

*The Need for a Programme of Study in*

**ENVIRONMENTAL SCIENCE**

by

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His Majesty king Birendra, in a message in September 1969, has urged that if our problems are to be solved satisfactorily, education, hygiene, sanitation, food and water control should be so developed as to suit the needs of public health. There was a warning that many problems still remain, because due attention has not been accorded to the root causes of health hazards.

In spite of these warnings, there have not been sufficient efforts to provide a category of personnel trained in Sanitary Sciences. The result has been total apathy from the government and the public about the environment they live in, and a feeling of fatalism on its inevitable permanence. Deepak Bajracharya, a young Environmental Engineer, recently wrote about our environment as remaining in total chaos, the least of the concern, and environmental hazards becoming disastrous. Technology and industrialization have not solved the basic problems of the society and never will so long as we do not modify in our mind the context of these problems in our own way.

With our country trying to take a hurried leap towards industrialization and raising the economic and health standards of the people, we may neglect many of the factors associated with these changes, and the damages to our environment may be irreparable. The result of a good piece of technology, through its bad use, may bring a desperate situation

through severe environmental deterioration, because, as Edward Ashpole remarked, man tries to rule nature without knowing all the rules.

For the present, we need to work for the protection of the public from the many health hazards associated with the man's environment like cholera, gastro-enteritis, enteric fever, intestinal worm infestations and malaria etc. by means of improved water supply, waste disposal, milk and food control, and insect and rodent control. For this we need to produce the persons who can apply his technical skill to be used for overcoming the environmental defects by studying local problems, and persuading the general public and the officials that something should be done, and that it can be done and that he can do it.

Dr. C. Mani, former Regional Director of the World Health Organization, declared that the greatest health problem in the world today is the grossly defective environmental sanitation of the developing countries, placing a heavy burden of preventable illnesses upon the countries of South East Asia. Dr. M. C. Candau, the Director General of W. H. O. once declared that probably three-fourths of the world's population drink unsafe water, dispose human excreta recklessly, prepare milk and food dangerously, are constantly exposed to insects and rodent enemies, and live in unfit environments."

More than one-fifth of all deaths in the world are due to faulty environmental conditions. Even this estimate gives no measure of its effect upon us. Death is a terminal event. But it is the chronic and repeated infections and infestation which convert man from a productive unit of society to a liability to society. The people exist in an environment in which there is dearth of technical competence, a shortage of capital, inept public administration, and no public comprehension of the goals. Often the degree of poverty is so profound and the acceptance of filth so complete that the battle towards improvement is sure to be long, arduous and often frustrating one.

The insanitary conditions giving rise to water and filth-borne diseases take terrible tolls in our greatest resource-manpower, by resulting in much suffering, sickness and death, imposing economic burdens on the family, on the community and on the nation. The age-structure of an unhealthy population may yield twice the number of mouths to feed, it does hands to work, because of the small proportion that survives to enter productive age. An authority has mentioned the dire effects of the worms infecting the people and metabolizing more of the produce of a country than do the inhabitants. *Thus half the work of a sick peasantry therefore goes into the cultivation of food for the worms that make them sick.*

We have cholera as a potential visitor every year, but as L. A. Kaprio states typhoid fever is a permanent guest and can be said to be "Invited guest", because lack of a counteraction induces it.

An American Engineer, K. C. Lauster, on a review about Nepal, observed that cholera, typhoid, dysentery and the diarrhoeas abound here. He noted so much fear and superstition about cholera that many of the doctors refuse to go to villages where cholera has been reported. Lauster found it difficult to understand, since of all filth-borne diseases

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Cholera is one of the most vulnerable to improved sanitation. He further concluded that obviously there is much to be done in improved living standards in Nepal. It is equally obvious that any improvements in general conditions and standards of living must be based on improvements in sanitation, otherwise all efforts will fail.

Besides these problems and their needs of improvements, we need trained manpower to help in reducing the further deterioration of our environment. The noted ecologist, Dr. Lamont C. Cole has recently pleaded so strongly to preserve our natural eco-systems from being further damaged due to reckless desires in short term benefits, before our fate has been irreversibly sealed. No study has been made as yet about the pollution of water bodies from the industrial districts and complexes in the Kathmandu Valley and outside. The dangers of air-pollution with consequent effects on our respiratory systems from the new industries have been as yet of no concern. Increased use of pesticides in agriculture can lead to ultimate destruction of our humane environment. *With the lack of men trained in sanitary sciences, no efforts are envisaged to study and check the undesirable consequences that may crop up very shortly.*

There is no sense in waiting and wishful thinking that because of our undeveloped economy, there is very little danger of imminent catastrophe from environmental pollutions in our country. As late as 50's, even the developed countries of North America and Europe and Japan worried very little on environmental pollution, expecting that nature has unlimited capacity to absorb and recycle the necessary elements or at least keep them harmless for ever. Now this has changed. Professor George Wald, Harvard University's Nobel-prize winning biochemist, recently warned that civilization will end within a generation, unless drastic and immediate steps are taken to reverse the despoliation of man's environment. Professor H. Bloom, Dean of Faculty of Science at the University of Tasmania in Australia, said that people who had thought carefully about pollution realized that man has perhaps 10 years or so to make changes if he wanted to save his environment from complete and utter destruction. The famous French scientist and explorer, Jacques Yves Cousteau, although dealing mainly about marine fauna and flora but which will apply equally well in most other cases too, said in glum, blunt terms that the pollution is general. He recommended that the world should devote 5 or 6 percent of their national revenues to fighting pollution, and warned that some scientists think it is already too late. But with strict management he felt he did not think so as yet for starting to act. Dr. Maurice Strong of Canada, Secretary General of the United Nations Conference on Human Environment recently held in Stockholm in June 1972, had warned earlier that human life as it is known today 'may not be able to continue to exist' 30 years from now if "environmental degradation" remains unchecked, asserting that the human race faced "serious risks" of ending up the race itself.

A Congressional Conference of U. S. Scientists in November 1969, warned that pollution could kill humanity in 'few decades', and not of some hundreds of years hence. The likelihood of this happening in our children's generation is very great, -with only years

rather than decades for us to act on, and may be that we are the last people on earth who can do something about it."

The DDT and other insecticides-pesticides abuse may cause so serious dangers to our environments that a fiery lawyer in U. S. A. recently went to court alleging personal damages suing in the name of all people of the country and "generations yet unborn." Another authority has warned that serious and congenitally malformed babies may be born from the chronic effects of continued ingestion of these common insecticides.

Many more serious views expressed by experts and specialists can be quoted. We should now be concerned as to how we in Nepal can act for our welfare and of posterity. *Only a few competent personnel are available in our country. And the few who have been trained in environmental sanitation in the last decade have either left the service or been employed in completely non-environmental aspects of disease-control projects.* The reason is, the number of trained personnel being so few, that no publicity is ever given as to how they may be at all useful to the government or the society. Only when a fair number of trained manpower is available, the government, industry and the society will feel their needs. As Professor Abel Wolman of John Hopkins University's Sanitary Engineering Department rightly declared, "one will not frame a policy or convert it into action unless there appears to be not only a reason for doing so, but a dramatic reason for doing so."

*So far our governmental policy has been to ask for "foreign aid" in all matters of technical know-how, ignore the local talents and disregard the training programmes, especially in the field of environmental health.* But we should ask ourselves, "Will this bring solutions to our problems?" An American authority on environmental health Henry Hyde declared that the accomplishments in these fields in U. S. A. have too often been vaguely attributed to the wealth of America rather than the devotion of trained men to the Sanitary Sciences. Another U. S. authority, H. M. Bosch deplored the customary thinking that an American expert sent to a foreign country will enable that country to take all steps necessary to solve its problems. Instead, he emphasized, the permanent solution of the environmental sanitation needs of any country will be one that utilizes to a large extent local materials and local labour, and which does not deviate widely from the established cultural pattern of the country.

The noted ecologist and crusader for the 'emerging science of survival', Professor Barry Commoner of Washington University in St. Louis felt that the environmental deterioration that we are now experiencing is not due to minor faults in our technology, but to major ones. Another crusader, Professor Rene Dubos of Rockefeller University in New York, has noted that to most laymen and not a few scientists, the word 'Environment' now evokes nightmares, because of the thousand devils of ecological crises and also because the modern environment threatens human life due to toxic effects of pollution and man's inability for proper adaptive responses to it fast enough. He also felt that it may cause not only impoverishment of life but also a progressive loss of the qualities that we identify with humanness and a weakening of physical and mental sanity. It is perhaps because as he had

earlier stated, "every civilization begets its own pestilences and must learn how to outwit them."

Edvard Hambro, President of U. N. General Assembly, in his opening address to the world body in September 1970, urged for working towards a halt to "the erosion of our environment", adding that pollution knows of no national boundaries, recognizes no political sovereignty, and does not distinguish between rich and poor. These remarks were made in spite of plenty of politico-military crises and opportunities for the U. N. to limit itself and get completely occupied in just assuming a peace-keeping role.

When these dedicated men and many others of outstanding calibre have warned us so much about the threats to our own survival, *can we neglect now from preparing professional men trained in Environmental Science ?* We have to act now before even the great Himalayas can protect us from the otherwise. The Expert Committee of the World Health Organization had warned that the 'relegation of these functions to less adequately prepared persons results from a great misunderstanding of the complex problems in Environmental Sanitation. For the solution of these problems, we need men of intelligence, *training* and experience'. "Let us not be unwitting accomplices", as the Engineering and Sanitation Section of the American Public Health Association appealed, "to the environmental engineering and health problems in existing and growing communities by failing to support sound directions for solution of the local health problems".

UNESCO's International Coordinating Council on the programme on Man and the Biosphere ( MAB ) in its Final Report in November 1971 has considered that the programme, to be fully effective, must be sufficiently supported through activities which will include formal *training* at different levels, as well as general education measures, including the dissemination of relevant information to the general as well as the specialized public. Our Nepal National Committee on Man and the Biosphere has also recommended for developing a broad educational programme in the nature-conservation and improvement of the environment ( ecology ) through *development of curriculum* and audio-visual materials, *training*, and more particularly through strengthening *environmental education* in Colleges, University departments and teacher training institutions.

Should we be satisfied with just passing resolutions and recommendations or should we also implement those things which are so inherently necessary for us ? His Majesty King Birendra, in a recent speech, has expressed little interest in delivering speeches and taking part in ceremonies only. His Majesty emphasized the noble opinion that 'development is not only an economic preposition but is also a human problem too; and we need to manage and set in motion the use of natural resources, labour and capital'. Let us act now by establishing a programme of study in ENVIRONMENTAL SCIENCE in this coming INSTITUTE OF APPLIED SCIENCE AND TECHNOLOGY, and prepare a base for all of our immediate and future actions in protecting the environment so vital for us. It will be appropriate to quote U. S. Senator, Edmund Muskie's warning against mere "slogan-rich and action-poor"

antipollution efforts. "Rhetoric", Muskie added, "takes us in one direction, while inaction leads to another".

We need to evaluate our duties to ourselves and the posterity too, by not merely relying on quick-return education and training programmes only. It may also be appropriate here to recall the words of the late President of U. S. A., Herbert Hoover, "The imperative need at all times is the leadership of the uncommon man or woman. We need men or women who cannot be intimidated, who are not concerned with applause meters, nor those who seek tomorrow for cheers today".

There are already several departments in HMG, that need to employ the qualified persons for tackling many kinds of environmental problems. There is great need of them in the local panchayats too all over the kingdom. Also several industries ought to need them for reducing their industrial pollution of waters. The reason that none of them feel the need so urgently is because of the non-availability of trained men, and also because no public information has been imparted by any governmental departments. The INSTITUTE OF APPLIED SCIENCE AND TECHNOLOGY can therefore play a nucleus for upgrading our environmental health activities, as well as reducing the damages to our ecology. The trained personnel can be made to feel himself so important, as an American executive once remarked, "The incentive is not monetary gain only.....I feel I'm part of a crusade marking the world a better place in which to live".

The study of ENVIRONMENTAL SCIENCE is an integrated discipline of physical, chemical, biological, ecological, public health and engineering sciences, and hence its best suitable place for training is the coming INSTITUTE OF APPLIED SCIENCE AND TECHNOLOGY. Any other institutes will limit the programme for their narrow individual purposes only, while the requirement is for the broadest possible management of all different aspects of the problems that we may be required to face.

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