

The Economics of Sustainability

What is 'Sustainability'? This word has been in debate since the beginning of the 20th century. With advancing technology and rapid usage of natural resources, there is a need to fully understand this word 'Sustainability'.

'Sustainability' can be expressed in several ways, but as we are talking about environment and architecture, I will describe it as the quality of not being harmful to the environment or depleting natural resources, and thereby supporting long-term ecological balance. The environment as we know it, has been greatly altered and damaged by us, modern humans. This was not the case a couple of centuries back. We have stretched the tolerance of the natural cycles, so much that it's beyond repair. Many species of living beings have been extinct in the last century and plenty more are on the verge of extinction. It's high time that we do something about nature. Nature has always been generous to us, that is why it's called "Mother Nature". To get the best of resources from nature, we must give something back to nature. Otherwise, every action of ours will have an equal and opposite reaction.

Every living organism on this planet has a special and most important requirement in life, they need to reproduce and continue their race with help of the next generation. Passing on the genes and adapting to the changing environment has been the key to success for life on earth. Like all the living organisms, we humans, can go to any extent to save our young ones. But are we doing enough? Are we considering long term effects of our actions? Now, if we continue depleting our environment, then what are we going to leave for our future generations? This is the question that needs to be answered and it needs a solution. There are four solutions for protecting nature.

1) UTILIZE RECYCLABLE PRODUCTS: - It is very essential that we find out various ways of recycling and reusing materials that are found in our day to day life. Though for an individual, it may be small in quantity, but looking at the larger picture, like that of a city, state or a country, production of such product/materials will prove to be sustainable and economical as well. Everyone uses paper and plastic, separating paper, plastic and organic wastes; we can recycle and reuse all of them. Paper can be recycled into paper again. Plastic can be melted and moulded into any shape and form as well and organic wastes can help produce bio-gas. This will help us save trees, which are being cut down at a far greater rate than ever and help reduce the production of new plastics which are non bio degradable. Such methods prove to be the most economical ones in conserving nature.

2) LIMIT THE USAGE OF NON-RENEWABLE RESOURCES: - Since different modes of transportation and industries have flourished in this world, we have exploited the use of non-renewable resources. Be it coal, crude oil, natural gas and mineral ores, we humans have disturbed the balance in nature and are still doing so. It is high time that we limit the usage of these non-renewable resources. In order to do so, we will have to find

replacements. We will have to adapt to the new, coming of age technology and use hybrid vehicles and full-electric vehicles. This will help reduce the carbon emission. This will make sure that the green house effect is in balance. Industries shall look forward to use different means of generate electricity and should stop relying on these non-renewable resources. In this way we can limit their usage and attain sustainability.

3) UTILIZE RENEWABLE RESOURCES: - Along with the non renewable resources, nature has provided various renewable resources such as solar energy, tidal energy, wind energy, timber, water etc. These resources are available to us in abundance, they may also be assumed as infinite sources as far as human time scale is concerned. They have been available since millions of years and there is no defined time limit for their exhaustion. Such renewable resources help in making a product/building, self sufficient. The product/building becomes self-sufficient in the long run because by using such resources, only the initial cost is concerned, it has almost negligible running cost and average maintenance cost. So in the long run, it covers the initial cost and can help save a lot of money and energy. Wind energy conserved through windmills, water helps producing electricity through dams and tidal currents. Solar energy is trending into the lives of the common people nowadays and will be very effective resource in the coming future for the common people.

4) IMPLEMENT TECHNOLOGY: - Today, in this modern world that we reside in, man has brought a radical change in the fields of science and technology. New and various techniques are introduced and discovered which can help us preserve our environment. To save water, treatment plants are provided so that waste water can be utilized for agriculture and gardening. Drip irrigation system is adopted to save the loss of excess water. LED is replacing other products like CFL AND Bulbs (in terms of lighting) and LCD AND Plasma (in terms of electronic products) to reduce the consumption of electricity. Hence all these technologies are playing an important role in replacing age-old techniques which in some way or the other were responsible for harming the natural cycle.

As an individual and as an architect, I would like to throw some light on the specific choices that we shall / can make in our profession, for designing sustainable buildings which are economical, social as well as ecological. There has been a constant comparison drawn between Grey architecture Green architecture. But the grey architecture (brick and concrete – traditional/modern) and green architecture (sustainable, self-sufficient) cannot be compared with a particular monetary criteria. They have their own set of pros and cons. Green buildings can be cost effective if visualized for a longer span of time. Contributing to the health of the environment at the end would be beneficial to the society as well as in the financial and the ecological perspective. Today Architects are trying to bring back the notion of preserving the environment by contributing to lessen the rate of carbon emission and making the built structures sustainable in several ways. Thereby increasing the value of the property by adding green areas which are one of the most important attribute that build up the value of a house. Other means of achieving a self-sufficient building is by providing openings for natural ventilation and natural light, thus reducing the usage of air-conditioning devices and artificial lights as much as possible. As architects, we need to

spread awareness among developers and clients and educate them how sustainable buildings can be made economical and viable. We need to help them differentiate between finance and economy. Financially a building may cost more initially but in the long run it will help conserve energy and save money. The question that we need to address is, for how long can we make a building sustainable or self-sufficient. As we all know that 'long run' is not forever. We need to define the term 'long run' and statistically find out the probability of its self-sustaining capabilities and then implement it in our designs. A building cannot be constructed by only using sustainable materials. Sustainable materials should blend with other materials to make a self-sufficient building. By doing this, we ensure that the initial cost is kept in check by using regular materials (cheap) along with self sufficient materials (costly). Also, there is a big difference between 'price' and 'value'. Price of a material or product may be high, but the value of that product can be much greater than its price in terms of ecology and sociology. Example: Initial costs of solar panels are very high. But in the long run, it helps you in reducing the usage of conventional electricity. It helps utilizing the solar energy which in any way would have gone wasted and it helps you not pay the electricity bills anymore. So with a high initial cost and low operating cost, solar panels can prove to be of great value over its price.

It is very important that we do Economic Analysis before designing a sustainable building. As there are various kinds of places in the world, which can be categorized based on its geography, topology, temperature, population etc, it becomes important that perfectly suited material/product is provided for specific conditions. This will help in extracting maximum amount of potential from a product for a given place. Example: A solar heater provided in an equatorial region where it rains through-out the year, will not be able to be effective as the clouds will block the sun light to fall on the panels. So for such a situation, it will not be economical to use a solar - heater. But if it is provided for a tropical region, it will be very effective. Hence an architect should always analyse the economical aspect of the product before designing a building.

I believe that an architect should, in his/her design, make the building adaptive to the climate changes. A sustainable building should not be such which favours one climate and will create problems for the dwellers in other climate or season. New technology has provided the opportunity for treating sewage water and re-using it for gardening and other purposes. This helps conserving fresh water and also proves to be economical as you pay less for the fresh water provided by the authorities. As town-planners, one can use natural systems to support city's infrastructure or use infrastructure to emulate natural functions like rain water run-off, drainage, treating rain water to re-use it, providing green facades and installing solar photo-voltaic cell panels for street lights and other street based products. Sustainable building can be very economical to affordable housing schemes by government authorities as the residents need not worry for high maintenance costs and moreover the initial cost of installations will be taken care of by the government. An architect should also raise social issues related to the collective self-esteem of the buildings in the town and one should remember that it's not about building fancy buildings, but it is about engaging the city and community, emotionally with the building. Public areas should

be made as much economical and sustainable as possible. One should make sure whether the building is contributing positive values to the neighbourhood or not. It is also important to provide self-sustainable and re-usable temporary structures which can replace permanent structures in public areas, this way an experiment can be done on the sustainable quotient of the structure and if not successful, it can always be reused to make something else out of it. One should also resort to mapping, as it helps identifying urban challenges and can help identify needs of a certain location of a city or a town.

I feel that if an individual architect, chooses well, as to how he wants to make his building sustainable, in the process he will make it an economical one too. Moreover an economical building which is self-sustainable will always prove to be ecologically and socially sustainable too, this will enable not even us but our future generations to utilize it with minimum costs and also by minimal damage to the environment. Though the idea may sound hypothetical one, there is always light at the end of the tunnel. Believing in a better and greener tomorrow will help us achieve it. This way, we can all contribute in healing the world!

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