

Engineering and the Environment

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We all know that our environment is a complex of physical, chemical, and biotic factors that act upon all living beings or communities. In Dictionary environment simply means 'surroundings' (*environ*) and it is the aggregate of that which includes social & cultural conditions or influences. The environment provides us food (*Roti*), clothing (*Kapda*), shelter (*Makan*), and fulfills all our desires and needs whether big or small. Moreover, the entire life support or ecological cycles of humans depends wholly on the environment. In addition, it also helps in supporting and maintaining various other thousands of ecological cycles sustaining on earth. The environment we live in is made up of natural or geographical and built or man-made. We Indians have a tradition of worshipping our environment as *Vaastu-Shastra* breaks down it into five (5) parts namely-fire, air, water, earth & space. Even before India's independence in 1947, several environmental legislations existed but only after the UN Conference on the Human Environment (Stockholm, 1972) did the National Council for Environmental Policy and Planning within the Department of Science and Technology was setup in 1972. This Council later revolved into a full-fledged Ministry of Environment and Forests (MoEF) in 1985 which today is the apex administrative body in the country for regulating and ensuring environmental protection. India is the 1st country to effect such legislation where constitutional sanction was given to environmental concerns through the 42nd Amendment, which incorporated them into the Directive Principles of State Policy and Fundamental Rights and Duties. Last but not the least, it may not be exaggerated to mention that animals (e.g., Crayfish-quality of freshwater; Corals- seawater rise and sea temperature fluctuation, which in turn are signals of climate change; Peregrine falcons-an indicator of pesticides like DDT; Frogs/toads-pollution, etc.) often act as an indicator which offers key clues to environmental change and pollution and by monitoring changes in the behavior, physiology, or the number of an indicator species, scientists can monitor the health of its whole environment.

We, as civil engineers have the duty not to build the infrastructure of a nation but to do justice to the natural environment in general & built environment in particular. Growing environmental concerns and climate change effects have highlighted another major problem with the built environment. Built Environment's basic ingredients like cement, sand, rocks & water are all sourced from mother earth. It is now a well-known fact that to produce 1(one) Metric Ton of cement approximately 1 (one) Metric Ton of CO₂ is disposed of off to the atmosphere. Also, limestone which is used to produce cement is becoming scarce day by day and in another 50 years or so this will become a scarce commodity. With the sand & stone mining ban and with water becoming progressively costly, what should be the new alternatives?.

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