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SUSTAINABLE MASS HOUSING IN INDIA, ISSUES AND CHALLENGES

NAGARAJU KAJA

Assistant Professor, School of Planning and Architecture, Vijayawada, Andhra Pradesh, India

ABSTRACT

India is one of the fast urbanizing countries in the world. Being a developing country, India's urban population is increasing and estimates forecasts that by 2041, urban population country reaches 50%. In this context it becomes important for the governments to provide adequate housing for all keeping in view of its liveability and affordability. But housing is one of the major contributors of Green house gases (GHG) with 12.5% GHG emissions attributed to buildings in India alone. Social housing is considered often as a burden by the local governments with the aspect of economic viability and time constraints, other important aspects like its impact on the environment or the carbon footprint it is going to create are being neglected. At this juncture, Sustainable and affordable social housing is the necessity for reducing its negative impacts on nature and also to give economical, healthy and environmental friendly housing for the people.

KEYWORDS: Affordable Housing, Environment, Sustainability, Urbanization

INTRODUCTION

Due to strong economic growth and increasing population, urbanization is taking place at a fast pace in India which is at 31.2%. This rapid urbanization is going to continue in the years to come and surpass china with a CAGR of 2.1%. The results of this are seen with growing urban populations and increasing land and building prices. Not to cope up with the high prices economically poor people are settling in slums and squatter settlements causing ecological imbalances. The gap between the demand and supply of housing units is increasing both qualitatively and quantitatively over the years. The need of the hour is to provide housing for all at an affordable rate, it needs to be seen the amount recourses it requires for construction and the carbon foot print it's going to create.

HOUSING SCENARIO IN INDIA

Urban population in India between 2001 and 2011 has registered 32% increase taking the numbers from 285 million to 377 millions. It is expected that by 2050, 900 million people will be living in Indian cities. If this becomes true, it is going to have enormous amount of stress on urban infrastructure and create maximum housing shortage. As per Ministry of Housing and Poverty Alleviation's (MHUPA) report on housing shortage, in the year 2012, the housing shortage is about 18.78 million units out of which 96% is in the LIG and EWS sectors. If you see the housing shortage, as per the report of the technical Group (11th year plan:2007-12) on estimation of urban housing shortage, maximum shortage in the year 2007 is in the EWS and LIG categories with about 24.67 million housing units against 0.04 million housing units in MIG and HIG sectors. Most of the mass housing projects are being undertaken by state and Central Government agencies and many private agencies are not keen on this segment as it is an unviable proposition financially. Though both state and Central Governments have been launched to meet the housing shortage, it has been insufficient in meeting the demand.

But with constructive policies and stringent rules can change this situation to meet the challenges of housing shortage in India.

	Monthly Per Capita Expenditure	Estimated Number of Households (2007)*	Housing Shortage in million (2007)	Percentage Shortage
EWS	0 - 3,300	21.81	21.78	99.9%
LIG	3,301 - 7,300	27.57	2.89	10.5%
MIG	7,301 - 14,500	16.92	0.04	0.2%
HIG	14,501 and above			
Total Shortage		66.30	24.71	37.3%

Source: Report of the Technical Group (11th Five Year Plan: 2007-12) on Estimation of Urban Housing Shortage

Figure 1: Housing Shortage in Urban India

HOUSING POLICIES IN INDIA

In India, National Urban Housing and Habitat Policy 2007 was created to formulate framework for the design and implementation of housing programmes. Govt of India provides broad guidelines and policies and gives financial assistance through Centrally Sponsored Schemes (CSS). Not all he States have the same housing policies in India. The flagship schemes today are AMRUTH an improvised version of JNNURM (Jawaharlal Nehru National Urban Renewal Mission) and RAY (Rajiv Aawas Yojana). These Acts and programmes can be categorized under the heads of Slums, Housing and Street Vendors. A summary of Acts ad Policies at National level on Housing is presented below

- 1972 – Urban Land Ceiling and Regulation Act (ULCRA) repealed

- 1994 - Urban Basic Services for Poor (UBSP)

- 2001 - Valmiki Ambedkar Awaas Yojana (VAMBAY)

- 2005 - Jawaharlal Nehru National Urban Renewal Mission, (JNNURM)

- 2005 - Basic Services for Urban Poor (BSUP)

- 2007 - National Urban Housing & Habitat Policy (NUHHP)

- 2011 - Integrated Housing and Slum Development Project (IHSDP),

- 2011 - Rajiv Awaas Yojana (RAY)

- 2011 - Indira Awaas Yojana (IAY)

- 2013 - Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

- 2015 - Pradhan Mantri Awaas Yojana (PMAY)

As the market for affordable housing is increasing, private sectors have stepped in to cash in the demand. Government housing projects are also joining hands with private parties to the development of affordable housing in India. But the main objective of these regulations is to provide affordable housing only, there are no environmental issues discussed in these acts and regulations.

IMPACT OF BUILDINGS ON ENVIRONMENT

Environmental pollution attributed to buildings is immense with the emission of 50% of GHG gasses globally from the manufacture of building materials, products and transport of construction materials. The estimate of resources used in buildings globally and World pollution attributed to Buildings are as follows:

Table 1

Resource	%
Energy	45-50
Water	50
Materials for Infrastructure	60
Agriculture land loss	80
Timber products	60
Coral reef destruction	50
Rain forest destruction	25

Table 2

Pollution	%
Air quality in cities	23
Climate change gases	50
Water pollution	40
Land fill waste	50
Ozone depletion	50

(The Impacts of Construction and Built Environment, 2010, Willlmot Dixon)

IMPACT OF BUILDINGS ON ENVIRONMENT IN INDIAN CONTEXT
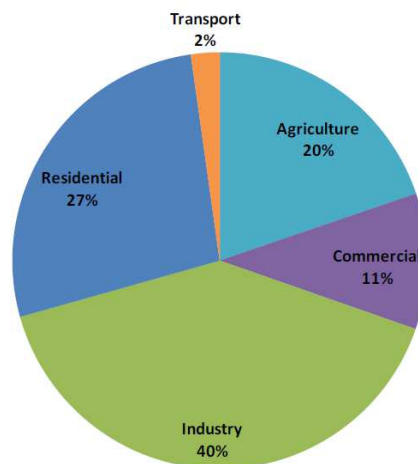
Share of electricity consumption by end user demand in 2010

(Based on model results as calibrated to the IEA World Energy Balances)
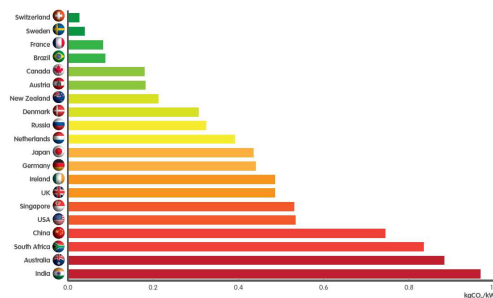
Figure 2

If look at the share of electricity consumption in India, buildings both commercial and residential combined consumes about 38% of the generated power. Not only this buildings alone contributing to 12.5% GHG emissions in India. As per India-Green House Gas Emissions, 2007 by Ministry of Environment and forests (MoEF, Govt. of India) if building

material manufacturing is also considered, this contribution will be 20.2%.

The majority of the pollution from the construction industry is coming from the manufacturing and use of materials like steel, cement and bricks. Only Brick manufacturing industry is alone contributing to 42 million tonnes of CO_2 emission annually and uses 20-30 tonnes of coal and 350 tonnes of topsoil in India (UNDP India, 2009). It is also estimated that in India, 40%–45% of steel production, 85% of paints, 65%–70% of glass manufacturing and major portions of output from the mining, excavating and automotive industries are used in the construction industry. These numbers will further increase when the construction activities to meet the housing shortage takes place causing further environmental destruction. As India is still developing with not much of urban infrastructure is fully developed, there is a possibility of developing positive urban infrastructure with less impact on the environment. The IPCC Fourth report also reiterates that appropriate efforts must be taken to bring down carbon emissions from the buildings sector. In its comparative study of the energy savings potential of the building sector when compared to other economic sectors, it is observed that the building sector has the maximum potential among all sectors, in all countries, and at all cost levels. This holds true for India too as the growth rate of construction industry is highest here. The exponential increase in energy demand will be exacerbated further by the fact that buildings usually have a life above 50 years which will increase the pollution further.

ENERGY CONSUMPTION AT BUILDING LEVEL

Environmental pollution attributed to buildings is immense with the emission of 50% of GHG gasses globally from the manufacture of building materials, products and transport of construction materials.

Carbon Emissions per Unit of Energy, Different Countries (kgCO2/kWh)
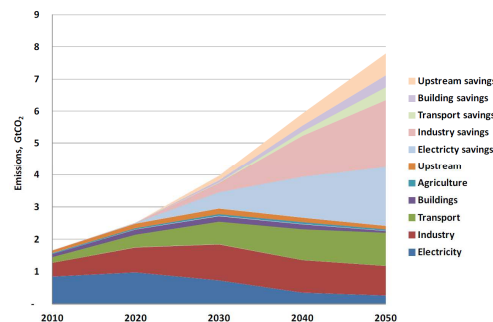
CO2 Emissions in India to 2050

*Data source: IEA (2010)

Figure 3

Inside the built envelop, finishes of many building materials give off toxic by products causing indoor air pollution and poorly designed lighting and ventilation can cause health problems. An aesthetically pleasing and

functionally active building is no longer a good Building design but it should be environmentally responsive too. Energy consumption in buildings can be attributed to two components

- Embodied energy in the materials, construction processes etc

- Energy consumed for creating the comfortable environment inside the buildings

The energy component in buildings in the life cycle of a building can be seen below with higher embodied energy consumptions in the initial 2-3 years, higher operational emissions in the next 40-60 years and energy component for the demolition of the building at the end of the life of the building.
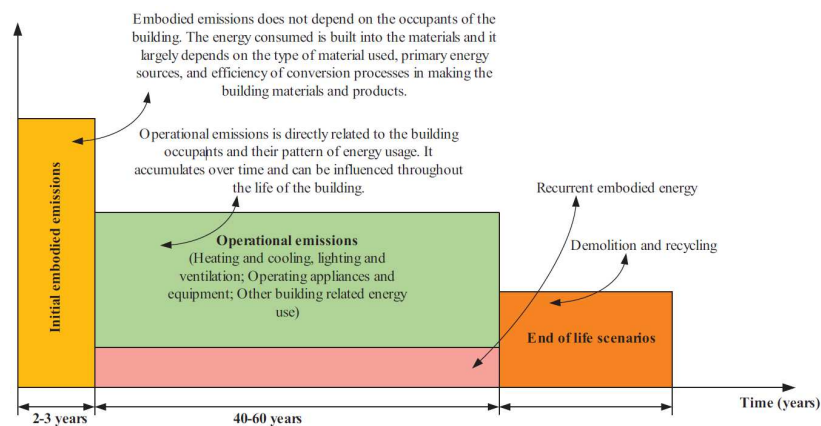

Figure 4: Life Cycle Energy Component in a Building

SUSTAINABILITY IN HOUSING PROJECTS

Sustainability concepts in construction industry is not penetrated much in to mass housing as it is perceived as cost intensive whereas affordable housing is to do with less cost and more in numbers. Sustainable housing so far is limited to gated communities and specialized projects aimed at upper middle and higher income group people because of the cost factors involved. At the same time there is not much of awareness in public about environmental concerns or even if they know about the problem not known the ways to curtail it. As per the Assessment Study conducted by Development Alternatives (DA) supported by United Nations Environmental Programme (UNEP), integration of sustainable concepts in the affordable housing sector end is minimal. The current policy framework in India addresses affordable housing and green building as two separate issues. Though urban housing policies and schemes refer to the need for exploring aspects of sustainability and innovation, these are not mandatory requirements to make sure they are implemented. To make this to happen, using of sustainable concepts in housing sector must bring good quality housing at an affordable pricing. Not only this housing must be eco-friendly but also should meet the aspirations of end users in terms of aesthetic appearance and functional quality. Thus sustainable and affordable social housing is the necessity for reducing its negative impacts on nature and also to give economical, healthy and environmental friendly housing for the people. It is important to find ways and means to integrate sustainability concepts in housing projects for poor to achieve the above results.

CONCLUSIONS

As there is an increasing demand for the resources to meet the housing demand in affordable housing category, we no longer can ignore this sector from the energy efficiency point of view only to keep the cost component in control.

Instead of continuing in the same old pattern, there is a transformative change required. There are important aspects which needs to be addressed to achieve this mammoth target.

Policies

- Bye laws have to be integrated with environmentally friendly aspects

- Energy efficient building materials and technologies have to be made a part of Contracts and Schedule of rates

- Passive Solar techniques have to be incorporated in planning bye laws

- Incentives for the projects at various levels are the best option to encourage people to adopt energy efficient technologies.

Capacity Building

- Capacity building at various levels of the stakeholders has to be developed to get the better results from the policies.

- Awareness has to be created among the people for the implementation of energy efficient technologies.

Availability of Materials/Techniques

- As the development of alternative materials and techniques is in nascent stage still, it is important to develop the availability of the resources which is very crucial for the success of the project.

- Supply chain of these materials/technologies has to be developed by offering financial incentives.

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