

## Needs of Green Buildings Fundamentals and its Implementation Flexibility for Prompt Effectiveness in Developing Countries

Pragyan Bhattarai<sup>1</sup> A.V.A Bharat Kumar<sup>1</sup> Rajendra Chaudhary<sup>1</sup> Dr. Shashi Kumar Gupta<sup>2</sup>

1.Student, Civil Engineering Department, K.L.University, India

2.Professor and Head of Department, Civil Engineering Department, K.L.University

Email address: pragyan25@hotmail.com

### Abstract

The construction concept is upgrading every year and major concern is given to the environment and human health. People's activities for the sophistication has really degraded the component of environment which has impact in global warming, heat island effect and other hazardous effect causing negative impact to human health as well as environment. Now this trend need be changed and any construction work must be in collaboration with environment which is also coined as Green Building concept. In spite of many organizations's effort this technology is being limited to some developed countries and no major progress is concluded in specially developing countries. Lack of awareness and misconception about the green building is limiting this concept. In order to make the green world very soon the system must be commenced from the government level itself. Government of every country should make grounds rules making basic green building categories and should register those building which have fulfilled the basic categories and certification must be given from government level itself evaluating the categories(Sustainable site development, Water saving, Energy efficiency, Material Selection, Indoor Environmental quality and Design) and innovation. Innovative design and implementation of engineering concept for every category must be given high priority. This paper forwards the concept of green buildings and basic categories which can be followed by government and basic planning design for everyone who can't afford export which can be amend and implemented as per the context.

**Key words:** Green Building, Environment, Awareness, Government, Engineering concept, Human health

### INTRODUCTION

Environment is the main component of the earth system and without which existence of any living things is not possible to imagine. Today, the world is encountering tremendous problems related to the environment. Global warming, increase in pollution, unusual calamities and other tantamount effects are the outcomes of the degradation of component of environment. It is very much clear that the life span of living beings is decreasing yearly due to the expose with many harmful chemicals and other various things which are the absolute consequences of human activities only. In the name of sophistication we are detonating the component of environment in that extends that we might be in very harshly circumstance at any instant. If we still take up this types of activities and do not control the activities then the result might not be in our favor so, this is a time to work in collaboration with environment maintain the component of environment and getting the profits for good life style. It's a time to think for green and work for green. Though, the environmental progress concept was commenced from 1970s and later in 1990 the green revolution commenced which raise the attention of the globe in the importance of preservation of environment and the role of human activities for environmental protection [4]. Many countries are very much responsible for the upliftment of this task and are working hard enough to make the world a green world. In spite of all this deeds there are no much improvement in this approach. Many developed countries are working hard for implementation but developing countries are still struggling and many of them are not at all effective in the case of implementation. Developing countries like Nepal, India, Bhutan etc has significant growth of infrastructure and this deed is going on. It is expected that India alone is growing in the construction industry by average of 9.5% which is covering 5% of global. We can't neglect the fact that the construction practice which is going on is creating lots of problem as many resources are being destroyed, non renewable resources are widely used, people are occupying the space and leading for deforestation which are best instance in which environment are not considered at all so, careful implementation of green concept helps to make the user active user of green revolution from the initial phase itself. To make people aware about the intense impact of our deeds in the environment and also their effects to the human beings and other things and inspire the users to be aware about the green material, use of eco-friendly methods for everything and preserves the component of the environment by being the part of environment not detonating the environment. [6].

We can take green buildings in tremendous way as we can preferably called it as Sustainable house or eco- friendly house, intelligent building and other tantamount things which overall give the reflection of a highly sophisticated and best performance building having high impact in human being and environment. It aids a lot to improve our health considering environment as the key factor which is today's main attention. These types of building are considered for human comfort by conserving the environment which helps to increase the overall

performance of life. This is nothing but the intellectual and creative use of the mind where simple things are given more priority and use of locally available materials and selection of more astute material in construction is its main motto. This technology is spreading rapidly all over the world and people are more prone to this technology. The need of this type of technology in developing countries has become more crucial nowadays. There are different organizations which are being associated with this technology and are responsible for spreading worldwide like US Green Building Council(USGBC) which is third party certification ,Bureau of Energy Efficiency(BEE), Indian Green Building Council and several other non profitable government organization and their research and findings also proves that green buildings are proven to be environmental friendly with lots of its merits in environment which indicates that giving more priority to environment indeed aids a lot in reducing consumption of natural resources, pollution and waste and also improves the health of people as per UNEP report forwarded in 2007 [5].

The process was commenced long back but still up till the date there is no major improvement in this field and there are tremendous facts which are the key factors for them which need to be analyzed and rectified instantly. Normally, the green house indicates the implementation of enlisted things

1. Use of local material, utmost use of renewable resources making limited use of non renewable resources.
2. Use of energy in an effective ways
3. Recycling and reusing the material for reducing pollution, waste material and other tantamount impacts

#### *Objective*

This paper is forwarded with the vision of finding the enigma behind the less effectiveness of green building in the developing countries. We have tried to find out the reason about why people are unaware about this concept and what are the common trends that have been going on in this field and how we can make this concept accessible to the world arena so that everyone can have the access to green and everyone can contribute for the environment. We also have surveyed some of the countries about the green implementation effectiveness and reviewed some of the research paper about what really is going on for the progress and have made some ground rules for the astute and effective implementation of green concept in this paper.

#### **PRESENT SCINERO AND IMPLEMENTATION EFFECTIVENESS**

It is clear that in the developed countries like USA, Canada etc the effectiveness of implementation is more appreciable whereas in the developing countries like Nepal, Bhutan, India etc, the development is very stagnant which is due to various facts. There are certain parameters which aid to lead for the green building which need to be fulfilled. Though location also make big different as the building certified as green in India might not be certified as green in Nepal due to change in topography, climatic condition and other tantamount things so different country need to have their own rules for their country as LEED, USGBC are considered in USA, India also have their own council known as IGBC (Indian green building Council)[6, 1] other different countries also have their own council to check whether or not the implementation is going on and almost all the councils are having common parameters which are 1) Selection of site, 2) Planning of building, 3)Innovative and astute design, 4) Use of local material, 5)Management of wastage 6)Management of water and its effectiveness, 6) Use of energy and it's management 7) Selection of Materials 8)Management of indoor environmental quality

These are some of the key parameters which is most important to be maintained in order to improved the performance of building and also reduce environmental impact. The general consideration is made and evaluation about the effectiveness of this green buildings important parameter which is being followed by different class of people are tabularized in a general form and here yes indicates that people of enlisted class can afford and No indicates they might not or can't afford which is based on the survey done in Nepal, India and Bhutan.

Table1. Effectiveness for different class people buildings under various criteria

<b>Sustainable site development</b>			
	High class building	Middle class building	Low class building
Local regulation	Yes	Yes	No
Soil erosion	Yes	No	No
Land scape	Yes	Yes	Yes
Parking facility	Yes	Yes	No
Heat island effect	Yes	Yes	No
Electric charging	Yes	Yes	Yes
Design	Yes	Yes	Yes
<b>Water efficiency</b>			
	High class building	Middle class building	Low class building
Rainwater harvesting	Yes	Yes	No
Managing irrigation system	Yes	No	No
Grey water treatment	Yes	No	No
<b>Energy efficiency</b>			
	High class building	Middle class building	Low class building
CFC equipment	Yes	No	No
Energy performance	Yes	No	No
Refrigeration	Yes	Yes	Yes
Solar	Yes	No	No
<b>Materials</b>			
	High class building	Middle class building	Low class building
Separation waste	Yes	Yes	Yes
Waste reduction	Yes	Yes	No
Organic waste management	Yes	No	No
Local material	No	Yes	Yes
<b>Indoor air quality</b>			
	High class building	Middle class building	Low class building
Day lighting	Yes	Yes	No
Fresh air ventilation	Yes	No	No
Low VOC	YES	NO	NO
Carpets	Yes	Yes	No
Day lightning	Yes	No	No
<b>Innovation design</b>			
	High class building	Middle class building	Low class building
Innovation design	Yes	Yes	Yes
Cost	Yes	No	No
<b>Registration cost/certification cost</b>			
	High class building	Middle class building	Low class building
Registration cost	Yes	No	No

All the above consideration are made by general survey of some of the developing countries like India, Nepal and Bhutan which was being followed by following criteria

**1) Income of People**

High class building	Middle class building	Low class building
People having more than 20 lakh income annually	People having more than 5 lakh and less than 15	People having less than 5 lakh

**2) Land accessibility of people**

High class building	Middle class building	Low class building
People having more than 9000 sq.ft land for construction	People having 1800-8000sq.ft	People having below 1800

**3) Awareness**

High class building	Middle class building	Low class building
Very low(as per IGBC)	Nil	Nil

**COMMON PRACTICES AND COMPARATIVE STUDY**

Many of the councils are working in the same basis where the pointing system is being followed up and criteria are classified. Checking for every criteria and the granting of the pointing system accordingly is done by all council in common. Many types of council in different countries like IGBC, LEED, and NABH etc are the third party councils which are for awareness as well as certification process

Division	Prerequisites			Max.points			Certified			Silver			Gold			Platinum		
	LEED	IGBC	NABH	L	I	N	L	I	N	L	I	N	L	I	N	L	I	N
ID	3		-	11		82	-	2		-	2	8	-	2	10	-	3	12
LL	-			10			-	-		-	-		-	-		-	-	
SS	2		-	22		-	5	12		5	18	100	5	21	100	5	24	100
WE	-		-	15		115	3	8		3	9	6	3	10	13	3	11	19
EA	2		3	38		338	-	-		-	-	37	-	-	62	-	-	100
MR	3		-	16		217	2	4		2	2	44	2	2	60	2	3	77
EQ	7		-	21		132	6	8		6	10	31	6	12	54	6	13	72
AE	1		-	3		18	-	17		-	20	3	-	24	5	-	27	6
Other	-		-			-		29			44	100	59		100	74		100
Total	18		3	136		921	45	51	100	60	61	237	75	71	311	90	81	395

L-LEED (Leadership in energy and environmental development)

I-IGBC (Indian Green Building Council)

N-NABH(

ID- innovation in design

LL- Location and linkages

SS- Sustainable sites

WE- water efficiency

EA- energy and atmosphere

MR- material and resources

EQ- indoor environmental quality

AE- Awareness and education

LEED, NAHB, National green building standard are the three green building certification organization that seems to be same but the cost and the types of buildings are different from them i.e., as per the cost that includes registration, certification and inspection and cost is more in LEED certification when compared to NAHB and national green building standard. Observing the types of buildings is all single family homes that can go for all the three organizations, for multistoried and commercial buildings we need to go for the LEED only and overall the pointing system is based on same principle [14].

Implementation in developed countries is very satisfactory than that of others. The suitability and effectiveness of green building were done by collecting data from LEED certified buildings and consequently effects are by direct mechanism and indirect mechanism to the environment. This mechanism effects on environmental design features of a Green Building on occupants, environmental awareness (EA) and Organizational Image (OI) [15]. For the astute implementation of green buildings, its components must be cared of and one of them is energy efficiency. Energy consumed by heating, ventilation and air conditioning (HVAC) system and lighting system utilize 60% of the electric power of the buildings, which is the key reason for the challenge to green concept. We need to reduce the level of utilization of such material and seek for the alternatives which might be photovoltaic solar [15] or reducing the consumption of lights through day lighting effects [16]. Energy saving can be imposed in different ways like considering the sustainable development site

as building orientation, building insulation, roof insulation, lighting, indoor, outdoor etc in a best possible ways. The building orientation should be as per Vastu direction which has very much aesthetical value and also building insulation can be taken care of through plantation of trees on the periphery which aid in saving up to 25% of energy. The roof should be green roof which can be obtain by various methods as using light color reflective coating which aid the natural light to pass by curtailing the energy consumed (50-80) % . We also can intensify the area of the windows such that it gives more light in day time which helps to reduce the use of electricity in daytime as natural light can be used up. If the light is not in use we can turn off the light, use CFL lamp, electric ballast etc which also helps for green concept in certain extend [15]. Most of the buildings are responsible for 40% of energy consumption and 36% of the CO<sub>2</sub> emissions. Energy performance of each building is a key element to achieve the climatic and energy objectives, such as 20% reduction of the greenhouse gases emissions and 20% of primary energy saving target by the year 2020. It should be possible by the use of solar powers and use of other tremendous renewable sources [10]. We basically should go through the basic component which need to be implemented in an innovative way as far as possible . They are (a) Sustainable Sites, (b) Water Efficiency,(c) Energy & Atmosphere, (d) Materials & Resources, (e) Indoor Environmental Quality, and (f) Innovation & Design Process. Maintain good indoor environment quality (IEQ). From the Indoor air quality it is of total 10 components that are to be considered they are (a) Minimum Indoor Air Quality Performance, (b) Environmental Tobacco Smoke Control, (c) Carbon Dioxide Monitoring, (d) Ventilation Effectiveness, (e) Construction Indoor Air Quality Management Plan, (f) Low-Emitting Materials, (g) Indoor Chemical and Pollutant Source Control, (h) Controllability of Systems, (i) Thermal Comfort, and (j) Daylight. If we can give more attention for the reduction of these things than it is very easy to get the credit and also make building green [4]. Emission of green house gases is the main fact due to which global warming is being occurred and other tremendous effect in term of environment and human health is concluding. For this Kyoto Protocol is worked which is a protocol which means international treaty on climate change in December 1997 to reduce discharge of greenhouse gas as to fight global warming created by United Nations to reduce the greenhouse gas emissions at least by 5% by 2008-2012 in order to tackle global warming and climate change. Some of the measures of the governments to achieve this goal are to promote new buildings construction and to retrofit existing buildings which can also satisfies the low energy criteria. In the same manner other countries also did the same [2]. Indoor environmental quality is also another main concern as people invest most of their time indoor and the air quality is most important which has direct influence in their health. The indoor pollution can be caused by the building and materials which are used for building decoration. It may damage people's health condition even more than outdoor pollutions. Now days human has to suffer not only outdoor factors such as: noise, water pollution and motor vehicle pollution that result from global industrial development. But also the indoor environment pollution that comes from the buildings and indoor decorative materials. 68% of diseases are related to indoor pollutions or poor indoor air quality, such as aging of skin. Hair shedding, general fatigue. Forgetfulness, infertile, leukemia, and cancer. Some of the main indoor pollutants are benzene, canbondioxide, formaldehyde, carbon monoxide, nitrogen oxides and biological pollutants that comes from material that we use inside the building, cooking, heating, furniture, attached garages etc. It is the reason due to which it is said that indoor environment is 70% more toxic than outer city environment. [8]

With the help of ventilation system also we can control the movement of air which helps in conserving the utmost use of air conditioning and also helps in other various factor. Concise Ventilation technique can be used up in order to reduce the consumption of energy that is being used up due to the heating of the house in the winter. Manual ventilation techniques were used where the consumption of the energy is highly reduced, but this created lots of problem as warm air get displaced by cool air when this process is incur. [11] The shock ventilation process is given more preference for maintaining the air circulation in the house without any loss. More than shock ventilation if the trickle ventilation is used than it helps to reduce the loss by around 20%. In many countries consumption of winter heating fuel is the major source of CO<sub>2</sub> emission and energy consumption, so application of this type of trickle ventilation can save lots of money time and facilitates a lot. An analysis depicted that 70% of street-facing windows are blocked from full opening as per the requirement for shock-ventilation, and half of these are single-paned windows which only can be opened slightly, by being put on the trickle-ventilation setting, due to these blockages. The proportion of blocked windows may be even higher on the non-street facing sides of dwellings. Profound observation leads to signify that proportion of windows are put on the trickle setting (which means 10 degree tilt of the window toward inside) in winter, are not to the mark. It is also advised and recommended that policymakers address the major issues: material design for affordable window modification; more focused numerical and scientific content in promotional aid in the development of the concept of the ventilation with simple techniques. [11] The analysis also provides knowledge on the contribution of each subsystem, e.g. glazing, sun-shading devices, natural and mechanical ventilation, so as to achieved energy efficiency. Buildings usually suffers from unconditional indoor comfort conditions (due to the high energy loss in winter, the excessive thermal gain in summer, the poor natural ventilation, and the visual discomfort which is caused due to the absence of shading devices) and energy consumption like HVAC systems

which is very essential component for indoor condition. The experimental campaigns were performed in two different locations in Northern Italy (lat. 45° N). [12]

It is proved that 80-90% of people's time is consumed indoor [17]. Due to the improper selection of materials the effects to human health is tremendous, Institute of Medicine (IOM, 2000) had enlisted the chemical and biological indoor pollutants and its effect in human health such as respiratory allergies caused due to sick building syndrome. Sustainable development and green building movement have been adopted faster than any other recent movement in engineering field [16]. It is noted that Green concept is influencing many aspect but the awareness is still lacking which is also one cause why it is not being spread rapidly. A survey was done among the students and academician where the fundamental of green building was also lacking for many people who consequently made green building enigma. The process need to be amended through the proper plan and its implementation. Firstly the awareness program must be targeted to young engineers, academician then the users. The roles and challenge that human being should face due to this environmental detonation should be made aware. The research and outreach efforts also must be approach for innovation and all this approach will helps to increase efficiencies in important resources with proper response of users. The planning in order to give awareness to students can be modeled by making a good curriculum to UG and PG students and also make a training program to academician with certain criteria [16]. It is also important that the innovative design can help in making the system or anything more efficient and economical. The simple techniques can be used up and proceed for the development. [17]

All these indicates that there are various factor which can be implemented for conserving the environment and new mythology and techniques with the application of fundamental engineering techniques in collaboration with environment is must for green.

### LIMITATION OF GENERAL BUILDINGS

The buildings that we are having might have many limitations which are the main reason for the negative impact to the environment as well as the health of human or living beings. The various limitations that general building have are no good planning and innovation in term of 1) Local regulation, 2) Rain water harvesting, 3) Solar energy , 4) Grey water treatment – treatment, management, reuse, 5) Innovation design, 6)On site renewable energy, 7)Rapidly renewable material , 8) Certification cost, 9)Cost of the materials, 10) Lack of awareness 11) Government implementation and support, 12) Lack of Public support, 13) Effects from paints that we use for painting of houses are volatile organic compounds (VOC) are the gases that release from paints increases urban smog and poor indoor air quality. 14) Cement industry is one of the two primary producers of carbon dioxide and green -house gases. Concrete construction leads to urban island effect, 15) the admixtures which we add in concrete release some radio- active elements which is very dangerous to humans health 16) Lack of parking facility cases the traffic problems on the roads, and 16) CFC equipment's like ACs, refrigerators, micro ovens that creates green -house effect.

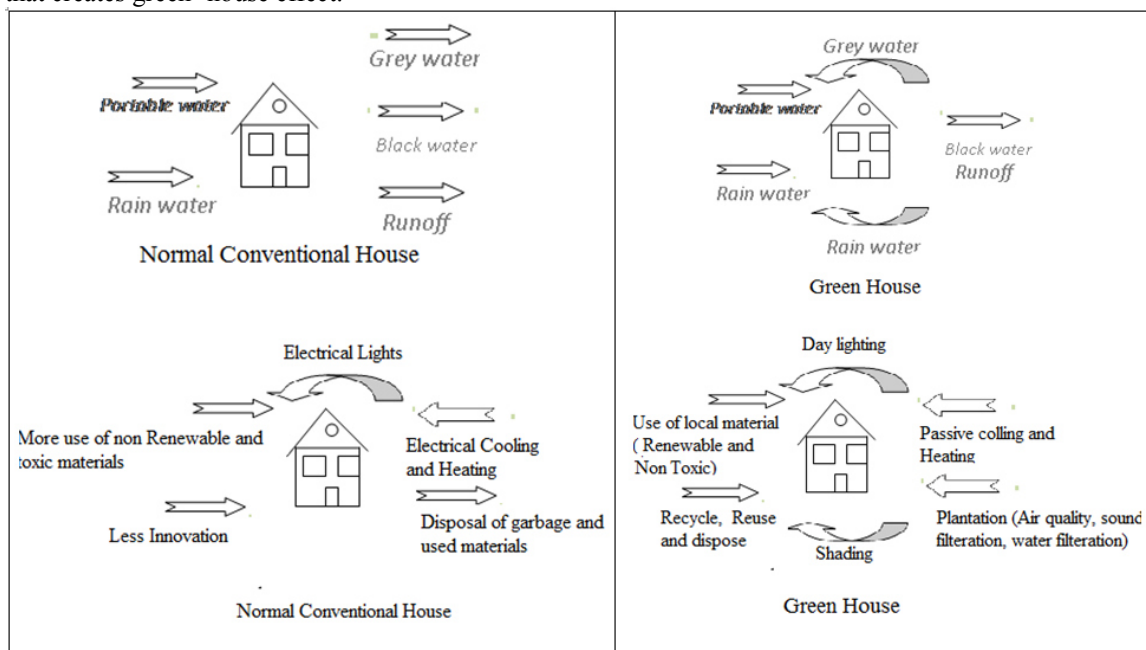


Fig. limitation of conventional building over green building

This figure clearly speaks that Normal building and green buildings are not two different things but the implementation of ideas and engineering concept is vastly different in two cases. The use of green building can

be beneficial for the environment as well as human beings.

## GENERAL AND RECOMMENDED METHODS

It is not necessary to get the sophisticated and expensive materials for the construction of green house. Green house is like a common house that we might be staying in but the implementation of ideas and innovation would be more in green house.

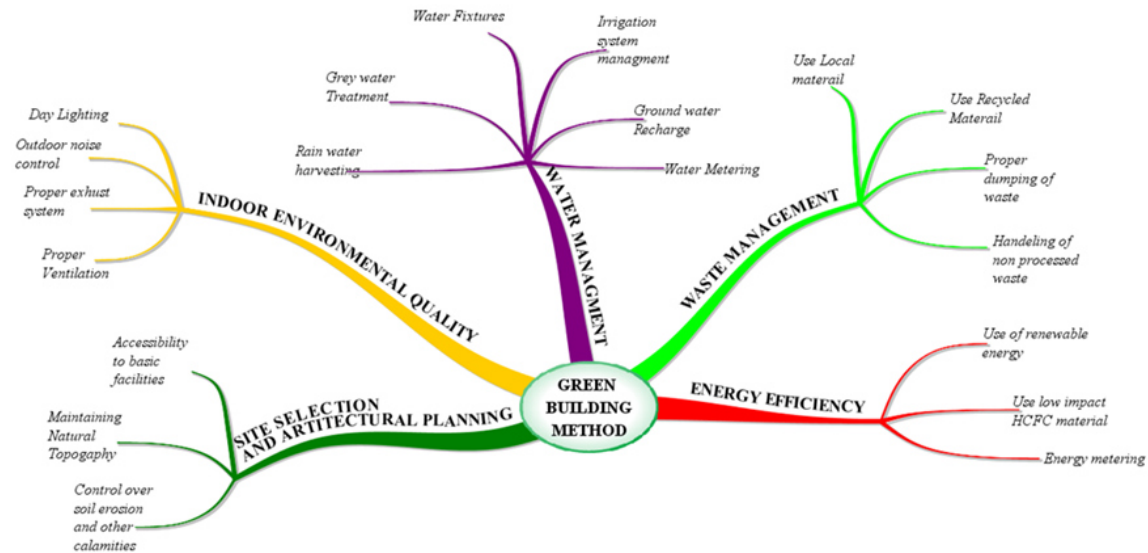


Fig.1 mind mapping for process of Green building method

There are certain criteria which can be worked out in a general building also for the conversion into green house. Normally any upcoming building must be checked the following criteria and innovative design and innovative implementation must be given more priority. The criteria for this are

### 1) Sustainable site Development

Mainly this sustainable site development encompasses the planning phase and also the conservation of grey water and other deeds which is related to sustainable site. Proper planning of this helps a lot in reducing the negative impact over the life of development and also environment. The orientation of the building and its suitability for the user is another important component. Normally, grey water coming from household purposes are not very much polluted so we can reuse this again for general purposes and the heating island effect in house also make some negative impact which must be address and planning must be done astutely.

**Solution- Firstly**, here the management of the grey water must be done within the house itself as grey water is used water after general purposes so we can reuse the water after certain level of natural filtration process which can be setup in the boundary itself, one of which is grey water can be collected in one place and they can be passed through the plants which absorb bacteria at higher rate for their benefits such as bamboos and then it can be sand filtered and so collected water can be reuse for flushing, cleaning, gardening etc. other innovation regarding the management of this grey water also must be appreciable. We can consume water with zero cost by natural process. Oxygen is important thing for human beings to survive so to get the oxygen or pure ore oxygen we can plant different types of plants which release maximum oxygen. Plants also help to increase Evapo-transpiration and can be used for shading purposes basically in northern part which helps to reduce the energy consumption indirectly. It also helps to enhance infiltration and reduce the runoff. One tree is enough to provide oxygen for 20 people for lifetime and also it helps to reduce the sound pollution. We also should select deep rooted herbaceous plants. Heat island effect is also another problem which has concluded many problems so this also can be reduced from the simple engineering implementation. Green roof helps to reflect the sunlight and prevent from heating the house and also rain garden in a community and also in junction of roads and uses of plants in the territory and also in parfaits of houses helps to reduced and balance the component of environment by various ways. If each and every house apply this then the efficiency will racket and eco-friendly environment is obvious.

### 2) Water Saving

Water is one of the major problems everywhere in the world. More than half of the population in the world has no good access to quality water. Water table is plunging down yearly and people are encountering tremendous diseases and other problem due to lack of quality water. The grey water can be treated and can be used again as stated in the first point. If people start to conserve the water from today itself then it is sure that they won't face any problem in the future. Normal calculation of water essential for one house is *For single family of 5*

*Members-* Drinking purpose= 5 liter per person=25liter, Other purposes=100 liter per person\*5=500liter/day. i.e.  $525*30*12=189000$ liter(app.5000gallon)

This much of water is needed for a family per year which can be stored in the house itself through different techniques.

**Solution-** Firstly, some portion of the water can be coup up with the grey water reuse after filtration purposes. The plants must be deep rooted so that they won't easily die and also there is good method to collect the drinking water which is Rain Water Harvesting where water is collected from the rain and then it is stored for future purposes. Rain is the pure form of water as it is coming from the complete process of environmental filtration and then so collected water an be used after wards in needy or scarcity of water. This water must be checked for its suitability as environment consist of various harmful gases so it might have make it impure then it can be used after the SODISH method. In which water is stored in 2 liter of white bottle and stored in sunlight for 6 hour and this can be used for drinking purposes which is the basic but effective mean. The extra water from rainwater can be used to recharge the water table by various means. This helps to store water in your house as well as store water in the form of water table which also can be used for drinking after certain level of filtration. This solely helps to address the water problem and make people not to depend upon others for quality drinking water.

### 3) Energy Efficiency

Energy is also one of the major considerations which are having high value in our life. Almost everything needs energy like TV operation, Light operation, Heating, Cooling, lightening and other HVAC etc. We are consuming energy in every step of our life. The need of energy has racket so much that demand is not able to be fulfilled as a result many problems are being encountered especially in developing countries which must be limit by innovation. The use of natural gas, coal and other non renewable resources are being used up in ample amount which is decreasing the amount utmost so this must be limited and alternative must be seek and this step must be started from our house itself.

**Solution-** We can use the innovative design such as passive cooling and heating methods which are economical and highly effective. We can use the passive heating process such as enclosed design of house with less ventilation probability. Windows can be of tilt one which can only tilted to certain angle which limits the flow of hot air inside the house to escape out. Passive cooling can be used by making plant shading to house, making green roof or green parfaits and green surrounding, smarts designs which helps to reduce the consumption of energy in ample amount etc. The use of day lighting technique also can be implemented for the limiting the use of lighting replaced by natural lighting and also lighting amplification techniques such as making curved place for bulb placement and using glass in that curve which reflects the light and helps to amplify the light. We also can use the solar systems which can be latest and highly efficient but economical photovoltaic solar panels. We must limit the use of green house emitting materials and should not use them or limit them.

### 4) Material selection and Indoor air quality

The selection of material is also crucial part as this is going to influence our health and also make different by many ways. Bricks that we use in house are clay brick which are extracted from non renewable resources and also need many process for its formation. Concrete or normal one which we use also has many health related disadvantages. Plastic that we use are not easily decayed and they creates lots of problem if burned. Stones that we use as aggregates are quarry of rock which is influencing our natural resources. Marbles and granites and other materials also are quarry of rock which are non renewable materials. As people spend lots of their time indoor so air quality inside room must be good enough.

**Solution-** We can use concrete block for construction of wall so that after dismantle of the building also they can be used as an aggregate by crushing them. Autoclaved aerated concrete (ACC) must be used utmost. We can replace the granite or tiling by veneer flooring or other economical and useful method. We must use low VOC materials and other materials which are toxic in nature must be avoided. Replacement of concrete with fly ash and other innovative stuff should be implemented to maximum limit. We also can use straw bale for the wall construction one of the economical and effective which has tremendous advantages. For maintaining air quality the wastage that is produced from the house should be disposed in house itself. We can construct separate compost site and dump all the decay able things and recycle and reuse other materials. With aerobic or anaerobic decomposition those can be used for productivity as compost. If from one house 1kg of waste is recycled then from 2thousand house it will be 2thousand kg which ultimately reduced the dumping of waste outside helps in air quality as well.



### 5) Design

The innovative design in term of all must be given high priority in the green house anything can be turned over and make in simple process if common engineering concept along with innovative design is there so much preference must be given to design. The General design which can be follow are drafted below

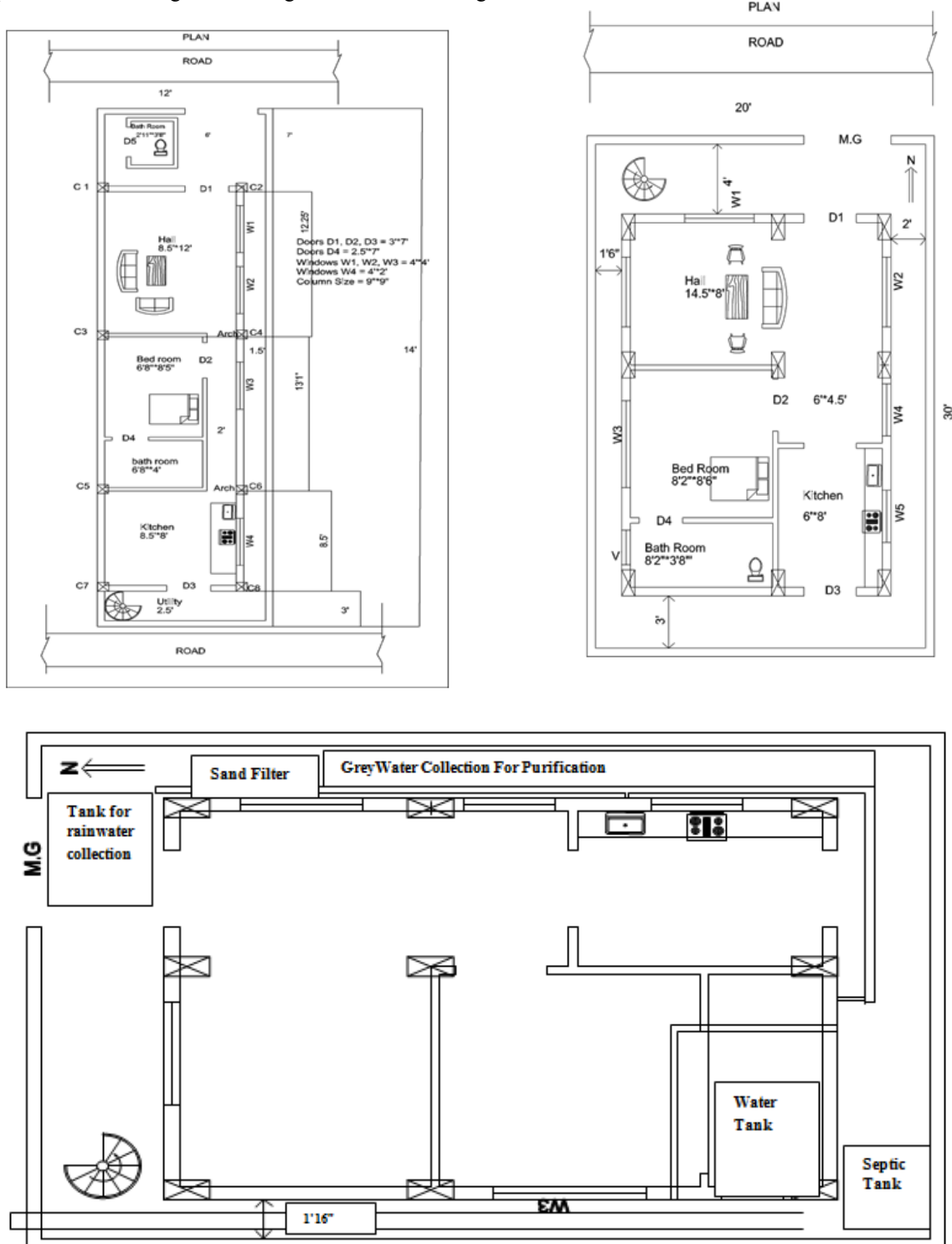


Fig. Design for planning of buildings

### DISUSSION AND GREEN BUILDING EFFECTIVNESS RECOMMENDATION

Though this technology is purely the application of basic science and engineering in construction and planning in an economical way for the assurance of quality health of people but progress is not so much appreciable. The main drawback behind it is lack of awareness among the people and less interest from the governmental sector.

We should update all the students about green from primary level by including it in course, providing more and more trainings to engineers and other concern people, launching conferences and other innovative program. This should be forwarded from the government itself, all the LEEDS, IGBC and others are the third party which might not effectively uplift the matter. As registration of design to the government is there for commencement of work to the government so government should make some ground rules and they must ensure that all the component are well designed or are encompassed in the design then only the registration process should be taken forwarded. Third party should work in collaboration of government to cross check and ensure that work is done according to the design. The ground rules should be made in such a way that all the above recommended methods must be obligatory as those are simple and easy to follow up and also accessible loan for this type of construction if needed must be granted and priority must be given to them for every way. For the poor and middle class family which can't afford high technology the common things must be compulsory and various recommended design and other handout must be provided for free and separate advisor for them must be arranged without any cost and the innovation that might be of any level must be accolade and government must provide discount for the registration process. The flexible registration fee and free for lower class along with accolade if the methods are applied must be given then only the number of green building certified would increase within short span of time and special grant from international organization for more research and assistance to developing countries for prompt implementation must be there. If this method is applied in a prompt manner then making green society leading to green world will be achieved in a short span of time. The flexible pointing system along with the flexible registration charge with free advisor for construction from government itself can only make this process prompt.

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#### **CONCLUSION**

The pace of development and rising need of people is increasing day by day which ultimately has increase the risk of environmental destruction through various means. Any human activities especially in construction impact various component of environment so working in collaboration with environment must be the main motto of today's world. Green building mythology is only the mean to get this done and there are various organizations which are working for spreading this concept. In spite of all this the pace is not so smooth and in developing countries this process is stagnant so this must be paced up. Firstly people must be made aware that green house is not an expensive house but the implementation of science and engineering in a tactful way with innovation is the basis of green building. This approach can be spread by updating the green concept course from the primary level itself. Various program, conference and training workshop must be lunched in a regular basis. The ground rules for all the upcoming construction which is going to be registered by the government should be done and regular check up from the export must be done, registration evaluation must be set up and they must be given pointing as per the design, innovation and implementation of all mandatory rules and certification must be provided. The five up listed basic parameters in General method must be considered and pointing must be granted on this basis and some discounts and accolades in term of registration must be given for middle and low class people. Green building is a boom to the world where we can reduce in the operation of energy and water consumption, increase productivity of occupants, health and safety benefits. This reflects that if we can effectively implement this concept then it will bring revolution to the world but the fact is we need to encompass all the people for this and this technology should not be limited to particular people instead it should be approachable to all people that may be rich or poor which can be done through innovative engineering design and implementation from government level of each and every country. Regular updates and separate government bodies for green building should be made and research team must be allocated for new and innovative findings. So, further research in this topic is must.

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