CPUH-Research Journal: **2018**, *3(2)*, 73-77
ISSN (Online): 2455-6076
http://www.cpuh.in/academics/academic_journals.php

Design of Eco – friendly Building

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ABSTRACT: The Eco-friendly building is a natural resource product and produce better atmosphere. It required low maintenance, save energy and reduces pollution problem. As benefits of human beings to effectively meet all their present needs without depleting resources and endangering the environment to survive comfort ability in future generation for construction of eco-friendly building natural resources like wood, bamboo, timber etc. used in research work. Eco-friendly building construction can not only help to makes a better atmosphere, it can also help to build healthier indoor atmosphere. Their needs maintain the potential of the environment of future generation. The residential sector has been seeing a rise in the building of eco-system and communities. Used solar system or solar panel & the utilization of solar panel system in the building is to reduce electricity power consumption, pollution and hence healthy environment can achieve. In the top of the roof rain water harvesting system is adopted and collected water is utilized for the plantation, gardening, and ground water surcharge and also used for domestic purpose.

Keywords: Solar panel system; save energy consumption; rainwater harvesting system; ground water surcharge

INTRODUCTION

The eco friendly building is a natural products, it also prevent land, air and water. In this building is mainly work on mange the eco system. Waste-reduce, recycle and reuse, sorting of recyclable waste and organic waste. The eco-friendly building is not only manage the eco system it should be reduce the house hold problem in situation. Climate change is not a problem of a community, country or continent, it's a global problem, it us all and we all have to gear up and play our part in saving our planet. This building is no harmful to environment and friendly behaves to atmosphere. Their needs maintain the potential of the environment a future generation. Pollution control to stop global warming: an air-source heat pump, triple-glazed windows, insulating the walls both internally and externally, insulating the ceiling and floor, green roofs for the cooling,

- Efficiently using energy, water, and other resources
- Protecting occupant health and improving employee
- Productivity Reducing waste, pollution and environmental degradation

Raipur is the capital of the newly formed state of Chhattisgarh, the environment of Raipur city is very warm. Owing to the increasing population needs s. The climate of the city is quiet warm during the months of summer with temperature reaching up to 48^0C so proper care should be taken to avoid getting any kind of heat related ailment. Also the phenomenon of global warming or climate change has led to many environmental issues including higher atmospheric temperatures Mentioning the buildings and human comfort level, with an increase in outdoor air temperature, buildings are experiencing indoor discomfort, thus increasing the demand for mechanical ventilation leading to higher energy consumption in buildings.

Using a solar panel system to utilize electricity will reduce the problem of electricity power consumption. With more than one million people, India is facing a huge energy demand and therefore, solar power is a growing industry in India. Generation of electricity has expanded over the years, but we cannot deny the fact that the population of the country is also growing. Energy generation, conservation and reducing CO2 emissions, Solar thermal panels for water heating, solar photovoltaic systems for generating electricity, motion-sensitive or energy-saving lighting system, under floor heating, provision of good daylight. Also mention a rain water harvesting system. This system is very important for environment survive a world. Present time in world is facing a water problem, to prevention for water problem. Rain water is store a tank to utilize a domestic purpose and ground water level increasing. Water conservation, rainwater harvesting, re-cycling and re-using for gardening, washing cars, flushing toilets, washing machines, bio-cleaning or self-cleaning windows.

This paper is based on a review of research that different types of energy efficient and save water problem in a building, focusing on indoor climate, technical operation, and natural resources are using. Energy efficient buildings are often rated better than conventional buildings on indoor climate, but when investigating more thoroughly, the users have different concerns. The varying results from the user evaluations reflect that the quality of the buildings differs. This is a shortage of research that takes into account

the social context for evaluation. The social environment, the process of moving into an energy efficient building, and rain water conservation, influences the evaluation of the building. Energy efficient buildings may also require specific architectural solutions, and further research should consider architectural and aesthetic aspects in the evaluation. Research on use and prevent the atmosphere, to use recycle products.

MATERIALS AND METHODS

In this project will be using a materials –

1. Woods , Timber , Plywood , Bamboo
2. Solar Panel System
3. Rainwater Harvesting System

Fig.1.1- Bamboo

Fig.1.2- Timber

Fig.2:- Solar Panel System

Fig.3:- Rainwater Harvesting System

Following steps are followed in these project-

- Phase1:- Eco-friendly building
- Phase2:- Solar panel system
- Phase3:- Rainwater drainage system

Phase 1:- Eco-friendly building

The process of construction is mainly designed by social and atmosphere according to work. The materials are using a natural resources, and work on artificially and natural in combination with manual labor. Our main purpose of construction must to be safe its environment and not harmful to atmosphere. Taking the serious problem of climatic change, global warming and pollution are avoided. Eco – friendly building are mainly work on eco – system to maintain. It's important to reduce the energy consumption and materials are easily available to local area. This project is less maintenance and good services due to better atmosphere are survived. Our materials are less polluted and economic; components are easily installation to building.

Phase 2:- Solar panel system

Utilize a solar panel system; this system is very much to electricity power consumption and power production. The solar panel system is installation on top of the roof. In this system are work on sunrays to presented by photon, the photon are converted into electron, solar cells to convert the sunlight energy into electricity. The components of the system convert the DC electricity into AC electricity.

Phase 3:- Rainwater drainage system

Rainwater harvesting system are a reduce in a problem of water. This system is mainly affected on eco – system. And again installing a top of roof this components, and rain water collecting and storing excess amount of rainfall received during the heavy rain period. A water harvesting is a directly productive form

of soil and water conservation and utilized for gardening, plantation and domestic purposes etc.
Several times are many problem of water sources, kindly help us this system are prevent ground water level (surcharge level).

Test Performed
(1) Testing in wood: –
a. Tensile Strength in wood testing with the help of UTM
b. Compressive Strength in wood testing with the help of UTM
c. Bearing Capacity in wood with the help of UTM
EQUIPMENT:

Figure 4: Universal Testing Machine

RESULTS AND DISCUSSION
In the structure made of wood, the wood testing is limited to compression testing because wood is more likely to fail due to compression than due to loads. compression strengh testing in wood results due to load applied in a altenate increasingly. Then one have a time due to woods are a compressed (decreasing), and saveral loads are applied in a wood structure.to calculate the different types of test and results. strain and stresses are more and deformation of woods. In this results are a good and suitable for constructed in a eco-friendly building . results are a efficient and save energy consumption, to use a solar panel system in a generate a electricity power.and rainwater harvesting system are increase a ground water level and good for environment and future scope.the climatic change and global warming problems are reduces.this projects is a economic and enhancement for health.

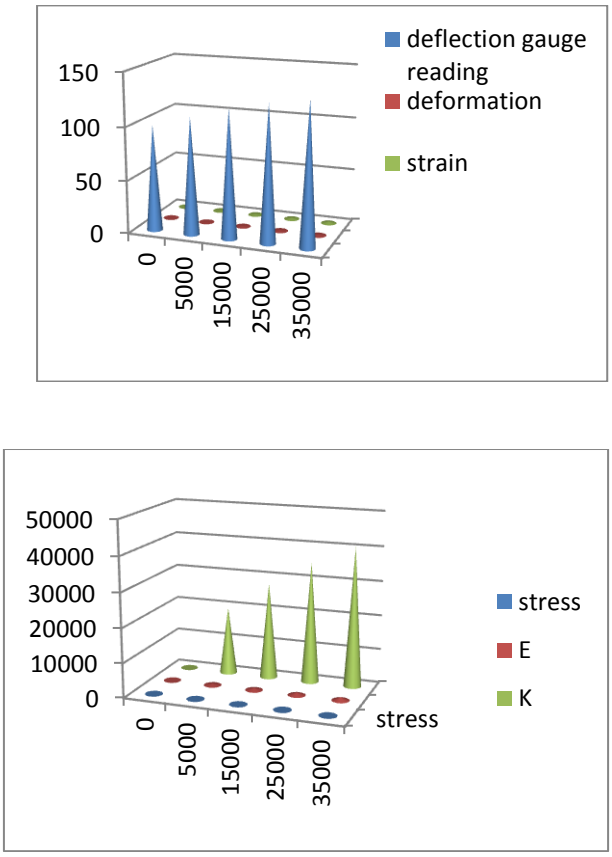

Figure 5: Represented by wood capacity due to load applied then deformation level

Table 1: Compressive strength testing in wood with the help of UTM

S.N.	Load	Deflection gauge reading	Deformation (mm)	% Strain	Stress (MPa)	E (MPa)	K (N/mm)
1	N		δ	(δ/H)*100	σ=P/A	σ/ϵ	P/δ
2	0	100	0	0.0000	0.0000	0	0
3	5000	110	0.254	0.4661	2.0510	440.08	19685.04
4	15000	121	0.5334	0.9787	6.1530	628.68	28121.48
5	25000	128	0.7112	1.3050	10.2551	785.85	35151.85
6	35000	134	0.8636	1.5846	14.3571	906.04	40528.02

Table 2: Static Bending (Flexural)Test

S.NO.	P g/m^3	W %	Pmax N	δmax mm	S mm	δmax mm	Σbw MPa	EL MPa
1	472.16	7.4	1730	7.5	0.30	7.20	74.54	7120
2	478.64	7.4	2090	6.5	0.30	6.20	83.84	8200
3	502.02	8.0	1830	5.8	0.25	5.55	74.11	7130
4	490.39	7.0	2030	6.1	0.30	5.80	80.94	8850
5	508.48	7.2	2120	5.9	0.15	5.75	88.74	9200

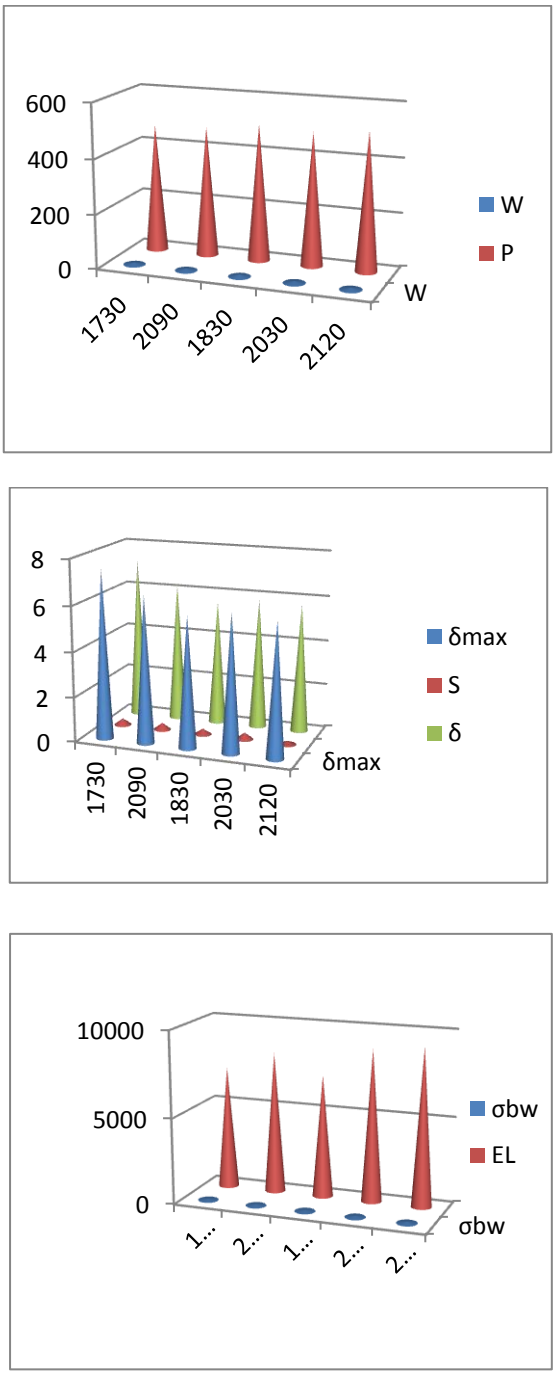

Figure 6: Due to load applied then bending strength are represented

CONCLUSIONS

According to research eco – friendly building is a sustainable energy providing the comfort level the resident. Reduce on pollution problem and enhance-ment our health. Materials are easily available, install ling and less maintenance. Save natural resources products and atmosphere are better survive. Pollution control to stop global warming: an air-source heat pump, triple-glazed windows, insulating the walls both internally and externally, insulating the ceiling and floor, green roofs for the cooling, including in this research work in solar panel system are save energy consumption and reduce electricity problem. This system is very much and no harmful in environment. Therefore we believe that solve energy is the energy of the future and can solve all of our energy demands including eliminating the pollution caused by other forms of electricity generation. Energy generation, conservation and reducing CO2 emissions, Solar thermal panels for water heating, solar photovoltaic systems for generating electricity, motion-sensitive or energy-saving lighting system, under floor heating, provision of good daylight quality. And also research a harvesting water can be utilize a daily household needs. Saving of water and surcharge level increase. Rainwater harvesting systems are presents time in the best option and future benefits.

REFERENCES

[1] National Policy of Housing and Habitat –2007, Ministry of Housing and Urban Poverty Alleviation, Government of
India, New Delhi.

[2] Gupta, R G, Shelter for the Poor in the Fourth World, Shipra Publications, Delhi, 1995.

[3] Harman, W.C, Housing and Social Policy, Prentice Hall, U.S.A, 1975.

[4] Housing: Who Benefits?' Economic and Political Weekly, Editorial, May 15, 2004.

[5] Manoj, P K 'Retail Banking: Strategies for Success in the Emerging Scenario', IBA Bulletin, Vol. XXV, No.11,
November 2003, pp.18-21.

[6] Manoj P K, "Dynamics of Housing Finance in India", Bank Quest, Vol.75, No.3, Sept.2004.
[7] Mathur, G.C., "Housing the Poor", Yojana, Vol. XXIII, No.24, January 01, 1980.
[8] Report on Trend and Progress of Banking in India 1996 - 2007, RBI, and New Delhi.
[9] Report on Trend & Progress of Housing in India 1999 - 2005, NHB, and New Delhi.
[10] N.K. Naik. ―Mechanical and Physical-Chemical Properties of Bamboos carried Out by Aerospace ―Engineering Dept., IIT – Bombay
[12] Wilkes, K., Proceedings of the International Symposium on Roofing Technology (1991)
[13] Yarbrough, D., "Thermal Decomposition of Ammonium Sulfate at Low Temperatures" letter report to the Cellulose Marketing Council (September 1991)