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GEOGRAPHICAL VIEWPOINT

TOBACCO — HAZARDS TO HEALTH AND HUMAN REPRODUCTION

Editors' Note: This is a well-documented report with 306 references of the Population Reports Series L, No. 1, March, 1979 under the Population Information Program, Johns Hopkins University, Hampton House, 624 North Broadway, Baltimore, Maryland 21205, USA. The summary is reproduced because of its important geographic implications to man and his continued existence. The full report can be obtained by writing to Population Information Program.

SUMMARY

The use of tobacco is one of the foremost public health problems in the world today. In the developed countries, tobacco-related disease subtracts 5 to 10 years from the life of the average male smoker. Tobacco also adversely affects the outcome of some pregnancies. In developed countries, public recognition of the danger is beginning to discourage smoking, especially among the better-educated. In the developing countries, however, there has been little attention to the hazards of smoking, and tobacco consumption has been increasing by about 5 percent annually. Governments have found it difficult to adopt vigorous, health-oriented tobacco policies partly because of the substantial export and tax revenues derived from tobacco. Nevertheless, health professionals should be aware of the full range of risks associated with tobacco. Especially those who work in maternal and child health and family planning should understand the dangers that tobacco poses for the reproductive process and for infants and children so that they can educate prospective parents to these dangers.

The impact of tobacco on health has been amply documented. As the 1979 report of the US Surgeon General on smoking and health confirms, the death rates of US men who smoke cigarettes are about 10 times higher for lung cancer, 5 times higher for bronchitis, emphysema, and asthma, and 2 to 3 times higher for heart disease than of men who do not smoke. The risk of death is somewhat lower for pipe and cigar smokers, for those who do not inhale, for those who use

filter cigarettes, and for women, but for all smokers the risk of death increases progressively with the amount smoked. In the developing countries, the long-term costs of tobacco use are just beginning to be apparent, although the link between tobacco use and morbidity and mortality has long been recognized — for example, the relationship of chewing tobacco and oral cancer in India.

In the developed countries, twenty years of publicity about the dangers of smoking are beginning to have some effects in reducing smoking. Between 1964, when the first US Surgeon General's report on smoking and health was released, and 1975 the percentage of males smoking declined from 52 to 39 and the percentage of females dropped from 34 to 29. Among US male college graduates the percentage of smokers fell from 42.5 to 28.1 between 1964 and 1975. In Britain surveys of 60,000 male physicians showed that between 1951 and 1965 half gave up smoking. As a result death rates of physicians for tobacco-related diseases dropped sharply below the death rates of the male population as a whole.

In the developing world, opposite trends seem to be at work. Smoking is a symbol of modernism, Western ways, and affluence — as tobacco advertising constantly emphasizes — appealing to the educated elites in the cities and to those with some cash income. Smoking is on the increase among university students, including those at medical schools. At the University of Lagos, for example, in 1976 nearly three-quarters of male medical students and one-quarter of female students described themselves as tobacco users. The expanding markets of the developing countries, where there are few restrictions on sales, promotion, and advertising, look increasingly attractive to tobacco companies which face ever more regulation and restriction in the developed countries. While the worldwide manufacture of Western-style cigarettes is growing, in rural or poor populations home-grown tobacco, potent leaf-wrapped or hand-rolled cigarettes, pipe tobacco, chewing tobacco, and other mixtures remain popular among women as well as men.

USE OF TOBACCO DURING PREGNANCY

Although much of the early research on tobacco dealt with adult males, the fact that young women are smoking in larger numbers is focussing more attention on the impact of smoking upon the process of human reproduction and specifically upon the development of the fetus and the infant. In general, that impact is adverse. Smoking during pregnancy is associated with:

* lower birth weights
* shortened gestation
* higher rates of spontaneous abortion, especially during the last months of pregnancy.

* more frequent complications of pregnancy and labor
* and, most important, higher rates of perinatal mortality.

For a healthy, well-nourished woman in her 20s who smokes in moderation and has access to good medical care, the additional risk of a stillbirth or infant death attributable to smoking is small, probably no more than 10 to 20 percent greater than for a non-smoker. By contrast, for a heavy smoker who is older, poor, or anemic, the risk of losing her baby may be as much as 100 percent higher. In Bangladesh, for example, among women with no formal education and low hemoglobin levels, perinatal mortality was twice as high among smokers as among nonsmokers. Although the exact manner in which tobacco affects birth weight, perinatal mortality and other aspects of pregnancy is not clear, researchers, suspect that carbon monoxide or nicotine or both are responsible.

Even after birth, the infants of mothers who smoke may face additional problems. Some studies have found evidence of increased congenital abnormalities among these infants, including cardiovascular changes that might lead to later coronary disease. If mothers who breast-feed smoke, their infants will imbibe nicotine and possibly more DDT, with unknown consequences. Infants in families where one or both parents smoke are more likely to develop bronchitis and pneumonia during the first year of life. The danger of Sudden Infant Death Syndrome (SIDS) is also suspected to be greater in families where the mother smokes.

Some effects may persist into childhood. For example, the children of British mothers who smoked were found to be about one centimeter shorter than the children of nonsmokers. More important, they scored slightly lower in reading, mathematics, and "general ability" tests than the children of nonsmokers. But it is hard to prove that smoking alone caused such differences.

GOVERNMENT RESTRICTIONS

As the public recognizes some if not all of these dangers, governments in the developed countries have been placed under growing pressure over the last two decades to take action, and now they are gradually beginning to do so. Policy changes in this area do not come easily, however. In the US, for example efforts to promote anti-smoking policy by the American Cancer Society, the Surgeon General, many health professionals, and now many of those who have stopped smoking are opposed by tobacco growers, tobacco manufacturers, advertisers, media dependent on tobacco advertising, retail distributors, and some individual smokers. Tax revenues of about $6 billion contribute to government reluctance to act.

As of 1974, 20 of 25 developed countries surveyed had taken some regulatory action against smoking as compared with only 13 of 49 developing countries. Since then many have increased taxes and a few have imposed stricter regulations. Finland, Norway, and Sweden among the developed countries and Singapore among the developing countries have probably gone furthest to institute anti-smoking policies. This means moving "from an implicit tobacco policy serving predominantly commercial and fiscal interests towards an explicit health-oriented smoking control policy" (137). Of international agencies, the World Health Organization (WHO) has taken the initiative in pointing out the health hazards of smoking and in recommending vigorous governmental anti-smoking policies.

Among the actions governments could take to implement "a health-oriented smoking control policy" would be:

* expanding research
* undertaking public education campaigns
* raising taxes, especially on high tar and nicotine products
* establishing government standards for production
* reducing export subsidies
* eliminating agricultural extension and government support services
* requiring health warnings and contents labelling on tobacco products and advertising
* limiting or prohibiting advertising
* limiting sales, e.g., to minors or in certain areas
* prohibiting smoking in public areas and in work places
* setting differential life insurance rates for smokers

No government has yet adopted the whole gamut of actions that would constitute a "health-oriented" tobacco policy, but there is ample opportunity for health professionals to move in that direction. Working from maternal and child health centers and in clinic or community-based family planning programs around the world, health professionals and community leaders are in constant touch with fertile couples and families. They could help all these families to reduce infant mortality, to improve the conditions of reproduction, and to protect the development of the next generation by discouraging the spread of a pernicious habit.

GEOGRAPHY AND ENVIRONMENTAL EDUCATION[1]

by

DOMINGO C. SALITA[2]

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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[1] Keynote address delivered at the joint convention of the Philippine Association for the Advancement of Science and Philippine Geographical Society on January 25, 1979.

[2] Dr. Salita is Chairman, National Research Council of the Philippines and Professor of Geology and Geography, University of the Philippines.

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 multidisciplinary 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.

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ABOUT THE AUTHOR

Dr. Domingo C. Salita has a rich educational background and experience. A holder of BSEM (Mining), BSCE, LlB, 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.

THE GEOGRAPHY OF RURAL DEVELOPMENT THRU LAND REFORM IN CENTRAL LUZON[1]

by

MANUEL J. NAVARRO[2]

INTRODUCTION

Region III, Central Luzon has an adequate resource base, i.e., its size, location, physiography, climate, natural and agricultural resource, and population, which when properly developed and utilized, the region could achieve regional development. Regional development will certainly enhance our national growth.

The problem of land distribution has its historical origin in Central Luzon. Prior to Proclamation No. 1081, landownership in the region has concentrated to the hands of the few which had many things in common with the encomienda system during the Spanish colonial period.

The feudalistic system of land tenure between the tenant and his landlord prevailed over the years and became the basic root of agrarian unrest in the region. Several laws were passed in an attempt to solve the unequal problem of land ownership, but due to the greedy manipulations of landlords as well as the lack of education of the tenants, the land problem continue to exist, and the tenant-farmer remained exploited, and his life became poorer and poorer.

With the advent of Proclamation 1081, a new direction of our agrarian structure emerged. Share tenancy was abolished and a shift to owner-cultivatorship was established. The region became the center of agrarian reform program, and after its five years of implementation, Central Luzon, regionwise, ranks first on the issued number of land transfer certificates in the country.

OBJECTIVE AND SIGNIFICANCE OF THE STUDY

This thesis is a modest attempt to find out socio-economic impact of the current land reform program as embodied under Presidential Decree No. 27.

The dynamic nature of land reform which requires constant adjustment and readjustments to changing conditions makes the present study significant in terms of its goal of making agrarian reform a more viable

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[1] Thesis presented and accepted to the U.P. Graduate School for the degree of Master of Science (Geography).

[2] Research Fellow, NRCP Project IH-58; Lecturer in Geography, U.P. College Manila; and Asst. Professor of Economics, De La Salle University.

instrument for agro-industrial development. The need for maximizing the agricultural output, to accelerate regional growth requires that the policy of agrarian reform be strengthened.

The shift to owner-cultivatorship is an important impact of this decree, as it widened the base of land ownership. It will also increase the farmer's initiative to work hard that will increase also his output and standard of living.

The study will analyze the extent of its implementation in Central Luzon being the center of rice production in the country. Geographical case studies of land reform villages were conducted to determine comparative changes which occurred before and after P.D. No. 27. The results of the study will provide the basis for analysis, improvement, and recommendation for the efficient implementation of the program.

REVIEW OF RELATED STUDIES AND LITERATURE

The economic and social welfare of Central Luzon is directly related to the development of its resources. Investigations and studies have established that Central Luzon has abundant natural and human resources necessary for regional growth and development.

The Harold E. Hodger report (1961) concluded that if fullest utilization of the region's river systems and watersheds will be achieved, agricultural production will also increase in order to meet the pressing needs of the fast growing population.

The U.S. Department of Interior conducted in 1966 similar studies on the land and water potentials of the region. The report confirmed that the only way to increase overall rice production in the region is to improve use of water and to increase water supply. This could be done by furnishing a year-round water supply through the construction of modern irrigation systems. This report became the basis for the construction of the Upper Pampanga River Project in Pantabangan, Nueva Ecija. The dam was accomplished in 1975, and at present it is being used not only for irrigation purposes but also for hydro-electric power, fishery conservation, and recreation.

Sandoval, M. et al., (1970), conducted further studies on the hydrogeology of the region, especially its ground water potentials. The report found out that underlying the region are alluvial and colluvial deposits, and a thick sequence of sedimentary and pyroclastic rocks with intercalated volcanic rocks. Geological information indicates that the upper Miocene, Pliocene, and Pleistocene sedimentary rocks and the Quaternary alluvium are the important ground water reservoirs of the region.

Central Luzon has also been the object of extensive geological studies because of the possibilities of the presence of petroleum. Most of these studies which have been conducted by petroleum companies and the Bureau of Mines revolve around the stratigraphy of the region. Find-

ings regarding these investigations are included in the following: Corby, et al., 1951; Reyes and Ocampo, 1962; Abieg, 1964; and Gervacio, 1966.

On the other hand, Rivers, G.F. et al., 1970 confirmed that the distressing economic and social situation in Central Luzon is aggravated by a combination of interrelated factors involving population, technology, social organization, and natural resources. The population of the region is increasing rapidly, bringing concomitant pressures upon the available resources.

Akira, T. 1969, made a similar socio-economic study of Central Luzon. Findings reported include the "actual state of land ownership, the tendency toward disintegration of large sized holdings, operation of the joint inheritance system among kins, precise division land in cultivation, and the horizontal stratigraphy of the village community." A particular important aspect of the work is the study of the interaction between the economic foundation and social relations. He concluded that the peasant's custom of depending on hired labor of the essential operations in cultivation makes possible the employment of a vast labor force in rural areas.

On the other hand, the Department of Agriculture's report on the "Agricultural Patterns in the Philippines: Central Luzon" 1973, identified the basic agricultural problem in the region, namely: low productivity, irrigation, and the need of technological innovations.

The FAO study on "Land Tenure in the Philippines" in 1972, made similar socio-economic report of the Central Luzon Basin. The study concluded that the root cause of agrarian conflicts in the region was attributed to the feudal character of land tenure.

Republic Act No. 3844 or the Agricultural Land Reform Code of 1963, laid the foundations of the current agrarian situation. One of the objectives of the Act as amended by Republic Act No. 6389, is to create a truly viable and economic structure in agriculture that will enhance greater productivity and higher farm income.

The objective was strengthened by the promulgation of Presidential Decree No. 27 in 1972, emancipating the tenant farmers from the bondage of the soil by transferring to them the ownership of the land they till.

In order to have an advisory and evaluation agency, the Agrarian Reform Institute of the University of the Philippines was established. The Institute further conducts: trainings, researches, and graduate studies on agrarian reform.

In 1975, the Institute conducted a series of researches with the objective of evaluating the impact of land reform on productivity and income of the tenant-farmers beneficiaries of the program of operation land transfer. The principal area of the study focused on the Central

Luzon Region. Among the various research projects conducted, Reynoso, M. (1975), "Socio-Economic Impact of Certificate of Land Transfer to Tenant-Farmer's Beneficiaries: Central Luzon" can be considered as the most comprehensive one on the aspect of productivity and income effects of the current land reform program. The author observed that low productivity of a tenant-farmer beneficiary was attributed to the farmer's lack of innovation. He concluded that the distribution of economic family-size farms will not affect an increase in productivity and higher farm income of farmers. According to the results of his study the primary basis for the increase of farm output depends on the farmer's degree of innovation thru the use of modern farm technology, pesticides and fertilizers, and the use of high yielding varieties of rice.

The study, however, is more comprehensive as it covers the basic geographic factors in agriculture, the resource endowments of the region as well as the extent and accomplishments of the current land reform program after its five years of implementation in the region. In brief, the study is a geographic study of regional resource management and land reform implementation in Central Luzon.

RESULTS AND DISCUSSION

Three land reform barangays were selected for case studies in order to determine the comparative changes on productivity, farm technology used, gross and net income, etc. which occurred before and after the promulgation of Presidential Decree No. 27. These barangays are (1) San Pedro, San Simon, Pampanga (2) Bobon II, Camiling, Tarlac and (3) Sta. Monica, Concepcion, Tarlac. Barangays San Pedro and Bobon II are heavily under leasehold, while Sta. Monica is under operation land transfer (OLT). The selection of leasehold and OLT villages provided the basis for analysis on the socio-economic impact of the two aspects of the current land reform program, i.e., leasehold program which covers land tenanted to rice and corn 7 hectares and below, and operation land transfer program above seven hectares.

In addition, the study dealt on a particular period of time in order to draw comparative changes before and after P.D. 27. The "before phase" covers the crop years 1969-1972, and the "after phase" includes crop years 1973-1977.

A total number of 230 land reform farmers were interviewed from the study areas. Of this total 104 are under operation land transfer category drawn from Barangays Sta. Monica, Concepcion, Tarlac, and the other 126 are under leasehold program from Barangays San Pedro, San Simon, Pampanga, and Bobon II in Camiling, Tarlac. (See Table 1)

In order to determine favorably the comparative changes which occurred before and after PD 27 notably on productivity, gross and net income, interviews were above. This system made feasible the basis of computation per hectare.

RESULTS AND DISCUSSION

Size of Farm. — The three (3) barangays contain an aggregate area of 1,312.00 hectares. Barangay Sta. Monica has the largest area of 671

Table 1. LAND TENURE STATUS OF THE STUDY AREAS

Barangay	Lessees	OLT	Owner	Share Tenants	Respon-dents	Total Farmers
Sta. Monica	48	193	—	17	104	241
Bobon II	129	18	6	12	41	165
San Pedro	139	—	18	56	85	213
TOTAL	316	211	24	85	230	619

Source: Office of the Barangay Captain of each barangay.

hectares, followed by San Pedro 434 hectares, while Bobon II has only 187 hectares. Of this total area, 953.6592 hectares are devoted to rice production among the land reform farmers under review broken down as follows: 259. 9321 has. in Sta. Monica; 310.675 has. in San Pedro; and Bobon II 113.052 hectares. In terms of average size per farm, the three barangays have an average size of 1.729 has. per farm. Sta. Monica has an average size of 2.740 has.; San Pedro 2.235 and Bobon II 0.876 hectares.

On the other hand, there are a total number of 716 parcels in the study area with an average number of 1.58 parcels per hectare. Bobon II has an average parcel of 2.1 per farmer; San Pedro 1.4 and Sta. Monica 1.26, respectively. Table 2 shows the total area cultivated, size of farm and number of parcel.

Table 2. LAND AREA, SIZE OF FARM AND NO. OF PARCELS (in hectares)

Barangay	Total Land Area (has.)	Tenan-ted Area to R	Total No. of Farmers Under R	Ave. Size of Farm	No. of Parcel	Ave. No. of Par-cel per-farmer
Sta. Monica	671	529.93	193 OLT	2.740	245	1.26
Bobon II	187	113.052	129 L	0.876	271	2.1
San Pedro	454	310.67	139 L	2.235	200	1.4

Source: Records of the Barangay Captain and Team Offices of MAR and municipality concerned.

Irrigation. — There are two types of irrigation system used in the study areas. Barangay Bobon II is being served by Camiling River Irrigation System under the National Irrigation Administration. All the tenanted areas in Bobon II are irrigated and the farmers enjoy the benefits of two cropping seasons a year. First crop is usually planted during the months of May to July the onset of the rainy season and second crop begins from October to November.

In Barangay Sta. Monica, irrigation is being served by the tributaries of the Pantabangan Dam which started in 1975. The farmers have also twice cropping season and areas under cultivation can also be irrigated.

On the other hand, in Barangay San Pedro, irrigation is being drained by a communal pump type system constructed in 1973. Majority of the farmers however have only one cropping season since during the rainy season, ricefields are subjected to heavy floods which last from the months of June to October. Farmers from this village can only start preparing their farms for rice culture from November to January. It is at this period when the pump communal type along the Pampanga River is utilized. It is owned by the Farmer's Cooperative of San Pedro and farmers pay an irrigation fee of ₱25.00 per hectare after their cropping season.

Average Productivity Per Hectare (in cavans) Before and After P.D. 27. — Productivity per hectare in a year was derived by dividing total productivity by the total area cultivated, or

$$\text{Productivity/hectare in a year} = \frac{\text{Total production}}{\text{Total area cultivated}}$$

On the other hand, average productivity per hectare was computed by dividing total productivity per hectare of the given crop years by the number of crop years under review. This formula can be expressed as follows:

$$\text{Average Productivity} = \frac{\text{Total Productivity/ha.}}{\text{Crop years under review}}$$

Using these formulae, the study shows that during crop years 1969-1972 or before phase, among the sample farmers interviewed average productivity per hectare was 42.96 cavans. Barangay Bobon II registered the highest average productivity per hectare of 66.31 cavans, followed by Sta. Monica 33.42; and San Pedro 29.17. The average yield per hectare in Bobon II was due to the favorable geographic location of the village. Bobon II is not subjected to the annual floods since the rice fields are not too level for floods to remain longer. In Sta. Monica and San Pedro the low-level agricultural lands are susceptible to heavy floods and bring about yearly damage to crops and property.

During crop years 1973-1977 however, average productivity per hectare increased from 42.96 cavans to 72.37 cavans per hectare. Bobon II retained the highest yield per hectare of 83.8 cavans, followed by Sta. Monica 70-10 while San Pedro 63.23 cavans. Table 3 shows the average yield per hectare during crop years 1969-1972 and crop years 1973-1977.

The overall increase of farm production during the "after phase" period was due to the introduction of modern farm facilities, the use of

Table 3. AVERAGE YIELD PER HECTARE BEFORE AND AFTER PD 27 (in cavan)

Barangay	Crops Years 1969-72	Crop Years 1973-77
San Pedro	29.17	63.23
Bobon II	66.31	83.80
Sta. Monica	33.42	70 10
TOTAL AVERAGE	42.96	72.37

Source: Interview

fertilizers, pesticides, high yielding varieties of rice, as well as the new status of farmers as independent lessees and amortizing owners already free from landlord's exploitation.

Annual Lease and Amortization Dues. — The farmers under review pay regularly their lease and amortization dues, effective 1973 after their conversion into leasehold and amortizing owners.

San Pedro and Bobon II are heavily under leasehold. Rental is determined by the 25-75% sharing method. This means that for every 100 cavans output 25% goes to the landowner and 75% to the farmer. The farmer however shoulders all the farm operation expenses and management. Other method is the fixed rental scale adopted by the Ministry of Agrarian Reform (see Lease scale in Chapter 4). Using this system among the total number of leasehold farmers reviewed in San Pedro and Bobon II, the average rental or lease is 21.51 cavans, distributed as follows: 20.31 cavans in San Pedro, and 22.72 cavans in Bobon II.

On the other hand, the annual amortization dues per hectare under the operation land transfer program is determined by getting the average yield per hectare within three (3) normal crop years prior to P.D. 27. The average yield will then by multiplied by 2½ times. The product will still be then multiplied by ₱35.00 the price per 50 kilos of palay adopted by the Ministry of Agrarian Reform. The gross value in pesos will be divided into fifteen (15) equal amortizations plus six (6) percentum per annum. This will give the annual amortization cost per hectare for a period of 15 years.

Using this method, of the 104 OLT sample farmers in Barangay Sta. Monica, the average annual amortization dues per hectare is ₱461.62.

Table 4 shows the rental in cavans and amortization value in pesos of the barangays under review.

Productivity expenses include expenditures in transplanting, animal, farm implements, harrowing, seed, threshing, pesticides, fertilizers, irrigation dues as well as the annual rental and amortization payments.

During crop years 1969-1972, the average yearly farm expenditures of the sample farmers was ₱118.56 per hectare. The highest expenditure was in San Pedro ₱178.92 per hectare; Sta. Monica ₱134.02; and Bobon II has only ₱42.76 per hectare.

Table 4. AVERAGE ANNUAL LEASE/AMORTIZATION

Barangay	Average Annual Lease/Amortization
San Pedro	20.31 cavans
Bobon II	22.72 cavans
Sta. Monica	₱461.62

Source: Interview

On the other hand during crop years 1973-1977 the average annual expenses per hectare shows an increase to ₱437.06. Bobon II has the highest average productivity expenses of ₱467.12 per hectare, San Pedro ₱442.82 and Sta. Monica ₱401.25. (See Table 5).

The low productivity expenses during crop years 1969-1972 was due to the fact that farmers were still less innovative to modern farming. In addition they were controlled by the pernicious practices of their former landlords. In the after phase period however, after their conversion into independent lessees and amortizing cultivators, as well as with the introduction of modern farm operations, they invest more in their farm in order to gain better yields.

Table 5. AVERAGE PRODUCTIVITY EXPENSES PER HECTARE BEFORE AND AFTER PD 27

Barangay	Crop Years 1969-72	Crop Years 1973-77
San Pedro	₱178.92	₱442.82
Bobon II	42.76	467.12
Sta. Monica	134 02	401.25
TOTAL AVERAGE	₱118.56	₱437.06

Source: Interview

Average Gross Income Before and After P.D. 27. — Gross Income per farmer was determined by multiplying total production in cavans by the prevailing price per cavan of palay, or

Gross Income = Total production x Prevailing Price of Palay in Cavan

Average gross income on the other hand was computed by dividing total gross income by the number of farmers under review, or Average Gross Income = Total Gross Income over number of farmers under review.

Using these formulae, during crop years 1969-72 the study shows that the average gross income per farmer was ₱3,334.33. The highest was observed in San Pedro of ₱4,406.22 per farmer, followed by Sta. Monica ₱3,487.92 and Bobon II of only ₱2,108.84.

For crop years 1973-1977 or after phase the average gross income was ₱7,917.21. San Pedro still leads the other villages and registered ₱9,329.25 gross income per farmer; Sta. Monica ₱7,739.115; and Bobon II ₱6,683.27 (See Table 6).

Average Net Income Before and After P.D. 27. — Net income was derived by subtracting the total productivity expenses from the gross income. And average net income was determined by dividing total Gross Income by the number of farmers interviewed.

With these methods, average net income of the sample farmers during crop years 1969-72 was ₱2,957.37.

During crop years 1973-77 however, average net income increased to ₱5,936.51. San Pedro registered the highest average net income during the before and after phase periods, followed by Sta. Monica and Bobon II, respectively. (See Table 6).

Table 6. AVERAGE GROSS AND NET INCOME BEFORE AND AFTER PD 27

Barangay	Average Gross Income		Average Net Income	
	Before Phase	After Phase	Before Phase	After Phase
San Pedro	₱4,406.22	₱9,329.25	₱3,666.45	₱6,848.37
Bobon II	2,108.84	6,683.27	2,036.60	5,053.82
Sta. Monica	3,487.93	7,739.115	3,169.06	5,907.34
TOTAL AVERAGE	₱3,334.43	₱7,917.21	₱2,957.37	₱5,936.61

Source: Interview

The increase of net income during and after phase was due to the increase in gross income, brought about by the use of modern farm technology, and the increase of farmers' initiative to work hard to produce higher production, as a result of their new tenurial status.

Technology Used. — The study adopted two categories of farm technology, namely: modern technology and the traditional type. Traditional technology includes the use of the usual plow and harrow, the carabao? The old varieties of rice, and the mixed type of planting rice. On the other hand, modern farm technology involves the use of mechanized farming thru tractor, pesticides, weeders, spray, fertilizers, high yielding varieties of rice, irrigation, and the "line system" popularly called masagana rice planting.

The study shows that during crop years 1969-1972 (before phase), the use of the traditional system of farm operation was practiced and during the after phase period land reform farmers shifted to modern farm mechanisms. As a consequence, average yield per hectare increased as well as their gross and net income.

Sources of Production Loans. — In order to maximize production agricultural credit is necessary. The rural banks, Philippine National Bank, Development Bank of the Philippines, Land Bank of the Philippines are the government's credit institutions extending production loans to land reform beneficiaries. Other sources are the landlords, and other private individuals.

During crop years 1973-1977, land reform farmers received the benefits of government credit institutions. Of the total land reform farmers interviewed, 225 secured their production loans from their respective rural banks, one (1) from the PNB and only 4 from the former landlords.

Compared to crop years 1969-1972, only 62 of the sample farmers availed the services of rural banks, and 168 were under the usurious control of their landlords. (See Table 7)

Housing Conditions Before and After. — The following types of houses were used as indicators of the study: (1) concrete, all houses made of concrete materials like hollow blocks, galvanized iron; (2) semi-concrete made of wood, hollow blocks, and (3) traditional houses made of nipa, sawali, cogon and bamboo.

During crop years 1969-1972, a total of 93 farmers interviewed lived in semi-concrete houses and 138 under the traditional category. During the after phase period however, as a result of their increase in production and income, 123 of the sample farmers were able to modernize their homes into concrete types, 107 are semi-concrete, and only one remained living in dilapidated traditional type. Table 8 shows the housing conditions in the study areas before and after PD 27.

Table 7. SOURCES OF PRODUCTION LOANS

Barangay	Before Phase					After Phase				
	1	2	3	4	5	1	2	3	4	5
Sta. Monica	30	74				102	2			
San Pedro	29	56				85				
Bobon II	3	38				38	2	1		
TOTAL	62	168				225	4	1		

Source: Interview
Legend: 1 Rural Bank
2 Landlord
3 Philippine National Bank
4 Development Bank of the Philippines
5 Land Bank

Table 8. HOUSING TYPES BEFORE AND AFTER PD 27

Barangay	Before Phase			After Phase		
	Concrete	Semi-Conc.	Trad.	Conc.	Semi-Conc.	Trad.
Bobon II		6	35	11	30	
San Pedro		43	42	52	33	
Sta. Monica		44	61	60	44	1
TOTAL		93	138	123	107	1

Source: Interview

Household Appliances. — Household appliances like radio, TV set, refrigerator, sala set are also indicators of socio-economic development.

During the before phase period 75 of the land reform farmers studied, have radios, 4 have refrigerators and 26 have sala sets. Compared during the after phase 134 farmers were able to procure radios, 46 with T.V. sets, 22 with refrigerators and 144 with sala sets. (See table 9)

Table 9. APPLIANCES

Barangay	Before Phase				After Phase			
	Radio	TV	Ref.	Sala Set	Radio	TV	Ref.	Sala Set
Sta. Monica	36		3	21	29	20	5	79
San Pedro	29		1		75	25	17	38
Bobon II	10			5	30	1		27
TOTAL	75		4	26	134	46	22	144

Source: Interview

Number of Farmers Who Could Send Their Children to School Before and After P.D. 27. — When farmers became amortizing owners and lessees, and as a result of their increase in productivity and income, they can now afford to send their children to school.

The interview shows that of the total respondents, during the before phase period, 148 could afford to send their children to elementary, 35 to high school, 14 to vocational training, and only 2 to college.

During the after phase period on the other hand, a total of 153 farmers sent their children in the high school, 46 in college, 27 in vocational training schools and 72 in elementary. (See Table 10)

Table 10. NUMBER OF FARMERS WHO COULD SEND THEIR CHILDREN BEFORE AND AFTER PD NO. 27

Barangay	Before Phase				After Phase			
	Elem.	High Sch.	Col.	Voc.	Elem.	High Sch.	Col.	Voc.
Bobon II	24	1	1	1	20	27	2	10
San Pedro	55	22	1	9	9	56	22	7
Sta. Monilo	69	12	—	4	43	70	22	10
TOTAL	148	35	2	14	72	153	46	27

Source: Interview

Employed Members of the Family. — Other than farming, other members of the family of the interviewed farmers are engaged in gainful occupations. A total of 135 family members of respondents work in various categories. Of this total 99 are working within their respective villages, and 36 outside of their communities. A breakdown of the distribution of other gainful occupations of family members of the sample farmers is shown in Table 11.

Market Centers and Other Facilities. — Market centers are vital factors in economic development, as they influence the exchange of goods and services. Farmers in the study areas are being served by favorable trading centers in their respective municipalities.

Bobon II which is only a kilometer away from the poblacion of Camiling receives the services of a growing market area. Barangays Sta. Monica and San Pedro are also connected by good feeder roads to their respective municipalities, whereby farmers can easily sell their products.

In addition, Barangays San Pedro and Sta. Monica enjoy the benefits of rural electrification program. In Bobon II, electricity will soon be served in the community.

Health Facilities and Home Management Services. — Land Reform is also supported with home management services, health and sanitation.

The three land reform villages are being served at least once a week by a home management technician. Housewives are given proper guidelines on how to take the growth of their children, proper food intake and other healthful practices.

In addition, a lecture on family planning is being served every Sunday in the three villages to orient couples on proper spacing of their

children. Family planning is necessary in order to give the family a happier life and environment. Each village, Bobon II, Sta. Monica, and San Pedro has a health center manned by a nurse and a midwife. Physician's service is every Sunday.

Viewing all these mechanisms, land reform brought about improvement in the socio-economic life in the rural areas. The results of the study in the three villages indicate that improvement in the rural areas occurs when farmers became free, liberated from the control of their landlords. The innovations they obtained from the various government institutions involved in the implementation of land reform, brought about the overall increase in crop production and enhance rural growth and development.

CONCLUSIONS/RECOMMENDATIONS

Central Luzon has an adequate resource base, i.e., its size, location, physiography, climate, natural and agricultural resources, and population which when properly developed and utilized, the region could achieve regional development. The study shows that the resource endowments of Central Luzon are not yet fully tapped to meet the needs of the fast growing number of people. In terms of water resource for instance, which is a vital factor to increase crop production, the region has abundant water systems, i.e., rivers, springs, and potable ground water. In view of the existence of abundant water resource, the government should construct more irrigation systems in order to maximize overall crop production. However, I observed that some of the existing irrigation systems like the Tarlac River Irrigation System, the O'Donell Irrigation System, and the Angat Dam in Bulacan and a host of others can no longer serve their usual irrigated areas. There are heavy siltations in the reservoirs, limiting the volume of water to flow the tributaries and irrigation canals. The government should take a look to the siltation problem of the old irrigation dam in order to regain and expand the services of these units, that will lead for further increase in overall crop production.

The increase in rice production was due to the current land reform program that changed the tenurial status of farmers from share-tenants to owner-cultivators. Since they are already free from landlord's pernicious control, their innovation to work hard coupled by the use of modern farm technology, i.e., fertilizers, pesticides, and high yielding varieties of rice, average yield per hectare increase. Particular cases occurred in the three barangays studies, whereby, by virtue of land reform, the socio-economic life of the people improved compared during the pre-PD 27 period.

However, despite the improvement of the standard of living among farmers, land reform implementation has encountered several obstacles and problems. The Ministry of Agrarian Reform outlined the following problems:

1) Incomplete carpet identification (barangay carpet mapping) on areas where the tenant and/or land owner is not available;
2) Insufficient land survey teams to cope with the documentation of barangay carpet mapping sketching;
3) OLT's cannot be issued to tenant recipients who cannot meet requirements and obligations imposed by the Samahang Nayons;
4) Difficulty in the establishment of land valuation thru BCLP;
5) Low-salary of MAR personnel; and
6) Arrogance of farmers.

In order to mitigate such problems the government should increase the budgetary requirements for the implementation of the program; standardize the salaries of MAR personnel in order to attract more technical experts into the program. Furthermore, a massive information/education drive on the various aspects, benefits of agrarian reform be extended to land reform farmers in order to increase their innovation towards the use of modern farm technology. The transfer of appropriate technology to the rural areas will bring about greater farm productivity and will induce overall national development. And finally, land reform widened the base of land ownership, transferring to the Filipino farmers the ownership of the land they till, already liberated from the feudalistic system of land tenure.

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ABOUT THE AUTHOR

Mr. Manuel J. Navarro, at the age of 27 years, has attained his Masters' Degree in Geography in April, 1979, Un.versity of the Philippines. His knowledge in geography will be useful in both Economic Geography and Political Geography. This present paper is his thesis for Masters Degree. Presently, he is Assistant Professor II of Economics at the La Salle University besides being lecturer in Geography at the University of the Philippines, Manila and also Research Fellow I, National Research Council of the Philippines Project No. IH-58, 1978-1979.

ENVIRONMENTAL FACTORS AND HEALTH IN INDIA

by

DR. RAIS AKHTAR[1]

INTRODUCTION

Environment means different things to different people. To a traditional geographer it is synonymous with natural environment, to a sociologist it means only the social environment, and to an anthropologist it is largely a cultural milieu. In the present paper it is proposed to discuss the natural environment and its influence on health.

Natural environment consists of such factors as landforms, soils, climate, water, flora and fauna. Studies made on relationships between natural environment and human life on scientific lines are very scanty. Hippocrates, writing in the fourth century B.C., had a clear appreciation of this relationship and his essay on AIRS, WATERS and PLACES, places emphasis upon both physical and social geography. Environmentalists like Huntington(1) and Semple(2) contributed pioneering studies on this aspect. However, these studies lack scientific recognition. Such studies were continued to flourish and recent contributions by Armstrong(3), Howe(4), Neri(5) and Momiyama(6) are pioneering efforts in this direction.

Notwithstanding the lack of sufficient field studies on the influence of environmental factors and health in India; a definite relationship between the two may be observed in various case studies conducted by different authors in different parts of the country.

HEALTH IN RELATION TO SOIL AND WATER

The groundwater found in Bijnor, Naini Tal and Moradabad districts of Uttar Pradesh in the northern part of India, contains substantial amount of thin flaky particles of yellow muds and minerals of ferruginous nature giving it a dark yellow to orange colour, without affecting its sweetness. The colour darkens in dry seasons at low water-table. The size of the particles in the water decreases with the distance from the ill-drained tarai belt of Uttar Pradesh. The general effect of this water on human physique and health is revealed through increased blackness and hairiness of skin, susceptible to certain itching diseases, liver and intestinal diseases, often leading to forward and downward bulge of bellies and curved, pale and separated teeth(7).

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Guinea worm (Dracunculus) (8) is one of the wide-spread diseases of Rajasthan especially in rural areas of the hilly humid tracts of Aravalli. The inhabitants instead of taking precaution of drinking hygienic water, believe occurrence of parasite is a part of their fate. The endemic zone is situated in southern Rajasthan where the stored rain water is the only source of drinking water for people and domestic animals. The embryos of this parasite are brought by infected people and animals who freely touch the waters of step-wells and ponds.

The cattle in Malapadu village in Guntur district of the southern part of India, suffer paralysis because of polluted drinking water available in the village. The stream which passes along the village is polluted by untreated effluents containing lead discharged by Hindustan Copper Limited (9).

A common belief prevails among many villagers of the Kumaon Himalayan region that the cause of Goitre lies in the water and this belief is in fact supported by a large mass of evidence collected by many researchers, medical and others, investigating goitre in the identified endemic areas. For example, there are portions of villages more markedly "goitrous" than others. In some of these villages, local inhabitants have directly attributed the condition to water. Some water supplies indeed were known as "goitrous springs" by villagers who preferred to use river water for consumption in order to prevent the disease. In a detailed study of Ghora Khal village in the Betalghat area it was noticed that goitre prevailed among people utilizing water flowing through rivulets originating from limestone rocks (10).

Another hypothesis much more difficult to substantiate because of the prevalence of water pollution in India is propounded by McCarrison, who suggested that water pollution may also influence thyroid enlargement (11).

While it can be established that limestone and lime bearing rock materials are most closely associated with endemic goitre, the disease is not restricted to calcareous areas. Still the explanation of the frequent association of goitre with limestone materials is considered important by some, because the limestone rocks are among the most porous as well as most widely distributed within the Kumaon region. In addition, limestone areas are also among the most freely cultivated and inhabited. Water derived from such rocks does contain excessive quantities of lime; the ingestion of which while not perhaps directly a cause of goitre throws an additional burden on the functional resources of the thyroid gland.

In some rural parts of India, we see a large number of people with brown or black stains on their teeth. In some of them, the shinning

coating of the teeth may be damaged or show pitted appearance. A few elderly persons may be seen moving about with hunchbacks or confined to bed with stiff joints. These are the effects of fluorosis — a crippling disease caused by excessive intake of a substance — 'fluorine' over long periods. Fluorosis is major problem in Punjab in the north-western India and in Andhra Pradesh in the southern part. Well and tank water is mainly used for drinking purpose, which sometimes contains very high amounts of fluorides. In fact, stagnant water (such as well or tank water) acquires fluorides which percolate up through the rocks. Higher fluoride content of the soil results in high fluoride levels of water. Flowing water sources such as canals have only low amount of fluorides. The temperature in these areas remains very high (100°F to 115°F) and sometimes rainfall is scanty during summer. This leads to a greater evaporation of water from the wells and ponds; leading to the higher concentration of fluorides in this water.

Indrapal(12) has noted that low altitude, dryness, irritant sand and dust, besides poverty of the people, are important epidemiological factors for the high prevalence of trachoma in Rajasthan. The irritant dust particles give rise to microtraumatism of the conjuctival epithelium, which is thus rendered a suitable host for trachoma infection.

RAINFALL DISTRIBUTION AND HEALTH

Numerous studies were carried out which show that the variation in rainfall may cause the prevalence of certain types of diseases. In a study based on the available data regarding the disease distribution and the ecological features in the Southern Asia, including India, Joshi and Deshpande(13) have proved that the ecology of this region is essentially controlled by monsoonal regime of rains in addition to the other features like the geographic relief, rivers, etc.

According to Joshi and Deshpande the monsoons divide Southern Asia into two parts, viz., a relatively dry western zone and the wet eastern zone. This division coincides in India roughly with the zone of 75-100 cm. rainfall isohyets. The disease patterns of the countries in the dry west zone, from Turkey up to about Central India have striking similarities. Similarly the countries on the eastern side of the Indian watershed up to South East Asian countries share a similar disease pattern. The incidence of hydatid disease, stone disease of the renal tract, trachoma, cutaneous leishmaniasis, etc., is remarkably frequently found together in the regions on the western side of the ecological watershed while the diseases like filariasis, cholera, visceral leishmaniasis, small-pox, protein calorie malnutrition are mainly found on its eastern side.

Rais Akhtar and Andrew Learmonth(14) noted the high incidence of malaria in the exceptionally high rainfall regions of Western India during

1965-76. It was also observed that the increasing intensity of irrigation is contributing in increased incidence of malaria in a well developed areas of Punjab and Haryana. Creation of more breeding places in these conditions may help in increasing incidence of malaria.

L. Rogers(15) has proved that the non-appearance of the east monsoon in Southeast India has triggered severe epidemics in the area of the densely populated state of Madras (now Tamilnadu) (1877, 1892, 1900). Starvation as a consequence of the crop failure was joined with the diminution and pollution of the water sources.

In other regions, also in the endemic areas, such as Bengal and the river deltas of the east, the rain without doubt unleashes new epidemics, especially when the precipitation causes flooding and stagnation in these water courses. In Bengal no time of the year is actually dry. And here dams and railways embankments increase the mass of stagnant water and consequent mortality from malaria, cholera and dysentery.

It is imperative to observe in North India the correlation between the amount of rainfall and the decline in cholera epidemicity from east to west. Also in India, torrential sweeping of rains lessen the danger of cholera in the narrow and dirty streets of the villages.

FOREST AND HEALTH

Learmonth(16) has studied some aspects of human health in communities in close contact either with the tropical rain-forest proper, or with other forest associations in the tropical zone. Changing ecological patterns of health and disease developing because of these increased contacts between man and the forest are of geographical significance.

In India, there are reports concerning the relations between JUNGLE (forest) and malaria in two contrasting areas — the foothill swamp-forests of northern Bengal and the Sunderbans of the south-western part of the Bengal delta(17). From Assam to the northern TARAI region of swamp forests have long spelt crippling or killing malaria. Now there is very low incidence in the TARAI region as the deforestation process started with the settlement of the refugees from Pakistan. There is hardly any forested area in the region. However, the ecological conditions in Assam are almost the same as earlier, resulting in the very high incidence of malaria, particularly falciparum incidence.

CLIMATE AND HEALTH

Among the climatic factors which appear to affect the regional distribution of disease are temperature, rainfall, winds and the humidity. An investigation which was carried out in Rajasthan, in the western part of India, reveals a correlation between climatic factors and the

distribution of smallpox. A comparison of the isotherm map with the smallpox distribution of Rajasthan shows that the area of maximum intensity of incidence lies between the summer isotherm of 32°C and 30°C. The incidence in the cold season is very low, which shows that the virus lies dormant during the season. Similarly, very high temperature retards the growth of the virus, and hence a low incidence in the desert areas of Rajasthan. It was also noted that the smallpox has a remarkably low incidence value in regions recording a high rainfall as well as low rainfall. Thus it has a low incidence value in Udaipur, Dungarpur and Banswara (all rainy districts) and in Jaisalmer, Jalore, Barmer and Bikaner (all districts of scanty rainfall) (18).

To sum up, it may be pointed out that there is a definite relationship between environment and health in various geographical regions in India. Unless the environmental factors are considered in the health planning, the eradication and control of different health problems would be rather impossible.

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ENVIRONMENTAL SYSTEMS — PHILOSOPHY, ANALYSIS AND CONTROL

By: R. J. Bennett and R. J. Chorley, September, 1978 Hardback O 41671020 4 624 pages — Princeton-Methuen, Illustrated £33.30

The environment is interpreted by the authors of this book in the broadest sense, to embrace its physical, biological, man-made, social and economic attributes. Their multi-disciplinary approach is original in its vision of a synthesis of socio-economic and physico-ecological systems and has wide implications for our understanding of man's interaction with the world around him. Bennett and Chorley have three broad aims. The first is to examine the capacity of systems theory to provide a multi-disciplinary focus on environmental structures and techniques. Second, to explore the ways in which a systems approach might lead to the development of an integration of socio-economic and physico-ecological theory. The third aim is to investigate the implications of the interaction between these two theories in relation to man's response to current environmental dilemmas, and in doing so, to lay bare the technological and social bases of the values which underlie man's use of natural resources.

Two types of environmental relationships are examined: first, the idea that man stands apart from nature and operates upon it, and second, that man is an integral part of nature. During this analysis, two views of systems interfacing are developed: the interventionalist and that of symbiosis.

The first of the book's four parts develops the philosophical and technical concepts by which systems can be conceived and described. The second analyses the cognitive foundations of decision-making, while in part three, examples of physical, ecological, social and economic systems are approached from the point of view of their analysis, synthesis and spatial expression. The final part of the book draws together the interdisciplinary approaches by exploring the dilemmas which confront man's intervention in natural systems and his living together with nature.

Within this broad interpretation of the environment, the systems approach provides a basis for understanding environmental situations of ever-growing temporal and spatial magnitude, and reducing the areas of uncertainty in our increasingly complex decision-making control systems. It will be useful not only to environmental scientists, but also to geographers in general, planners, economists and other social scientists, and to all who are concerned with the implications of man's ever-increasing interaction with the world in which he finds himself.

CONTENTS

NOISE POLLUTION

DECIBEL

This is the unit of measuring the intensity of sound. Zero in the decibel scale is the slightest sound that can be heard by humans — rustling of leaves or breathing. The scales are:

1. Ear drum rapture — 140 decibels, the sound of jet taking off.
2. Deafening — 100 decibels exhibited by loud power lawn mower.
3. Very loud —80 decibels produced by portable sander or food blender; Continued exposure brings about loss of hearing, impossible to use phone.
4. Loud — 60 decibels — city playground, average restaurant or living room.
5. Faint — 20 decibels — courtroom or classroom, private office, a whisper at first feed away.

BOOK REVIEWS

BIOGAS AND WASTE RECYCLING: THE PHILIPPINE EXPERIENCE

By Felix D. Maramba Sr., B.S., M.S., DSc (Honoris Causa) XIX and 230 pp., illustrations, figures, Glossary, Bibliography, Index. Regal Printing Company, Philippines, 1978 7¼ x 10¼.

This book is considered the only one of its kind on the subject within the context of Philippine Experience. It is written by a man qualified as per his education and experience and assisted by equally five highly qualified scientists and technician.

Dr. Maramba Sr. was my professor in Agricultural Engineering in U.P. College of Agriculture in 1926-1928. When he was Chief, Industrial Engineering Division of the Bureau of Science, I was a junior Chemist of Soil and Fertilizer Divisions of the same bureau where we met almost everyday. By the time the World War II started in 1941, he pioneered in charcoal producer gas to run trucks and cars during the Japanese occupation in 1942-1945. As Director of the Bureau of Plant Industry, his agricultural engineering expertise became more valuable in the farm mechanization program of the Philippines.

In his capacity as President and Director of Liberty Flour Mills he made use of his experiences to utilize and recycle factory wastes and produced energy out of these various waste products from factory, livestock, and poultry industries. His experiences assisted by able and equally knowledgeable men enabled him to produce an authoritative book — Biogas and Waste Recycling: The Philippine Experience.

The book is divided into four parts: Part I — consisted of the Scientific Aspects discussing nature and history of Biogas; Biochemistry and Microbiology; Laboratory and Pilot Plant experiments; Raw materials for Biogas Production; The Sludge, all these subjects are systematically presented for easy reading. Part II — Biogas Technology — The Chapters in this part of the book are: Fundamental of Biogas Plant Design; Biogas Plant Design Around the World; Sludge-Conditioning Plant Designs and Biogas Work Designs; Planning and Establishing the Biogas works; and Operating Biogas Works. Part III — Utilization and Economics — Biogas as Fuel; Sludge as Fertilizer; Sludge for Feed and other uses; Biogas Works for Pollution Control; and the Economics of Biogas Works. Part IV — Waste Recycling through the Biogas Works — Recycling System of Farming; Rural Development through Waste Recycling; Biogas Works in Practice and Socio-Economic Impact of Biogas Works.

The other contents of the books are Glossary of terms, Bibliography and Index.

This book must be in every library of the schools, colleges, and universities and in all libraries of technical men, professional men and even the practical man of the street and home.

D. Z. ROSELL

GEOGRAPHY AND THE ENVIRONMENT IN SOUTHEAST ASIA

Edited by R. D. Hill and Jennifer M. Bray. Proceedings of the Department of Geography and Geology Jubilee Symposium, University of Hongkong, 21-25 June 1976, 485 pp. Published by Hongkong University Press, 1978.

This book is a collection of papers presented during the Jubilee Symposium of the Department of Geography and Geology, University of Hongkong on June 21-25, 1976. There were over 30 participants from the countries of the Southeast Asia and other countries such as the Philippines, Malaysia, Singapore, Thailand, Indonesia, Hongkong, Taiwan, West Germany, Australia, Canada, and Japan.

This is one book that must be in every library particularly in Southeast Asia countries for students, teachers, geographers, and those interested in environmental studies and their problems.

The papers read were grouped into five areas of concern, namely: I. Problems of Urban Environment, II. The Impact of the City on Rural Areas, II. The Impact of Development on Rural Life and Environment, IV. Analysis and Planning, and V. Education and Environment.

In the Urban Environment area there were six papers presented mostly devoted to environmental pollution, solution on problem of pollution, transportation — pollution problems and Impact of Urbanization on Environment.

In the Impact of the City on Rural Areas, the paper of C T Wong on Urbanizations and Agriculture: The Impact of Agriculture and Town Development on the Rural Environment in Hongkong is of interest to developers of homesite subdivision. The paper of Aurapin Bunnag on a Study of Land Use and Socio-Economic and Demographic Change in the Suburban Areas of Bangkok Metropolitan shows the picture of relationship of land use to economic and demographic changes.

In the Impact of Development on Rural Life and Environment, Rosell's paper on the Geographers view on Natural Resource Conservation is thought provoking on the meaning of the term conservation. The paper of Niew Shong Tong on the Impact of Road Networks on Rural Development in Sarawak, East Malaysia shows the geographic implications on rural road development.

In the Education and Environment the paper of D. G. Biddle on Landscape and Ecosystem — A Conceptual Model for a Geography Curriculum is indeed worthy of consideration and adoption in developing countries where geography has lost its glamour in the educational system. Domingo C. Salita's Geography and Environmental Education in the Philippines is a challenge to the Philippines policy in bringing geography education system in the same footing as the other areas of study in public and private educational institutions.

This book should be a MUST for all libraries for students and teachers of geography and environmental studies at upper secondary and tertiary levels. In this age of environmental concern, this book will give the reader a new look in our contemporary developing society.

D. Z. ROSELL

THE INTERNATIONAL GEOGRAPHICAL UNION

1. THE 1980 INTERNATIONAL GEOGRAPHICAL CONGRESS IN JAPAN

"1980" is the year when the International Geographical Union will hold its 24th Congress and 15th General Assembly, Japan will be the host country and this will be the first full occasion for IGU to meet in East Asia. In the long and fruitful history of IGU, much has been discussed and reported about the different aspects of the world, but as for Asia, geographical knowledge is still inadequate. The 24th IGC is primarily intended to exchange new ideas and information on the geographical science as well as on the geography of the world. Simultaneously, however, the Japanese geographers would like to present the land and sea of Japan as fields of our science where all geographers of the world may observe relevant features and discuss techniques and problems in a friendly atmosphere.

Needless to say, Japan can offer a great variety of geographical phenomena, especially contrast, within its territory: mountain vs. sea, snow vs. tropical vegetation, volcano vs. land subsidence, congestion vs. tranquility, megalopolis vs. isolated village, cottage industry vs. ultra-modern factory, sugar beet vs. sugar cane, rice vs. dairy farm, high-rise building vs. underground shopping center, etc. Japan is a land where the greatest continent Eurasia and the greatest ocean Pacific meet, and this geographical location demonstrates a striking mixture or juxtaposition of contrasting features. Traditional and modern, Eastern and Western, and even within the traditional Eastern cultural aspects, there exists much diversity, although Japan is often thought to be monoethnic. Such topics as earthquakes, typhoons, ocean development, aquaculture, environmental pollution, hydrological problems, hot springs, recreational activities, population concentration, housing, transportation networks, and many others are to be discussed and observed very properly in Japan. Land uses are very often of mini-size and it is quite possible to see fast-changing landscapes within a very small area. Old and new maps demonstrate very well the everchanging geographical aspects of Japanese coasts, country-side and towns. High density, environmental and resources problems, that the world are now or will be experiencing as problems to be solved urgently, can be studied and discussed in full scale in Japan.

The Japanese geographers have conducted creative researches on truly Japanese or Asiatic as well as nomothetic topics of our science.

On the land of Japan, this time, we believe that the geographical science will be promoted further through scientific and friendly discussions. We hereby heartily invite geographers and their friends from all countries and areas of the world to the 24th International Geographical Congress to be held in Japan in 1980.

2. HOST INSTITUTIONS

The Science Council of Japan
The Association of Japanese Geographers
The Tokyo Geographical Society
With the cooperation of many other societies and organizations.

3. LANGUAGES

English and French as working languages of IGU. Japanese can be used for discussions in the Main Session, since some form of interpretation may be expected.

4. MEMBERSHIP AND REGISTRATION

1) Categories of membership and registration fees

Category A (Regular Member) : ≒30,000. (Y = Japanese Yen)
Can participate in all activities except Family Program.

Category B (Student Member) : ≒15,000.
Including graduate students. Can attend scientific meetings and participate in excursions and tours. Those student who wish to read a paper or obtain Congress publications should register as regular members.

Category C (Accompanied Member) : ≒15,000.
Can attend scientific meetings and participate in excursions and tours in addition to Family Program.

Category D (Nonattending Member) : ≒25,000 for individuals and ≒40,000 for institutions. Can get Congress publications. Registration fee for those who participate in an IGU Commission or Working Group meeting only is ≒10,000. (Category E)

2) Registration Form A and Application Form B (inserted) should be returned to the address below before Oct. 1, 1979:

The 24th International Geographical Congress Office
c/o Japan Convention Services, Inc. (J.C.S.)
Nippon Press Center Bldg. 8F.,
2-2-1, Uchisaiwai-cho, Chiyoda-ku, Tokyo 100, Japan

3) Those who have registered should come to Nippon Toshi Center (the main building of the Congress) to receive materials and to

reconfirm registration between 13:00-20:00 on August 31 (Sunday), 1980.

4) Fees for registration; before April 1, 1980.
Deposits for IGU Commission and Working Group Meetings and Post-Congress. Excursions (Pre- and Post-Congress Programs); before Oct. 1, 1979. Fees (balance) for Pre- and Post-Congress Programs; before April 1, 1980.

All payments should be paid to:

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NOTES FOR CONTRIBUTORS

The Philippine Geographical Journal, the official publication of the Philippine Geographical Society, is the only geographical publication in the Philippines. It accepts for publication articles, reports and other works of geographical sciences within the context of the Five Traditions of Geography. The Journal is particularly interested to publish works in the Philippines and the regions of Asia, Australia and New Zealand.

Manuscripts should be typed double space on one side only on regular 8½ x 11 inches size and should be carefully edited by the authors. Figures should be drawn on hard tracing paper. Tables and captions to illustration should be typed on separate sheets and their desired position indicated in the text by leaving a four-line space with words such as **Take in Table X or Take in** Figure X. Statistical data used in tables and figures should be in metric unit. Photographs should be black and white, strong in contrast and printed on high class paper. Line drawing for maps and diagrams should be prepared in dense black ink on white paper or board.

Authors should accompany the MS with brief bio-data and if possible a passport size black and white picture for publication.