

Light Pollution; is the Night Really Dark?

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Have you ever had trouble in sleeping because of the light of a street lamp or lights from a neighboring house entering your room? This is called light trespassing, which is a classic example of light pollution. Light pollution is a silent type of pollution that have been increasing gradually with the advancement of artificial lighting and the urbanization.

In the past when the electricity was something only privileged people had, majority of the houses had one or two kerosene lamps and there were very minimum light in outdoor at night. But with more and more areas being electrified and our houses, offices and

roads been developed, today almost all the buildings and roads will be lit with lights at night and this phenomena is called ALAN (Artificial Light at Night). While all this can be seen as an advancement of the quality of life of humans, artificial light at night has introduced a silent mode of pollution, light pollution. Light pollution can be recognized as the

excessive light that is directed to unintended directions including towards the sky.

Over many years humans, animals and plants are used to having bright lighting conditions at the daytime and low light in night. In fact most of the animals and plants have “circadian cycle” which is a 24 hour cycle that regulates

their internal body functions. It is proved by scientists that lighting conditions in the environment can affect the circadian cycle. Therefore if these living beings are exposed to unusually high lighting conditions at night, it can affect their circadian cycle which regulates the internal body functions. The excessivelight



Figure 01 : Light Trespassing



Figure 02 : Sky Glow

emitted by windows of buildings, street lighting, name boards and any other similar light sources in the night can create these harmful effects for humans, animals and plants who are living in that environment. This can happen as light trespassing to areas that is not intended to get lit, or by glare created by bright light sources such as a signboard, LED screen or street light. The figure 1 indicates light pollution created by light trespassing by windows of one house entering to the neighboring house through windows.

In recent years there have been arguments that LED lighting is also responsible for pollution. The main reason for this argument is, in most of the LED lights the major component of its spectrum is blue light. Whereas before the introduction of LEDs, most of the street lights and other outdoor lights used sodium vapour lamps that had majority of the spectrum in red and orange (yellowish light). It has been observed from the researches that the bluish light is more disrupting to the circadian

rhythm when compared with yellowish light. This is the reason for the idea that LED lighting can affect the human health. Although they are not widely used, LED lights are also available with lesser blue spectrum so that the light will be more yellowish and will have less impact on the circadian rhythm.

Lighting pollution creates skyglow which disturbs activities such as sky watching and other astronomical research activities. The light that is emitted from buildings and other outdoor lighting that is directed upwards will enter the sky and create this sky glow. The above figure 2 shows an example for the sky glow created by the lighting pollution. Apart from disruption for astronomical activities, sky glow also affects animals since it will be a disruption to their normal living conditions.

At present many high rise buildings and monuments are also lighted up for aesthetic purposes and also to draw the attention of the people to these locations. If very strong lighting is used for this purpose and the lighting that is directed to the

sky is not controlled these systems will also create skyglow and be disruptive to animals and humans. These problems have risen because of installing lighting systems without proper planning and design, which has created situations where the light will be directed to unintended areas. The solution for lighting pollution is not entirely stopping using artificial lighting at night. When lighting is installed in a

certain location the effect created by light pollution must be evaluated and necessary remedial actions should be taken.

For outdoor lighting such as street lighting, the light fittings which minimize the light directed upwards should be used. These light fittings are called full cutoff and cutoff luminaires. In order to control lighting pollution all the outdoor lighting should be at least semi cutoff type. The below figure 3 shows the different types of light fittings and the suitability of them in terms of light pollution control.

Also when selecting LED lighting for outdoor areas special care should be taken to select the lights with colour temperature. Since higher colour temperature (bluish light) is believed to be affecting circadian rhythm of people and other living beings, the LED lighting of lower colour temperature (yellowish) should be selected. This will minimize the disruption created by bluish light to the body rhythms of humans and other animals and plants.



Figure 03 : Cutoff Classification of Light Fittings

In several countries rules and regulations has been established by the government to make sure that any lighting system installed will have minimum lighting pollution. In Sri Lanka, upto now there are no such regulation. However, the GreenSL rating system for built environment published by the Green Building Council Sri Lanka specifies that the green buildings should take necessary precautions to minimize the lighting pollution. The relevant regulatory institutes in our country should seriously consider about introducing rules to control lighting pollution in Sri Lanka since we can observe lighting pollution in many situations.

As general public we can also contribute to reduce the lighting pollution. Even the lighting at our homes can create light pollution. We can switch off the unnecessary lights, specially the ones installed in outdoors . We can also rethink whether we have installed the lights with correct brightness, because excessively bright lights also creates lighting pollution. To reduce the lighting trespassing

created by the indoor lighting we can use shades or curtains to cover the windows during the night time. If the street lights in your lane is creating lighting pollution you can request the local authority who maintain the street lighting to do the necessary modifications to reduce light pollution. By doing so, you contribute to a better, healthy and comfortable nighttime environment not only for yourself but also for the animals and plants in your neighborhood.

Lighting pollution is truly a form of silent pollution where all of us are unknowingly subjected to harmful effects of lighting pollution and we are not preventing the pollution due to our ignorance. Hence education regarding lighting pollution is very important since we all have our part to play to reduce the disruptions created by lights we use, to our neighbors, animals and plants. Doing the minor modifications to existing lighting systems and being careful about lighting pollution when designing new lighting systems can reduce the lighting pollution

happening today. If each one of us work towards reducing the lighting pollution in these methods we can make the nighttime life of humans, animals and plants comfortable and undisruptive without compromising the luxuries we enjoy with artificial light at night.



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