

**Awareness & Knowledge of Green Building****Radha Pathak \***

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**Abstract:**

*A green building is one that uses less water, optimizes energy efficiency, conserves natural resources, generates less waste and provides healthier space for occupants as compared to a conventional building. Components of green building are water, renewable energy, reducing waste, and reuse and recycling kitchen garden, green roof, better indoor air etc. Green building has various advantages like environment, economic, and social advantages. The present study was conducted in Nagpur city. The samples were homemakers. 100 samples were selected by convenience sampling method. The data was collected with the help of questionnaire cum interview method. Green building is the need of the hour but homemakers are not aware about the green building concept. Government, contractor, and builder should spread awareness on green building in the society.*

**Keywords:** Green Building, Green component, Homemakers, Awareness

**Introduction:**

A green Building uses less energy, water and other natural resources, creates less waste & Greenhouse gases and is healthy for people during living or working inside as compared to a standard Building. Another meaning of Green Structure is clean environment, water and healthy living. Building Green is not about a little more efficiency. It is about creating buildings that optimize on the local ecology, use of local materials and most importantly they are built to cut power, water and material requirements. Thus, if these things are kept in mind, then we will realize that our traditional architecture was in fact, very green. Today, we have forgotten how to make a natural environment, instead copying it from developed countries.

**Concept of Green Building**

The green building concept is gaining importance in various countries. These are buildings that ensure that waste is minimized at every stage during the construction and operation of the building, resulting in low costs. Green building is a whole-systems approach for designing and constructing buildings that conserve energy, water, and material resources and are more healthy, safe,

and comfortable. Green building offers a response to the realization that the way we have been building everything from houses to skyscrapers is not sustainable. Many health problems today stem from, or are aggravated by poor indoor air quality and exposure to toxic substances contained in commonly used building products. Green building practices can eliminate these health-damaging conditions.

**Definition of Green Building**

- A 'green' building is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life. Green building is not new. Humans been building with local materials such as mud, straw, wood, and stone, and using renewable energy from the sun, the wind, and water for thousands of years. (World Green Building Council, 2019)
- "Green" or "Sustainable" buildings use key resources like energy, water, materials and land more efficiently than buildings that are just built to code. With more natural light and better air quality, green buildings

typically contribute to improved employee and student health, comfort and productivity. (Mehta and Porwal, 2013)

## Components of Green Building

### 1. Water

Minimizing water use is achieved by installing grey water and rainwater catchment systems that recycle water for irrigation or toilet flushing; water-efficient appliances, such as low flow showerheads, self-closing or sprays taps; low-flush toilets, or waterless composting toilets. Installing point of use hot water systems and lagging pipes saves on water heating.

#### • Rainwater Harvesting

Water is our most precious natural resource. The harvesting of rainwater simply involves the collection of water from surfaces on which rain falls and subsequently storing this water for later use. Normally water is stored in rainwater tanks. Water can also be collected in dams from rain falling on the ground and producing runoff. The collection of rainwater from the roofs of buildings can easily take place within our cities and towns. All that is necessary to capture this water is to direct the flow of rainwater from roof gutters to a rainwater storage tank.

#### • Grey Water

The separate treatment of grey water falls under the concept of source separation which is one principle commonly applied in ecological sanitation approaches. The main advantage of keeping grey water separate from toilet wastewater is that the pathogen load is much reduced and the grey water is therefore easier to treat and reuse.

### 2. Renewable or Non-Conventional Energy

Renewable energy is obtained from the continuous or repetitive currents of energy occurring in the natural environment. An obvious example is solar energy, where repetitive refers to the 24 hours major period.

#### • Solar Energy

With the growing effect of global warming and carbon pollution, environmental conservation has become a priority. Solar panels are one of the best options of effective energy sources to meet our energy needs at an affordable price. A solar panel converts sunlight into an electric current or heat used

to provide electricity for home or building. Solar panels are constructed as a collection of lots of small solar cells that are spread over a large area to provide enough power.

### 3. Reducing Waste

#### • Compost

Composting is the best way to handle food waste. Home composting is an easy way to turn much of the waste from the yard and kitchen into a rich material that we can use to improve soil. It is also a way to speed up the natural process of decomposition and return organic materials to the soil. Traditionally composting at home was done in a pit in the corner of a garden. Most urban Indians are not aware that they can significantly improve urban waste problems by composting at home. Kitchen compost has come up with easy and simple methods of composting. For household level compost can give organic fruits, vegetables and flowers. Compost is decomposed organic material, such as leaves, grass clippings, and kitchen waste. It provides many essential nutrients for plant growth and therefore is often used as fertilizer.

### 4. Reuse & Recycle

Recycling involves the collection of used and discarded materials, processing these materials and making them into new products. It reduces the amount of waste that is thrown into the community dustbins thereby making the environment cleaner and the air fresher to breathe. The steps involved in the process prior to recycling include

- Collection of waste from doorsteps, commercial places, etc.
- Collection of waste from community dumps.
- Collection/picking up of waste from final disposal sites.

Most of the garbage generated in the household can be recycled and reused. Organic kitchen waste such as leftover foodstuff, vegetable peels, and spoiled or dried fruits and vegetables can be recycled by putting them in the compost pits that have been dug in the garden. Old newspapers, magazines and bottles can be sold to the kabadiwala, the man who buys these items from homes.

### 5. Kitchen Garden

The importance of a kitchen garden is great and manifold. A kitchen garden ensures an inexpensive, regular and handy supply of fresh



vegetables which are basic to nutrition. The green vegetables contain vitamins and minerals which protect us against diseases. Lack of vegetables, particularly the green leafy vegetables, leads to malnutrition which causes diseases like anaemia and night-blindness. Kitchen garden prevents air pollution. It purifies the air through the plants. Plants breathe in carbon dioxide and breathe out oxygen which is vital for our life, in order to preserve health and prevent malnutrition.

## 6. Better Indoor Air

Some pollutants only show effects after the damage has been done. Indoor pollutants can cause heart disease, cancer and other potentially fatal illnesses. Health issues aside, poor air quality in our facility can lead to issues with productivity, workplace satisfaction, and attendance. Directly impact our organization's operations and ultimately, the bottom line. While people may react very differently to indoor air pollutants, employers have a duty to provide a safe, non-harmful environment for their employees. Understanding and controlling common pollutants indoors can help reduce our risk of indoor health concerns.

- **Benefits of Green Building** (World Green Building Council, 2019)

A green building has a variety of advantages. We can broadly classify them into three subheads:

- **Environmental Benefits:**

Green buildings have a huge positive effect on the environment. They use fewer natural resources as compared to a normal building. A green building ensures that it is water-efficient and energy-efficient, and has a much smaller carbon footprint. A green building also ensures that the surrounding ecosystem is protected and further enhanced.

- **Economic Benefits:**

It is commonly believed that green buildings are costlier than normal buildings. While that might be true at the initial stage i.e. while the building is being made, it has been effectively proven that the overall costs are much lesser than the normal buildings. They consume less resource, and improve the productivity of occupants. Green buildings also entail higher real estate value. Besides these benefits, incentives are also

given by local government bodies in order to achieve a sustainable future.

- **Social Benefits:**

- Green Buildings have been proven to have a positive impact on the health of residents. Since they provide a balanced and optimal eco-system for residents, they have a positive effect on the productivity and wellbeing of those who occupy the building.

## Purpose of Studies:

Day by day the natural resources are depleting. Due to global warming the climate is changing. In the future we all will suffer because of scarcity of resources like water; energy etc. Green building is the best solution to this problem. The concept behind having green buildings in less usage of water, optimizing energy use, and conserving natural resources. Green building promotes sustainability without disturbing natural habitats. A green home can cut down energy consumption, save money and have a major impact on betterment of the environment. But general public is not aware of advantages of green building

## Aim:

- To study awareness and knowledge of Green Building in Nagpur City.

## Objective:

- To identify the awareness level of the green building concept.
- To study the problems of green building.

## Limitation:

- Present study was limited to Nagpur city only.
- Only 100 Homemakers were selected as a sample.

## Material & Methods:

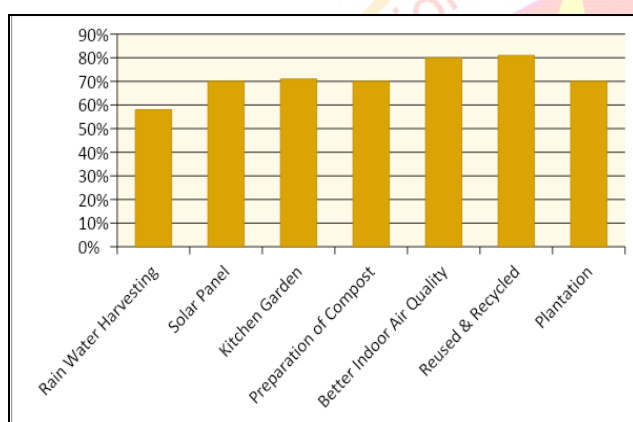
For the present survey the area was selected from the Nagpur city of Maharashtra state. The samples were homemaker's. 100 samples were selected for the survey from Nagpur. Samples selected by Convenience sampling method. Data was collected through a survey method. Primary data were collected through Questionnaire –cum-interview method. Secondary data required for the study were collected from books and journals.

## Result and Discussion

### Awareness level of green building concept

Table No 1- Distribution of the respondents on the basis of Knowledge about green building.

Sr No	Knowledge about Green Building	Percentage
1	Rain Water Harvesting	58%
2	Solar Panel	70%
3	Kitchen Garden	71%
4	Preparation of Compost	70%
5	Better Indoor Air Quality	80%
6	Reused & Recycled	81%
7	Plantation	70%

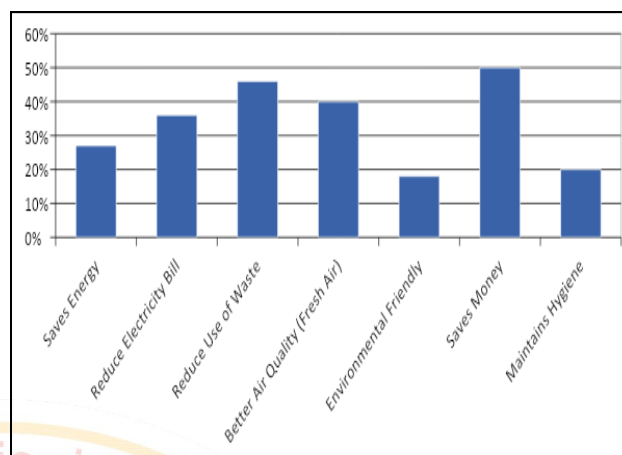


When the respondents were asked about their knowledge and awareness about green building, they gave the following responses. The table no 1 revealed that .81% respondents known the concept of reused and recycled, 80% respondents were ideas about better indoor air quality, 71% have knowledge about kitchen garden, 70% respondents were known the concept of solar panel and preparation of compost and plantation and only 58% were idea of rain water harvesting. Maximum respondents have knowledge of green building. They got information through builders, television, magazines, Radio etc.

### Benefits of green building.

Table No 2-Benefits of green building

Benefits	Percentage
Saves Energy	27%
Reduce Electricity Bill	36%
Reduce Use of Waste	46 %
Better Air Quality (Fresh Air)	40%
Environmental Friendly	18%
Saves Money	50%
Maintains Hygiene	20%



There are lots of benefits of green building but homemakers are not much aware about the Green n building concept. Many times the role of homemakers is not important when building a house or buying a flat.

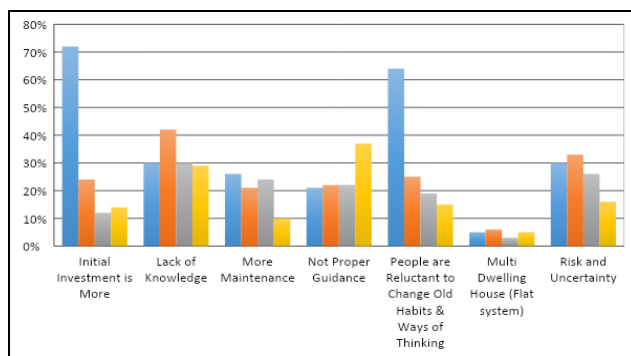
The Table no 2 shows that 50% respondents said that due to green building money could be saved.46% opined that it reduces waste, 40% thinks that green building gives better air quality (fresh air), 36% said that it reduces electricity bill, 27% opined that energy is saved.20% thinks it helps to maintain hygiene and 18% thoughts green building is environment friendly.

### Problems of Green Building

Table 3- Problems of Green Building

Problems	Solar panel	Rain Water Harvesting	Compost	Kitchen Garden
Initial Investment is More	72%	24%	12%	14%
Lack of Knowledge	30 %	42 %	30 %	29%
More Maintenance	26%	21%	24%	10%
Not Proper Guidance	21%	22%	22%	37%
People are Reluctant to Change Old Habits & Ways of Thinking	64%	25%	19%	15%
Multi Dwelling House (Flat system)	5%	6%	3%	5%
Risk and Uncertainty	30%	33%	26%	16%





Investigator asked about problems of green building to respondents. Why don't people adopt the Green building concept? The respondents have given the following responses.

The following problems related to solar panels were mentioned. The table no 3 shows that 72% of respondents felt that initial investment is far more by installing solar panels, 64% people are unwilling and hesitant to change their old habits and way of thinking. 30% respondents face risk & uncertainty problem, 30% respondents could not install due to lack of knowledge about solar panel, 26% people thought it have more maintenance, 21% respondents are having problem of proper guidance, 5% flat owner are not having place for installing solar panels, it's very problematic situation for them. Regarding Rain water harvesting they faced some problems. 42% people don't know about the rain water harvesting, 33% respondents have risk & uncertainty problems, 25% public has not changed there thinking and did not install rainwater harvesting, 24% public thought initial investment is more by installing rainwater harvesting system, 22% have problem of proper guidance, 21% people thought it had more maintenance, and only 6% respondents live in flat system so they have no proper place for installing rainwater harvesting system.

They complained about compost preparation. 19% of respondents are reluctant to change old habits. 30% don't know about preparation of compost, 26% fill risk and uncertainty, 24% think that it requires more maintenance for preparation of compost, 12% are having problems with initial investment in compost and only 3% respondents said that there is no place for preparation of compost.

Some respondents are unable to create a kitchen garden at home due to the following reason. The above tables show that 37% of respondents had no proper guidance, 16% fill risk and uncertainty for kitchen gardens, 15% people are reluctant to change old habits and way of thinking for kitchen gardens. 14% said that initial investment is more, 29% had lack of knowledge, 10% think that it requires more maintenance cost for preparation of kitchen garden and only 5% people have no space for kitchen garden.

### Recommendations

1. Its very necessary for the government to spread green building awareness to the people through social media like what's app, Facebook, Radio, Television etc.
2. The Government should give the information of the green building, to increase their awareness level.
3. Government gives the opportunity for people who have constructed a new house and its efficiency to install two components of green building like solar panels or rain water harvesting.

### Conclusion

Green Building is needed in today's time but when investigators conducted a survey, it was observed that homemakers are not aware of the green building concept. There needs to be more public awareness about green building. The concept behind having green buildings in less usage of water, optimizing energy use, and conserving natural resources. Government, Contractor, Builder should spread awareness of green building in the society.

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