

THREE ASPECTS



OF

UNIVERSITY EDUCATION

ASSOCIATION OF INDIAN UNIVERSITIES

Three Aspects of University Education



ASSOCIATION OF INDIAN UNIVERSITIES

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Foreword

As has been customary for several years now at every annual meeting of the Association certain themes are selected for intensive discussion. The themes selected in 1979 at the session held at Patiala were as follows :

- (i) Linkage with Environment
- (ii) Internal Management of Universities
- (iii) Cost of Higher Education

Quite some people thought that the papers presented needed to be shared with a wider audience. This has been done now and the papers are here to read for those interested in the subjects.

NEW DELHI
December 5, 1980.

AMRIK SINGH
Secretary

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THREE ASPECTS OF UNIVERSITY EDUCATION

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- Group II Internal Management of Universities**
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GROUP I

LINKAGE WITH ENVIRONMENT

Linkage with Environment

A.S. ATWAL*

The quality of environment is now-a-days engaging the attention of the people all over the world. The environmental problems are those conditions in the bio-physical environment which have an adverse influence on the health and happiness of man. There are many instances to show that the environmental problems reached the crisis phase in the advanced countries. Environmental problems in India differ from those faced by the industrially advanced countries.

The process of human problem solving passes through three phases (Swan, 1974) :

- (i) To create awareness that the problem exists.
- (ii) To analyse the problem and to identify its root causes.
- (iii) To develop corrective strategies for the present problems and preventive measures for the future.

In order to determine how far the environmental problems exist in India, we must have the right perspective of the beliefs, attitudes, values and behaviour of the people. Such an approach will be helpful in appreciating the magnitude of the problem.

The aspects of human behaviour which are directly related with man's interaction with the bio-physical environment and his ability to solve environmental problems are related with environmental education. The objectives of environmental education programmes include the utilization of extra-perceptual information, sensory awareness, the relationships of

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oneself to society, the ecological thinking and value development. It leads to creating ecological conscience and for that reason an action is considered right when it tends to preserve the integrity, stability and beauty of biotic community. The aim of environmental education is, thus, to bring man into harmony with himself, his fellowmen and his environment.

An action model suiting conditions in USA has been proposed by Stapp (1974). The instructional programme approach to environmental education is considered by him to bring out the following major constraints to the development, implementation and evaluation of such a programme :

- (i) Environmental education is interdisciplinary and problem-solving, whereas the present day education is discipline oriented.
- (ii) The educational curricula are already crowded with subject matter materials and incorporation of additional areas is considered a burden.
- (iii) Environmental education cannot avoid the value question.
- (iv) Shortage of classroom teachers prepared to effectively integrate environmental education into instructional programme.

India harbours 1/7th of the world population on 2.5 percent of the earth's surface. It is essentially a rural society, about 20 percent of the population lives in town and cities. India's problems revolve around very high population, low availability and utilisation of natural resources, poor standard of living and low literacy level, which is around 30 percent. Besides a poor understanding of the environmental problems of India, there is even a very low level of awareness and hence the process of working out the strategies is very slow.

Environmental Problems in India

The environment of man has been changing owing to climate or geological upheavels. Man himself has been responsible for altering the environment and in many instances his influence resulted in accelerating the process of deterioration. The influence of man in changing the environment is more spectacular wherever he has tried to concentrate in grate numbers. When living in the countryside in small villages, he fits in

with the nature quite well and whatever filth or pollution he gathers around him continues to dissipate in the adjoining countryside. The process of disintegration of waste materials is further accelerated by the climatic conditions obtained in India. About 80 percent of the people in India live in the rural areas and 20 percent in towns and cities. This has been almost a steady pattern during the last more than 100 years except that the density of population has increased tremendously in the recent past.

Human aggregations in big villages, towns and cities are confronted with the problem of accumulation of human and domestic wastes. There is open sewerage system in practically all the villages, towns and even in the major cities in the country. The pathogenic micro-organisms emanating from such wastes pose health hazards. The contamination of drinking water supplies with sewage polluted water has been responsible for the occurrence of epidemics of diseases such as hepatitis, dysentery, typhoid, cholera etc. at many places. The epidemic of hepatitis that rocked Delhi during 1956 is one such example. According to an estimate about 20 percent of the hospital beds in India are occupied by patients suffering from typhoid and cholera, caused by the drinking of sewage-contaminated water.

It is estimated that sewerage produced by a single person would consume the total quantity of oxygen dissolved in 9000 litres of fresh water and hence the sewage water when released in a stream is harmful to fishes and other wildlife. About 3000 million litres of sewage or sullage are estimated to flow out of cities and towns of India every day. It is either applied as irrigation water with or without treatment, or discharged into the nearest river or stream. The addition of sewage/sullage emanating from the towns located on the banks of the rivers Cooum, Adyar, and the two tributaries Amaravathi and Bhuvani of Cauvery in South India has resulted in the deterioration of the quality of water. The modern methods of sewage treatment, involving sedimentation, biological oxidation and chlorination, lead to the removal of a fairly large number of pathogenic bacteria and organic matter from the sewage. The provision of a similar system in such a vast country as India is a stupendous task which involves huge capital investment. Some steps in this direction have, however, been initiated in the major cities of the country.

The wastes given out by various industries vary in their characteristics and quantity depending upon the nature of the product, raw materials and the processes to be used, and the by-products recovered. The common practice is to dump liquid wastes either into the soil around factories or to discharge them into a nearby water body. Industries like pulp-paper, textiles, sugar, hydrogenated vegetable oils, coal, petro-chemicals, antibiotics, agrochemicals, leather products etc., all pollute urban as well as the rural environment. The effluent water is not only a source of direct poisoning of the human beings but also kills practically all the aquatic fauna. The pollution of air caused by various industrial units include dust particles, hydrogen sulphides, oxides of nitrogen and sulphur, carbon monoxide, etc. which cause various physiological ailments and the diseases like pneumoconiosis, silicosis besides causing structural damage. The ensuing threat to the historic Taj Mahal owing to the location of petro-chemical complex at Mathura is causing anxiety among the Indian society.

A wide range of biologically active organic compounds have come into use in modern agriculture. These chemicals include fertilizers, insecticides, fungicides, weedicides etc. The consumption of agro-chemicals in India is not as high as compared with that in USA, Japan or UK but there are, however, certain localities where the use is rather heavy. Only 9.45 kg of fertilizers are consumed per hectare in India as compared to 31.85 kg in USA, 97.04kg in UK and 346.81kg in Japan, but in Ludhiana District of Punjab over 130 kg of fertilizers are used per hectare. Similarly, per hectare consumption of pesticides in India is worth Rs. 2.15 as compared with that of Rs. 66/- in USA, Rs. 82/- in UK and Rs. 200/- in Japan. The pesticides, however, are used far in excess on vegetable crops grown around big cities in India. The public-health programmes also include an extensive application of pesticides that can itself pose hazards to the health of man and cattle. The recent reports (Dhaliwal & Kalra, 1977)* about detection of contamination of milk samples with DDT (mean level 0.26 ppm, maximum 1.02 ppm) in the Ludhiana District of Punjab, as against the permissible limits of 0.0625 ppm of DDT in milk, emphasize the gravity of health hazards posed by insecticidal pollution in localized situations. The adoption of intensive cultivation

*Dhaliwal, G.S. and R.L. Kalra, 1977. DDT residues in milk samples from Ludhiana and surrounding areas, *Indian J. Ecol.* 4, 13-22.

practices on a massive scale for increased agricultural production would involve still greater use of agro-chemicals.

The forest wealth of India has been exploited on an extensive scale. Deforestation led to floods and water erosion of the soils, rendering huge areas unfit for cultivation. It is estimated that India has a total of 400 million hectare metres of ground water out of which approximately 29% runs off as seasonal floods which not only destroy crops and valuable property but also drain large amounts of plant nutrients from the soil. Massive efforts are underway to canalize the ground water in the country but it is also essential that areas prone to water erosion are planted with forests. It will serve the dual purpose of stopping water erosion and of providing people with timber, cattle feed, fuel and paper-pulp.

Environmental Education in India

The greatest enemies of man in his struggle for decent living/existence are ignorance, apathy, inhumanity and venality, whereas his best allies are knowledge, ambition, humanity and integrity. The aim of education is to help man's allies dominate over the enemies and thus make him more functional. Since education is the natural, progressive and harmonious development of all the human powers and faculties, the aim should be development of inherent potentialities rather than merely imparting of knowledge. Thus, the environmental education should be aimed at improving the man's ability to solve the problems of his biophysical environment.

The strategy for environmental education in India has to be different from that adopted by more advanced countries. The action plan should include the following :

- (i) The adult education, both formal and non-formal, must start from understanding the physical self which is possible only through the understanding of the environment.
- (ii) Since India is predominantly an agricultural country, the rural masses must have a proper understanding of the environment and be familiar with the concept of optimum exploitation of natural resources.

- (iii) The school education which has a compulsory curriculum of general science, must start with the basics of environmental education and the place of man in environment.
- (iv) For preparing the right curricula for environmental education and the textbook materials, the required knowledge of the principles of ecology is essential. In fact, all biological sciences must have a strong base of ecology which should be taught in terms of physical, biological and social components. For giving proper training to teachers, planners and educationists, the higher institutions like universities must have Departments/ Institutes of Environmental Sciences where emphasis should be laid on integrating the role of physical and biological sciences for the attainment of natural balance and welfare of man.
- (v) The government at all levels of planning must accept the role of ecology and environmental sciences in the optimum exploitation of the natural resources and in the normalization of human welfare, suiting the psycho-sociological, climatic and political conditions. This policy will not only speed up the process of development but will also economize the implementation of various projects. The concepts such as 'Integrated Rural Development' or 'Integrated National Development' basically imply the integrated development of man. Hence, man should be the centre and the environment around him should come first in planning and the implementation of national policies.

There are going to be many constraints in adopting the above action plan in India. Some of these would be :—

- (i) Improvement in living conditions involves huge expenditure.
- (ii) Widespread illiteracy and religious fanaticism.
- (iii) Lack of public opinion for forcing the government for enactments and implementation.
- (iv) The tropical climate with high temperature and humidity leading to fast multiplication of vector species and the easy natural culturing and growth of micro-organisms. This leads to rapid outbreaks of epidemics.

Both for formal and non-formal environmental education, direct, immediate and concerted efforts are needed for imparting population education, improving public health, controlling industrial and agricultural pollution, and rationalising the use of natural resources. The concept of environmental education is new to India but many universities and research institutes have already included some environmental courses in their curricula. There is a strong need to evolve a national plan on environmental education so that the subject is taught at all levels both as formal and non-formal instructions. The proposed curriculum should create ecological consciousness leading to an overall improvement in the quality of environment.

It is recommended that environmental education be accepted as an essential component of the national education programmes and that a national level group for devising the curricula for environmental education be set up so that ecological consciousness is created at all levels and strata of the Indian society with the minimum loss of time.

Proposed curriculum for Environmental Education at various levels

A. *General Public* : Ecological consciousness could be created among the people through mass media of communication. The emphasis should be on : population control ; human environment and its deterioration ; environmental health and epidemiology of infectious diseases transmitted by vectors ; personal and public hygiene ; traffic congestion ; noise ; industrial pollution, etc.

B. *School Level* : Since biology is not taught as a compulsory subject at the high school level, the introduction of environmental education, which is interdisciplinary in approach, would be considered an unnecessary burden. Keeping in view the importance and the potentialities of the programme the students need to be exposed to :-(a) the concept of environment ; (b) growth of human population and its influence on resources ; (c) usage of land, water and forest wealth ; (d) environmental health emphasizing the importance of public sanitation, health and the common infectious diseases transmitted by vectors. This can be done by widening the scope of physical education, which is a compulsory subject. The land, water and forest usage can be covered under geography.

C. College Level : There are two streams of students in the traditional system of college education, the science group and arts and the humanities group. The science group can be imparted environmental education both as part of the science subjects and as a general coordinating course linking the physical and biological sciences as applied to the environmental studies. The topics covered should include :— the concept of ecosystem, population growth, environmental deterioration, recycling of wastes, personal and public hygiene, traffic congestion and improvement of human habitat.

The students of arts and the humanities group are not generally exposed to the science subjects, hence it would be rather difficult to incorporate environmental education in the study programme of this group. Even they can be exposed to environmental education by way of tutorials arranged once or twice a week, but the students must earn credit. Environmental education can be a subject for the B.Sc. (Medical) graduates. They could be considered for appointment as Sanitary Inspectors.

D. University Level : Here again there are two streams of students at this level. Similar difficulties as explained at the college level are envisaged for introducing environmental education in the traditional system of university education. For the science students best of the universities have courses in related subjects such as plant ecology and animal ecology. Environmental orientation even in physics, chemistry, physiology, etc. should be introduced.

Some of the professional institutions like the Agricultural Universities offer courses which have a direct bearing on the environmental problems. The following courses are taught at the undergraduate level for the students of Agriculture Faculty in some universities :—

(i) *Agricultural Resources :* Land and water resources for agriculture, impact of agriculture on trade and industrial development, crop and livestock production and the yields, plants in relation to environment, agrometeorology.

(ii) *Introductory Agricultural Ecology :* Concept of ecosystem and biosphere interaction between biotic and abiotic components and problems