JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Architectural Design and Sustainable Development: Some Observations

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Keywords: sustainable development, earthquake resistance, safety measures, degradation

Abstract:

The housing is the most essential need of the mankind. The rise in population led to rise in the construction of houses. People live in their own houses throughout the life. But the large number of houses is being constructed without proper architectural design, which should have been environment friendly. The construction of houses without proper architectural design may result into environmental degradation and disasters. The construction of houses may affect the sustainable development, as in returns, the environmental degradation affects the human health. The construction of houses without proper architectural design in selected region may be dangerous for whole region. This article explains the significance of architectural design in protecting the environment.

1) Introduction:

The population of India has been growing at alarming rate over the decades. In the year 2020, the total of population of India was measured as around 138 crores, which has been putting pressure on the environment. In the last twenty years i.e. between 2000 to 2020, the rise in population in India was almost 51 crores. The continuous rise in population can create a great danger to the environment, if it has not been planned scientifically. The rise in population brings rise in demand for various needs. The housing need is most essential. The construction of houses in the urban area has been done without proper architectural design, especially in the dense populated areas in the cities. This has created several environmental issues. The environmental degradation in India also has become serious issue in the recent times. The population explosion increases the level of consumption of resources. The global population also has put the pressure on global environment. The ecosystem of India has close relation with the practice of the increasing population. The level of consumption of resources has been very high in the recent period. The globalization and commercialization of the economic activities also has contributed to rise in the level of consumption. The population pressure and their practice have made great danger to the environment. In order to save the humanity, the environmental balance is most essential. In order to meet the need of the increased population force, there has been increasing demand for house construction. Especially, in the urban area, the construction of houses is carried out without considering the environmental need. The construction of the houses may disturb the natural environmental flow, which can create disaster in the later period. The architectural design is most important in the protection of environment. The natural setup of environment must be protected. The architectural design can protect the environment and promote the sustainable

development. This paper has explained the selected observation of architectural design and environmental degradation in India.

2) Objectives of the Study:

2.1 To take review of the architectural design in the construction activities

2.2 To explore the relation between the architectural design and environmental degradation

2.3 To explain the need of sustainable development during the construction activities.

3. Hypothesis of the Study:

3.1 The architectural design can protect the sustainable development

3.2 The unplanned architectural design can result into environmental degradation

3.3 The sustainable architecture can promote the sustainable development.

4. Literature Review:

Gary Evans and Janetta Mitchell McCoy (1998) have studied the role of architecture in human health. According to the researchers, the people spend most of the life in their own building by unknowing the effect of architecture on their health. The architecture of the building can affect the human health and hence this needs to be addressed before the design. Simos Yannas (2013) has studied the sustainable environmental design. According to the researcher, there has been least focus on architectural design dedicated to the sustainable environment. The architectural education also has neglected the environmental issues in the modern times. Rahaei, Derakhshan and Shirgir (2016) have studied environmental architecture. According to the researchers, the sustainable architecture has been significant part in the building construction. The structure of the building should be promoting the sustainability.

5. Methodology:

The researcher has secondary data for the analysis. The report of the World Bank (2022), Census data and other published data has been used for the analysis. Besides this, the researcher also has used published book and research article.

6. Analysis of Data and Result:

India is a vast country with huge population. According to the World Bank Data (2022), the population of India has been increasing over the decades. The total population in the year 1960 was measured as 45 crores, which increased over the years and reached to 138 crores in the year 2020. (Table No.1) This shows that, in the last 60 years, the population in India increased by 93 crores. The rise in population always brings a pressure on the system. The increasing demand for houses was one the effect of the population growth. Especially, in the urban area, there has been high rate of density of population. Large section of the people has constructed their houses without considering nature and environmental set up. The large numbers of construction of houses without proper architectural design have created danger to the environment. There are increasing environmental issues, which have ultimately made danger to the mankind. The lack of proper architectural design has resulted several disasters and environmental degradation.

On the other side, the increasing demand for houses have made rise in the construction activities. The rise in population also has demanded several public constructions, which again has made pressure on environment. The construction in India has been growing in the recent years, despite of the ups and downs

in the economy. There has been increasing rate of saving in the construction industry. Around 16 per cent of the total workforce depends on construction industry. It was estimated as; around 30 million workforces were engaged in this industry as in the year 2019-20. In case of gross domestic product of India, the construction industry contributes around 5 per cent of its total as in the year 200-01, which increased to 12 per cent in the year 2004-05.This shows that, the construction industry in India has greater potential to grow. The increasing population has been creating increasing demand for construction resources. According to Sanjeev Sinha (2022), the housing market in India has been growing fast, despite of covid-19 effects. The growth of housing market was recorded as 27 per cent in the year 2020-21. The demand for houses in selected cities was very high compared to the other cities of India. The housing market in selected cities as New Delhi, Ahmedabad, Kolkata, Noida and Bengaluru, was highest in India.

The architectural design of the building must be environmental friendly. The architectural design must consider the nearby natural setup. The design must work to avoid the negative impact on environment. This should include the minimum resource consumption and promotion of natural environment. The minimum use of natural sand has become the need of the time in the present time. The architectural design must be promoting sustainable development. The needs of the present must be met without harming the needs or resources of the future generations. According to William Murphy (2020), the sustainable architectural design can be reflected in the use of building materials, resource use and surrounding environment. The design must be done considering the long term energy consumption and resource efficiency. The architectural design based on environmental balance can also be stated as 'green architectural design'. The green architectural design can build a house by protecting the natural environment. It does not harm the ecosystem or the communities at large. Construction of house without referring architectural design or architectural design without referring eco system, both are harmful for the society. The architectural design must consider several factors as the protection of the trees, natural flow of water, natural sunlight, natural wind, minimum use of natural sand, minimum use of steel and better living of the house owner. The architectural design has different paradigm. The sustainable development is most important paradigm of the architectural design. The building is a place, where the natural resources are being processed and converted into sewage. The design of the building must promote the sustainable development. The building with proper ventilation and air can reduce the consumption of electricity. The rain harvesting plant on a building can process the natural water and can be made re-used.

Architectural design depends on the geographical features of the regions. In case of earthquake prone regions, the architectural design must be earthquake resistance. The architecture also has relation with climatic conditions. The highly rainy area needs special architectural design. The urban area with dense population should have proper architectural plan considering the flow of rain water, sewage flow, lake, hills and others related things. Ignoring the geography and environment by the architectural design may result into disasters. In the big cities, the construction of building is being done without considering the scientific architectural design. This has been resulting into floods in the cities. The construction of building is made for comfortable living. People spend their major part of live in the houses. The architectural design should guarantee the comfort and quality of living to the people. The advancement in the technology has improved the level of comfortable and the quality of life of the people. The natural air, clean water, clear sunlight is the basic guarantee comes from the architectural design. The architectural design should also guarantee the safety measures. The architectural design of home differs from the design of hospitals. Depending on the uses, the proper architectural design can be build. The main aim of the design should be improvement in the safety measures for the users.

Architectural design must respect the natural resources. As architecture protects the human beings from the severe exposure from sun and climate, there is also need to have fresh air, fresh sunlight and clean water for the house. Architecture is also determined by the culture, customs and needs. The modern technology in construction sciences has negative affected the environment at extreme position. The public constructions have adversely affected the land, forests, air and water resources. However, individual houses also can affect the environment at one point of time. Therefore, it is very essential to have proper architectural design to promote the sustainable development. It is the responsibility of all stakeholders to not to disturb the natural environmental setup. Urban planning in the cities is most important. The government has been trying to set up the laws and rules to protect the environment and sustainability. One should be responsible to construct the houses in order to promote the sustainable development.

Table No. 1
Population Growth in India

Year	Total Population (in Crores)	Actual Increase in the Population compared to last decade
1960	45	-
1970	55	10
1980	69	14
1990	87	18
2000	100	13
2010	123	23
2020	138	15

Source: World Bank Data (2022) available on https://data.worldbank.org/indicator/SP.POP.TOTL?locations=IN

7. Conclusion:

The increasing population in India has brought pressure on the natural resources. The rise in population also brings rise in the demand for houses. The construction of the houses, especially in the urban area has been increasing at alarming rate. The construction industry is growing as the demand for houses is rising. The architectural design is the most essential part of the construction of houses. Even a single constructed house can disturb the environmental balance. Most of the general public do not follow the scientific architectural design, which results into environmental degradation and disasters. The proper architectural design can protect the sustainable development. The public constructions and individual constructions both have to follow the sustainable architectural design. This is need of the time, otherwise the society will come into the danger.

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