

266

NATURAL RESOURCE CONSERVATION: GEOGRAPHER'S VIEW¹

by

(DOMINADOR Z. ROSELL²)

INTRODUCTION

The human race, down through the ages, has not only been breeding itself to extinction but also bringing about the destruction of all other forms of life on the earth planet as well. Man's insatiable love for physical well-being and convenience to the detriment of his environment had moved Alexis de Tocqueville to write 130 years ago. To satisfy even the least wants of the body and to provide the little conveniences is uppermost in every mind. The love of well-being has now become the predominant taste of the nation; the great current of human passions runs in that channel and sweeps everything along in its course.

But things now seem promising; for now, man, faced with the appalling population of 4 billion (2) and the wanton depletion of natural resources, is belatedly coming to terms with his possible sins of neglect in the decaying state of his environment. He can no longer run away from grim reality which is, if he has to survive, much less improve his standard of living, he must create for himself a healthy harmonious relationship with his total environment.

ROLE OF THE GEOGRAPHER

What contribution can geographers possibly provide to the conservation of natural resources and the maintenance of environmental quality to ensure continuity of a good life in our planet?

By the year 2000, it is projected that the planet earth will have eight (8) billion people with Hong Kong, for instance, having 8 million. It is well and nice if we are all chummy, and the carrying capacity of the area and community is not strained beyond the point where it can maintain the biotic potential and the environmental resistance. It is the purpose of this paper to present the principles and concepts of the conservation of natural resources on the basis of the geographer's

¹ Paper read during the Jubilee Symposium on Geography and Environment in Southeast Asia, Hong Kong University, Hong Kong, June 21-25, 1976.

² Chairman, National Committee on Geographical Sciences, NSDB and Professorial Lecturer, University of the Philippines, Diliman, Quezon City and Philippine Women's University, Manila.

view point. (Since I have no idea of the extent of the natural resource of South East Asia, much less of their utilization, my presentation will be anchored to the area of the Philippine setting.)

GEOGRAPHICAL SETTING

Geography and Environment in Southeast Asia, as theme of this Jubilee Symposium of the University of Hong Kong, is indeed a very timely subject for discussion in this time of rapid changes. While this occasion celebrates the 25th year of the Department of Geography of the Hong Kong University, it becomes doubly meaningful that Hong Kong University sponsored this symposium because of another valid reason. It is because Hong Kong University has a very strong faculty in Geography in this part of the SEA (1). The Philippines being within the SEA region naturally shares with Hong Kong University's thinking regarding the importance of a study of the Geography and Environment in this area, which we are going to do.

Table 1 shows the population data of the countries within the region. There are twelve (12) countries in SEA, with Hong Kong considered by the World Bank Atlas as within the region of East

TABLE 1. WORLD POPULATION DATA, SOUTHEAST ASIA AND HONG KONG³

	Estimate As of Jan. 1, 1973	Urban Pop. %	Rural Pop. %	Area in Sq. Km.	Density Per Sq. Km.
1. Brunei	142,000	56	44	—	—
2. Burma	29,213,000	19	81	678,033	39
3. Cambodia	7,659,000	13	87	181,035	36
4. Indonesia	128,121,000	18	82	1,491,566	76
5. Malaysia	11,681,000	43	57	332,000	75
6. Laos ⁴	3,163,000	16	84	236,800	17
7. Philippines	41,288,000	35	65	300,000	120
8. Portuguese Timor	632,000	11	89	—	—
9. Singapore	2,201,000	110	0	581	3,422
10. Thailand	39,075,000	15	85	514,000	66
11. North Vietnam	19,743,000	18	82	158,750	39
12. South Vietnam	19,561,000	25	75	173,800	100
<hr/>					
Total for Southeast Asia	302,479,000	22	78	—	—
<hr/>					
Total for Hong Kong (East Asia)	4,140,000	92	8	1,024	4,043

³ From World Population 1973, U.S. Department of Commerce, Bureau of Census; World Bank Atlas, 1972; and Political Geography by Norman J.C. Pounds, 1972, 2nd Edition.

⁴ Includes West Malaysia, Sabah and Sarawak.

Asia. The countries making up Southeast Asia are: Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Portuguese Timor, North Vietnam, and South Vietnam.

NATURAL RESOURCES AND CONSERVATION

What are Natural Resources? And what is meant by Conservation? How are they related to each other?

Natural resources are naturally occurring substances and considered material things. These include: (1) on the surface as land and soil, water, natural fauna, and natural flora; (2) underneath as minerals and underground water; and, (3) below the sea as fishes and other marine flora and fauna upon which man derives his livelihood and well-being. These resources together with climate and landforms or topography comprise the earth resources that are considered elements of the natural environment that affect or control the activities of man.

Semantic Problem of the Word Conservation. — During the last half century, the word conservation is one of the most controversial and misused word in English Language. Schoenfield Clay said that the term conservation was "invented" 60 years ago and has become one of the most comprehensive, evocative and contradictory word in American Lexicon. Conservation can carry connotation of birth control or contour cropping of land, tempest in teapot or quiet of wilderness areas or tourist traps. So diffused and shop-worm has conservation, as a word, become that we are seeing the term increasingly replaced by such phrases as natural resources management, environmental control, quest for quality manland ethic, and so on, in an effort to lend new prestige, if not precision. (11)

Since President Theodore Roosevelt, Gifford Pinchot and others defined conservation as wise use of natural resources, "all sorts of people must have crawled under the blanket and snuggled down. People with many interests to promote and people with various conservation philosophies have adopted the term to their own devices, until today it is in danger of becoming one of the glittering generalities. The number of definitions of the word "conservation" is directly in proportion to the number of scientists and interest groups concerned with natural resources."

Conservation, as defined by Webster Dictionary, means, the act of keeping or protecting from loss or injury. The dictionary further quotes W.H. Taft's Speech on September 5, 1910 before the conservation congress in Saint Paul, Minn. as follows: "Conservation as an economic and political term means the preservation of our natural

resources for economic use so as to secure the greatest good for the greatest number." This definition sounds too idealistic and unless further explained would only mean the keeping of the natural resources for somebody else. On the other hand, that definition established the subject for discussion which challenges others whose philosophies of life in this world are for the establishment of a better place to live in. The geographer, agricultural economist and sociologist advanced their definition. (6)

The geographer defines conservation as the wise utilization of natural resources which would minimize loss and avoid waste. This also means the employment of all faculties of good judgment for the efficient utilization of certain resources in question. The economist, on the other hand, defines conservation as "conservation in practice as in public policy is to increase the productivity of our natural resources and to heighten social values." Thus, conservation may be characterized as a prudent administration of the natural agents of production enforcing reasonable strain and efficient utilization in the appropriation of the physical resources of the earth, and when feasible, promoting their reclamation to the end that productive capacity shall be economically developed and maintained and the natural inheritance of the earth shall be improved. Following the trend of this definition, it seeks to provide for a well-balanced production and consumption of resources for indefinite time. (3)

In the Philippines, especially the Philippine Geographical Society, National Committee on Geographical Sciences, the College of Arts and Sciences of the University of the Philippines and recently the newly established Department of Natural Resources of the Government have a big stake in the correct meaning and the application of the word conservation. When we talk of conservation, we are concerned with natural resources and vice-versa.

EXPLOITATION vs. CONSERVATION OF NATURAL RESOURCES

To an engineer, exploitation is a perfectly respectable term, meaning to develop for use and benefit. It comes from a word meaning to unfold. To the conservationist, it has an evil meaning: Wrong, destructive and selfish use. Here is where the word exploitation differs from conservation, both economically and morally. Conservation as applied to land and to other resources means wise use. (10)

To illustrate — let us consider the natural drainage arteries of an urban area. In the Philippines we call these drainage arteries "Esteros" of which we have quite a number in the City of Manila. For conservation of these esteros, we keep them clean and dredged as often

as possible to keep the rain water flow freely and avoid flood during the rainy season of the year. Other people, however, especially the affluent and the capitalists or the oligarchs exploited these channels by constructing commercial and business buildings on these esteros, thus obstructing the flow of water. The volume of flowing water particularly during heavy and continuous rain that occur during the monsoon seasons of the year rises in great proportion and causes floods. This kind of exploitation of a natural resource is a clear violation of the Constitution of the Republic of the Philippines.

NATURAL RESOURCES AND THEIR CONSERVATION

The Philippines is rich in natural and earth resources. The total soil cover is 300,000 square kilometers or 30 million hectares. The mountains, hills and rolling lands are replete with vegetation of forest trees and grasses, of wildlife and comparatively rich in minerals and mineral fuel. The lush forest cover constitutes 52.2 per cent while the non-forest land is 47.76 per cent or 14 million hectares. There are 15 principal metallic and 20 non-metallic minerals in 25 million hectares of geologically surveyed land.

The territorial water is composed of 180 million hectares with 2,200 known species of fish with mollusk life known to be most abundant.

The landforms or topography is generally mountainous, hilly rolling to level with 30 per cent of the area level to slightly rolling as high as 20 per cent slope.

The climate provides abundant rainfall and sunshine giving the whole country twelve months of growing season in the year. Rice and corn can be planted the year round and where irrigation is available, rice crop is grown in three crops in one year. (9)

"The wants of people must be met out of land or go unsatisfied. Of course, different groups of people want different things at anytime. And the wants of individual groups change over periods of time. Conservation insists that land and other natural resources must be used for supplying present wants and maintained in a condition to supply future wants."

CONCEPTS OF NATURAL RESOURCE CONSERVATION

Professor Behan, in his exposition of the "Litany of Scarcity versus the Challenge of Abundance" presented provoking exposition that lead to various concepts in the conservation or wise use of natural resources. (12)

He started with a paragraph from the book sent to him for review from an obscure professor of an obscure university. Behan said, he is another obscure professor from another obscure American University.

This book, *Natural Resources Conservation: An Ecological Approach*, in its introduction has this to say and I quote:

"America is on the sharp edge of crisis (1973). She is degrading her natural environment. She prides herself on conquering outer space, yet after two centuries she still does not know how to manage her "inner" space here on earth. This environment dilemma is the result of four major factors, namely: rapid population increases, pollution, excessive consumption of resources and the gradual deterioration of land ethics," unquote.

Professor Behan further said: "We all know that the natural resources are fixed and finite. There is just so much, quantitatively of our stock resources of iron ore, petroleum, sulfur, etc. And there is a fixed limit on how much we can grow of the renewable resources — timber, forage, and wildlife. Natural resources are fixed and/or limited." It is on this basis that he called this inventory concept of natural resources conservation.

The other concepts of natural resources conservation that I proposed to present are **functional concept, multiple purpose use concept, watershed concept of water conservation and environmental concept.**

1. *Inventory Concept.* — The utilization of our forest resources within the context of inventory concept has been going on year after year especially after the World War II when the Philippines went into massive reconstruction program of the economy. With the help of the US dollars and army surplus equipment such as trucks, bulldozers, and such other heavy equipment for road construction, Mindanao island rich in forest resources was the first victim to the unrestricted exploitation.

Conservation of the forest resources within the context of inventory concept, demands that while these resources are being utilized, provision for future generation and use must be programmed. As a tree is cut down for logs and lumber, seedlings of trees must be planted to replace the trees cut and other trees destroyed during the operation. Logged over areas must be planted either with fast growing soft-wood trees that can be harvested in 8-10 years or with other dipterocarp species for a long term period. In this way, deforestation of forest areas will be avoided and therefore, kept evergreen for generation.

This concept of conservation of natural resources especially forest resources if followed strictly will provide our children and grand-

children with forest trees, quality watersheds and refreshing climate for all time.

2. *Functional Concept.* — The conservation of natural resources within the context of functional concept make use of technology as an important component of conservation. In this concept, a resource is more than just the tangible, physical substance. A resource is also defined by the utility we perceived in the substance and by the technology of transforming the potential of the substance into the actuality of satisfaction. "The equation to express this concept is:

$$R = f \text{ (U.S.T.)}$$

therefore a resource is the function of utility, substance and technology. The substance factor, for all practical purposes and orthodox minds is indeed fixed and finite. But the utility factor and the technology factor are not limited at all. We find new ways for and new ways to use, many new substances all the time, and for many old substances too. The logical conclusion here is as simple as it may be startling: Natural resources as function rather than inventories are not the least bit limited." (12)

In the Philippines we find this concept very practicable, effective and constructive. After the great flood in Central Luzon in July 1972, the forest concessionaries of the whole country were given new directives in the logging operations. Only those concessionaries who have equipment and machineries to process the logs into finished lumber and who can use the waste materials in logging operation into useable products like wallboard called "lawanit" and similar products are allowed to continue to operate their concessions. These directives remove the operators whose aims are to exploit the forest resources for few dollars and denude the hills and mountains of forest trees and that their concept of development of our economy is increased exportation of logs and increased the dollar income without thinking of future conditions of the forest resources for the next generation. This is really exploitation of the first degree, and not conservation.

3. *Multiple Purpose Use Concept.* — The utilization of natural resources within the context of multiple purpose use concept makes use of some of the components of the functional concept. Here technology go one or two stages farther the usual transformation of a substance into the actuality of satisfaction.

This concept is being applied more and more on forest and range lands, in watersheds, on water impoundments and water courses. As recreation-use soars, there is a greater need to protect the many fragile scenic and aesthetic areas. Conservation have known and applied the skills and technology necessary to safeguard and improve our resource base. (14)

A good illustration of multi-purpose use concept is the conservation of water. Water, a natural resource, can be utilized to serve many purposes to satisfy human wants. This is besides its use directly for human consumption. Such water uses as recreational, fishery, irrigation and water power all in one system is exemplified in our Upper Pampanga River Project (UPRP) of the National Irrigation Administration (NIA) of the Republic of the Philippines. Completed recently at the cost of about 1 billion pesos, the project irrigates 770 sq. kms. of rice lands during the wet season and 729 sq. kms. during the dry season with an annual production of 570,000 metric tons of rice. The water supply of 2.5 billion gallons (1 gal. = 3.79 liters) in this project will generate 100,000 kw. of hydroelectric power, besides controlling floods, production of fish and promote ecological balance and tourism in the region. Here is water resource conservation under the multiple purposes use concept.

4. *Watershed Concept of Water Conservation.* — Water is an important element of nature and of the human body. Its relation to land is that 71.7 percent of planet earth is water and 28.3 percent land. According to the data produced by the International Hydrologic Decade the total amount of water of this planet is 326,071,000 cubic miles.

1. In the Ocean	317,000,000 cu. mi.	
2. On the Surface		
river & streams	300 cu. mi.	
fresh water lakes	30,000 "	
salt lakes & inland seas ..	25,000 "	
3. Underground Water		
soil & moisture seepage .	16,000 "	
groundwater $\frac{1}{2}$		
mi. deep	1,000 "	
groundwater $\frac{1}{2}$		
more mile	1,000 "	2,016,000
4. Glacier & Ice Cap		7,000,000
Grand Total		<u>326,071,000</u>

(1 cu. mi. of water = 1,101,117,143,000 gallons)

The distribution of water of the world and the amount any country has depends upon many factors, such as climate, soils, topography of the land, natural flora and fauna, and the location and space within the surface of the globe. The Philippines and the countries in Southeast Asia are within the torrid zone north and south of the equator; rainfall is abundant and temperature is warm to hot. As part of the monsoon region of Asia the rainy season is influenced by the monsoon winds. Most of the time torrential rains come sometimes by nine continuous

days at a time. These continuous rainy days cause disastrous floods and destroy lives and properties by the billion of pesos.

The conservation of water where we avoid or minimize floods is one of our problems in the Philippines especially in low and level areas of the country. We are aware of the fact that water seeks its own level. So, wherever the rain water drops or occurs the tendency is to accumulate in the low places. And when the input of water in the area is more than the output, flood occurs. Water accumulation in the area during the rainy days due to lack of passage way to the sea is bound to increase in volume and flood the surrounding area.

The solution would be the construction of a catchment basin big enough to accumulate all running water that come from the watersheds. To illustrate: we construct a basin as big as eight kilometers long, five kilometers wide and ten meters deep in the Candaba swamp. This does not need concrete wall since the excavation will create a natural basin big enough to accommodate 400 cubic kilometers of water.

5. *Environmental Concept.* — To the conservationist, this concept has several implications. To the bird watcher, it is the protection of the bird sanctuaries. To the hunter, it is the preservation and increase of game in the hunting ground. And to the pastoralist, it is living in harmony with nature. About the only group of people who came close to doing this was the American Indians of the early days.

The utilization of natural resources within the context of environmental concept is well exemplified by the projects of the Parks and Wildlife Office of the Department of Natural Resources of the Republic of the Philippines. This concept is not well known by the public because it is being taken for granted.

However, in the case of the famous Rizal Park in Manila, you find the concept being applied and fully appreciated by thousands of people. Trees are planted not for the logs or the pulp they produce but for the shades and the beauty the trees impart to the whole park complex. A hill is constructed to simulate a water fall for the park visitor to see, a long pool of water and fountain create a make-believe of wilderness.

Animals of local and foreign species are kept in well-constructed cages for the park visitors to see and venture into the study of their existence and origin. Flowers of different varieties are planted not to be picked-up but to be admired by park visitors.

The environmental concept can be considered as the results also of the application of the combination of inventory concept, functional concept, and the multi-purpose use concept of natural resource conservation.

In sum, the geographer, as a generalist, makes use of a variety of disciplines to achieve man's desire in the satisfaction of human wants. His concern for the future generations makes him a citizen of the world, not only of an individual country. If man really learns and understands that natural resources are not infinite, he may yet be able to live in harmony with our planet millenia.

It is obvious therefore, that the most urgent need is to find some ways of making conservation education into a law for the young and old to see that the future is still there as good if not better. The law should be instruction, study and discussion of current problems and needs in the conservation of natural resources; included but not limited to air pollution, water pollution, the effects of excessive use of pesticides, the preservation of wilderness areas, forest management and protection of wildlife and humane care of domestic animals, wise use of soil and water, timberlands, forests, minerals, fish and wildlife and the scenic and recreational resources. (15)

REFERENCES

- Shortle, David — Geographical Education in Hong Kong, A Preliminary Assessment of Needs, Goals and Opportunities, IGU Conference & 22nd NZ Geographical Conference, Dec. 4-11, 1974. Palmerston North, Massey University, NZ.
- March 24, 1976 — (UPI) Washington, D.C. As published in Bulletin Today, March 25, 1976.
- Marshall, Alfred — Principles of Economics, 3rd Edition, McMillan & Co., London, 1947.
- Soth, Lauren K. — Conservation — A Misused Word, Journ Soil & Water Conservation, Vol. 20 #3, May-June 1965.
- Minckler, Leon S. — Conservation — Do We Need Another Word, Journ Soil & Water Conservation, Vol. 21 #3, May-June 1965.
- Rosell, D.Z. — Report of D.Z. Rosell to the President of the Philippines on his Studies & Observation in USA as Government Student, August 1940-41.
- Kircher, Harry B. — Semantic Observation on the Meaning of Conservation, Journ Soil & Water Conservation, Vol. 30 #2, March-April 1975.
- Pinchemel, Ph. — History of Geographical Thought, Chairman, IGU Commission Geographical Thought.
- Antony, Tony — Natural Resources are Taken for Granted, Bulletin Today, April 8, 1976.
- Sears, Paul B. — Exploitation and Conservation of Land, Journ Soil & Water Conservation, Vol. 12 #2, March 1957.
- Schoenfeld, Clay — Education of the Public in Natural Resources, Journ Soil & Water Conservation, Vol 20 #6, November-December 1968.
- Behan, R.W. — The Litany of Scarcity vs. The Challenge of Abundance, Journ Soil & Water Conservation, Vol. 28 #2, March-April 1973.
- Hill, Russell G. — Journ Conservation, Vol. 22 #6 November-December 1967, Conservation Ethics: A Basis for Understanding.
- Portain, Lloyd E. — Reassessing Education in Natural Resources, Journ Soil & Water Conservation, Vol. 23 #6 November-December 1960.
- Ring, Robert M. — Conservation Education, It is a Law, Journ Soil & Water Conservation, Vol. 24, May-June 1969.

*Submitted 2/20/76, M. Portain
Revised, 1/10/76, M. Portain*