

GEOGRAPHY AND ENVIRONMENTAL EDUCATION¹

by

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The theme of the joint convention of the Philippine Association for the Advancement of Science and the Philippine Geographical Society, entitled "Geography and Environmental Education" suggests a strong connecting link between the discipline of geography and the science of the environment. Geography is a broad division of human knowledge which is concerned with the study of the earth and man or the relationship between man and his environment. The environment is the aggregate surrounding that influence the growth and development of an individual or population especially man. It includes the natural components and the man-made features of the earth such as the air, water, soil, minerals, plants and animal life as well as the social organizations and infrastructures on land. The environment, in a nutshell, includes everything outside the skin of man.

Man's awareness about his environment gained impetus after the UN conference on the human environment was held at Stockholm, Sweden in 1972, which focused worldwide attention on the frailty of the biosphere and the impacts of modern technology on the rapid consumption of the natural resources and the accompanying pollution. Among the legacies of that conference is the declaration on environmental education provided for under principle 19 which is quoted as follows:

"Education in environmental matters for the younger generation as well as adults, giving due consideration to the underprivileged, is essential in order to provide the basis for an enlightened opinion and responsible conduct by individuals, enterprises, and communities in protecting and improving the environment in its full human dimensions. It is also essential that mass media of communication avoid contributing to the deterioration of the environment but on the contrary, disseminate information of an educational nature on the need to protect and improve the environment in order to enable man to develop in every respect."

In the Philippines which is fast approaching an agro-industrial economy, the study of the environment has acquired a very significant role.

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It is observed that much of the damage to the quality of our environment can be attributed to ignorance and because of this the impetus of the movement in environmental education has gained accelerated momentum. In May 1974, the Philippine National Science Development Board and the United States National Academy of Science sponsored jointly a workshop in Manila on education and training needs for the Philippine Environmental Program. The workshop underscored the importance of education and training in solving environmental problems and recommended that environmental studies be introduced in the elementary, secondary, and tertiary levels of education. The contemplated reform in the educational process is central to the promotion of a new socio-economic order. The basic cause of our environmental woes is man's lack of ecological sensitivity. Unless the youth receives a new kind of education that is ecologically oriented and until the environment is regarded as a responsibility rather than an economic opportunity, the programs and approaches to economic development will only be short term pallatives. The heated debate going on between economic development and the maintenance of the quality of the environment will only slow down the progress of mankind until man will become more aware of the needs of his fellow organisms and the correspondence between their well-beings and his own. Education moulds human values and this makes man more keenly interested not only in his own survival but also in the society where he lives.

To provide leadership and qualified manpower in fostering environmental education, research, and management, the College of Arts and Sciences of the University of the Philippines instituted in 1974 a Ph.D. program in environmental science which is considered the first among developing countries of the world. Environmental science is the study of all systems of air, land, water, energy, life and society that surround man. It includes all science directed to the system level of understanding drawing heavily on the disciplines of the earth sciences, biology, chemistry, mathematics, engineering, public health and the social sciences. The approach is multi-disciplinary and inter-disciplinary in nature which integrates the physical and biological sciences, as well as the social sciences as the framework of the program. The basic contents of the subjects in environmental education are not new. It is the orientation, analysis, and synthesis of the complex natural and human systems that are new. It is concerned with the maintenance and conservation of the natural resources, reducing the effects of natural disasters, abating pollution by man and coping with natural pollution. The goal of environmental education as defined in the Belgrade Charter is to develop a population that is aware of and concerned about the environment and its associated problems and which has the knowledge, skills, attitudes, and motivations, to work individually and collectively toward the solution of current problems and the prevention of new ones.

How then is the discipline of Geography related to the study of the environment? In 1968 a joint inquiry by the International Bureau of Education and UNESCO found out that the study of the environment is an essential part of every subject and geography was ranked first in terms of its contribution. The term geography is derived from the Greek word "geographia" which may be translated as "earth description." This historic concept that geography is a description of the earth is no longer adequate to meet the modern concept of geographical science. It is not a mere enumeration of rivers, mountains, lakes, cities and capital towns. Webster defines geography as the science of the earth and its life especially the description of the land, sea, air and the distribution of plants and animals including man and his industries with reference to the mutual relations of these diverse elements.

The field of the geographer is limited to a thin shell of the earth extending about 50 kilometers into the atmosphere and 5 kilometers below the surface of the ground. It is in this zone that makes ordinary life possible. The study of geography is concerned with two interconnected streams of inquiry, the natural and the social aspects. The natural aspect which is called physical geography is the systematic study of the landforms, climates, the oceans and the natural resources while the social dimension which is denominated human geography studies population, settlement, socio-economic activities and man's imprints on the earth. It is for this reason why geography is classified both as a natural science and a social science discipline. It provides the connecting link between the territory of the natural scientists and that of the social scientists. In the National Research Council of the Philippines, geography is grouped with the social sciences while in the University of the Philippines it is included with the Division of the Natural Sciences. Professor Houston outlines his conception of geography as a study of the earth and its relation to the solar system, to government, to society and to nature.

The main thrust in geographical study is to analyze and synthesize the various components of the earth in an holistic way. It is multi-disciplinary in nature which concerns itself in the interrelationship and interdependence of the physical, biotic, and human elements of the earth. For this reason the science of geography can very well serve as the basis and the foundation of environmental education.

The study of the environment has attracted the attention of many scholars and scientists whose findings are of interest to us. One such group of scientists, educators, economists, and industrialists representing ten different countries met in Rome in 1968 to discuss the present and future predicament of man. Out of this meeting grew the Club of Rome, an "invisible college," which envisioned to examine the complex problems troubling men of all nations. Phase One of the project examined the five basic factors that determine and ultimately limit growth

on this planet, namely: (1) population; (2) agricultural production; (3) industrial production; (4) natural resources; and (5) pollution. All these five issues are all geographically and environmentally oriented.

On population growth it was found out that it took a million years to reach the first one billion (by 1850). For the second billion, it took only 80 years (by 1930) and for the third billion only 30 years. If the present world population growth of 2% annually is not reduced, the population of the earth may reach 7 billion by the year 2000. The question is now raised, can the earth support indefinitely the exponential growth of the world population?

On the Philippine situation, at the time of the coming of the Spaniards, our population was estimated to be half a million. Today with our population of 45 million it is clear that we have multiplied by 90 times. The size of the Philippines has, however, remained the same, 30 million hectares. This will mean increase pressure on the land. It means more mouths to be fed, more bodies to be clothed, more houses, schools, hospitals, and other facilities to be constructed and more opportunities for employment must be provided. While we have endeavored to reduce our rate of population growth, the pattern is shaping that we will reach the 100 million mark by the year 2020. The 100 million mark is significant because it is considered the maximum population which the country can permanently support with a reasonable quality of life for the Filipinos.

On agricultural production, the UN Food and Agricultural Organization estimated that in most developing countries the basic calorie requirements especially protein are not being supplied. The primary resource necessary for producing food is land. Studies show that the yield of the land can not increase indefinitely. The point of diminishing return will someday be reached as a limit to growth. The quantity that is obviously in finite supply and which is inelastic is arable land. It is estimated that the globe has about 3.3 billion hectares suitable for agricultural production. If we assume that every hectare can support 3 persons, then the optimum carrying capacity of the earth is only about 10 billion population which will be reached by the year 2020. After that we face a complete land shortage.

Taking the Philippine situation, it is estimated that about 40% of our land area of 30 million hectares is arable, which is equivalent to 12 million hectares. Considering our climate, soil conditions, and standard of living, it is estimated that every hectare of land may be able to supply the rice intake of 8 persons in which case the optimum population of the Philippines may be taken at 96 million or say 100 million. It is however necessary that the population be evenly distributed and our natural resources be developed more efficiently and scientifically. After that the Filipinos will face a land shortage not only for agricultural

purposes but also for residential, commercial and industrial uses. Even now it is hard for an average family to get a residential land within Metro Manila so much so that even good prime agricultural lands are being converted into subdivisions for settlement purposes.

With respect to industrial production, for the past 300 years man's success in advancing the frontiers of science and technology has created an impressive record in meeting many of the needs, comforts, and convenience of man. The rise of more factories and the inventions of new machineries, tools, and equipment have both beneficial and disadvantageous aspects. The mass production of goods and services has given man cheaper consumer goods and more leisure time. However, this also resulted in the rapid exhaustion of the non-renewable natural resources, pollution of the air, water, and land and produced more unemployment. The fossil fuels which are the principal sources of energy at the present are estimated to be exhausted within 100 years. The use of other sources of energy such as nuclear power, solar, geothermal, and others if properly developed and harnessed may provide the energy to turn the wheels of industry. However, up to now man has not yet found a safe way of disposing radioactive wastes. In the case of solar energy its economic feasibilities in industries and transportation facilities is still in its infancy. For geothermal energy only the countries situated within the active volcanic belts may have the potential of this type. Many of the minerals that are used in industries such as copper, aluminum, manganese, lead phosphate and others will be exhausted by the next 100 to 200 years. Recycling of wastes may increase the lifetime of some of the resources. But they all point to one conclusion that the resources of the earth are finite.

Every factory that is established discharges effluents that pollutes the environment. Even in agricultural production, the use of fertilizers, herbicides and insecticides are also sources of pollution and through the food chain may eventually reach man. It seems obvious that pollution is also increasing at an exponential rate as an outcome of population explosion and industrialization. This is now being observed in the Philippines so much so that the National Pollution Control Commission is also kept busy in seeing to it that we have clean air, clear water, and clean surroundings. The government has also created recently the National Environmental Protection Council to provide policies and guidelines for the protection of the quality of our environment.

In the light of these observations what conclusions can be drawn? The conclusion becomes inescapable that we are living in a finite earth with limited resources, and has limited capacity to absorb pollution. On the other hand, human population grows exponentially and has the propensity to increase consumption of all these resources and correspondingly increase also pollution emission. There is no conceivable tech-

nological solution that can solve completely all the problems of mankind particularly the dwindling non-renewable resources, the living space requirement and the degradation of the environment.

The lessons of geography and environmental education has taught us that man must view the earth which seems large in its smallness as the only planet that is definitely known to be inhabited by intelligent beings. Man lives in a closed system that has finite resources and that he is absolutely dependent upon the earth for his survival. For this reason man should find a way to control population growth to balance the number of births to those who die. In brief, man should now aim to attain zero population growth for man has a negative effect on our deteriorating environment.

Finally, it is incumbent upon to live in harmony with nature and to cooperate with fellow human beings to evolve a world society that will produce a state of global equilibrium between and among population, resources, and pollution. For in this way we can keep the Earth as the home of man not only for the present generation but also for the generations yet unborn.



ABOUT THE AUTHOR



Dr. Domingo C. Salita has a rich educational background and experience. A holder of BSEM (Mining), BSCE, LIB, MS and PhD degrees, he was Dean of the College of Arts and Science, University of the Philippines and presently professor of Geology and Geography, Department of Geology and Geography of the same university. During his incumbency as Dean of the College of Arts and Sciences, he instituted the Doctoral Program leading to the degree of PhD in environmental sciences in 1974 which is reputedly the first to be offered among the universities of the developing countries of the world.

Presently, Dr. Salita is Chairman, National Research Council of the Philippines, Vice-President, Division of Geography and Earth Science of the Philippine Association for the Advancement of Science, Vice-President, Philippine Geographical Society, and member, Marine Sciences Committee of the UNESCO, Philippines.

Dr. Salita is a prolific writer and has written a number of books. Some of his Geography books are *Geography of Natural Resources of the Philippines* and the other, now in the press, is *Economic Geography of the Philippines* which is intended for use in colleges and universities.