ENVIRONMENT

'Heat' Islands

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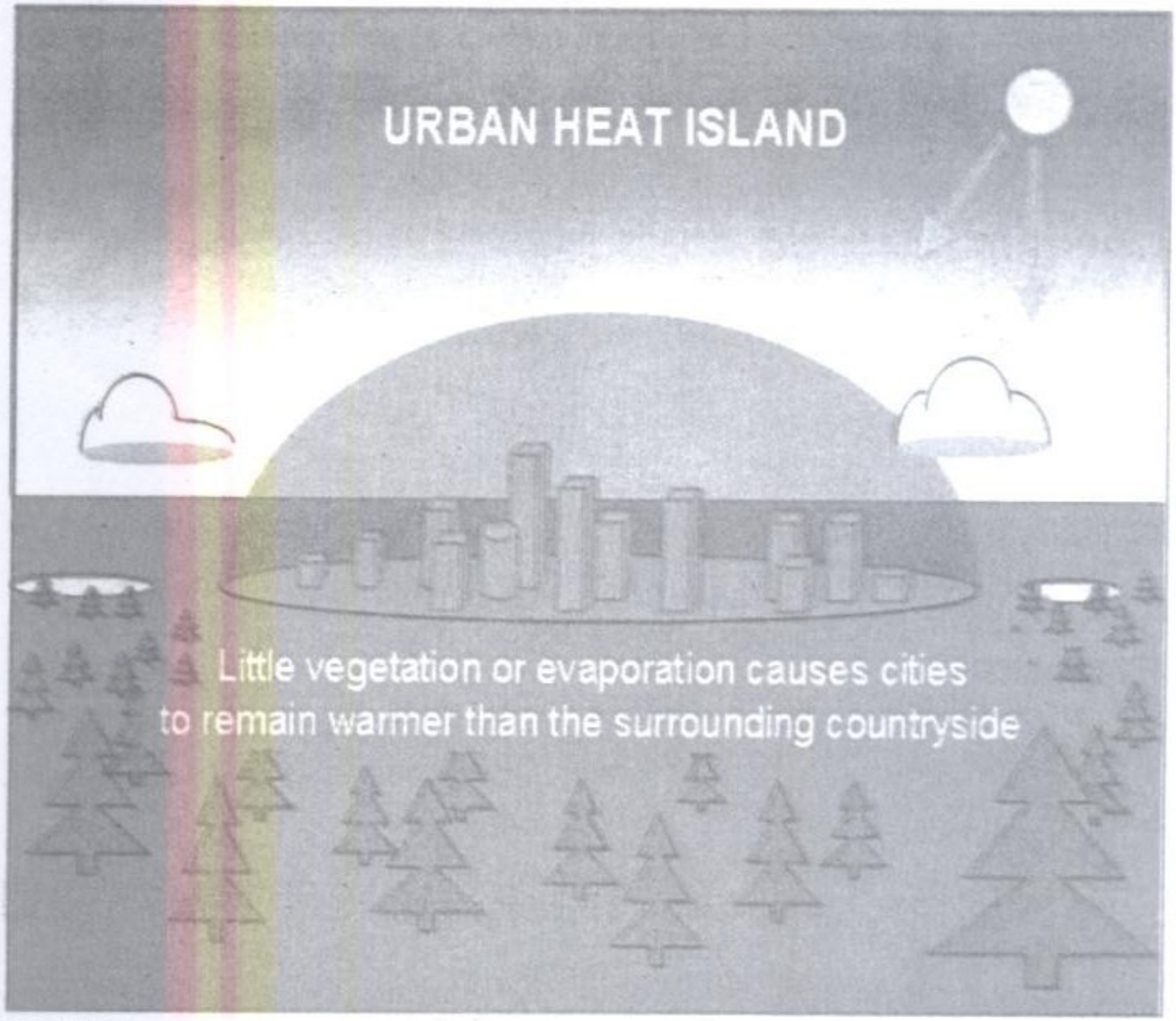
WE LIVE on an island, but do we live on a HEAT island? First of all what is a Heat island? Heat islands or urban Heat islands (UHIs) are terms that have been coined to refer to a developed area that is hotter than nearby rural areas.

In the following paragraphs we will take a look at what makes an area a heat island, its disadvantages to the environment and human health and what can be done to curb its harmful effects.

Basically the development of an urban area changes the environment which causes a localised increase in temperature. The existence of UHIs have been around for quite a while which is evident if you were to listen to foreign weather reports, where you might hear the phrase, "67 degrees in the downtown area and 65 degrees in the suburbs".

Heat islands exist at two levels; at ground surface and in the atmosphere. At the surface level, urbanisation converts permeable, moist surfaces, to dry and impermeable ones such as pavements, roads and other infrastructure. Daytime temperatures of these urban surfaces can range from 27 to 50oC hotter than the air temperature, while in rural areas the surface temperature is closer to the air temperature. But it should be noted that surface urban islands exist during both the night and day but are stronger during the day.

On the other hand, atmospheric heat islands are weak during the late morning and throughout the day. It is usually after sunset that their presence is felt due to the slow release of heat from these urban structures into the atmosphere.



Also, tall buildings usually concentrated in urban centres provide multiple surfaces that reflect and absorb light, referred to as the "urban canyon effect". These buildings also prevent heat loss during the night through convection by blocking the wind.

The colour of buildings in urban centres also plays a big part in the heat intensity of these areas. As a general rule light colours absorb less heat than dark coloured surfaces, with black surfaces like roads and the roof tops of some commercial buildings absorbing the most heat. Therefore, the effects of urban heat islands (UHIs) can be relieved by painting surfaces of buildings in lighter colours, and roofs in a green colour which reflects more light and absorbs less heat. Trees and other vegetation also produce this cooling effect, as well as removing air pollutants and carbon dioxide from the atmosphere.

Secondary effects of UHIs include alteration of local wind patterns, humidity, rates of rainfall and the development of fog and clouds. The increased precipitation is caused by the extra heat entering the atmosphere.

UHIs can also influence human health and well-being since the increased heat can lead to very intense heat waves, which can be fatal. This is made worse by the fact that no relief is found at night when the heat that is supposed to be released remains trapped. UHIs also have decreased air quality because air circulation is prevented and low-level ozone from nitrous oxides and volatile compounds already in the air are allowed to accumulate. Water quality is also affected, since the heat from urban surfaces like roofs and pavements is transferred via rainwater which drains into nearby rivers, streams and lakes, which can be stressful to these ecosystems.

In addition to our health, UHIs affect us economically as we have to spend increasingly more in energy to cool these urban buildings.

As this country works towards developed nation status we should also be aware of the environmental and heath risks associated with development. As these urban centres grow, so too does the area of land they affect, as well as the average temperature of the area. Therefore, given the fact that we live on a small island the effects of UHIs are not localised as in large countries but affects the entire island. Since we live in a tropical climate, we will have to deal with these conditions on a steady basis. There is little change in the overall temperature, unlike temperate countries.

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