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Environmental Impact Assessment on Green, Existing and On-going Buildings

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Abstract: Environmental impact assessment is a planning authority and also provides detail information about particular type of project. Environmental impact assessment (EIA) aim is to analysis both (positive and negative) plan, for before starting the project. Environmental impact assessment is used when applied to actual project by companies or individuals. In construction project to analysis the environment for both on and off-site condition. The main thing to assess the biological, physical, chemical, social-economic in environment for three various kind of building like green, existing, and on-going building. They study focused on various parameters such as water quality, risk assessment, solid waste, and energy resource. Then water parameters have to be tested in laboratory. Analysis risk assessment by SPSS (Statistical Package for the Social Science) software, collection of data related to energy resource and solid waste management by questionnaire survey. The aim of this paper is increasing the natural resource and reduces environmental impact in the buildings.

Keypoints: Green building, existing building, on-going buildings, water quality, risk assessment, solid waste, and energy resource.

1. INTODUCTION

Environmental impact places a major role in every country. Its affects due to the pollution, land use planning, demolishing natural resources as well as others. Unplanned land use creates a major problem. In the United States compare then other industries construction industry create more waste per year. There are lot of environmental impact occurs. This paper compares both conventional building and Green building. There are many agencies to analysis environmental impact assessment but most important agencies like LEED (Leadership in Energy Environmental Design) and GRIHA (Green Rating for Integrated Habitat Assessment) provided rating system in India because that gives accurate rating system for building construction. Due to construction many parameters are affected. Four main and normal parameters used in this project. Such as Water resource, Risk assessment, Solid waste and Energy resource. Motive of this paper is to compare the three building and finally concluded Green building is best because reuse material increase natural resource in building construction.

EIA Scenario

In India, first EIA introduced in India based up on the Environmental Protection Act (EPA), 1986. It comes from the effort when MoEF (Ministry of Environment, Forest) passed legislative measure under EPA in JAN 1994 For (EC) Environmental Clearance known as EIA. Current amendments EIA 2006. Main laws.

- Water Act(1974)
- Environment (protection) Act(1986)

Central pollution control responsible for total body. In India EIC is the secondary source of data for environmental impact

2. OBJECTIVE

- To establish the existing physical-biological-social-economic condition of the project area
- To identify the both positive and negative impact of the project area
- To make recommendation to eliminate /mitigate /control and identify impact
- To integrate the view of the code, national and international, report, stakeholder and final project design from the EIA review report

3. METHODOLOGY

Over view of life cycle of the project is said to be methodology it's analysis both theoretical and systematic field study of the project. Execute Step by step process of

the project is said as methodology. For Research purpose here taken three various kind of building across in same campus location. A questionnaire survey was done for the four parameters such as water resource, solid waste, risk assessment and energy resource after that finally compared the result. After that provided five categories of option for risk assessment and analysis by using SPSS (statistical package for the social science) software. Relevant data were collected by frequently interacted with site engineers, supervisor and workers associated project.

4. STUDY AREA

Salem is the fifth largest city in TamilNadu. Salem word comes from sela or shalya its refers. Around the country hills are surrounded in salem.Two thousand years ago salem is the silver coins of Greek Emperor Tiberices Nero (37-68 A.D) Koneripatti of Salem in 1987.

Best in Agricultures also.location of this project is selected at Sona College of Technology it is an autonomus campus. This Campus located Center of the City.Inside the college having three various kind of buildings that are

I.Green Building (MCA Block)
II.Existing Building(CIVIL Block)
III.On-Going Building(University Block)

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Figure 1. Sona College map Location

Figure 2. Salem city map

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Figure 3. Green Building Block in sona college

Table 1.1. Study Area

Type of Area	In Acres	In square Meters
Building Area	4	173600
Road Area	1	43400
Walking Area	0.75	30380
Parking Area	0.60	26040
Playground Area	1	43400
Green Cover Area Include Open Area	8	347200
Total area	15.35	620620

Table 1.2. Environmental Impact Assessment Study Area Report

S.No	Parameters	Study area
1	Location	Salem
2	Nearest Railway Station	Salem Junction
3	Project Cost	-
4	Power Requirement	Yes
5	Size of Area	15.35 Acres
6	Green Area	8 Acers
7	Parking Facility	Provided
8	Water Requirement	Yes
9	Solid Waste Generation	Yes
10	Source Of Water Supply	Ground, Lorry Water
11	Sewage Generated	Yes
12	Rain Water Harvesting System	Building Based
13	Distance From the city Centre	Salem 5km

5. LITERATURE

S.Selvakumar[1] and R.K.C.Jeykumar[2] (2015)
In this paper said that Environmental Impact Assessment (EIA) Study prepared for appropriations interventions for before starting the project as well as economic and technical criteria. Here analysis by checklist methodology. In this paper take various parameters such as water quality, parking area, solid waste, rainwater harvesting, sewage treatment plant, source of water, total area, basement area. Study area of the building construction is Madurai. Motive of this paper is to be analysing the environmental condition before starting the project.

Devarshi Ththagat[*],Dr.Ramesh D.Dod[**] (2015)
This paper about how to minimize energy consumption in green building in India and degradation of environmental through Green House Gas Emission (GHG) and also it said about the benefits of the green building construction as well as detail about the GRIHA and LEED both rating and green building certified system .

Electrical Techniques:

- Optimum use of natural light
- Compact fluorescent lamps instead of incandescent lamps
- Energy efficient fluorescent lamp/LED instead of conventional fluorescent lamp
- Solar lighting

6. PARAMETERS DETAILS

In this paper deals with four parameters such as

- Water resource
- Solid waste management
- Energy resource
- Risk assessment
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1. Water Resource

Water resource places a major role without water there is nothing in the world like human beings, plants, animals, agriculture and also important for construction. In the world 97% of water is salt content and only 3% of water is fresh water. Not only fresh water need for human and also it's important for building construction purpose. In conventional building they don't provide rain water harvesting but in green building normally provide rain water harvesting. Here water tested in college laboratory. In the below water test result analysis under permissible limits as per IS 105000 and IS 456 test result is done for both portable and construction purpose.

Table 2. Water final result

S.No	Name of the Test	Result for Green Building	Result for Existing Building	Result for On-Going Building	Permissible limits as per IS 456- 2000 and Is 3025	Permissible limits as per IS 105000-1991
1	Colour	Less	Less	Less	-	-
2	Odour	Less	Less	Less	-	-
3	pH	7.76	7.78	7.6	Not<6	6.5-8.5
4	Total Hardness (mg/l)	230	226	240	<600	<600
5	Calcium Hardness(mg/l)	200	200	216	<300	<200
6	Magnesium Hardness(mg/l)	30	26	24	<75	<100
8	Chlorides (cl)(mg/l)	83.97	83.97	79.97	<2000	<1000
9	Sulphate (so_3)(ppm)	36	36	35	<400	<400
10	Iron(mg/l)	0.1	0.1	0.1	<1	<1
11	Fluoride(mg/l)	1.2	1.2	1.2	<1.5	<1.5

2. Solid Waste

Solid waste management is important for both existing and on-going building. Waste creates more pollution in the world. Now a days more knowledge and awareness about waste management. Waste that generate by building occupants and disposal in landfills. Recycling of glass, metals, paper, and cardboard.1 ton paper that prevent the process of 17 trees and save 3 cubic yards of the landfill. Don't filled waste in to the land that affect water, air, and land pollution. In building construction there are lot of solid waste present.in normal building construction solid waste to be reuse and used for landfill. In green building they could be split in to various bin formation. In India there are three various waste separation bins are used like Food and garden waste in green bin .mixed dry recycling in red bin, non-recyclable waste in black bin.

Terminology:

- Landfills: landfills are the disposal sites for the solid waste from human activities
- Tipping fee: tipping fees is amount based method by landfill for disposal of waste, typically quoted "per ton".
- Hauler: hauler is a company or person which collects the recyclable materials and sent to recycling facilities.
- Comingle recycling: comingled recycling is a term used recyclable materials such as (plastic, cardboards, metal, paper) are material stored in single storage place. The hauler separated they materials and sends in to corresponding recycling facilities.

3. Energy Resource

In normal building they used incandescent lamps, conventional fluorescent lamp this lamps are costly compare then compact fluorescent and LED. In green building optimum use of natural light that compares both conventional building and green building. After they suggested that green building provided optimum use of natural light more free spacing for window, doors so don't need more power supply for light and fan. So that it's not affect environmental as well as reduce cost. And also provided solar system for building so lot of benefits in

green building compare then conventional building. In questionnaire survey relevant data were collected by frequently interacted with site engineers, supervisor and workers associated project.

4. Risk Assessment

Risk assessment analysis by SPSS (Statistical Package for the Social Science) software to been used. There is much type of methods available for analysis data. Hear data were collected and analysed by Relative Important Index (RII) Method. The RII method is used to show the level of the factor contributing to risk management on constructions sites. The RII is the "summation of the weight value" (SWV) and the total number of respondents in all rating. The SWV is the addition of the product of value attached to each rating and respective number of respondents.

SWV= $\sum \quad Xi\ YI\ and = SWV/Xi$

Where,

Xi= number of response to rating

Yi= the value of rating

In this project collected information from various sites after that data was analysis by SPSS software.

7. CONCLUSION

In building construction create more water pollution, solid waste, energy resource and risk assessment. In this paper said that minimization of resource in building and decreases natural pollution. Finally conclude green building is best compare then other buildings because it prevents resource from environmental effects.

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