Reemphasizing ecological design: Adding responsibility as a key ingredient in the design of cities and products

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Abstract: Urbanization is happening very rapidly across the globe. Statistics point to the fact that in a few years more than half the world's population would be living in cities. Do modern day cities have the capability to sustain given this rapid and unprecedented growth? They surely don't as they have limited availability of natural resources. Man, must aid cities in their growth and transformational journey by taking up a more responsible approach and apply good design principles when designing cities and the products that we use. While we must continue to educate people on this topic we may not be able to totally depend on them to help build a sustainable environment where we are constantly thinking about the impact of what we do on the ecology and practice sustainable habits all the time. This article intends to reemphasize the need and importance of ecological design and point out to planners, designers and implementers to take on a more responsible approach when they are designing cities and products. This would implicitly take care of ensuring minimal impact on the environment. It also intends to arm educators with the thought process to inculcate ecological design thinking in the minds of inventors and implementation teams to help us build products and cities that are ecologically pertinent.

Index Terms **- Ecological, design, responsible, cities, products.**

I. INTRODUCTION

Environmental experts predict drastic climate changes and environmental degradation over the next few decades. Per the experts' human caused climate changes are largely due to the extensive burning of fossil fuel like coal and oil. This is causing global warming at a much faster pace than ever before. Compared to the natural warming of the earth which occurred over a period of ten thousand years, it is now happening within a century or two which is quite alarming.

Therefore, today there is a growing need for city planners, architects and designers to be aware of the impact that we human beings have on the environment through the work that we do. So much so that Ecological design which focuses on this very issue of being conscious and considerate of the environment is ever so relevant and significant in today's world. Sim Van der Ryn, considered the leader in sustainable architecture along with co-author Stuart Cowan in their book 'Ecological Design' defined the concept of Ecological design as a form of design that minimizes environmentally destructive impacts. Ecological design is practiced by integrating design seamlessly into living processes. That's also the reason that Ecological design is referred to as an integrative ecologically responsible design discipline.

II. THE NEED AND IMPORTANCE OF ECOLOGICAL DESIGN

Ecological design is often considered synonymous to Eco Design, which is an approach to designing a product with special consideration of the environmental impacts that the product has during its whole lifecycle. The term ecologically responsible design is key here as it is so important for us to consider aspects related to the environment and natural resources like the landscape, nature of the soil, water table, climate, etc., which are often ignored or sidelined when products are designed. Experts think that a lot of issues that major urban areas and large metropolitan cities face like depleting water levels, soil erosion, floods, landslides and many other natural calamities are due to the neglect of the environmental during city planning and development. The recent floods and the impact that it has had on people, their livelihood and the city's infrastructure particularly in many districts of Kerala the southernmost state in India and in Coorg, a district in Karnataka, India in August 2018 is a testimony of this fact. The administrators of these respective states ignored a comprehensive environmental report and warnings from eminent scientists and environmentalists on the destruction that could be caused if the environment was not protected from further large scale urbanization and the ensuing deforestation in the Western Ghats, the natural range of forests that touches most of the states in western and southern India.

Ian McHarg's book "Design with Nature" is a stimulating book that inspires readers to look at their own environment in different ways. "Design with Nature" was amongst the first work of its kind to define the problems of modern day development and presents a methodology and process prescribing suitable solutions. Since Ian's insights in 1970 through his book, many landscape architects, community and regional planners, and liked-minded professionals have started creating designs that take advantage of ecosystem services and promote environmental and public health. In his study, Ian uses national environmental databases and residents' survey

information across many years along with the use of the Geographical Information System (GIS) – a method to visualize, manipulate, analyze and display spatial data, to arrive at conclusions and convey his point.

The GIS and similar data are considered as a good source of information to provide suitability for urban planning and development. But currently in India, not a whole lot of importance is given to the use of such systems in the design and planning of our urban areas or it is conveniently ignored by the stakeholders. Cities are the engines of growth for the state and the country and therefore bureaucrats and politicians are afraid to change the existing urban fabric and the possibilities of expansion and growth least it might impact the revenue generation opportunities needed to run the cities. Planning and building new cities is not a risk anyone wants to take as it involves a lot of time, resources and money. More importantly the benefits of which are seen only in the long run. From a standardization perspective, land and planning is a state subject and is done by the State Town and Country Planning Organization (TCPO) and hence we see varying and different approaches to the subject across states and regions in India.

Rapid urbanization had led to most of the early cities being built without a lot of planning and thought. In fact, most of the modern-day cities were not built but formed around the cities that already existed. The primary motive early on was to ensure that the needs of a transformational city were met. For instance, in the industrialization phase the industrialization needs needed to be met... factories, roads connecting major hubs, housing to cater to the thousands of workers who were employed in the factories. All of this was done quickly, without a lot of planning and at the cost of losing and degradation of existing natural landscapes, forests, streams and lakes. City life brings in stress and exhaustion along with other health issues due to environmental concerns like pollution. What does one do to de-stress or escape from the monotony, noise and pollution of city life … we take a walk in the woods, listen to the trickle of the nearby stream or the chirping of the birds. This cannot be found in large cities and urban surroundings these days as it has not been thought about by early designers and planners and included within the city. What needed to be done was the seamless blending of cities into nature but what is now being done is a band aid fix where we are trying to blend in nature into existing cities and urban sprawls. Man-made vertical gardens seem to be one of the ways nature is making a comeback to cities and providing temporary relief. There are also a few people practicing terrace gardening at a personal level. While this is a shot in the arm it is surely not sufficient.

Urbanization and development is impossible to control. It is a necessity of life across the globe. It cannot be stopped, however it can and must be predicted by designers and accommodated by planners. If one accommodates for the future, they can create a space that works for today, tomorrow and much further into the future, making the investment much more cost effective than it may have otherwise been if you are looking at it holistically and from a long-term perspective. It is next to impossible to bring down existing buildings, roads and other infrastructure and redesign and rebuild it. Consider for example the hardships and challenges that a large metropolitan like Bangalore and its citizens are currently going through during the construction of the metro rail system across the city which will hopefully improve the existing traffic situation in the city. But these are time consuming and highly expensive activities. In addition, it causes a lot of health-related issues due to the dust and pollution caused when structures are being brought down, the land being excavated and not to mention the plentiful use of resources like water and electricity.

Referring to the book "Design with Nature", Ian goes on to state that designing requires interdisciplinary scientists, planners and professionals along with the communities working together to maximize the benefits of the knowledge and experience of all these people and to reap better results and outcomes. Ian goes on to term this method as Integrated Planning where you have the Intelligent Science – the planning aspects; Community – the knowledge, participation and awareness and finally the Governance – policies and administration, working together to ensure that we design taking advantage of and keeping the environment in mind.

III. CONCLUSION

Mankind is already facing the risk of falling short of energy, water, minerals and food to cater to our needs very soon. Nature has already figured out how to address or avoid these problems. It's about time we started looking at nature as a role model and use ecological design principles to inspire human engineered projects and products. Continuing to design products like most of the Reverse osmosis (RO) Water Purifiers currently being sold in India which waste a lot of water during the water cleansing process would not be the recommended way forward. We as accountable designers should not design such products, while populaces being responsible citizens should not buy such products. Encouragingly the talk of a hundred new and improved smart cities – an initiative by the present NDA government of India is a sign of things improving in design and planning in city planning keeping nature and the environment in mind. How much is implemented, how soon and the impact it will have on easing some of the key urban issues while protecting the environment is something to look out for in hope.

Ecological design also brings in other challenges in a country like India. Products and solutions must be economically viable for it to be affordable by common man. The electric car for example saves fuel, is practically noise free and does not pollute the environment, but is it affordable by an average middle-class citizen in India? The few options that are available in the market are very expensive and can only be afforded by those who are more economically sound. It also requires a charging point which is an additional infrastructural setup at one's home and at various other destinations like an office. Ironically even organic food which is said to be cultivated without the use of fertilizers and pesticides and uses minimal resources is much more expensive and not affordable by an average middle-class citizen in India. On the contrary packaged or processed food, which is unhealthy comes at a lower cost and is easy to prepare to suit the fast-paced needs of the new age urbanite. Problems are aplenty, needs are numerous, but importantly we have the people, infrastructure and resources in India who can help. Calling for indigenous ideas and inventions for

the local needs and markets and in the process, let's not forget to reemphasize the importance and need of ecological design to be a part of the design process.

IV. ACKNOWLEDGMENT

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