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## *Full Length Research Article*

# GREEN BUILDING CONSTRUCTION FROM COMPANY PERSPECTIVE IN GWALIOR REGION

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**ABSTRACT**

Now a day a construction industry growing on a large scale methods and quality of work, improved but due to increase in the construction the land space for living were made available by deforestation which result in Green House Gas (GHG) Emissions which in turn increasing carbon footprints in nature which is very dangerous for environment. On the basis of survey in Gwalior region by asking certain question by construction practitioners evaluated the awareness level of Green Building, Green Building Rating System (GBRS), Green Building Methods adopted by construction sites, Waste material management, Obstacles in promoting green building, Methods of green buildings which take less time and of less cost etc. are discussed and shown by the graph and pie charts.

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## INTRODUCTION

According to report of World Health Organization (WHO) Gwalior is third most air polluted city in the world (WHO 2014). Construction is responsible for 23% of air pollution globally (Willmott Dixon, 2010). According to Agenda 21; sustainable construction is best possible measure for reduction of construction pollution. Sustainable construction another form is green building construction. Due to which Green Building Construction is very important for reduction construction pollution. The aim of this research is to investigate and find the awareness level among the construction practitioners for Green Building construction in Gwalior Region. Green building construction is new and advance technique which save energy and provide a healthy environment for all living beings.

- To examine the knowledge of Construction personnel about Green Building Construction.
- Weather they know about the Green Building Rating systems which are currently used for rating in India.
- Various companies taken in survey are concern about Green Building Construction or not.

From above the entire three questions we can conclude how it is important for environment, nature, habitat, atmosphere and for live hood.

### Green Building Construction

Green building construction is new concept which introduce for recently 20 -30 years ago. But due to time of orthodox technology in developing countries; this technique is very challenging for developing countries where the low income profile. Green Building Construction is little costly but overall Life cycle compare to general building it is cost efficient techniques. The application of processes which are used in GBC that is environmentally accountable and resource-efficient throughout a building's life-cycle (https://en.wikipedia.org/wiki/Green_building). There are

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many software used for designing of Green Building such that the Building could be more energy efficient (4). The green building plays a crucial role in maintaining the stability of environment and less effect on nature. The various techniques related to green building construction is to use a eco-friendly products (Usman AminuUmar, ?), Rain water harvesting, Green Roof, Solar panels etc such that the structure should be energy efficient. The green Building scoring system (GBRS) that square measure rate a building on a precise score based on the energy efficiency of the structure and weather the building is green or not can be determine on a certain factors (There are many software used for designing of Green Building such that the Building could be more energy efficient (4). The green building plays a crucial role in maintaining the stability of environment and less effect on nature.

The various techniques related to green building construction is to use a eco-friendly products (Usman AminuUmar, ?), Rain water harvesting, Green Roof, Solar panels etc such that the structure should be energy efficient. The green Building scoring system (GBRS) that square measure rate a building on a precise score based on the energy efficiency of the structure and weather the building is green or not can be determine on a certain factors (6). In India there are three primary GBRS such that Indian Green Building Council (IGBC) (http://greencleanguide.com/ three-primary-rating-systems-for-green-buildings-in -india/), Green Rating for Integrated Habitat Assessment (GRIHA) (https://igbc.in/igbc/), Bureau of Energy Efficiency (BEE) (9) which give a building a certain score. In India there are three primary GBRS such that Indian Green Building Council (IGBC) (https://igbc.in/igbc/), Green Rating for Integrated Habitat Assessment (GRIHA) (Fromhttp://www.gr ihaindia.o rg/i ndex. php?option=com_ content&view=article&id=87 &t= Green_ Rating_ for_Integrated_Habitat_Assessment), Bureau of Energy Efficiency (BEE) (https://www.beestarl abel.com) which give a building a certain score.

## MATERIALS AND METHODS

The present investigation has been done in Gwalior region among the construction practitioners to know the awareness level of the concept of Green Building construction and what are the problem faced for adopting this concept.

### Survey

The survey has taken in Gwalior, Madhya Pradesh. All the basic questions regarding to green building construction and awareness asked to the respondents. There are total 21 questions out of which 4 question are descriptive in the survey and taken by 41 respondents.

### Research Design

This survey is divided in two section in first section General profile information from construction practitioners are taken and second section Normal perspective view on Green Building Construction are taken from construction practitioners and this section is further divided into four parts.

### Understanding of Green Building Construction

There are 6 questions asked from this part

- Have you listened about Green Construction?
- Benefits of green construction?
- Should Company aware of Green Building Construction?
- How you can promote Green Building Construction?
- Do u have any experience about green building construction?
- Green building construction can be a good impact on climate?

### Techniques of Green Building Construction

There are 9 questions asked in this part

- How you encourage and make alower energy consumption on site?
- Green Building material is easily available or not?
- Do you recycle the waste material for further use?
- Does Waste material management have financial implication on cost of the construction projects?
- How you Handel waste in construction process?
- How you Select the best material for the Green Building project?
- In your opinion what is the best way to ensure minimum pollution from site so that it cannot harm Environment?
- Does Green Building design is only efficient for conservation of energy or other measure should also be taken to minimize energy consumption?
- Any Green Building Software used for designing the building?

### Policy of Green Building

There are 2 question asked from this part

- Is there any policy of green building construction in your company?
- Do you know about green building rating systems in India?

### Awareness of Green Building

This is a descriptive part in which 4 questions

- Obstacles in promoting green building construction?
- Any procedure followed in company for green building construction?
- Are you think Green Construction resources efficient in this city?
- Method of Green Building which is of less cost and take less time and give better result?

### Respondent

There are 41 respondents out of which 29 Engineers and 11 Architects& 1 Contractor Figure 1.

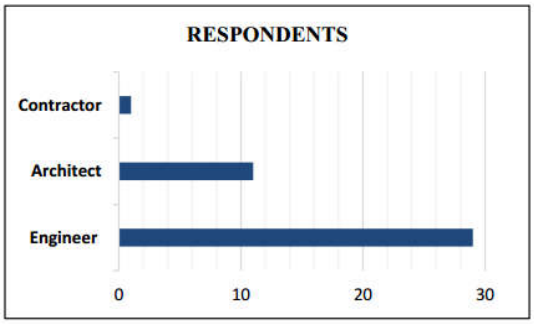


**Figure 1.**

## RESULTS AND DISCUSSION

There are 4 Groups in the survey and 21 question asked

### 4.1Understanding of Green Building Construction

There are 6 question asked in this part

1. Thus all the respondents know about green construction (Figure 2).

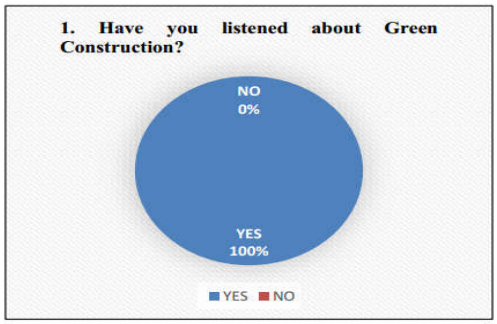


**Figure 2.**

2. There are 4 options added in the question and 30 respondents said Energy Efficiency, 24 said Water Efficiency,16 said Material Efficiency and 12 said it reduce cost of construction (Figure 3).

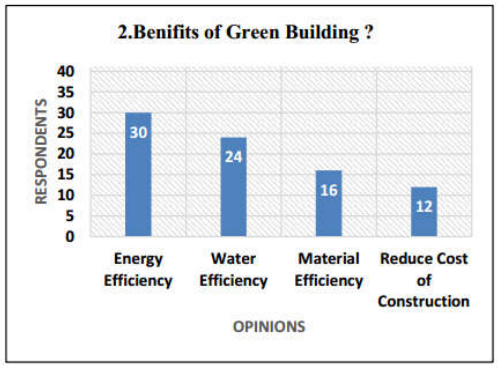


**Figure 3.**

3. 17 % of respondents said that their company doesn't aware of Green Building that's the alarming issue while rest of respondents said their company is aware of Green Building (Figure 4).

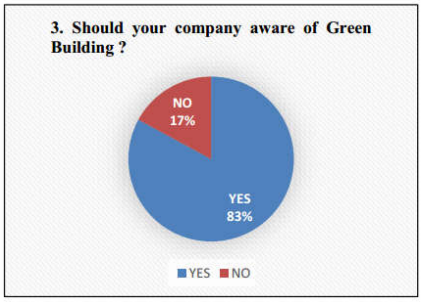


**Figure 4.**

4. This is important question and 25 respondents said they can promote green building construction by using environmental friendly construction materials while 21 said by obeying environmental laws and 20 said by tree plantation on nearby site (Figure 5).

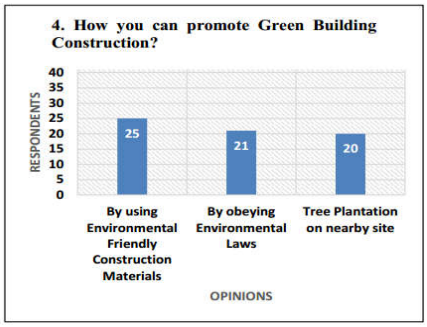


**Figure 5.**

5. 59% have no experience in Green Building Construction while 41% have experience in green building construction (Figure 6).

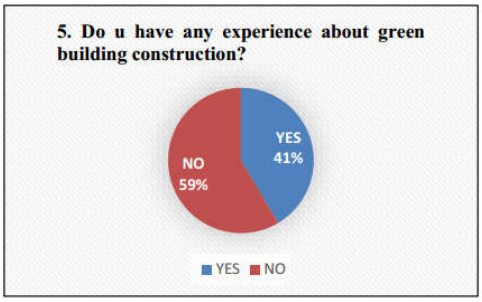


**Figure 6.**

6. All the respondents said Green Building construction can be a good impact on climate (Figure 7)

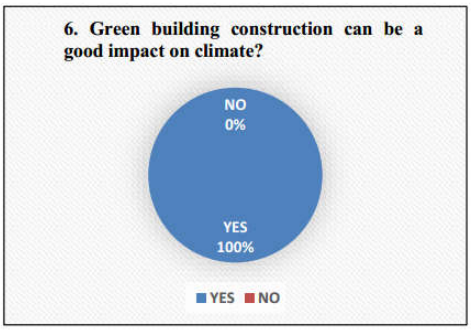


**Figure 7.**

## Techniques of Green Building Construction

There are 9 Question asked in this part

7. 27 respondents said Low wastage of material on site is the best way to encourage and make a lower energy consumption on site while 21 said Reuse of Construction Material and 18 said by using minimum electricity on site (Figure 8).

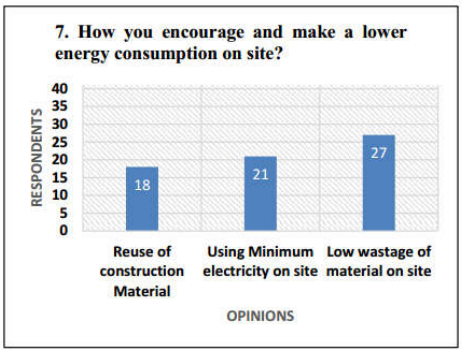


**Figure 8.**

8. 46% respondents said that Green Building Material is easily available and 54% said that Green Building material is not easily available (Figure 9).

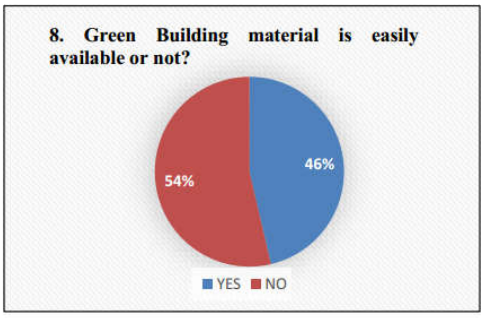


**Figure 9**

9. 15% respondents said that they can't recycle material for further use but 85% said that material can recycle for further use (Figure 10).

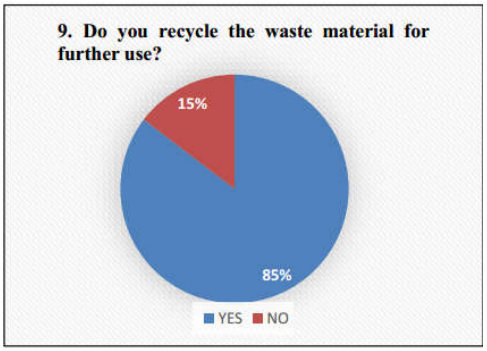


**Figure 10.**

10. 66% respondents said that waste material management does not have financial implication on cost of the construction projects while 34% said yes (Figure 11).

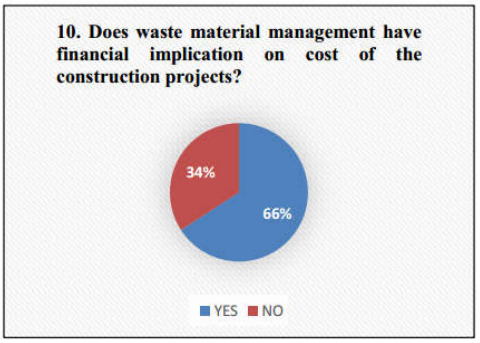


**Figure 11.**

11. 25 respondents said that proper dumping and reuse of construction waste is the best process to handle construction waste while 12 said that selling the construction waste is beneficial,10 said that proper dispose or dump the waste but not use it again and 4 said leave the waste behind the site (Figure 12).

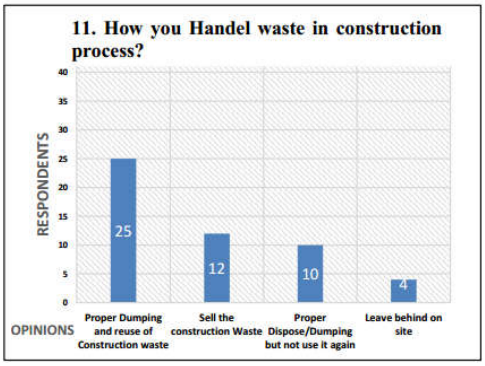


**Figure 12.**

12. 24 respondents said the material of suitable quality and standard of materials are best material for site while 17 said locally available material & 12 respondents said that material which contain in work and terms and condition (Figure 13)

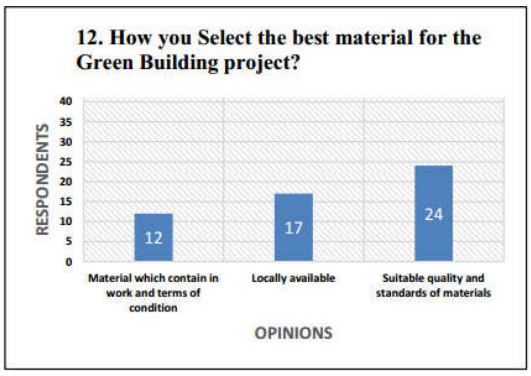


**Figure 13.**

13. 23 of respondents said that plantations of trees on site ensure minimum pollution on site so that it cannot harm the nature, 19 of the respondents said that the regularly check the waste material and dispose it of properly and 18 said that proper dumping of all waste material on a specific location (Figure 14).

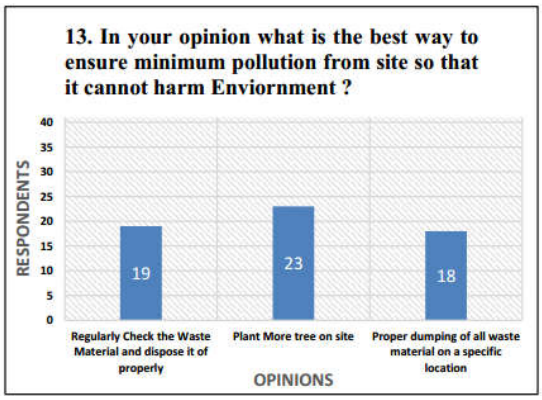


**Figure 14.**

14. 68 % respondents said that Green building is only efficient for conservation of energy or other measure should be taken to minimize energy consumption while 32% said no (Figure 15).

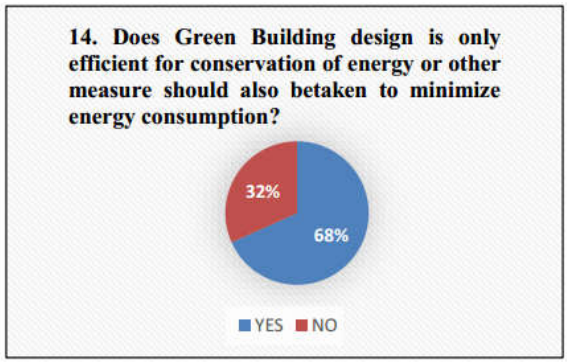


**Figure 15.**

15. 29% of respondents said that green building software is used in the company while 71% of respondents said no (Figure 16).

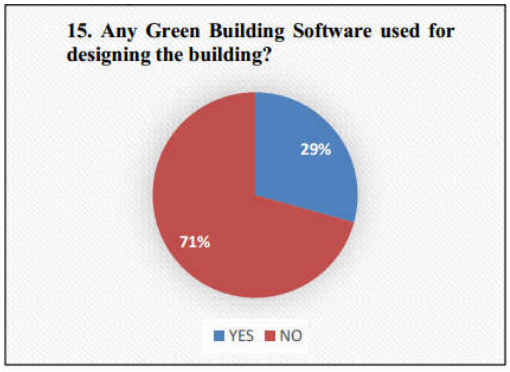


**Figure 16.**

## Policy of Green Building

There are 2 question asked from this part

16. This is the major question and 46% respondents said yes they know about green building rating system of India while 54% said no (Figure 18).

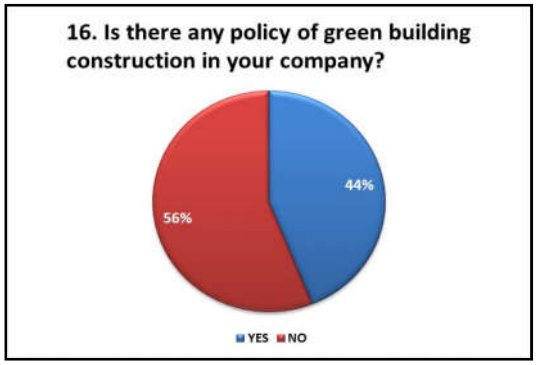


**Figure 17.**

17. 44% respondents said they have green building policy in company while 56% said no (Figure 18).

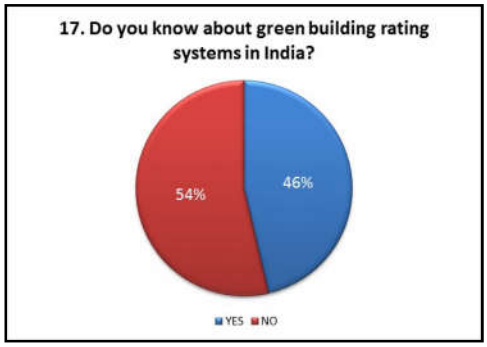


**Figure 18.**

## Awareness of Green Building

This is a descriptive part in which 4 questions asked

18. 21 of respondents said Behavior of Workers is the main obstacle in promoting green building construction while 19 said that budget problem is the main cause and 12 said that design problem is the main factor (Figure 19).

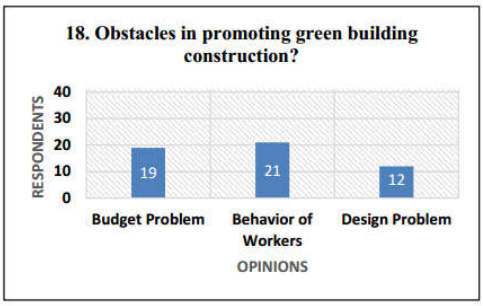


**Figure 19.**

19. 46% of respondent said Green Building Construction format is followed in company and 54% said no Green building construction is der (Figure 20). There are various response and many of respondents said that Tree plantation along the construction site, Use of Fly ash block which reduce consumption of water during curing, using of Autoclaved Aerated Block which reduce the load of building along with it has

good insulation properties does not require any other insulation & Rain water harvesting.

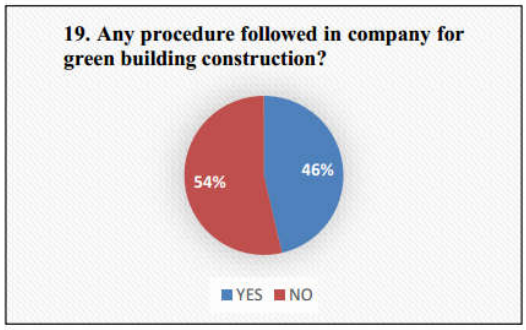


**Figure 20.**

20. 68% of respondent said yes green construction resources are available in the city while 32% said no (Figure 21).

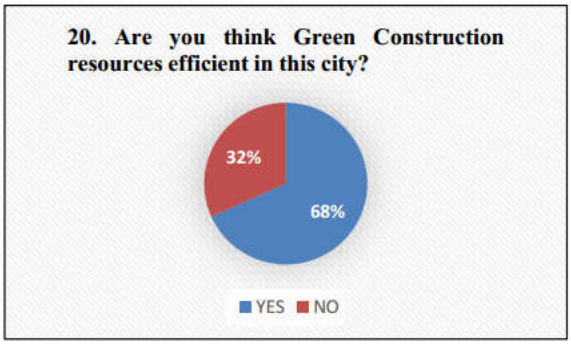


**Figure 21.**

21. 30 of respondents said Rain water harvesting is less cost and take less time to construct and 15 said Green Roof and 15 said Solar Panel (Figure 22).

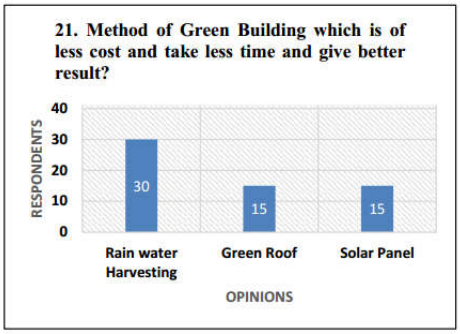


**Figure 22.**

### Frame work for using green building concept

From the above result by construction practitioners it is clear that they haven't any experience of Green Building construction which reduce the understanding of Green Building so it important for the construction practitioners to increase the knowledge and do steps to reduce greenhouse gases. The 54% of Construction practitioners said Green Building material is not easily available in Gwalior region so it is main barrier for implementation of techniques of Green Building. 56% of the construction practitioners said there is no policy of Green Building construction in company and 54% of the construction practitioners have no knowledge of Green Building rating systems in India which reduces the awareness of policy of Green Building. Proper framework should be adopted for construction of Green Building

- The construction practitioners should be aware time to time for awareness by seminars.
- The ecofriendly material should be easily available at low cost for proper green Building construction.
- The Government should aware peoples about Green Building Rating systems so that companies follow the law and save the nature.

### Conclusion

From the above responses of construction practitioners, we can conclude that everyone knows about Green Construction but many of companies are not aware of Green Building policy and rating system. Most of the respondents said no procedure followed in company for implementation of green building that is the major issue as they are using orthodox methods till now. The maximum no of construction practitioners said that no availability of eco-friendly material in Gwalior region so this can be a barrier for Green Building Construction. For reduction the impact of construction and to reduce the effect of Global warming construction companies must adopt the green building concept.

All knows green building concept is good impact on Climate, but use and make energy efficient building no one can do this. It is new concept issue of cost, design problem are major but the several concept green building is used in normal building, so it can change green building construction. It is energy efficient technique and cost reduction which uses natural energy and reduce the energy consumption.If Indian government has strictness for reduction the use of orthodox method of construction strictly follow green building concept than save millions of dollars every year.

### Acknowledgment

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