



Study of Indoor Light Pollution with Special Reference to Pandharkawada Dist. Yavatmal (MH)

Suyog Surendra Mankar

H.O.D. Department of Physics, Shivramji Moghe Arts, Commers and Science college, Pandharkawada Yavatmal, Maharashtra, India

ABSTRACT

Indoor lighting and its impact on Light Pollution in Pandharkawada dist. Yavatmal was studied for this paper. The area which is selected to study indoor light pollution in Pandharkawada is mainly restricted to Residential areas. The Indoor lighting system i.e. Types of Indoor light, their Positions, light directions, Shielding types and their condition, Time of use, actual need of light etc parameters are studied in this study. Results show that: Maximum lighting systems are set up without any study. Position and unwanted intensity of lights are main factors affecting the light pollution level. There is no focusing of the light observed in the direction where needed. Lights from homes shine upwards and increases sky glow. Poor or absence of shielding to the source of light increases the chance of light trespass and unwanted glare. Generally it is found that most of the lights at homes in balconies, backyards and porches are without shields which cause light pollution. It is found that while thinking of installing interior lighting people don't think exactly what they need to illuminate, where lighting is necessary. And how much light they need. Light systems are not design to see or illuminate required objects but illuminates area around it.

Keywords: Indoor lighting, Light Pollution, Shielding, sky glow, light trespass, glare.

I. INTRODUCTION

Quality of light plays very important role in human life. It shows both positive and negative effects on human health, comfort and productivity. Proper indoor lighting system improves satisfaction and performance of human being. It influences social interaction, changes mood, promotes security and safety and increases visual comfort. Maintaining light quality means balancing among human needs, architectural considerations and energy efficiency.

If we are unable to maintain quality of indoor lighting, it leads to Light pollution. This has very adverse environmental effects. Light pollution is excessive, misdirected and inappropriate artificial light. Light pollution, also called photo-pollution. It is excessive or obtrusive artificial light due to human activity. Light pollution is the pollution caused by misplaced artificial light.

The four different forms of light pollution are often combined and may overlap:

Urban Sky Glow: The brightening of the night sky over inhabited areas.

Light Trespass: Light falling where it is not intended, wanted, or needed.

Glare: Excessive brightness which causes visual discomfort. High levels of glare can decrease visibility.

Clutter: Bright, confusing, and excessive groupings of light sources, commonly found in over-lit urban areas. The proliferation of clutter contributes to urban sky glow, trespass, and glare. Too much light pollution has consequences. It is a growing problem that threatens wildlife, humans, natural habitats, our energy use and the heritage of appreciation for our night sky. Light pollution caused due both improper outdoor and indoor lighting system. In present paper the main focus is on indoor lighting system. Improper use of indoor lighting that is wrong light, wrong place and wrong time of light creates the indoor light pollution. Level of light affects

the visibility of what we see. Selection of proper light level is important for safety and health. Good lighting reduces the glare makes objects visible and more attractive. There are different disadvantages of indoor light pollution such as

Eyestrain: very dim or intense light cause strain to read, see and work.

Tiredness: Trying to live in dim or intense light is mentally and physically exhausting.

Poor sleep quality: Faulty lighting system can affect sleeping quality of the person.

Decrease productivity: lighting quality can decrease human productivity.

Health issues: Different researches shows that light pollution can increase health issues in humans and animals. In present paper there is a study of indoor light pollution in Pandharkawada city in residential areas. This study includes finding causes of indoor light pollution and to find out some possible solutions to minimize indoor light pollution.

II. MATERIAL AND METHOD

The main aim of present study was to study indoor light pollution. Indoor lighting and its impact on Light Pollution in Pandharkawada dist. Yavatmal was studied for this paper. The area which is selected to study indoor light pollution in Pandharkawada is mainly restricted to Residential areas. The Indoor lighting system i.e. Types of Indoor light, their Positions, light directions, Shielding types and their condition, Time of use, actual need of light etc parameters are studied in this study. Collection of data was done by survey method and observations method. As per objectives of study raw data is collected and after processing conclusions are drawn. From the present study factors which are responsible for indoor light pollution are found out. In this paper some solutions are given to minimize indoor light pollution.

Findings:

The main factors behind indoor light pollution are as follows-

1) Selection of Light bulbs: It is found that right bulbs are not selected for right task.

2) Improper Position of lights: It is found that the different types of lights which are used for indoor lighting are not properly fixture.

3) Improper direction of lights: It is found that the light coming from the source is not directed properly.

They were not fixed in a proper direction for which they supposed to use.

4) Inappropriate Light intensity: Too somber or too brighter lights can pressure our eyes.

Intensity of lights used in homes found inappropriate. Most of the places it is too bright.

5) Light Shielding: there is lack of proper Shielding where required.

6) Over illumination: Over illumination is one of the main reasons behind indoor light pollution. Particularly it is found in falls ceiling and for decorative purposes.

7) Light trespass: Light trespass is the main purpose for sleeping discomfort. Light trespass happens due to light coming in to unwanted areas.

Proper Indoor Lighting Design for reduction of Indoor Light Pollution

While designing indoor lighting system if some energy efficient design principles are taken in to account, it may very useful for reduction of indoor light pollution. Firstly educate your family, friends and neighbors about light pollution. Remember that Indoor light quality is as important as quantity. More number of lights is not necessarily better. Maximize or increase the use of day lighting. Use energy efficient light components. Install task light where light is needed. It is found that while thinking of installing indoor lighting people don't think exactly what they need to illuminate, where lighting is necessary. Light systems are not design to see or illuminate required objects but illuminates area around it. Brightness level of lights is high than need. Make the balance between need of light and amount of light used of that purpose. Exchanging high wattage bulbs by dimmer ones can also very useful. By putting as many as household bulbs on dimmer switches we can reduce light pollution as well save energy too. Use of table lamp and floor lamp is also very useful. Unnecessary indoor lighting particularly in empty malls, shops, offices and homes should be turn off. Poor or absence of shielding to the source of light increases the chance of light trespass and unwanted glare. Generally it is found that most of the lights at homes are without a shield which causes light pollution.

III. CONCLUSION

Indoor lighting and its impact on Light Pollution in Pandharkawada dist. Yavatmal was studied for this paper. Light pollution is excessive and inappropriate

artificial light. It is excessive or obtrusive artificial light due to human activity. Light pollution is the pollution caused by misplaced artificial light. Light pollution is the result of poorly designed outdoor lighting fixtures that send unwanted and/or unnecessary light into adjacent areas. The dark side of excessive use of lighting is Light Pollution. From the present study it is found that Indoor Light systems are not design properly. Brightness level of lights is higher than need. Light systems are not design to see or illuminate required objects but illuminates area around it. Unnecessary indoor lighting increases the light pollution. Generally it is found that most of the outdoor lights at homes are without shields which cause light pollution. It is found that while thinking of installing interior lighting people don't think exactly what they need to illuminate, where lighting is necessary. Elimination of light pollution saves money, energy and resources, which in turn reduces air pollution, water pollution and carbon dioxide emissions caused by energy production and resource extraction. Light pollution can be reduced by choosing the right type of light, proper shielding, controlling its direction, and controlling its duration. The most necessary thing about light pollution is that there is lack of awareness in peoples so there is need to run awareness programs. The work presented in this paper is for understanding the indoor light pollution problem in Pandharkawada. It should be noted that all the data analyzed in this study is raw data. The quality of the data may be affected by the field environments.

Following are the solutions to help dealing with indoor light pollution.

- 1) Install good quality lighting.
- 2) Switching off unnecessary indoor lighting.
- 3) Fit the right light for the right task.
- 4) Use light only when you need it and where you need it.
- 5) Install and adjust all lights correctly.
- 6) Operate lights for the minimum required time.
- 7) Use the minimum level of brightness.
- 8) Put as many indoor household lights as possible on dimmer switches.
- 9) Use table and floor lamps with lower wattage instead of intense overhead lights.
- 10) Install motion sensed lighting in homes. Use timers, dimmers, and sensors.
- 11) Shield and lower the wattage of all outdoor light.
- 12) Use blackout blinds curtains at night.

- 13) Turns light off in rooms you are not.
- 14) Select certified lighting products.
- 15) Use warm white or orange hued bulbs. Use light emitting diodes (LED) technology with long wave length light in a red or yellow tint to minimize impact and save energy.
- 16) Keep laptops, smart phones, televisions out of your bedroom.
- 17) Shut off the lights when you can.
- 18) Consider light wall colors to minimize the need for artificial lighting.

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