Green building design: A step toward reduce energy consumption

APAR CHITRANSH[1] GAZIA MANJOOR[2]
M.E. ELECTRICAL ASSISTANT PROFESSOR

DEPARTMENT OF ELECTRICAL ENGINEERING
CHANDIGARH UNIVERSITY

Abstract:-

We know that energy is a need of every person in the world, and today's world energy consumption is more increases due to increasing the population. Thus the thermal comfort and build environment are inter-related. As increasing the population daily as well as the built construction section increase daily and increase the greenhouse gas emission to the environment and primary energy consumption. In Recent year survey found that in construction building rate India's construction rate is highest in the economy rate due to increase the population in Indian. And its growing rate is approximate 9.5% as compared to global average of 5%.

And yes we saw that every construction building demand a highest power supply to construct them and after the construction its maintenance, operation demand to more energy. Due to this reason more than 30 % electricity used by building sector and approximate 30-40% primary energy consumption being in India. For making the green building, climate responsive building, energy efficient building we can reduce the green –house gas emission, waste management, energy consumption and water use efficiency. In this paper we talk about how to reduce the energy consumption and carbon footprint by discussing the green building by taking the various measurement and also see what is the IGBC and CII role to make the green building perfectly and how they work in India.

Keyword:-

Thermal comfort and energy efficiency in building, IGBC, CII sustainable habitats, green building and design.

Introduction:-

A green building is one building which use less water, optimises energy efficiency, natural resource, generate less waste and provide a healthy environment as compared to a conventional building. In other word we can say that it is a building its design, construction or operation reduce the negative impact and create a positive impact on own climate which is contained by the green building and it improves our quality of life.

In India CII-Soharjii Godrej Green building which is situated in Hyderabad was awarded in the first price and platinum rating for its founded green environment nature in that building. In according to survey it is found that approximate 20,000 sq. ft. green built area in our country in the year of 2003, today (as like 12 DEC 2020) approximate more than 6,222 green building project running up and over 7.71billion sq. ft. area registered on the based on green building construction under the IGBC.

Mostly when any green building made some special quality include them as like good indoor environment air quality, use of energy in the form of renewable energy, such as solar energy which is most popular in modern day. In according to IGBC 2098 out of 6,222 projects are certified and fully functional in India. Today's most of IT parks, office, government office and most of building are made according to a green building project because of its design and construction and operation is totally on basic of environment friendly.

In according to the US energy information administrative (EIA) and international energy agencies (IEA) the conventional building are responsible for consumption the electricity is approximate 43%. In conventional building, maximum energy consumption is not for only its construction but in house for heating and cooking, lighting, cooling of the building, means that typically 80% of totally energy consumption is happen of operation after the building making and 20% of energy consumption is happen on the construction time. As I already illustrate that in construction zone India growing rate is 9.5% as compare to the global percentage. Commercial building is need for today's generation due to increasing the population, and yes it is a major part for consuming the energy after the using energy in industry and agricultural field. According to the survey 14% energy consumption in 1970s in building sector but in present status its more that 33-44% consumption.

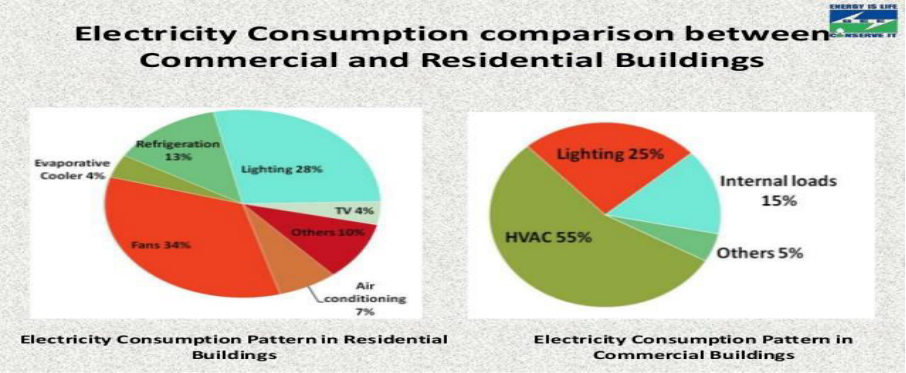

Figure: consumption of energy in commercial and residential building

Thermal comfort:-

Thermal comfort is an important factor for health it really means that a person who's live in a building that is neither too cold and nor too hot warm. Means that a normal temperature whose could a human body can accepted easily. And it is not right that a constant temperature is suitable for every human body temperature. So in other word we can say that thermal comfort is the condition of mind to express satisfaction.

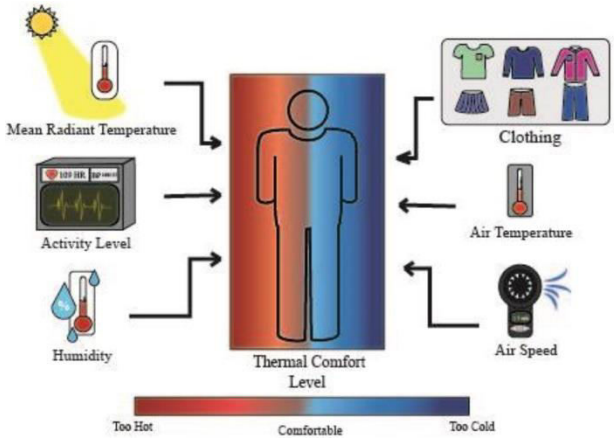

Figure: thermal comfort level in human body

Energy efficiency:-

Energy efficiency defined as it is that type of efficiency which extent to measure the energy consumption of per square meter of the floor area of the building. The major areas of increase the energy efficiency in to the building are heating, ventilation, air cooling machine and this all consumption of energy rating is approximate of 35% and all other appliances as like lighting, fan, TV extra rating is approximate 11%. For measuring this energy efficiency and improving this ENERGY CONVERSATION BUILDING CODE plays an important role. ECBC launched in India in 2007 and we can say that it is first energy code of the building in India. it applicable for a new commercial building with a connected load of 100kw-h or a contact demand of 120kv-amp. In according to the survey ECBC adopted 7 states and 16 states are processing to adopt.

Green building:-

It's also known as construction and sustainable building and it is easy method to control the economic rate by design the building according to the green building design. As I already illustrates that it use less water, optimises energy efficiency, utilize the natural resource as like solar, wind energy.

The main objective of this to reduce impact on human health and using energy and water from the natural environment. And second one is to reduce the pollution from environment and waste also to use this building design method.

Green building design: -

Before invent the modern technologies as like heating and cooling machine which is keep in mostly every conventional building the passive structure of building design trends come in last thousands of the year. Means that in past century era most of the building construct on the basic of solar radiation oriented and ventilation process and thermal mass process in fact in some year back Goober gas useful thing in most of the work and its actually means that it is evidence that use of natural resource we construct the building with sufficient less economy rate. First time Greek found that technologies (solar architecture) and after that china worked on that.

In India, FATEHPUR SIKRI, AGRA FORT, RED FORT IN DELHI AND TAJMAHAL, is the best example of solar architecture, by the passive structure building design criteria. The passive solar building design is the part of green building design.

The main aim to design green building to less energy consumption in construct the building and water consumption in that process. Green building is the right plat form which is contain the consumer waste handling, water conservation,and energy conservation. And this convers 30-40% water saving by encourage to reuse and reduce and recycle strategies by own.It save the energy by using energy efficient artificial lighting system , motor, air conditioning system and using of INTERNET OF THINGS. By using IOT(internet of thing) we reduce the energy consumption as like if some where no need the electricity that time the by using the IOT we switch off the light to sit that place. And use this technologies we can reduce approximate 20-30% of electricity.

To use the green fuel and other material we can reduce the impact on environment. This project encourage us to recycled and reuse the material to reduce the impact on environment.

Green building example in India:-

• **Suzlon one earth, Pune: -**it is top ranking green building in India and in 2010 it got LEED platinum rating because of 90% of energy comes from daylight in to the building and efficient ventilation regulation of fresh air system and reduce the energy consumption.

Figure: suzlon one earth in pune

• **ITC MAURYA, NEW DELHI: -**one of the largest hotels building on the planet which has a platinum rating and number of occasion awards of eco-friendly nature and reduce the energy consumption. It is also recycling the water of approximate 90%.

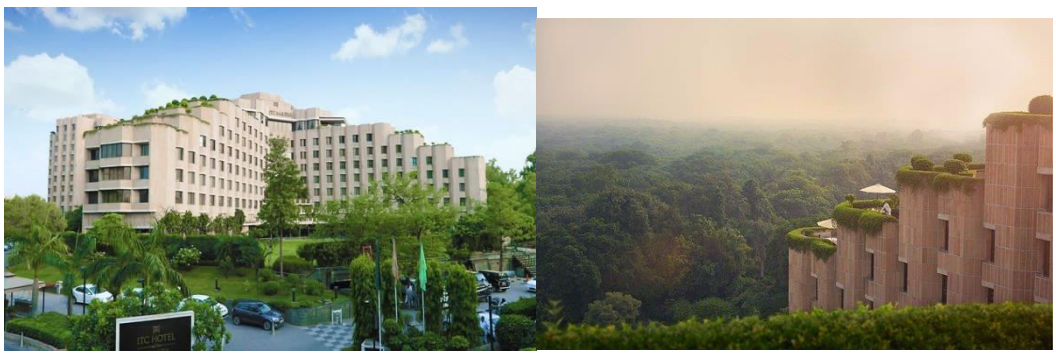

Figure: ITC MAURYA, NEWDELHI

• **JAWAHARLAL NEHRU BHAWAN, NEWDELHI:-** It is basically a office of ministry of external affairs but it structure is design and show the environment friendly because its external design in according to LUTYEN'S era and internal wall design to according for purpose of cooling and that internal wall reduce approximate 30% of air conditioner.

Figure: JAWAHAR LAL NEHRU BHAWAN

• **ITC GREEN CENTRE, GURGAON: -**It has received the most LEED certificate by USGBC LEED dur to construct building according to the green and sustainable building technique which is reduce the energy consumption.

Figure: ITC GREEN CENTRE, GURGAON

IGBC:-

Its full form is Indian green building council and it is a part of confederation Indian Industry (CII) which is established in India in 2001. The main MOTO of this industry to established and change conventional building in to sustainable building by 2025 and take awards and top in global leaders in the sustainable built environment.
We know that Soharji Godrej green building which is situated in Hyderabad was awarded with the first and platinum rating of green environment in India. According to the survey 20,000 sq. ft. are comes in to the green building project in 2003 and 6,222 green building project coming under this and approximate 2098 project certified. And itis inaugurated by the Excellency DR. A.P.J ABDUL KALAM the president of India.

CII:-

Its full form is confederation Indian Industry also it's a non-government and not profit Industry and plays a most important role to managed this organization and India's development process. For 125 years (since 1895) it working on shaping India's development and also transform the Indian's Industry engagement in national development. With about 9100 members of private sector as well as public sector, including SMEs and MNC membership of over 300,000 enterprises from 288 national and regional spectral Industry bodies working with that industry.The main objective of this industry for 2020-21 is that to bring back the growth to the economy and mitigate the human cost of the pandemic by protecting jobs and health.

Conclusion:-

It is clear that green building is reduce the energy consumption, water and land also and use natural resources and reduce the construction the conventional building because of this reduce water and air pollution also. It is a very old method to build building by help of natural resource and attractive to human. With the economic and technologies process most of the people lives in worst environment in the world it began to focused on the healthy environment and some events outside the economy.

Green building concept in the construction of industry has a great initiative because it reduce the waste of resource, improve resource utilization and also reduce the human activity which is destroy the natural environment and give the manner with proper pure quality of life with green building concept. Means main conclusion of this paper is that green building is more efficient with compare to the conventional building and yes it is reduce the energy consumption with compared to the conventional building. Because in sustainable building include solar light in daylight which reduce the energy consumption.

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