Journal of Dharma 39, 3 (July-September 2014), 213-218

Editorial

INTERFACE OF ENVIRONMENT AND SCIENCE

Environment is the milieu in which we live, move and have our being. As we live, we not only adapt to the environment but also adapt the environment. Science and technology helped us in this endeavour and the impact of science is evident in our ways of living. With the advancement of science and technology and ever growing interventions of humankind in the nature, however, the quality of life is often declining and even the very existence of life on earth are threatened by human lifestyles. Science and technology has worked with mechanistic and anthropological perspective and was oblivious to the environmental price; humankind is increasingly becoming a threat to the rest of the reality – living and non-living. In our search for comfort and pleasure, we seem to be forgetting the fundamental truth that we live, move and have our being in a network of relations with matter, microbes, plants, animals and other human beings and the greater truth that the network of relations is constitutive of our forms of life. Though as human beings we have our unique identity, we form part of the universe with the rest of the creation, who are not strangers or enemies but neighbours and partners without whom human life is impossible. We have a responsibility toward them and to the earth as whole, our home.

All the adaptations we have done for better living with the help of science and technology has an environmental price; yet we understand a life without science and technology is impossible for us. Moreover, science and technology also have great potential for protecting the environment. They are indispensable tools for understanding the environment, curbing violence done to the nature because of human interventions in the name of better living, and protecting the environment where we live, move and have our being.

In this issue of the Journal of Dharma, we are making an effort to explore and evaluate the Strengths, Weaknesses, Opportunities and Threats of Science and Technology at the interface of Environment. Scholars present the fruits of their research and offer critical and creative evaluations of current practices and ways of living from a scientific perspective as they affect the environment.

Dr A. R. R. Menon, a retired Senior Scientist from Kerala Forest Research Institute, Peechi, Kerala with fields of specialization in Forest Ecology, Remote Sensing and GIS and its applications in Forestry sector argues in his paper "Forestry for Sustainable Management" that sustainable management of natural resources is important for survival of life. The most appropriate method to do that would be to assess the ecological sustainability by way of understanding the ecosystems/ landscape complexities and their uniqueness. Traditionally monitoring of populations or habitats involved field based observations, an approach that is time consuming and also requires specialist's involvement. Remote sensing and GIS technology can be used as an effective tool in resource assessment.

"Nuclear Energy and Technology: Ecological-Sociological Impacts with Special Reference to Koodankulam, India" by Sahaya Celestine Soosai explores the question of Nuclear Energy Security and the future of the Universe from philosophical and ecological perspectives. The study is based on the ecological and sociological impact of the Nuclear Project at Koodankulam in India. In recent times, the developed countries concentrate on Renewable Energy Resources, while developing countries continue to invest in the nuclear plants and African countries have the desire to invest in Nuclear Energy. The greenhouse effect has awakened the world to look for an alternative energy security, and 2011 Fukushima has threatened the world on the danger of the Nuclear Energy. In his view, nuclear energy and technology would lead to major negative impacts upon the world in general and to the Indian society in particular, especially with regard to ecology and environment and for the future of the humanity.

M. K. Singh and Ajit Kumar Behura from the Indian School of Mines, Dhanbad present the prospects of "Nanotechnology towards Environmental Sustainability." Nanotechnology has moved from the realm of science-fiction to reality at more than expected speed. Various areas in which nanotechnology presently seem to be having a decisive role to play is still in the state of tip of the iceberg and once it is exponentially deployed and employed there will be hardly any sphere of life which will not have a nano-touch in it and by that time world might be known as nano-world. With this at the backdrop the answer to the problem for sustenance of the planet will also have to come from nanotechnology. In the visible spectrum the planetary medicine aspect of artificial photo-synthesis seems to be the answer, once effectively arrayed on ground. If that is to be the case, the ethical aspect of its fructification will need to be conceptualized and formulated and global regulatory system will need to be put in place. Needless to say, either ethics will have to catch up with the galloping nanotechnology or the latter will have to slowdown to be in empathy with the former, in the overall interest of humanity and that of the planet.

"Larvicidal Efficacy of *Scindapus Officinalis* against A*edes Aegypti*, A Dengue Fever Vector" by P. Sreedev, K. Misvar Ali, and E. M. Aneesh is a research paper on the larvicidal efficacy of petroleum ether extract of *Scindapus officinalis* against the fourth instar larvae of *Aedes aegypti*. Insecticidal susceptibility tests were done according to WHO standard procedure and the mortality was observed after 24 hours of exposure. The extract showed potential larvicidal efficacy with LC_{50} value of 3.18 mg/L. This is a pioneer attempt to explore the larvicidal activity of this plant. The petroleum ether extract of its fruit showed potential larvicidal efficacy even at very low concentrations. Further, the biochemical mechanism and mode of action are under investigation and warrants extensive study. The development of an effective eco-friendly mosquitocide of plant origin would reduce the risk of wide use of synthetic insecticides as mosquito control agents.

Dr Gregory Malayil, a scientist and philosopher, presents "A Thermodynamic Approach to the Kinetics of Environmental Pollution" in his presentation. In his view, environmental pollution is a social issue since people are the only party both at the giving and receiving ends. It is initiated by the people and they themselves are the victims. To analyze the issue, however, a multi-disciplinary study is essential. In the realm of environmental studies, physical and chemical sciences are very important. Both the physical and chemical aspects are linked to thermodynamic processes and a thermodynamic approach is very much relevant in environmental issues. This paper is an attempt to view the environmental issues from a thermodynamic perspective. Generally, thermodynamics is concerned over the efficiency whereas for the environment, the energy consumed for the work also is critical. The smaller the energy consumed the smaller is the pollution and the environmental impact. The energy that is spontaneously dissipated in to the surroundings causes to a large increase in entropy or disorder of the environment. This energy may affect particles of the environment mechanically or chemically, though it is not useful for the organisms as they are unable to absorb the energy beyond certain specified spectral ranges. Furthermore, excess energy dissipated in any process turns as a pollutant as it affects the equilibrium of the various material particles in the surroundings. Since environment also has an intrinsic value owing to the mutuality with humans, we are morally obliged to protect the environment. It seems that technological optimism will not be a solution for these emerging issues.

Dr E. Shaji from the Department of Geology, University of Kerala, investigates the "Fresh Water Challenges in Kerala." The fresh water crisis is a global phenomenon and many parts of India are also affected by water scarcity, varying in scale and severity at different times of the year. There is growing concern in Kerala on availability and quality of water and deterioration of fresh water eco-systems due to natural and human activities. Population growth and changing lifestyles have created overuse of fresh water resources. Kerala, due to its greenery, water

resources and copious rainfall, gives the impression that it has enough water resources for all its needs. But this is a partial truth. The groundwater level trend during the last decade shows a conspicuous decline indicating more groundwater use in the state during the last decade. Other problems on water sector in Kerala are depletion of surface water in rivers, ponds, reservoirs and other freshwater bodies, drought during summer and floods during rainy season, sea water ingress into rivers and lakes, effect of sand mining, change in land use pattern, over dependence on groundwater, less recharge, bore-well culture, and impacts of climate change. According to Dr Shaji, the root causes of the water crisis are mismanagement of freshwater resources, poor maintenance of the water distribution system, land reclamation, land use pattern, lack of adequate attention to water conservation, efficiency in water use, water re-use, ground water recharge and wetland conservation. Despite the current situation of crisis, indications are that the current trend is not to going to change so easily and Kerala is going to become a water scarce state by 2020.

Wishing you critical and creative thoughts on the interface between Environment and Science, may I submit this issue of the *Journal of Dharma*!

Jose Nandhikkara, *Editor-in-Chief*