stadiums during night events.
5. Lighting of buildings and architectural facades.
6. Excessive lighting in homes and gardens.

Types of Light Pollution

1. Sky Glow

The brightening of the night sky over cities caused by the reflection and scattering of artificial light by dust and gases in the atmosphere.

2. Glare

Intense light that causes visual discomfort and may reduce visibility.

3. Light Trespass

When light reaches areas where it is not desired, such as streetlights shining into homes.

4. Over-Illumination

The use of more lighting than is actually needed.

Methods of Measuring Light Pollution

Light pollution can be measured in several ways, including:

1. Using satellites to monitor lighting intensity in cities.
2. Using light intensity measuring devices.
3. Comparing the visibility of stars in the sky between urban and rural areas.

Control and Reduction of Light Pollution

Light pollution can be reduced through several measures, including:

1. Using downward-directed lighting fixtures instead of allowing light to spread into the sky.
2. Reducing unnecessary lighting, especially in public places.
3. Turning off lights when they are not needed.

4. Using energy-efficient lamps such as LED lights.

5. Implementing regulations to limit excessive advertising lights.

6. Raising environmental awareness about the importance of reducing light pollution.