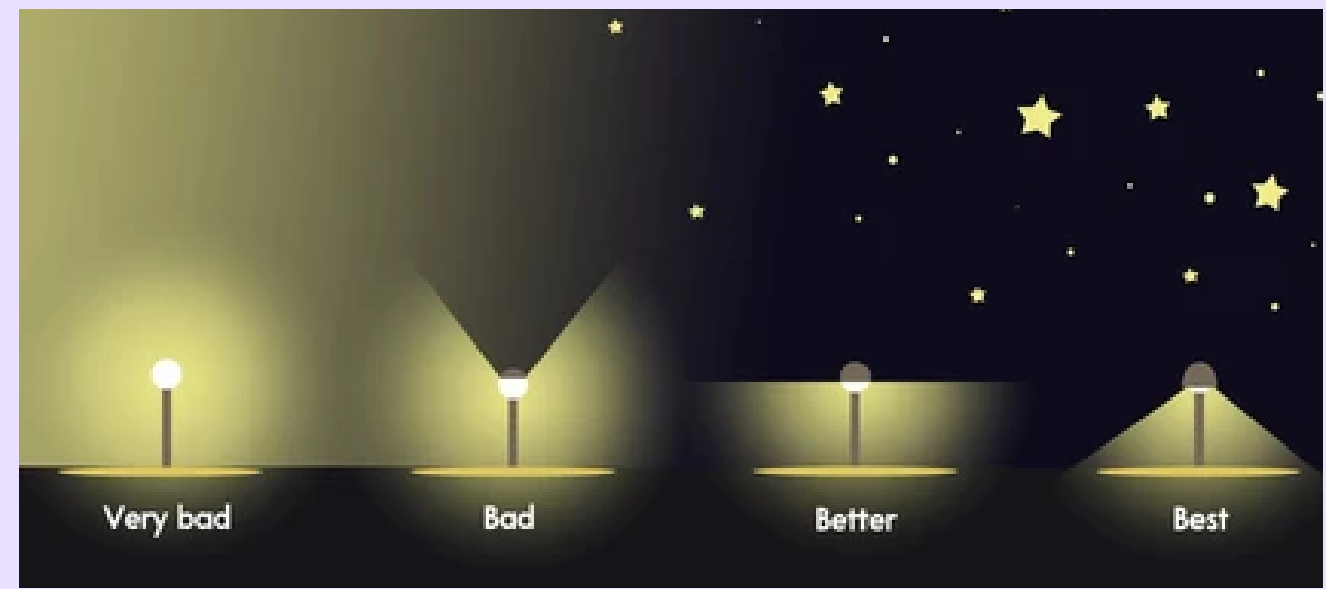




*The view of the globe illuminated by hundreds of lights is impressive. Few, however, realize that what pleases the eye in the photo is in fact also a serious civilization problem.*

## What is light pollution?

Light pollution is the disturbance of the night time environment by light emitted from outdoor lighting.

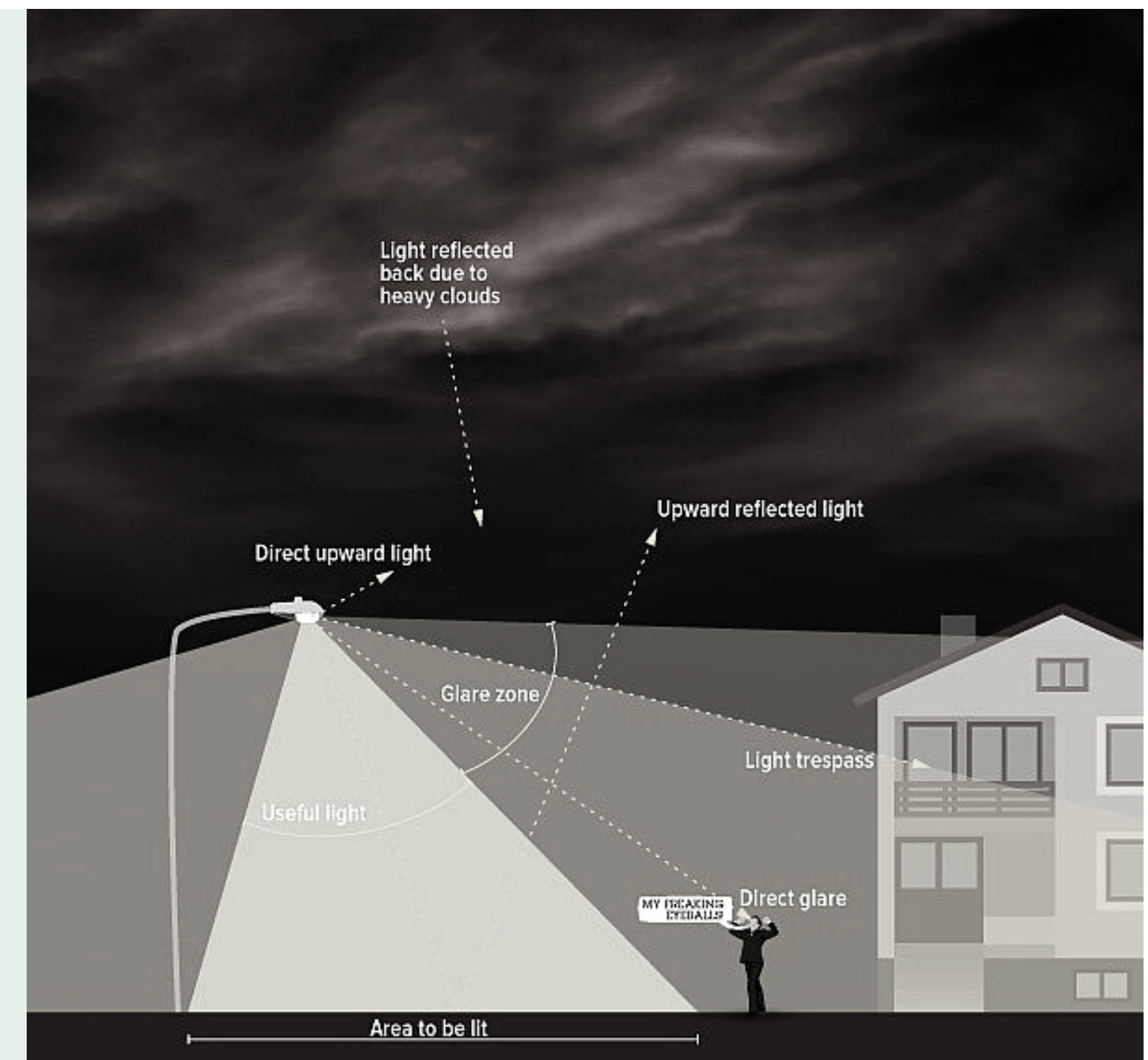


## Effects of light pollution on humans

In the human physical body, diurnal rhythms regulate hundreds of life activities, including sleep and wakefulness, temperature and blood pressure, hormone production, secretion of digestive juices or immune processes. As with animals, light pollution disrupts the natural human diurnal cycle. Artificial Lighting at night, even if relatively low, can cause various ailments such as fatigue, stress, feelings of restlessness, insomnia and can be a disruptor of the immune system. A surprising result is the study of suicides committed in countries in the polar zone, such as Greenland. Contrary to expectations, most suicides occur not in winter, when the days are short or the polar night lasts, but in summer, when the day lasts practically around the clock. Increased exposure to artificial light, with reduced time spent in natural sunlight also causes deficiency of vitamin D, which initial synthesis occurs in the skin under the influence of UV radiation. Vitamin D deficiency can lead to cardiovascular disease and atherosclerosis, increased insulin resistance and diabetes, and obesity.

## Why is it hard to resolve the problem?

From the very beginning of the Earth's existence, due to its rotation around its axis, there has been a continuous succession of day and night. The life that originated on our planet has adapted to these cyclical changes, just as it has adapted to the presence of other non-living environmental elements. Through evolutionary and cultural conditioning, we do not associate light with pollution. Light at night is a symbol of safety, progress and prosperity for us. Light symbolizes life, goodness, joy, truth, etc. Darkness, on the other hand, is a symbol of death, evil, sadness, and lies. This symbolism of light hinders us from understanding how big a problem we face.





## Kinds of light pollution

**Light trespass** – The escape of light into areas that should not be illuminated or that are not the purpose of the lighting

**Over-illumination** – Emitting more light than needed (lighting that is too bright and lighting that operates when it isn't needed).

**Glare** at users of outdoor lighting from light sources that are badly shielded or directed or that are too bright, leading to feelings of discomfort or even making it difficult to use the lighting.

**Light clutter**– Light chaos, caused by poorly designed lighting, leading to disorientation or distraction e. g. along accumulation of illuminated advertising and traffic information signs in one place.

**Skyglow** – Artificial lighting of the night sky occurring especially over urban areas; is caused by the scattering of artificial light in the atmosphere.



## Effects of light pollution on animals

Lack of darkness at night can disrupt animals' spatial orientation, alter the interrelationships between different species, and affect foraging, reproduction, communication, and other important animal behaviors. Environmental contamination by artificial light leads to disruption of the biological clock, resulting in animals changing their behavior. Artificial light is misinterpreted by nocturnal animals as still being daylight. This leads to a gradual increase in the time during which the animal "waits for night to fall", which means, for example, less time that the animal could spend hunting. Malnutrition in turn affects the weakening of the body, which can translate, for example, into less attractiveness for a potential partner. The presence of animals under severe light stress may consequently lead to a decline in the population of a given species.

Light pollution affects the lives of young turtles. They move towards the illuminated cities instead of into the ocean waters. This is because the young interpret city light as the moonlight reflected on the surface of the ocean waves, so shortly after hatching they follow the artificial light (instead of the moon's reflection in the ocean waves )



## Effects of light pollution on plants

Solar radiation reaching the plant surface is subject to processes of reflection, absorption, and transmission, which leads to changes in its spectral composition. The spectral composition and intensity of the radiation reaching the plant have a fundamental effect on its growth and development. This determines not only the possibility and efficiency of the photochemical processes that make up photosynthesis but also provides information about the surrounding environment, as well as the season, allowing the plant to best adapt to current environmental conditions. Artificial light pollution has been shown to cause some trees to shed their leaves off-cycle, disrupting the typical ecosystem food chain.



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