

Office Holders 1993-1994

GOVERNING COUNCIL

Carmencita T. Aguilar
Chairperson
Allen L. Tan
Vice-Chairperson
Ruben F. Trinidad
Secretary

Leslie E. Bauzon	Telesforo W. Luna
Emma S. Castillo	Nelia R. Marquez
Ibarra M. Gonzalez, S. J.	Angela L. Pangan
Milagros C. Guerrero	Corazon M. Raymundo
Mario B. Lamberte	Patricia A. Sto. Tomas
Corazon B. Lamug	Lerma D. Yambot
Amaryllis T. Torres, ex-officio	

EXECUTIVE BOARD

Amaryllis T. Torres
President
Teodoro M. Santos
Vice-President
Ma. Concepcion P. Alfiler
Treasurer
Ruben F. Trinidad
Secretary

Shirley C. Advincula	Eliseo A. de Guzman
Clemen C. Aquino	Generoso de Guzman
Delia R. Barcelona	Gonzalo H. Jurado
Erlinda A. Cordero	Fe T. Otañes
Rosario M. Cortes	Sabino G. Padilla, Jr.
Socorro L. Reyes, ex-officio	
Carmencita T. Aguilar, ex-officio	

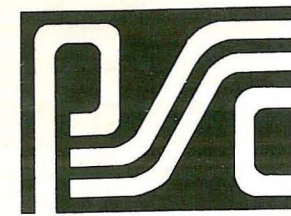
SECRETARIAT

Ruben F. Trinidad
Executive Director
Lorna P. Makil
*Senior Coordinator, Project Development and
Publication Division*
Alana Gorospe-Ramos
*Coordinator, Project Development and
Publication Division*
Leo F. Malinay
Administrative and Finance Division

Philippine Social Science Council
P.O. Box 205 UP Post Office, Diliman, Quezon City, 3004

May be opened for postal inspection


**SOCIAL SCIENCE
INFORMATION**



SOCIAL SCIENCE INFORMATION

April-September 1993

Vol. 21, Nos. 2-3

PHILIPPINE SOCIAL SCIENCE COUNCIL



Symposium on



"ENVIRONMENT AND SUSTAINABLE DEVELOPMENT: SOCIAL SCIENCE PERSPECTIVES"

January 29-30, 1993

PSSC Auditorium
PSSCenter, Commonwealth Avenue
Diliman, Quezon City

EDITORIAL

As early as the fifties and sixties, politicians, orators and writers used to proclaim the cliché that the Philippines was rich in natural resources. But in the early seventies, people began to realize that the country not only has a finite resource base but that these natural resources were fast vanishing. Careless if not criminal exploitation of the country's forest lands has resulted in disastrous floods and siltation of dams. Unwise management of mineral resources has prejudiced ethnic groups on their ancestral domains and similar exploitation of marine resources has depleted our seas. All these, coupled with a galloping increase in the population, have resulted in increasing poverty among our people and a series of continuing natural disastrous events.

The twentieth century has seen great advances in science and technology, economic development and industrialization of many countries. In the Philippines, government planners and policy makers have turned to science, technology and industrialization to provide a more meaningful life for the masses. The attempted solutions to the problems of poverty and unemployment, however, are not as simple as first thought. Unfortunately, the effects of economic development and industrialization have been uneven. While these have raised the level of the standards of living of the well developed countries, it has been accomplished at the expense of Mother Earth and has brought on a host of other problems, the principal of which is the degradation of the environment. The easily visible example of this in our part of the world is the pollution done to the Pasig River and the Laguna de Bal by the industrial factories. As a consequence, these water resources can no longer provide sustenance to small fishermen. Human development and economic growth as a goal should not be accomplished at the expense of the environment but should be reconciled with the conservation of the environment.

We have been late in giving recognition to this issue. While the Philippines merely exported its timber to Japan, in the process ravaging its forests and making loggers millionaires, Japan on the other hand chose to import lumber while conserving its own forests. The disastrous floods and the failure of hydroelectric plants to provide energy due to siltation of dams warn us of the dangers we face. Still, our legislators continue to debate, whether or not logging should be banned. In a similar manner, our government agencies have not been alert to the depredations done on our coral reefs, the criminal use of dynamite fishing and other fishing practices which have depleted our seas of its marine life.

The issue of Environment and Sustainable Development concerns not only our people but all inhabitants of planet earth. What were once regarded as local incidents of pollution like acid precipitation now involve a number of nations. Chemical and radioactive waste disposal are no longer just current problems as they will affect future generations. In June 1992, an Earth Summit sponsored by the United Nations was held in Rio de Janeiro. The first of such summit was held in Stockholm twenty years ago raising environmental consciousness to such level that all governments of the world responded by creating cabinet posts dedicated to environmental problems. In our government we have such a unit — the Department of Environment and Natural Resources.

This issue of promoting economic growth, without sacrificing the environment, has been recognized so significantly that it has been adopted as the theme of the PSSC Silver Jubilee. The celebration of this silver jubilee opened with a national symposium under the Social Issues Committee (SiCom) last January 29-30 on the theme, "Environment and Sustainable Development: Social Science Perspectives". It will close with the holding of the National Social Science Congress III with a variation of the said theme. The articles in this issue are a product of the January 1993 Symposium.

Rosario Mendoza Cortes, Ph. D.
Chair, Social Issues Committee

PSSC Social Science Information

April-September 1993

Vol. 21, Nos. 2-3

Social Issues Committee of 1992

Symposium Task Force

Dr. Rosario M. Cortes
Chair

Members

Prof. Carmencita T. Aguilar
Prof. Mary Constanca C. Barrameda
Dr. Telesforo W. Luna
Dr. Gloria M. Santos
Dr. Amaryllis T. Torres
Dr. Zelda C. Zablan

EDITORIAL NOTE

This double issue for the 2nd and 3rd quarters of 1993, featuring nine papers presented during the January 29-30, 1993 Symposium on Environment and Sustainable Development, is made possible through the efforts of the Social Issues Committee (SICOM) for 1992 of the Philippine Social Science Council.

The PSSC is grateful to UNESCO (Bangkok) for funding the two-day symposium; thus, this publication.

ISBN 0115-1169 THE PSSC SOCIAL SCIENCE

INFORMATION

The PSSC Social Science Information is published quarterly by the Secretariat of the Philippine Social Science Council with Ruben F. Trinidad as Executive Director. It is produced by the Project Development and Publication Division.

All correspondence should be addressed to The Editor, PSSC Social Science Center, Commonwealth Avenue, Diliman, Quezon City.

Contents

2 Editorial

□ Rosario M. Cortes, Ph. D.

Main Features

- 4 Overview of Environment and Sustainable Development
□ Zelda C. Zablan, Ph. D.
- 9 Sustainable Development: A Historical and Theoretical Explication
□ Prof. Mary Constanca C. Barrameda
- 18 Overview: Policies, Strategies and Administrative Implementation for Sustainable Development
□ Prof. Carmencita T. Aguilar
- 23 Government Appropriations for the Environment and Sustainable Development
□ Commissioner Sofronio B. Ursal
- 27 A Paper on the State of the Environment
□ Fr. Ibarra M. Gonzalez, S.J. and Olive R. Hofilana
- 32 Health, Environment and Economic Productivity
□ Alejandro N. Herrin, Ph.D.
- 37 Population Carrying Capacity of Potential Food Production from Land and Aquatic Resources
□ Candido A. Cabrido, Jr., Ph.D.
- 44 'When Sister Earth Suffers, Women Suffer Too': Women's Perspectives on Sustainable Development
□ Amaryllis T. Torres, Ph.D.
- 49 Environmental Impact Assessment: A Policy Need for Sustainable Development
□ Telesforo W. Luna, Jr., Ph.D.
- 52 Philippine Encyclopedia of the Social Sciences
- 53 PNHS Publication

Editorial: Genaro N. Jacob, Elvira S. Angeles, Mark M. Averilla
Circulation: Lydia G. Wenceslao

The views expressed here are by the author and do not necessarily reflect those of the Philippine Social Science Council.

ALL RIGHTS RESERVED

To quote from this publication, proper acknowledgement should be given.

OVERVIEW OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT*

• Zelda C. Zablan**

I. Introduction

Our current concern over the environment has been brought about by two major phenomena which we have been witnessing over the last decade or so. These are: (1) continued deforestation of watershed areas, and (2) water, land and air pollution. Another important phenomenon which has bearing on environmental concerns is rapid population growth.

This symposium aims to promote the discussion of environmental concerns and to elevate it to a scientific level in order to get the facts straight, and to provide a sound basis for environmental planning and policy formulation.

For the appreciation of the papers to be presented in this symposium, it will require enough understanding of what environment and sustainable development mean. It is the task of this overview to present these definitions and to attempt to lay down a broad conceptual framework on sustain-

able development which, is hoped, would be helpful for the integration of the findings of the papers presented in this symposium.

II. Definition of Environment

A broad definition of environment states that it is

"...the circumstances, objects or condition by which one is surrounded."

A more descriptive definition of environment is

"...the complex of physical, chemical and biotic factors that act upon an organism or an ecological community that ultimately determine its form and survival."

Since the term environment is so broad, concern for it must be delineated and focused in order to plan and formulate policies for its improvement. The following are a few guiding principles that circumscribe environmental concerns.

Environmental concerns should be:

1. Focused on the sustainability of life support systems or ecosystems (such as the forest, agricultural, fresh water, coastal and urban systems).
2. Both site-specific and system-based. The strategy is to think globally (using a system-oriented framework) but to act specifically (on site-specific environmental problems).
3. Dealing with ecosystem interactions and interrelationships. Ecologically, various ecosystems are actually inter-related through flow of energy and materials, or by activities of people.
4. Dealing with long-term strategies and scenarios such as population and environmental relationships since ecological processes are time-bound and cumulative in nature.

*Paper presented during the "Symposium on Environment and Sustainable Development: Social Science Perspectives", sponsored by the Social Issues Committee of the Philippine Social Science Council, held at the PSSC Bldg., Commonwealth Avenue, Quezon City on 29-30 January 1993.

**Associate Professor of Demography, Population Institute, College of Social Sciences and Philosophy, University of the Philippines, Diliman, Quezon City and Member, Social Issues Committee of the Philippine Social Science Council.

5. Take account of global factors because environmental problems transcend international boundaries.
6. Promote the well-being of local communities occupying a considerable area of the country.
7. Take into consideration the promotion of equal opportunity and access to resources, not only of the present but also of the future generations.
3. Deterioration of freshwater bodies. Out of the 384 river

"Weak institutional capacity to deal with environmental problems, non-participation of local communities, a non-responsive political system, and a stagnant economy all contributed to the current environmental problems which we experience today."

The right of every Filipino to enjoy a productive and wholesome environment is guaranteed by our 1987 Constitution as stipulated in Article II, section 16.

III. The Current State of the Philippine Environment

The present state of our environment is considered by experts as already critical. They cite:

1. The forest cover, which was 60 percent of our land area some 90 years ago, is now only 23 percent. At the current rate and efficiency of reforestation, it will require 177 years to restore our present forest cover to that obtaining 90 years ago.
2. Agricultural production efficiency of grain crops such as rice and corn has been declining since 1985. This is due mainly to expansion into marginal lands, degradation of the soil, pest incidence, chemical pollution (from

excessive use of fertilizer), and reduction of arable land area due to land conversion for residential and industrial uses.

excessive use of fertilizer), and reduction of arable land area due to land conversion for residential and industrial uses.

systems in the country, 40 are now considered biologically dead, and 480,000 hectares of freshwater areas are affected by salt water intrusion.

4. Coastal habitat and resources declined considerably due to coral reef, mangrove and sea grass destruction.
5. Growth of human population in urban and settlement areas has led to incompatible and inappropriate land uses which, in turn, caused environmental deterioration such as air and water pollution, water disposal problems, deterioration of health and nutrition status of the people, and greater disaster impacts.

This state of our environment has caused "low income and poverty, displacement of cultural communities, social conflicts and instability, declining productivity of the natural resource base, poor health and nutrition, and hydrologic instability and siltation.

These environmental problems have been exacerbated by the heavy foreign debt burden of the

country which constrained it from undertaking serious environmental conservation measures, and by poverty which forced people to depend heavily on natural resources. Rapid population growth continues to exert enough pressure on natural resources for the accommodation of the additional population. Inequity in income marginalized a great majority of the population to occupations that often resort to destructive means of exploiting these

natural resources. Weak institutional capacity to deal with environmental problems, non-participation of local communities, a non-responsive political system, and a stagnant economy all contributed to the current environmental problems which we experience today. (See Figure 1)

IV. Definition of Sustainable Development

Sustainable development can be defined as:

"... a dynamic process in which the development and utilization of resources, orientation of technological development, institutional change and direction of investments are in harmony and enhance both current and future potentials to meet human needs and aspirations" (UP National Assessment, Report on the Environment, 1992).

According to this definition, sustainable development is composed of four (4) interrelated components, namely: (1) resources, (2) technology, (3) insti-

tutions, and (4) investments. These components exist in harmony with one another. An alteration in one component initiates changes in the other three components. (See Figure 2)

Figure 3 presents yet another framework which is both dynamic and integrated, and shows the mechanisms that will allow the human society to cope with changes in the various elements involved, for example, change in population and technology.

The 1987 Philippine Constitution provides that... "The State shall promote a just and dynamic social order that will ensure the property and independence of the nation and free the people from poverty through policies that provide adequate social services, promote employment, a rising standard of living, and an improved quality of life for all" (Section 9, Article 11).

Since socio-economic development is for the people and is achieved by the people, it is important to recognize the inter-relationships of population, resources and environment. Population factors affect resources and environment, just as the availability of resources and environmental conditions affect population concerns.

Thus to achieve development within the context of environmental concerns, three (3) elements are needed. These are:

1. definition of what the minimum quality of life or standard of living is for the people.
2. limits or carrying capacity of the ecosystem and resource base as expressed by indicators that will inform us whether the limits have already been exceeded.

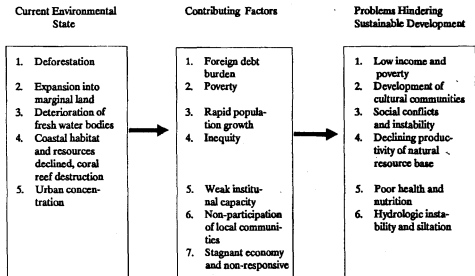
3. technologies which can enhance the transformation of goals and services into more useful but environmentally benign form.

The dynamic and integrated nature of sustainable development suggests three priority strategies for its operationalization. These are:

1. adoption of non-destructive technologies as well as provision for technology assessment (such as environmental impact assessments).
2. rational population policy whose main component is the control of fertility.
3. environmental education.

The papers to be presented in this panel entitled "People, Development and the Resource

Figure 1. OVERVIEW OF THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT



CONCEPT OF SUSTAINABLE DEVELOPMENT (WCED, 1987)

Sustainable development is a dynamic process in which the development and utilization of resources, orientation of technological development, institutional change, and direction of investments are all in harmony and enhance both current and future potentials to meet human needs and aspirations.

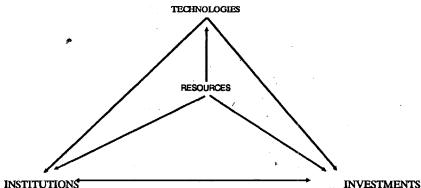


Figure 2. CONCEPTUAL FRAMEWORK FOR SUSTAINABLE DEVELOPMENT

Base" highlight the interrelationships between population growth and food production, the effect on health of environmental quality and economic productivity, the lack of integration of the cultural dimension in the developmental efforts particularly as concerns ancestral domains, and the effects of open-pit mining on indigenous residents.

Population and Environment Interrelationships

Forest denudation can be traced to rapid population growth, internal migration and poverty. Logging and the growth of upland settlements have led to upland population growing at a rate of 3.5% per year, a rate that is 34% higher than the national rate of 2.3%. This rapid upland population growth rate reflects the

population pressure experienced in the rural areas as the agricultural land to population ratio declines considerably leaving farmers with no alternative but to move to the marginal lands.

Decline in agricultural production efficiency may be attributed to expansion of cultivation into marginal lands as prime agricultural areas are converted to residential and industrial uses to make way for urban migrants and factory sites.

Decline in marine resources may have resulted from the destruction of mangrove areas due to increased fuel-wood cutting. The coastal and nearshore settlements have increased from 28.7 million in 1980 to 36.3 million people in 1990 leading to over-fishing. Use of destructive fishing methods led to the destruction of

coral reefs which are the natural habitats of marine life.

Over-concentration of population in the cities goes unabated due to the lack of employment opportunities in the countryside resulting in the environmental deterioration of urban settlements such as air and water pollution, waste disposal problems, congestion and the deterioration of health.

While these are but a few illustrations of the pressures of high population growth on the major life support systems, the prospects of their amelioration remain dim since about 55% of the population are below the poverty line who often resort to destructive means of utilizing our natural resources.

The current population growth is estimated at 2.3% per

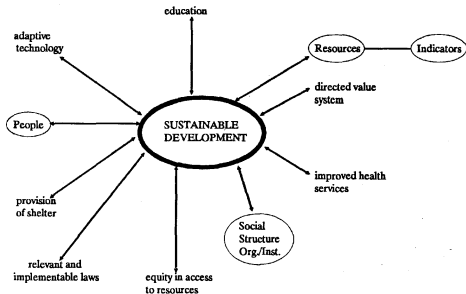


Figure 3. DYNAMIC AND INTEGRATED CONCEPTUAL FRAMEWORK FOR SUSTAINABLE DEVELOPMENT

year. The 1990 Census placed the Philippine population at 60.5 million. At the current rates of growth, this population is expected to double in size in 2020 or in 30 years. Zero population growth is not foreseen within the next 30 years. The ever-growing Philippine population would continue to exert pressure on the country's life support systems. Our development efforts need therefore to be based on environmentally sound strategies of resource utilization, of adopting environmentally neutral technologies, and of being supported by a strong population program for these efforts to be sustainable. ■

Herrin from p. 36

Adults in the Developing World, Washington, D.C.: Population and Human Resources Development of the World Bank.

Paqueo, V.B., 1985, "An Econometric Analysis of Educational Attainment Among Elementary School Age Children: Preliminary Analysis", in *Transactions of the National Academy of Science and Technology, Republic of the Philippines*, Volume 7.

Popkin, B.M. and M.L. Ybanez, 1982, "Nutrition and School Achievement," *Social Science and Medicines*, 16:53-61.

Rabai, D., 1991, "The Effect of Schistosomiasis on Rice Production: A Study of Farm Households in Tago and San Miguel Municipalities of

Surigao del Sur Province, Philippines". Unpublished Master of Arts thesis, University of the Philippines School of Economics.

Walsh, J.A. and K.S. Warren, ed., 1986, *Strategies for Primary Health Care*, Chicago and London: The University of Chicago Press.

World Health Organization, 1992, *Our Planet, Our Health: Report of the WHO Commission on Health and Environment*, Geneva: World Health Organization.

World Bank, 1992, *World Development Report 1992: Development and the Environment*, New York: Oxford University Press.

SUSTAINABLE DEVELOPMENT: A HISTORICAL AND THEORETICAL EXPLICATION

• Mary Constancy C. Barrameda

Introduction

The buzz word "sustainable development" has created considerable debates since its inception in the 1970s. The issue continues, confusing and muddled as it is, to be the rallying point of environmentalists, policy makers, businessmen, indigenous peoples, and others. Social scientists, as of late, have joined the chorus.

This paper has three complementary objectives: First, to give an overview of the myriad definitions of the concept and practice. The problematic obtaining in the definitions of development brings to fore the conflicting orientations, goals, and conditions for sustainability.

Second, to underscore the fact that the non-agreement among proponents brings us farther from the goal. This necessitates an explication of the history of sustainable development and ecological thinking itself. This is given in the hope that social scientists will eschew the neutral ground in the pretext of objective social science.

Third, to outline the strong pro-human ecological-ideological stance as affirmed by the resolutions of the summit conference at Rio de Janeiro. Ecological theory and praxis involve a struggle against individual and corporate selfishness.

Sustainable Development: The Concept and Practice

The spate of literature on the concept reveals its growing popularity. However, very little agreement is reached on the fundamental issues involved in the concept showing that the goal of sustainable development is far from realization. This is the contention of Diana Mitlin in her comprehensive survey of literature on sustainable development.¹

She underscores, among others, the controversy between the North and the South on the very definition of the term. The North concentrates primarily on "sustainability" rather than on sustainable development, i.e., how environmental constraints may be overcome while maintaining

standards of living. The South loathes the fact that the need for development of all peoples in terms of insuring their survival is ignored or given little attention.

The conditions for the attainment of sustainable development is, in itself, also undergoing intensive debate. One group says that economic growth is essential to provide the resources for basic developmental needs to prevent further exploitation of natural resources. They say poverty is responsible for environmental degradation.

The opposing group says that economic growth is incompatible with sustainability. Continued economic growth inevitably leads to environmental degradation somewhere else in the globe where the resource base is located.

Definitions

The situation being such, the components of the definition of sustainable development can be narrowed down to: 1. the meaning of development as a composite of economic growth and/or basic

¹Most of the contents of this section are lifted from the article of Mitlin entitled, "Sustainable Development: A Guide to Literature," published in *Urbanization and Environment* 4(1)(April 1992). A number of the books and articles reviewed by her were not available to the writer (a predicament of Third World scholars) which, otherwise, would have rendered this paper more comprehensive.

needs and rights; and, 2. conditions necessary for sustainability.

The (one and) sundry definitions put forward by the different Commissions and individuals are as follows:

The World Commission of Environment and Development in its report *Our Common Future* (1987) emphasizes the obligation of all human beings "to ensure that it meets the needs of the present generation without compromising the future generation".

The World Conservation Strategy (1980), on the other hand, focuses on conservation: "to maintain essential ecological processes through the preservation of genetic diversity and to ensure the reasonable utilization of species and ecosystems." This definition has received criticisms because of its focus on sustainability of environment rather than on sustainable development. It is faulted for paying very little attention to the political and economic forces behind the unsustainable or excessive and wasteful lifestyle of the western world.

The subsequent definitions by individuals of differing persuasions revolve around economic and mathematical definitions and the vehement reactions to these.

Pearce, et al. (1989), gives an economic definition of sustainable development that requires policies that would enable the future generation to have as much wealth (stocks of environmental assets or otherwise) as the present generation receives. They distinguish economic growth in terms of Gross National Product and economic development. The latter is being examined in terms of the requirement that one generation

leaves a constant stock of assets to subsequent generations.

Pezzy (1989) describes a number of definitions of sustainability and development in a mathematical model. He differentiates measures of development based on output, consumption, and utility. For him, sustainable development requires welfare that is above the minimum level of growth, but that growth should be ecologically sustainable.

The corresponding critics of "growth ideology" led by Daly (1987; 1989) argue that the attractiveness of the concept of sustainable development arises from the recognition that the present levels of per capita consumption underlying the economies of the US and Western Europe cannot be generalized to all living peoples in contemporary societies, much less to future generations without destroying the ecological resources upon which economies depend.

The work of Daly is instrumental in moving the debate from individual project planning to macro-level policy-making. The term 'sustainable development' was originally used by funding agencies in assessing whether development projects proposed by non-governmental organizations and people's organizations for funding will continue to function even after the funds have been used up.

Redclift's definition (1988) takes the two opposing intellectual traditions into consideration: those concerned with the potential for development contained within nature itself and those concerned only with nature.

For Redclift, sustainable development is more than just a compromise between the natural

environment and the pursuit of economic growth. It means a development which recognizes that the limits of sustainability have structural and natural origins. Differing perceptions of environment are "socially constructed and supported by groups with different degrees of power and conflicting economic interests."

Two other authors gave a critique to the concept and touched on an important approach to sustainable development. Adams (1990) maintains that sustainable development is an immensely synthetic concept in which different ideas on development can be grafted on with apparent ease. This is because sustainable development has no theoretical core. It is not the strength of the concept but the relative ease with which all things can be said to be sustainable development. Adams cited the amenability of the British government to sustainable development because it does not require major policy changes.

In the final analysis, sustainable development for Adams is not only about the way the environment is managed, but is also a question about who has the power to decide how it is managed. In development, the exploitation of nature is part of a wider economic and political process. The only way to strike a balance in the relationship between nature and development is through a radical political economy.

Central to his definition is the stress on the poor people's right to exist on their own terms and that sustainable development is the beginning of a process and not the end.

Rees (1989) suggested that sustainable development be

approached through a "bottom up" decision-making process. Though this is not integral to the definition, the participatory approach is picked up by several authors. This may provide the best political framework to allocate and manage environmental resources.

poor; and secondly, "real" development should be consistent with local socio-cultural values and be pursued with due consideration for the physical environment.

Other authors look as far back as the 15th to the 19th century in tracing the development of the

for perpetuity). Economics looked into the implication of sustainable yield policy (rate of time preference and opportunity cost of capital). It also explored the value of non-marketable forest products.

Interestingly, the neo-Malthusian perspective which rests

"Central to [Adam's] definition is the stress on the poor people's right to exist on their own terms and that sustainable development is the beginning of a process and not the end."

Origins of the Discussions on Sustainable Development

One may wonder how conflicting interest groups came up with the term sustainable development with differing definitions and meanings in mind.

Mitlin traced the origins of the discussion to the 70s with the Publication of Meadows, et al.'s *Limits to Growth* (1972); *Only One Earth* (1972) by Ward and Dubos which they prepared for the UN Conference on Human Environment in 1972, and Schumacher's *Small is Beautiful* (1973).

Both Babier (1987) and Pezzy (1989), as quoted by Mitlin, *op. cit.*, agreed that the pioneering work of Meadows, Ward/Dubos and Schumacher made the clarion call warning the global community that economic growth must run into decisive bottlenecks against the perspective of the environment.

Babier identifies the two strands that are evident in the three great works: firstly, there is the stress on the "basic needs" approach in the efforts to help the

concept. Redclift for instance, traced the debate to the development of the popularity of sustainable development in relation to the growing awareness of and attempts to respond to environmental constraints.

Grove (1991) discussed the changing conceptualization in Britain in the 16th to the 18th century.

Drawing on a number of sources including nature conservation, tropical ecology, and managerialism, Adams (1990), explained the evolution and development of the popularity of sustainable development in relation to the growing awareness of and attempts to respond to environmental constraints.

Mitlin, *op. cit.*, still quoting Adams, showed that the increased contact with various specializations and disciplines began to lay the foundations for sustainable development. Forestry, in the 18th and the 19th centuries, for instance, drew on growth biology to develop such concepts as sustainable yield (the amount of timber which can be extracted from the stand on a regular basis

on Malthusian conclusions formulated in 1798 finds its expression in lobby groups concerned with over-population. This is the basis of the North's agenda on population control. Malthus maintained that a population cannot exceed its resources without famine or disease providing a natural check on population growth.

Political science stressed the need for policy changes and explored the concept of power. Participation in ecological planning, use of appropriate technology, and the demand for the satisfaction of basic needs are among the issues addressed by political science.

Adams, *op. cit.* and Redclift, *op. cit.* pointed out that the Marxist approach is unable to take adequate accounts of environmental goods. Both claimed that society-nature relationships are much broader than what Marxist theory allows for.

This is of course contested by authors of Marxist orientation. Leiss (1972), Gray (1991), and Contreras (1991) to mention a few, extensively discussed environ-

mental degradation as a result of domination and hegemony by First World countries.

Adams, however, offers a general discussion on the relationship between "red" and "green" thinking.

Literature on "deep ecology" shows that the debate goes beyond political economy, questioning the very tenets of scientific rationality. It upholds the inherent rights of every species (including disease causing micro-organisms) to a sustained existence, independent of their instrumental value to human beings.

The apologetics of deep ecology have intensified the debate on sustainable development, putting policy makers and planners into a dilemma: should sustainability be for people or for the biosphere?

Responses to the Dilemma

To make sense out of the concept of sustainability, Mitlin, *op. cit.*, in her review of literature, examined specific instances where the concept is applied.

A discussion of the concept first appeared in the Stockholm papers entitled *Natural Resource Management* (1980) where questions, like does this apply to individual species or to whole ecosystems?, were tackled.

Later developments showed that the term was used to seek funding or aid. For instance, projects by the Swiss Directorate for Development Corporation focused on funded projects with two criteria in mind:

1. project sustainability where time is limited but with lasting sustainable outputs.

2. prospects of achieving autonomy and self-reliance.

Conway and Babier (1990) defined sustainability as the ability to maintain productivity whether of a field, a farm, or a country/nation in the face of shock or stress. Three criteria were raised in agricultural development:

1. productivity (absolute amount produced)
2. stability (how reliable is production)
3. equality (all receiving an equal share of the produce)

On project sustainability, Pezzy (1989) brought out another criteria: long term, derived from inter/intra generational justice, they act as constraints. However, Pezzy is vague as to the system to which sustainability is to be applied. Questions whether the projects should be sustainable or whether they should be made to allow for trade-offs are not addressed.

The concept of sustainability was later extended beyond ecological areas and to the social sphere. Social conditions and structures for achieving ecological sustainability were targeted — the requirements for institutions to come up with agreements and policies providing for structures that would ensure replacement of renewable resources.

The discussion on changing social structures was given emphasis for the simple reason that they perpetuate the lifestyle of extreme exploitation and wastefulness. Criteria, imposing limits on human systems, have to be set. It was argued that human beings have an immense capacity to adapt

compared to the limited capacity of the natural environment.

Achieving Sustainable Development

Different commissions, notably from the United Nations, came aborning with the aim of achieving sustainable development.

1. The UN World Commission on Environment also known as the Brundtland Commission in 1983 brought to fore the seriousness of the ecological destruction and the corresponding no non-sense policy measures needed. Among others, it reconciled the North and South controversy enjoining the whole of human kind to take responsibility for *Our Common Future*.

This appropriate title of the Brundtland Report underscores the fact that questions of development and environment is one single issue. It espouses, therefore, the policy of ensuring sufficiency of food to every human being while, at the same time, protecting the disappearing species and the threatened ecosystem.

It recognized the need to meet global energy demands for industrial growth, including urban development that meets the needs of all citizens, without causing environmental degradation.

All these necessitate population control and development of existing human resources at the national and regional levels.

The international environment policy provides that global growth should be accompanied by redistribution (not in terms of aid

but of just and equitable economic relations). [parenthesis supplied]

There is, lastly, the need to arrive at new forms of managing global commons in order to reduce military expenditures and the risk of war. War and its armaments are the best destroyer of nature. Institutional change is imperative to achieve all these.

2. The Latin American Caribbean Commission on Development and Environment came up with *Our Common Agenda* (1991), where the interdependence of the North and the South is underscored even as it traces the development problems of the region to the hegemony of the North. The focus of the report, though, is the alleviation of poverty based on the use of the region's natural resources. It emphasizes the imperatives of changing socio-political-economic institutions as well as technological apparatuses if development is to be sustainable.

3. The World Health Organization (WHO) Commission on Health and Environment published *Our Own Planet Earth* (1992) which discusses human health maintenance and improvement.

Noteworthy is the Commission's emphasis on the mutuality of meeting health needs and ecological sustainability. It is asserted that health is directly related with a high consumption type of lifestyle. On the contrary, simple living and balanced intake of food, proper exercise, fresh and clean air and environment are what essential in eliminating health problems: disease, premature death, injury, etc.

4. The World Conservation Strategy (1980), published by World Conservation Union (IUCN) focuses mainly on conservation of resources. It points out the reality of resource limitation and the carrying capacity of ecosystems. This necessitates strategies on living resource conservation in order to maintain ecological processes, preserve genetic diversity, and ensure sustainable utilization of species and ecosystems.

Though highly criticized, the IUCN's thinking has contributed to the critical evolution of sustainable development. Learning from the criticisms, IUCN after the decade, published *Caring for the Earth, A Strategy for Sustainable Living* (1991). The IUCN expanded from mere conservation to social and economic concerns that provide real improvements on the quality of life. The whole concept is utopian, according to Mitlin, but nevertheless it is attainable; in fact it is the only rational course of action.

5. The Environmental Concerns and Commonwealth Commission is composed of a group of experts on the perspectives of Commonwealth countries. They take up the concerns of small states and the gender aspects of environment and development.

On the whole, the issue of sustainable development is juxtaposed with economic growth. There are those who maintain that these two are incompatible. There are those who hold that the latter is essential in achieving the former. The geographic focus of the

contenders in the debate determines their stand. Proponents from the North tend to stress the limits to economic growth while those from the South tend to stress the need for growth.

There are those who maintain a third view, i.e., that sustainable development and economic growth are not incompatible. In fact, they point out that economic growth is not only compatible but essential to the protection of the environment. This view, however, rests on high technological progress and appropriate resource conservation policies.

The debate can be brought to brass tacks by assigning monetary values to natural resources and ecosystems to aid economic decision-making.

One last issue needs to be examined closely — the preoccupation with biodiversity rests on the economic potential of useful tropical plants which when converted to pharmaceutical would bring millions to business corporations. Gray sounded the warning signal to the indigenous peoples whose ancestral lands abound with these plants to prevent usurpation by multinational corporations.

Capping her review of literature with a resume on the Third World type of sustainable development, Mitlin points out the fact that this type of sustainable development is dominated by donor agencies.

The guiding philosophy is premised on the fact that the grinding poverty of people is the source of environmental degradation. They exhaust their natural resources to keep themselves from starving.

Again two groups are seen vying for recognition in their approaches. There is the group that limits the strategy to livelihood programs that would guarantee the immediate satisfaction of needs and provide security with low risk. Projects include sustainable livelihood, appropriate technology and industry, human settlements, and other institutional developments. The other camp, however, stresses the point that sustainable development goes beyond local focus. Central to their argument is the role of international structures that limit the possibilities of the local economy. The unequal trade relations, including onerous debt policies imposed by the World Bank and the International Monetary Fund are major constraints to sustainable development.

Third World authors are one in pointing out the impact of colonization on the environment. Expansionism or colonization was undertaken primarily to search for and exploit raw materials to support the industrialization of Europe.

Historical-Philosophical Perspectives of Ecological Thinking

The imperatives of this section stem from the problematic of sustainable development itself. Even as the debate goes on, environmental destruction the world over is unabated. The realities of global degradation has a long history. Leiss claims that as complex and momentous as they are, they are only the symptoms. Modern mind-set relegates the problem, and the survey of literature bears this out, within an unexamined frame of references — Science and Technology (S&T). These will take care assuredly, of

the environmental problems. Not for free, of course, economic calculus has it that human beings themselves should foot the bill and only those who are willing to pay the price can enjoy the commodities that used to be free — clean air, blue seas, crystal streams, productive land, virgin forests, milder climate, flowery meadows, etc.

No sufficient solution exists at the moment. Definitely, the techno-economic approach which creates more problems and sucks every participant in the debate deeper into the dilemma is not one.

Social science, specifically anthropology, tells us that human beings found themselves, in the early periods of their existence, one with Nature. There was deep kindred spirit to a point of reverence, awe, and wonder. Humans, in turn, were nurtured by her, as it were, to the point of prodigality. Self-consciously and reflectively though, they attuned themselves to her rhyme and rhythm.

Over time, through the growth and complexification of the human brain, caused and effected by keen observations of the surroundings, actual labor and experiences, humans learned more of the secrets of nature. These experiences stored as knowledge and learning in the brain were in turn creatively applied as humans moved up the evolutionary trajectory. The resultant concepts and ideas took on concrete forms and structures, the totality of which we now call CULTURE.

Through extrasomatic forms of adaptation, humans learned to imitate Nature in her nurturing capacity. For humans learned to produce food, used and

manufactured tools, build shelters, made use of fire and harnessed other forces of Nature.

In all these endeavors, that part of culture which captures and translates human reflective capacities on the non-material levels was given predominance. Humans at this stage, contrary to modern speculations, were not brutes, barbarians, or savages in the connotations we know. They were deeply spiritual. They were oriented to the transcendent, to the world of the spirits which to them pervaded and is the source of the forces of Nature, including human nature.

It goes without saying that because of this orientation their life was unfragmented. Whether in war or in peace, in plenty or in scarcity, in the pursuit of their daily subsistence, their life was one integral activity. They were animated with a desire to appease and to be in harmony with the transcendent, with Nature, as well as with their fellow humans.

Peter Farb (1975) gives a comprehensive description of the techno-economic dimension of culture. The hunting-gathering stage which covers the longest span of years in the evolutionary trajectory, lays the foundation for subsequent development, including our modern industrial stage.

While it is true that this technoeconomic form of subsistence and the population density (10 Million human beings all over the globe—until some 12 thousand years ago) may not have been that taxing to the ecosystem, the behaviors developed during the ascendancy of this form of adaptation have minimized the disruption and damage done to the environment.

The primacy of sharing, cooperation, and other altruistic behaviors offset the effect of intensive exploitation. Even a small band numbering a few dozen people is likely to overharvest and so experience the "imminence of diminishing returns." They pay the price of longer man hours in hunting to farther places or have lesser food intake.

Society and social groups were extremely important to them. Contrary to the claims of Thomas Hobbes (*Leviathan*, 1651) and Mark Twain (*Roughing It*, 1871) that hunters-gatherers had no society (Quoted by Farb, op. cit.).

It goes without saying that extreme individualism and its accompanying vice of hoarding and possessiveness inimical to common living were then unheard of. The intuitive fear of violence springs from the fact that this poses a threat to their social group.

The onset of food production, first by shifting cultivation and later by permanent agriculture, marked a quantum leap in the progress of human kind. The effects on nature and human nature were unprecedented. More fundamental changes in human ways of life occurred in the preceding three million years.

Braidwood, Fagan, and Flannery claimed that there was a sharp increase in population and qualities of both plants and animals as a result of domestication. Wild sheep, for instance, have very little wool compared to domesticated ones. Wild cows produced limited milk and only when nursing. Certain species like corn, date palms, and bananas would have become extinct without human intervention in propagating them.

Increase in food and in human population were the hallmarks of this stage. The trade-offs, however, were enormously devastating. Vast tracts of forest land were cleared, irrigated, and planted with grain, beans, and squash as exemplified in the New World.

The increase in population, whether the cause or the consequence of food production, brought with it the scourges of epidemics, famine, conquest, and warfare. Contests for arable lands ended in the subjugation of one group by another. This became the

of reactions on the socio-political* ideological dimensions of human existence.

Once underway, human existence was never the same, anymore that the environment can sustain. The transformation of societies in all their cultural dimensions could not be held back. The trajectory travels faster than ever wreaking havoc all the way. By hindsight, it can be said that the transition from the hunting-gathering mode of adaptation to food production was a wrong turn for humankind.

"By hindsight, it can be said that the transition from the hunting-gathering mode of adaptation to food production was a wrong turn for humankind."

order of the day, even as these lands became the breeding places of disease-carrying vermin, ticks, fleas, and mosquitoes. The fowls, including cows, pigs, and other animals that were domesticated carried with them pathogenic microorganisms that caused pulmonary tuberculosis, anthrax, and parasitism to name a few.

More important than the power to facilitate and enhance biological processes was the power to alter the properties of matter. This is manifested in the manufacture of tools from ores, pottery from clay and soil, etc. All these brought a profound intellectual awareness and new confidence in the human beings' capacity to satisfy their needs and wants. This, in turn, created tremendous impact on the environment and made more complex and aggravated the chain

The succeeding periods of industrialization/modernization rode roughshod on the same path in the trajectory. This augurs well for the final destruction of the planet Earth unless humankind decides otherwise. The double-edged character of the agricultural stage is magnified a hundred times given the sheer pace and scope of change in the age of modernity.

It is instructive to retrace our steps to the 17th century when, with the ascendancy of Christianity, the attempt to take full control of nature to satisfy human wants and needs was taken seriously as a divine mandate.

Here the historical delineation of ecological issues will take on ideological and epistemological overtones.

The preceding period, characterized by the spread of the Greco-

Roman cultures into the known world, gave us an inkling into their world view as expressed in their myths. With the revival of classical learning, these myths, including the biblical creation stories, were used by philosophers like Bacon to push their ideas of probing into the secrets of nature in a more systematic and orderly manner.

The drive to dig deeper into nature's way using what we now call the scientific method, was a reaction to the prevailing mode of inquiry — magic. Magicians, the prototypes of modern-day scientists, were regarded highly and taken as advisers to the kings and nobles and were in fact more powerful than the rulers (Leiss, op. cit.). Bacon sought to encourage intellectual pursuits through royal patronage. He won his cause, however, through the indestructible apology which struck at the heart — the strong Christian sentiments which swept Europe at the time. The biblical quote in the book of Genesis "to subdue the earth and all that is in there" was to be concretized in a serious study, by all and sundry, of the processes of nature and how they might serve human beings.

Descartes and Newton, the other two of the triumvirate who, though existing at different centuries, coursed history to where we are now. They stressed the importance of mathematics in understanding and translating the laws governing nature into a concise and orderly paradigm. This extends to the terrestrial and celestial laws of gravity and motion which finally ushered in the wholesale transformation of nature (Leiss 1977; MacDonald 1991; Ferkiss 1969).

The mechanical paradigm did not merely push the *Homo Faber* to create new machines and

effectively control the planet Earth. It also changed the manner in which we view everything on Earth, including ourselves. This is best seen in the politico-economic dimension of our life. McDonald insightfully points out the manner in which we view the Gross National Product (GNP). This economic indicator of progress merely tells us the speed at which the manufacturing and service sectors take natural resources, process them, speed them through the market, and in a few years, discard them in a heap. It does not tell us the interchange of goods and services between all species in the life community. It surely does not tell of the domination of human beings of other species and even of other fellow humans.

The domination of nature and of fellow humans takes place overtly, as well as covertly, and knows no limit. Indeed, with human ingenuity, through the instrumentality of science and technology, domination ranges from outright usurpation of lands and resources from indigenous and rightful occupants, annihilating the latter if need be, to such varied insidious and surreptitious means as mass media, tourism, missionary work, laws and decrees, etc.

Implications and Conclusions

The unique contribution of social science, and anthropology for that matter, to the proper understanding of ecological problems and the proposed solution of sustainable development lies in its tradition of holistic, comparative, empirical and historical or evolutionary approaches.

What we have done briefly is to approximate these approaches. It is instructive to look afresh into

these tenets. Ferkiss (1969) insightfully brings out the idea of a new holism, new naturalism, and new immanentism in his critique to the technological world view. It is summarized here by way of concluding this paper.

New Naturalism. At the expense of being labeled as atavistic, Ferkiss, a political scientist at that, suggests not to regard nature/physical environment as inert, rigid, and mindless — a deterministic machine that Newton conceived of. The indigenous thinking cap runs parallel to the anthropological hallmarks that humans are in fact part of nature rather than apart from it. In fact, the biblical people (e.g., psalmists) are one in their deep respect of Nature.

In contrast, the old philosophy dominated by dualism and later by scientism of the Enlightenment period looked to the world of Nature as something to conquer, to dominate. It lost sight of the creation stories and focused exclusively on human history, on the Fall and the Redemption. The traditional Christian thinking takes the idea of liberation or redemption as one of rejecting the world and concentrating on saving souls for the world beyond.

New Holism. Closely related to the new naturalism is a new holism. This is the realization of the interconnectedness of every thing. Included in this is the evolutionary concept which emphasizes the idea of "becoming." This argues strongly against the deeply held distinction between being and non-being. The Newtonian concept of the world as matter in motion, a complex of forces exerted on objects, the idea of leverage and weight — all these connected with the early period of

industrial era ought to give way to the idea of process.

Processes and systems imply, among other things, a recognition that no part is meaningful outside of the whole. No part can be defined and understood save in relation to the whole. There is no such thing as closed or isolated systems, none in nature, none in culture, none in societies. On the contrary, the empirical world exists in mind-body-society-nature totality. More importantly, this organic whole is determined not from the outside but from within.

New Immanence. The organic whole presupposes an interior principle of order and becoming. Eastern philosophies and indigenous thought stresses this immanence in what Christians call pantheism. For the Judeo-Christian tradition, God is primarily "up there," or "out there." This is traced to the fact that the biblical people were living in inhospitable environments in the Middle East. So that both the pastoralist (e.g. Abraham, Lot, etc.) and the settlers felt the need to separate the Divine from the human and the natural world. This is in direct contrast with the fertility cults which are similar to indigenous tribal religion. Here the deity reveals itself in the rhythm of the natural world, especially in the mystery of fertility.

Christian thought is further truncated by the legacies of the Enlightenment era dominated by physicists who see the deity as cosmic watchmaker of the universe; here everything is set and done.

Biological anthropology, however, points to the fact that nature works in another way. Life is anti-entropic. The factory that

makes the parts of the flower is inside, and is not a factory but a development. The creative principle is not external.

These new modes of anthropological thinking are offered to provide the necessary basis for the outlook that must come to permeate human society if humans are to survive the existential revolution and the destructive effects that come underway. Modern humans must so internalize these ideas and make them part of their instinctive world view in order to inform our personal, societal, and cultural life. This, in turn, will make us realize that our aim is not to conquer nature but to live in harmony with it. ■

Bibliography

- Adams, Francis G. 1976 Econometric module of world agricultural commodity markets. Bellinger Pub. Cambridge, Mass.
- Babier, Edward. 1976 The concept of sustainable development. Environmental Conservation Vol. 4 No. 2. 1987
- Braidwood, Robert. Prehistoric Men. Glenview, Illinois. 1975
- Contreras, Antonio P. In the Service of two Gods: Deconstructing environmentalism as a two-faced discourse. mimeographed. U.P. Diliman. 1992
- Cowsey, Gordon & Babier, Edward After green revolution: sustainable agriculture for development. Earthscan. Publication. London. 1990
- Daly, H.E. "The economic growth debate: what some economists have learn but many have not" Journal of Environmental Economic and Management Vol. 14 pp. 323-336.
- _____. "Sustainable development from concept and theory towards operational principles" Population and Development Review Hoover Institution Conference. 1989
- Fagan, Brian. Men of the earth: An Introduction to World Prehistory. Little Brown: Boston. 1974
- Farr, Peter Humankind. Bantam. N.Y. 1973
- Ferkins, Victor C. The Technological Man. Menter Book. N.Y. 1969
- Flannery, Kent. "Origins of agriculture" Annual Review of Anthropology vol. 2 pp. 271-310. 1973
- Gray, Andrew. "Between the spice of life and the melting pot: biodiversity conservation and its impact on indigenous people." IWGIA Document 70 Copenhagen, August. 1991
- Grove, Richard. "Threatened islands, threatened earth: early professional science and the historical origins of global environmental concern." In Angel, David and others, Sustaining the Earth: Responses to Environmental Threats. McMillan Ltd., London. 1990
- International Union World Conservation Strategy. IUCN/for Conservation of UNEP/WWF Glands, Switzerland. 1980
- Nature and Natural Resources IUCN/ UNEP/WWF Caring for the earth: a strategy for sustainable development. Earthscan Pub. Ltd. London. 1991
- Latia America & Caribbean Commission on Development and Environment Our own agenda Inter American Development Bank and U.N. Development Program 1990
- Leiss, Williams Domination of Nature. Beacon Press, Boston. 1972
- McDonough, Sean/Te care for the earth. Claretian Pub. Quetzon City. 1986
- Meadows, Donella H. et al. Limits to Growth Universe Book, N.Y. 1972
- Mitlin, Diana "Sustainable development: a guide to literature" Environment and Urbanization Vol. 4 No. 1 April 1992.
- Pearce, David & others Sustainable development: economics and environment in the Third World. London: Earthscan Pub. 1980
- _____. Blueprint for a green economy. Earthscan Pub. London. 1989
- Pezzy, John "Economic analysis of sustainable development." Department Working Paper No. 15 1989, World Bank, Washington.
- Redclift, Michael. Sustainable development: exploring contradictions. Methuen, N.Y. 1987
- Rees, William. "Defining sustainable development" CHS Research Bulletin Univ. of British Columbia, May. 1989
- Schaumacher, E.P. Small is beautiful a study of economics as if people mattered. Abacus, London. 1974
- Ward, Barbara & Dubos, Rene. Only one earth. Placan, N.Y. 1972
- World Commission on Environment Development and Oxford. Our common future. Oxford Univ. Press. 1987
- WHO Our planet, our health. Report of the WHO Commission on Health and Environment. Geneva. 1992

OVERVIEW: POLICIES, STRATEGIES AND ADMINISTRATIVE IMPLEMENTATION FOR SUSTAINABLE DEVELOPMENT

• Carmencita T. Aguilar*



In the 60's and 70's, the term sustainable development was often used in relation to the country's economic development strategy intended to utilize and develop the economic resources of the country toward agro-industrial productivity. The objective was for the country's economy to achieve a level of viable and self-reliant development. One of the strategies for sustainable development then, was to allow foreign investors to develop our natural resources for export to provide support for trade. Some foreign investments came and local capitals, in joint ventures, participated in the development of resources in the hope that economic growth could be achieved.

In the 80's and 90's we saw that together with the development effort to make the natural resources productive, came also the depredation of our forests, mangroves, rivers, and fishing grounds. There was also the destruction of the environment and widespread pollution of the atmosphere, lands and seas caused by domestic wastes, industrial wastes, pesticides, mining wastes

and oil spills. Above all, a great number of our people get poorer than before and more deprived of what ought to belong to them in terms of economic benefits. The objective to bring about industrialization did not happen altogether as intended. Agricultural development could not provide sufficiency in food for the population requirement. Today, we still suffer acutely from power failure and the energy crisis has hindered industrial productivity and income potentials. The gains of the 70's in industrial development were set back. Worse, the Philippines has to import basic agricultural product to abate food shortage.

It is to our advantage that the United Nations in the mid 80's initiated the thinking that sustainable development must take into consideration the global preservation of the natural resources and the protection of the environment for the benefit of the people. In the well-attended Earth Summit in Rio de Janeiro in June 1992, it was made clear that sustainable development means the management of economic growth so that no irreparable damage is done to

the environment. A desirable economic development must satisfy the needs of humanity and must protect the interests of future generation.

The Philippine government in 1988, through the Department of Environment and Natural Resources (DENR) formulated a Philippine Strategy for Sustainable Development (PSSD) which addressed the adverse impact of growth and development on the environment caused by pollution from agro-industrial activities as well as the exploitation, misuse and depletion of the natural resources. The ten strategies adopted by the DENR considered the following: (1) the integration of the environment factors in the formulation and decision-making thus, recognizing the need to organize special units as the Natural Resource Accounting, Environmental Impact Assessment and Land Use Planning. Some results of the operations of these units, however, are yet to be seen.

The other strategies include: (2) the proper pricing of natural resources that should build-in the

*Chair, Governing Council; President, Philippine Political Science Association; and Associate Professor, Department of Political Science, University of the Philippines.

cost of the damages to the environment; (3) the property rights reform that shall regulate the open access to the natural resources with instruments like forest stewardship contracts, small holder timber concessions, artificial reef licenses, community forests, community fishing grounds and mining cooperatives to provide equitable access, tenurial security and responsibility system in the utilization of natural resources; (4) the establishment of an integrated protected areas system that shall conserve the wildlife and unique ecosystems in order to preserve the genetic resources for scientific, educational, cultural and historical values; (5) the rehabilitation of the degraded ecosystems which shall require the reforestation of denuded watersheds, mangrove replantation, clean-up and control of pollution and revival of biologically dead rivers and transplantation of seagrass; (6) the strengthening of residuals management in industry or pollution control which would involve technological innovations which appeared difficult to realize immediately. Thus, the instruments for pollution control rest more on the strengthening of the pollution control laws, supplemented by providing economic incentives to pollutive firms to install pollution control facilities. (7) The involvement of the population consensus and social welfare in development planning with the intention that they become the industrial base for livelihood which shall preserve the ecosystems and the natural resources. The population program therefore, must include improvements in health, education and values formation to be implemented in the regional and community levels which shall

“The population program therefore, must include improvements in health, education and values formation to be implemented in the regional and community levels which shall emphasize the benefits and importance of spacing births.”

emphasize the benefits and importance of spacing births. Population distribution must encourage migration towards the less densely populated and less environmentally sensitive areas; (8) The rural areas must be developed where majority of people live by providing employment to increase incomes in the rural areas. The rural folks can either be the protector or the destroyer of the ecosystems depending on their economic situation. By empowering them to participate in policy-making and project implementation, and by granting them equitable access to natural resources and alternative livelihood they can contribute to the development of the rural areas. (9) environmental education which shall be integrated in the elementary and secondary schools curricula to develop social values supportive of environmental protection and commitment. And finally (10) constituency building must be strengthened by allowing NGOs to assist in the environmental protection and management efforts of the DENR.

The framework and strategies formulated by the DENR shall apply to the environmental and sustainable development policies of the major sectors, namely; population, environment and natural resources, agriculture,

industry, infrastructure and energy. The DENR has provided the major sectors with assessments and situationers on the resources available. The policy implementation and its outcome are dependent on these various sectors. The DAR and CARP policies have considered integration of the sustainable development and environmental preservation objectives and the necessary support services requirements.

The DENR strategy is broad and encompassing. This paper presents some aspects that were given priority.

1. *The Rehabilitation of Degraded Ecosystem*

As reported by the DENR, the rehabilitation of the forests and upland was given priority attention. The Philippine total land area is 30 million hectares and 15 million hectares of this comprise the ecosystem. The ecosystems include the soil cover and croplands, fresh water supplies, the air and coastal areas. The forest lands is about 800,000 hectares and 6.5 million hectares of these had been deforested. The denudation of the forests had been due to the *kaingin* and timber poaching done by 8 million forest dwellers or by illegal loggers. The policies to improve the greening of the forests are the following:

1. Enforcement of forest laws against timber poachers and illegal loggers particularly on the regulation of licenses for timber and forests.
2. Reforestation efforts using upland families and communities and non-governmental organizations as contractors.
3. Provisions for more tenurial security of the uplanders to discourage them from engaging in slash and burn agriculture. Included among uplanders are the indigenous communities.
4. Alternative livelihood opportunities for forest dwellers to discourage them from cutting trees for a living.
5. Development of communities in the uplands and forest areas as part of the forest management and protection by involving the non-government organizations.
6. Ban on logging and lumber exports means ban on logging in old-growth or virgin forests and shift of timber production to residual forests. The former is protection forests and the latter is production forests. The plan for forest development is for a 25 year period and that commercial development of residual forests will continue up to 2015.

The government budgetary support to the DENR is as follows: 1986 - P1.08 B; 1987 - 20% more or P1.34 B; 1988 - P1.59 B; 1989 - P3.29 B; 1990 - P4.55 B which included the implementation of the National Forestation Program (NFP). For 1991, the appropriation was P3.74 B and for 1992 was P3.06 B. These appropriations were considered the most supportive budget that

government had ever given to DENR. But the DENR still has to avail of external sources of funds for the NFP such as the loans from the Asian Development Bank (ADB) and the Overseas Economic Cooperation Fund of Japan (OECF) of \$120 million each. The US Agency for International Development for the Natural Resources Management Program (USAID-NRMP) gave a \$125 million grant in aid, considered to be the largest grant given to the environment and natural resources sector from this institution. The World Bank also gave a loan of \$369 million under the environment and natural resources sectoral adjustment loan. The DENR program in 1992 for reforesting denuded forest areas was estimated to cost P130 billion covering 6.5 million hectares. With the funds poured into the reforestation program, the DENR is expected to show a success story.

2. *NGO's Involvement in Reforestation*

The NGO's involvement in implementing the National Forestation Program began in 1988 as reforestation contractors, evaluators and assessors. In terms of performance, a total of 520,100 hectares of forests had been replanted since 1986. A total of P1.08 B reforestation contracts were given to some 500,000 beneficiaries. This, according to the DENR provided 520,000 jobs - one person to a hectare proportion. (The Marcos administration's DENR was able to reforest only 649,095 hectares.) The contractors were required to maintain the trees for three years to assure their survival. Final payment to contractors is paid only after three years to be assured of the tree's survival. The

monitoring is done by the NGO's, the COA, and the ADB and the OECF personnel. The DENR claimed that in 1989, it was able to replant 131,404 hectares, more than the 119,000 hectares that were denuded or deforested. In 1990, it claimed to have replanted 191,663 hectares against 90,000 hectares that were deforested. The National Forestation Program also provided for the development of industrial forest plantations which was funded by an ADB loan of \$25 million to encourage the private sector investments in forest rehabilitation.

3. *The Integrated Social Forestry Program (ISF)* was also implemented to provide the upland people tenurial security by giving them stewardship contract certificates (SCC) for twenty five years. *Kaingin* farmers were regulated by giving them tenure to the forest lands as well as agro-forestry technology assistance on the condition that a portion of the land granted to them was planted to trees. They were also expected to observe soil conservation measures. The ISF program had been in operation since 1982 and is considered as an effective upland development strategy. From 1982 to 1985, 47,950 stewardship contracts certificates were issued under PROFEM II and from 1987 to 1991, a total of 430,819 hectares covered by 146,467 stewardship contracts were distributed.

The ISF program assisted the forest dwellers with support services such as access roads, small water impounding dams and upland farmers training on community organizing. The dwellers earned income through reforestation contracts. The 1990 program included the community reforestation program (CFP)

which allowed the community to participate in the management and protection of the residual forest lands including those lands reforested under the NFP. The community had also the privilege to harvest the mature trees in the place. Contracts for community training and organizing were also given to qualified NGOs. Forest Land Management Agreements (FLMAs) were also given to NGOs that had accomplished successful reforestation activities. There are 33 community forestation program sites in the country. Logging ban is implemented in the old growth or virgin forests and in areas with 1,000 meters elevation. The logging ban had reduced the Timber License Authority (TLA) to only 33 from 143 in 1987 which covered an area of 5.4 million hectares or 32% of declared forest lands. The coverage of TLAs presently is 2.2 million hectares or 13 per cent of declared public forest land.

4. The pricing and valuation of resources was done by the imposition of an environmental fee of P500 per cubic meter of timber harvested in natural forests. This was implemented since July 15, 1990. In October 1991, Republic Act 7161 was passed which authorized the increase in forest charges on timber and other forest products. The increase was 25 percent of the old P30 per square meter fee. The fees also varied according to the timber species and grades. Agroforestry was also encouraged under the Social Forestry Program to rationalize the land use in the upland area and to encourage food production. Food crops were planted alternately with trees.

On illegal logging, the DENR confiscated 377,769 cubic meters of contraband timber and 8.78

million lineal meters of rattan and other forest products from 1987-1992. There were 1,140 cases filed illegal logging but there were only 45 convictions. Among those convicted were 82 military officers and military men, 9 local government officials and one Korean national. The ban on logging in old growth forests and the permit to log on residual forests took effect on January 1, 1992.

5. For the protection of the indigenous communities, the Indigenous Community Affairs Division (ICAD) was created. The ICAD is expected to issue Certificates of Ancestral Land Claims (CALC). The indigenous community claims (ICC) in the Cordillera had been granted. The ICCs also provide livelihood support by allowing community participation in the National Forestation Program and the Community Forestation Program.

6. The ecosystem is also upgraded by requiring the environmental regulatory measures for the mining industry particularly the small scale mining. Thousands are employed in gold mining in both the South and in the North who are exposed to the danger of collapsing tunnels, mercury and cyanide pollutants and poisoning. The DENR had provided training of small scale miners in building safe tunnels and precautionary measures against mercury and cyanide health risk with the assistance of the Department of Health. The DENR had also implemented the Mineral Production Sharing Agreement (MPSA) and at the same time allowed the 100 percent foreign equity in mining operations. To implement the mining environmental measures, the Environmental Impact Assessment (EIA)

system was applied to mining projects and operation. Protective requirements against mine tailings disposal and soil erosion are monitored. Reforestation is made on depleted mine areas.

7. The urban environment has been given attention by cleaning up the industrial and domestic waste in major waterways under the Rivers Revival Program. The Metro Manila waterways were given priority attention because of the serious pollution problems in the area. The priority project was the Navotas-Malabon-Tullahan-Tencjeros System. The DENR adopted the policy of involving 12 biggest polluters in any area as arms in the pollution drive. Polluting firms within the area were ordered to close down or de-pollute. As a result, an amount of P9 billion had been contributed by the industrial firms to fund their pollution Management Programs in cooperation with the DENR. The EIA had included requirements such as the monitoring project of design and by requiring Environmental Compliance Certificates. The NEDA Investment Coordinating Committee and the financial institutions grant the EEC before approval is granted to any industrial project. The funding support for the Rivers Revival Program came from the World Bank's Industrial Restructuring Program, the Industrial Efficiency and Pollution Control Program and the USAID's Industrial Environment Management Program. The success of the river cleansing effort depends on the political will and seriousness of purpose of the DENR implementing arm.

The other project under the Urban Environmental Program was the anti-smoke belching program called GASMASC or

Group Against Smoke-Belching to Make Air Safe and Clean supported by civic groups and NGOs. The focus was to improve the air quality in Metro Manila and other urban areas. According to the DENR statistics, during the five years operation of the program, the Department apprehended 132,125 vehicles nationwide.

The other river systems in Metro Manila under the Rivers Revival Program are the Pasig-San Juan-Marikina River System; the Las Piñas-Zapote River System; Parañaque River; Laguna Lake Basin; and Meycauayan River. (A clean-up of the Manila Bay was part of the project.) The river clean-up will include the septic tank cleaning and sewerage collection and treatment for domestic sewage; individual or combined waste water treatment for industrial firms, dredging of rivers to remove accumulated debris; and the transfer of squatters away from the river banks.

8. The coastal resources had been indiscriminately exploited and depleted by the destruction of mangroves, siltation, human encroachment, dynamite fishing, flow of all kinds of wastes and other pollutants to the seas as well as overfishing. Of the 500,000 hectares of original mangrove species vegetation in the 1920s, only 38,000 hectares are left today. There are, however, 149,000 hectares of secondary growth mangrove vegetation which are considered as a positive factor in forest resources. The coral cover of the coastal resources occupies 33,036 square kilometers but only five to six percent is considered in good condition. The coastal areas had been affected by the mine tailings from the mining industries aside from the pollution caused by oil spills from the ships.

The depletion of the marine life due to overfishing, as well as wrong methods of fishing, remains a serious environmental issue. The enforcement of the law against this must be improved.

The DENR strategy as I have mentioned is encompassing and has many positive points. But the intention to reconcile sustainable development and environmental regulation on several programs has to be assessed in terms of their real accomplishment. A challenge on effective performance is thus posed to all the government sectors involved in the implementation of the sustainable development and environmental protection programs and strategy hereby presented.

References

- DENR, *Philippine Strategy for Sustainable Development, A Conceptual Framework*. January 1990.
- DENR, *1990 Annual Report*.
- DENR, *1989 Annual Report*.
- DENR, *1988 Annual Report*.
- Sec. Fulgencio Factoran Jr., Speech, Aquino Legacy Series, March 23, 1992. U.P. College of Law, Diliman, Quezon City.

Cabrero from p. 43

considered and the degree of reliability of the data/information used.

Population carrying capacity of food production depends on the land use mix decisions taken by government planners and the farmers themselves (i.e., the amount of land devoted or allotted to food crops, cash crops, non-food crops, tree crops, forest, nature reserves/parks and wildlife sanctuaries/reservation areas, and built-up areas (residential,

commercial, industrial, institutional, etc.). Thus, given a certain land use mix, population carrying capacity of potential food production could be determined. Population carrying capacity therefore changes through time as land use changes.

The results of the population carrying capacity study serve as an important input in agricultural development and population planning. The study provides information on the potentials of the land and aquatic resources of a particular geographic area to support the food requirements of

its projected populations. It also gives an indication of the area's margin for agricultural growth, the technology needed to optimize production, and the critical year in which food production even under the best technological and management conditions will no longer be adequate to meet the nutritional requirements of the projected population. This temporal information provides the signal for the immediate initiation of concerted step-up actions necessary to avert future food crisis. ■

GOVERNMENT APPROPRIATIONS FOR THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

• *Sofronio B. Ursal**



Introduction

The most desirable and carefully planned government program for development will remain a mere declaration of intent, unless funds are actually committed to its implementation. And the importance by which a government regards a development program is measured not by the rhetorics of its policy pronouncements, but by the magnitude of public funds invested or appropriated for the purpose.

This paper, therefore, will attempt to inquire into how much of government funds were committed for the environment and sustainable development programs of the country from 1988 to 1993; what are the major project components of these programs; and how government investments in this area rank among the other competing government programs.

No inquiry is made on how the funds appropriated were spent, nor the manner or status of the program implementation, much less an evaluation on the social

impact of these government expenditures, all of which are important public concerns which could be an interesting subject for further research.

The Role of the State

No less than the Philippine Constitution has declared it to be a State policy to "protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature".¹ Towards this end, government agencies have been established, notably the Department of Environment and Natural Resources (DENR)², and the Bureau of Fisheries and Aquatic Resources (BFAR).³

The DENR is the primary government agency responsible for the conservation, management, development and proper use of the country's environment and natural resources. To accomplish this mandate the DENR is guided by the following objectives: (a) Assure the availability and sustainability of the country's natural

resources through judicious use and systematic restoration or replacement, whenever possible; (b) Increase the productivity of natural resources in order to meet the demands for forest, mineral and land resources of a growing population; (c) Enhance the contribution of natural resources for achieving national economic and social development; (d) Promote equitable access to natural resources by the different sectors of the population; and (e) Conserve specific terrestrial and marine areas representative of the Philippine natural and cultural heritage for present and future generations.

The DENR, in carrying out its objectives, coordinates with the following staff sectoral Bureaus, Line-Regional Offices and Attached Agencies:⁴

A. Staff Sectoral Bureaus

1. Forest Management Bureau;
2. Lands Management Bureau;

*Sofronio B. Ursal is a member of the Philippine Bar and a Master in Public Administration (U.P.-Cebu). He is a Director of the Philippine Society for Public Administration (PSPA) and its representative to the Social Issues Committee of the PSSC. He was a former provincial treasurer and presently a Commissioner of the Commission on Audit.

3. Mines and Geo-Sciences Bureau;
4. Environmental Management Bureau;
5. Ecosystems Research and Development Bureau and
6. Protected Areas and Wildlife Bureau

B. Line-Regional Offices

1. DENR National Capital Region;
2. Twelve Regional Offices
3. 74 Provincial Environment and Natural Resources Offices (PENRO);
4. Community Environment and Natural Resources Offices (CENRO).

C. Attached Agencies

1. National Mapping and Resource Information Authority (NAMRIA);
2. Natural Resources Development Corporation (NRDC);
3. National Electrification Administration (NEA).

Funding Environmental Development

For the year 1993 the total government appropriations for the Department of Environment and Natural Resources (DENR) amounts to P3.6 Billions.⁵ This represents 1.74% of the total National Government budget of P209 Billion for the same year.⁶ The DENR however obtained better shares in the total Government budget in the past, with 2.91% or P4.5 Billion in 1990; 2.61% or P3.0 Billion in 1989; and 2.25% or P3.7 Billion in 1991. During the 5-year period, the banner year for the DENR is in

1989 when its share of the total Government budget increased by 114% from P1.4 Billion in the previous year. Overall, the current DENR appropriations increased by P2.218 Billion, or some 157% over that in 1988.

Compared with the budgetary allocations of the other Departments of Government, the DENR appropriation ranks tenth (10th) in priority under the Ramos administration.⁷ The Departments which have bigger shares of the budget pie are the: (1) Department of Education, Culture and Sports; (2) Department of National Defense; (3) Department of Public Works and Highways; (4) Department of Local Government; (5) Department of Agriculture; (6) Department of Health; (7) Department of Transportation and Communications; (8) State Universities and Colleges; and (9) Department of Finance. From 1988 to 1991 the DENR budget used to hold on to either rank 6th or 7th, sliding down to rank 9th in 1992.

The 1993 DENR budget is allocated among its various staff sectoral bureaus and line-regional offices as follows: (1) General Administration and Support Services - P736,024,000; (2) Forest Management Services - P544,935,000; (3) Land Management Services - P345,798,000; (4) Mines and Geo-Sciences Development - P106,717,000; (5) Environment Management Services - P51,024,000; (6) Ecosystems Research and Development - P64,739,000; (7) Protected Areas and Wildlife Resources Development - P87,014,000; (8) Locally Funded Projects - P641,687,000; (9) Foreign Assisted Peso Counterpart - P192,962,000;

and (10) Loan Proceeds - P874,127,000.

In terms of object of expenditures, 38.92% of the current DENR budget is earmarked for salaries and other employee benefits; 29.45% for maintenance and other operating expenses; and 31.64% for the payment of capital outlays.⁸ Salaries and wages used to occupy 53% of the total DENR budget in 1988, gradually declining in the succeeding years, but regaining its prominence in 1992 at 50.80%. The allocation for capital outlays has an erratic trend, with only P22.5 Million in 1988 then reaching a high of P1.9 Billion in 1990, and declining to P696 Million in 1992.

Major Programs and Projects

The programs and projects of DENR may be categorized into two types on the basis of funding sources, namely locally funded projects and foreign assisted projects. For the 5-year period starting in 1988, locally funded projects aggregated P2.6 Billion,⁹ while foreign assisted projects for the same period totaled P6.1 Billion.¹⁰ The amount allocated for locally funded projects in 1988 amounted to P585 Million while for 1993 the amount allocated is P642 Million, or an increase of 9.74%. Foreign assisted projects started in 1989 with an appropriation of P1.06 Billion increasing to P2.5 Billion the following year then declining to P1.7 Billion in 1991 and P.87 Billion in 1992. For 1993 the projected funding for foreign assisted projects is estimated at P1.07 Billion.

There were 35 various types of locally funded projects during the

5-year period ending in 1992. The most heavily funded of which are as follows:

Rank	Project Title	Amount
1	Reforestation Project	P1,171,815,000
2	Cadastral Survey	493,279,000
3	Survey of Tenanted Rice & Corn Lands under Land Reform Program	338,476,000
4	Survey of Foreshore Lands, Re-settlement Areas under CARP	204,111,000
5	Integrated Social Forestry	165,920,000
6	Watershed Rehabilitation	68,532,000

The General Appropriations Act for 1993 no longer carries appropriations for these projects, although a catch-all item identified as "Maintenance and Protection of Existing Plantation" appears with a total of P642 million. This suggests that all projects implemented in the preceding years have either been completed or terminated and are now being maintained by the DENR.

The foreign assisted projects may be ranked as to magnitude of appropriations for the years 1989 to 1993 as follows:

Rank	Project Title	Amount
1	Forestry Sector Loan Project	P5,105,985,000
2	Phil. Forestry	361,421,000

	Development	
3	Low Income Upland Communities Project	178,601,000
4	RP-Japan Forestry Development Watershed Management Project	101,288,000
5	Natural Resources Management & Development Project	56,601,000
6	Rainfed Resources Dev. Project	52,906,000

Certain projects listed in the previous years no longer appear in the current year's budget, notably the following: RP-Japan Crocodile Farming Project; RP-Japan Forestry Development Project and Watershed Management; and

1988 to 1993, public funds in the aggregate amount of P19.47 Billion have been invested for the environment and its sustainable development. Also, in the yearly national government budgets for the same period the DENR appropriations consistently ranked within the top 10 agencies with the biggest funding outlays. In fact the DENR annual share in the national budget pie is equal to the yearly joint appropriations for both the Judiciary and the Congress of the Philippines. This amply demonstrates the relative importance with which the Philippine Government attaches to the environment and its sustainable development.

In terms of government investments in specific projects, the staggering sum of P10.5 Billion has been set aside for the environment and natural resources development during the six-year period from 1988 to 1993. Again this is a convincing indication of

"But the setting aside of public funds is merely the first step in the process of public administration."

RP-New Zealand Integrated Tree Plantation Project. On the other hand, new projects appear in the DENR budget to commence in 1993, as follows: Environment and Natural Resources Sector Adjustment Project, Fisheries Sector Loan, Integrated Rain-forest Management Project and Industrial Pollution Control Project.

Conclusion

Based on the six year survey of the general appropriations acts of the National Government from

the State's desire to implement its policy to "protect and advance the right of the people to a balanced and healthful ecology" as enshrined in the Constitution.

However, as earlier pointed, the scope of this paper is limited to the determining the magnitude of public funds committed or appropriated for the environment and its sustainable development within a period of half a decade. But the setting aside of public funds is merely the first step in the process of public administration. Even more crucial would be the manner by which such funds are

"Even more crucial would be the manner by which such funds are actually utilized or expended."

actually utilized or expended. For in the final analysis the sincerity of the Government's protestations of concern over the welfare of its citizenry is not tested by how much, it spent in their behalf, but as in this particular calls, whether the massive expenditures of public funds actually resulted in the realization of the state's declared

policy to "protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature." ■

Endnotes

1. Sec. 16, Art. II, 1987 Philippine Constitution.

2. See P.D. No. 461 (1974) and E.O. No. 192 (1987).
3. Originally created under the Ministry of Natural Resources pursuant to P.D. No. 461 (1974), subsequently reorganized under E.O. No. 967 (1984) under the Ministry of Agriculture and Food, now Department of Agriculture.
4. See Annex A for Statement of Functions of the agencies and offices enumerated.
5. See Table No. 1: DENR Appropriations for 1988 to 1993.
6. See Table No. 2: Summary of Appropriations by Agency.
7. See Table No. 3: DENR Summary of Appropriations by Object of Expenditures, 1988 to 1993.
8. See Table No. 4: Schedule of Locally Funded Projects, 1988-1993.
9. See Table No. 5: Schedule of Foreign Assisted Projects, 1988-1993.

Gonzalez from p. 31

mation about environmental issues but will focus on the Pasig River pollution problem to capture the public's interest. The Pasig River is chosen as the focus since it is an issue which people can relate with concretely.

Since results show a pattern that the economically well-off are more aware of environmental issues than the poor, the lower economic class will be addressed primarily by this communications strategy. The 18-27 age group which showed greater awareness of environmental issues will be used as a supporting arm to the project. They will also be part of the target of the awareness campaign but it is also hoped that they can spread the information by word of mouth.

The communications program will take off with a tri-media campaign. TV, radio and newspapers will be used because survey results indicated more than

50% of respondents are regular consumers of these media. News on the state of our environment and other environmental issues should be made part of their regular news programs or articles.

Themes in TV programs could be effective ways of getting attention about the Pasig River. Aside from this, documentaries, features, advertisements and teasers on broadcast media should be used fully to disseminate information in a more entertaining and creative way.

For the community-based networking, the school, barangay and the church will be utilized. These institutions will have to work hand in hand with the media. The school can do the research and provide the necessary information for media to disseminate. The media can likewise be used as instructional materials in school, church and the barangay. Personalities who will be invited to

get involved in the awareness program will go to certain schools, churches and barangays to further talk about the issues. On the other hand, the media can get people from the church, barangay and school as resource persons. Certain barangays, schools or churches can be featured on newspapers, radio and TV showing their work on the environmental problems.

With these recommendations, it is hoped that a new height will be reached in the awareness level of the people. These campaigns must be able to lead the people from different sectors to create and initiate plans of action that will help maintain and improve the environment. It is hoped that with an increased knowledge about the environment and the conditions in which people live in, the world will someday be better place to live in. ■

A PAPER ON THE STATE OF THE ENVIRONMENT

- *Fr. Ibarra M. Gonzalez, S.J.*
- *Olive R. Hofilena*

I. Introduction

One of the universal concerns which has reached alarming heights is the deteriorating condition of the environment. Media, government and non-government agencies have concerted efforts to foster awareness among the people and to counter the erroneous perception that the environment is an inexhaustible resource. M. J. Broom attributes this partly to the lack of education or information about the effects of polluting the environment, and partly because it is not easy for the individual polluter to see how the pollution he is causing can affect his own personal interest.

The most startling evidence of the people's apathy towards the environment is the biological death of the rivers in Metro Manila. The Environmental Management Bureau said that the five major river systems considered biologically dead are the Pasig-Tullahan-Tenejeros, San Juan and Parañaque-Zapote Rivers. Among these rivers, the Pasig seems to receive much publicity.

The main focus of this study is the environmental awareness of the people living within the vicinity

of the Pasig River, particularly their awareness on the deteriorating state of the Pasig River.

The Pasig River: A Background

The Pasig River is a 25-kilometer waterway which flows through the heart of Metropolitan Manila from the mouth of Manila Bay to its source in Laguna Lake. The river traverses the city of Manila and the municipalities of Makati, Mandaluyong, Pasig, Pateros, Taguig, San Juan, Quezon City, Marikina, San Mateo, and Montalban. Within its 58-square kilometer basin are population centers and human settlements, industrial firms, commercial establishments, and to a limited extent, agricultural lands, parks and other infrastructures. The waterway which has a depth range of 3 to 6 meters is basically used as a transportation channel and as a receptacle of land and water-based waste discharges.

The river is officially categorized as Class C, that is, the best usage is the propagation of fish and other aquatic resources. For the past years, however, water quality data show that the limits for Class C waters are not met at

the river, particularly at its 17-km downstream stretch. The great stretch of Pasig River is devoid of almost all fishes and aquatic plants due to wastes from population and industrial activities. Other issues also confront the river: a) floods which are the direct result of the reduced discharge of the river; b) diseases from harmful acids of long-lived metals which get into the water supply; c) garbage thrown is not necessarily garbage lost.

The Feasibility Study on Pasig River Rehabilitation Project has further expounded that there are about 250 water pollutive firms within the river basin. The general constituents of industrial discharges apart from organic matter are heavy metals, pesticides, oil and grease, paints, solvents, organic and inorganic sludges. The study also mentions the minimal or non-existent sanitation facilities in the river bank settlements where makeshift structures are usually built along the river banks and direct waste discharge into the river is practiced.

The government and the private sector are not really oblivious to this situation. Establishments like the Pasig River Development Program, the

Pasig River Development Council in 1973 to administer the PRDP and the PRDP Trust Account claim to achieve temporary relocation of squatter families; dredging of the waterway, relocation of two sewers to Manila Bay; industrial water treatment; temporary elimination of berthing water crafts and constructions of sidewalks, promenades, and railings along the river banks. There is also the Pasig River Development Foundation whose main purpose is to serve as the vehicle and prime mover for the rehabilitation and improvement of the environmental aspects surrounding Pasig River and its tributaries.

Giron (1987) also mentions the presence of the Rehabilitation and Restoration of Three River Systems Project spearheaded by the DENR which covers the three main rivers, Pasig, Bulacan, Marilao and

Tencejros-Tullahan. This four-year environmental project aims to clean up and develop the riverway into a major transport and commercial artery. It also aims to restore and beautify the sights and to clear it of hazardous sunken vessels.

Environmental concern is not limited to the knowledge of the government. There is a growing awareness of the environmental problems among the people. A Philippine Information Agency study in 1990 showed an 87% level of awareness on environmental issues and problems. The study also revealed that television is the most preferred mass media source of environmental information while the barangay captain,

friends, neighbors and local officials are the most preferred inter-personal sources. Newspapers and radio are also preferred media sources.

II. Problem Statement

The study aims to measure and increase the level of awareness on the problems and issues concerning the environment including the plight of the Pasig River. The focus of the study shall be made on the residents near the river mainly because this group of people is so near a major environ-

“Environmental concern is not limited to the knowledge of the government. There is a growing awareness of the environmental problems among the people.”

mental problem.

III. Scope and Limitations of the Study

The scope of the study covers an inquiry into the level of awareness on environmental issues of people residing within the vicinity of the Pasig River basin area. These areas are: Barangays Bagumbayan, Santolan, Ugong, Rosario, Buayang Bato, Hulo, Ilaya, Sta. Mesa (PUP), Pandacan, Santa Ana, West Rembo, San Joaquin, Buting, Comembo, East Rembo, Pineda, Bagong Ilog, and Pembo. The study aims to: 1) find out which environmental issues people are aware of; 2) find out the level of environmental awareness of the people; 3) find out whether the level of awareness

of the people affects their value system; 4) propose communication strategies which will: a) increase awareness among the people and b) correct misconceptions regarding the environment.

The study utilized the random sampling technique, thus, only those who were willing were interviewed. Due to this, respondents' age and income were not controlled so brackets were established by the study.

A limitation of the study is the number of respondents per barangay. Since some areas were bigger than others, a balance in distribution of respondents had to be established and in the process the number of respondents in one barangay may have been lessened in favor of a larger barangay.

IV. Methodology

This research is a descriptive study of the level of awareness of the people living in the vicinity of the Pasig River. It is the first part of a three-part study aimed to design a communication strategy for the rehabilitation of the Pasig River.

The questionnaire-response method was used in gathering data for the study. The questionnaire was formulated to draw out: a) various media habits of the respondents; b) their waste management methods and practices; c) their level of awareness, their attitudes, and receptivity towards the issues and information about the problem and the rehabilitation of the Pasig River and the environment as a whole.

Questions on the media habits of the respondents were

included to determine the type of media to be used in the information dissemination and public awareness campaign. Respondents were also asked where they expect to get more information about the Pasig River and other environmental issues to determine what could be used as information sources.

People's values regarding the environment and the importance of the Pasig River were also looked into since their values affect the way they treat the issue, thus this is an important factor in mobilizing them to participate in the project. Questions on their level of awareness of environmental issues, especially the Pasig River and the actions taken to solve the problem were asked. To determine who would be or what could get them involved in the project, respondents were asked to name their choice of leaders and institutions to handle the project.

A pre-test survey of the questions formulated was conducted in the sample areas. The areas were divided into three groups: Group One covered the following barangays: Buayang Bato, Hulo, Ilaya, Sta. Mesa (PUP), Pandacan, and Sta. Ana; Group Two covered Barangays Rosario, Santolan and Bagumbayan; Group Three covered West Rembo, East Rembo, San Joaquin, Buting, Comembo, Pineda, Pateros, Bagong Ilog and Pembo.

The pre-test was conducted face to face so that reactions and comments of the respondents would be seen. After the pre-test, the questionnaire was then revised based on these reactions and comments.

The Sample Population: A Profile

The sample group consisted of 1,199 respondents residing in the

selected barangays located within the vicinity of Pasig River. The barangays covered were: Bagumbayan, Ulong, Santolan, Rosario, Hulo, Ilaya, Buayang Bato, Sta. Ana, Pandacan, Sta. Mesa (PUP), West Rembo, San Joaquin, Buting, Comembo, East Rembo, Pineda, Bagong Ilog, and Pembo. The sample areas are a mixture of school, residential and industrial areas. The residential areas ranged from the squatters' colony, middle class to exclusive subdivisions. The industrial areas were composed of factories while the school was the Polytechnic University of the Philippines.

The sample was divided equally into 3 groups, each working on the study of 400 respondents. Random sampling was used in selecting the barangays to be surveyed. The skipping method: one respondent every three houses was also applied in our research survey.

The personal interview method was used primarily in the survey. Self-administered and modified mailed questionnaire methods were also used in some cases.

Descriptive statistics for all the sample characteristics showed a male-female distribution of 41.3% -56.3%, with 2.4% who did not identify their gender. 45.1% of the respondents were in the 18-27 years old age bracket while 49% of the total sample population was married. The survey also showed that 35.3% of the sample population did not finish their college education, while 17.2% earned their high school diploma.

83.3% of this sample population were Roman Catholics with the Iglesia ni Kristo claiming

a 4.6% following, and the Born Again Christians claiming 2.5%.

Based on the sample's economic situation, 15.8% belonged to families with P3,000-3,999 monthly income while only 3.6% earned P5,000-9,999 monthly income. 38% of the sample were unemployed while the remaining 62% were professionals, service, technical workers.

V. Results: Analysis of Data

The study looked into, gathered data on and analyzed the following areas of concern: 1) respondents' level of awareness of environmental issues; 2) sources of information of environmental issues; 3) media habits of respondents and media sources of environmental issues; 4) respondents' level of awareness of efforts to rehabilitate the Pasig River and the environment, in general.

With regard to respondents' level of awareness of environmental issues, the study shows that with respect to age, economic situation, and educational attainment, the level of awareness follows a pattern. An overall assumption can be made that the most aware individuals are those belonging to the 18-27 age group, with families making at least P10,000 monthly and have access to or had access to higher education. These are the people who have the most access to media and other information sources, such as the school, the barangay, and the church.

On the other hand, the least aware individuals appear to be those within the 48-57 and 58-67 age groups, with families earning less the P3,000 a month, and had no or very little education.

Though these people do have access to media, it is to a limited extent with respect to time, availability of materials and equipment. These people are more preoccupied with earning a living.

With the exception of air pollution, water pollution and health care, the awareness level for the other issues dropped below 50%. Issues less talked about but quite relevant and important to the country, such as deforestation, waste management, and river silting are known by less than half of the respondents.

The next area of concern in the study is the respondents' sources of information regarding environmental issues. This area also includes a description of the respondents' use of media sources.

Results show that despite the fact that media, along with the school, rate as the most common source of information regarding environmental issues, the level of awareness as mentioned before remains low. However, media do concentrate more on the pollution and health care, and awareness for these issues is considerably higher than the rest. What is also observed in the results is that it is the issues which people already have knowledge of that get more attention in media and other information sources as well. Aside from health and pollution problems, issues like river silting are just as relevant and important.

Interpersonal sources of information such as the school, the barangay and the church are also quite active in imparting environmental issues. Teachers, priests and the barangay captains are individuals whom the people respect and therefore are influential.

Results also indicate the significant emergence of the Barangay as the category with the highest frequency, comprising 14.1% and 17.8%. Mediated forms of communication, namely TV, Radyo and Dyaryo followed in that order. Paaralan had the fifth highest frequency among the sources. This indicates the sample's preference for community-based sources of information.

Results also indicate that 63.1% of the total respondents are aware of WATER POLLUTION and that 56.2% know about HEALTH CARE. It also shows that the samples acquire their information from mediated sources such as television, radio and newspapers.

The results also show that the respondents' immediate sources of information are mainly mediated forms of communication: RADYO (21.3%), DYARYO (14.7%) AND TV (11.3%). Interpersonal communication coming from schools, church, neighbors, relatives, friends and barangay captain elicited minimal response. (See Table 19).

Results show that 35.5% of respondents said that they frequently listen to the radio, "palagi." 90.9% said they watched television and that 50.9% watched from 1-3 hours. 35.6% said they frequently "palagi", read the newspaper. The respondents show a high tri-media exposure. These answers are the highest in their corresponding classes, meaning that in their own fields, i.e. newspaper, TV, or radio, these are the high ranking answers.

It appears that for the ten environmental issues, the four most common sources of information are : 1) television (566 or

47.2%); 2) radio (536 or 44.7%); 3) newspaper (502 or 41.9%); and 4) school (384 or 32.0%).

The respondents' main source for their perception of the river's overall condition are: 1) sailing kaalaman (896 or 74.7%); 2) television (288 or 24%); and 3) radio (257 or 21.4%). Other sources of information are the church and the barangays.

556 or 46.4% of the total respondents said that the church is either "very active" or "somewhat active." More than half, 637 or 53.1% said that the barangay is an active force in environmental issues and nearly half 543 or 45.3% said that the barangay captains do or say something about the environment.

As to media sources, results show that the radio and the television are the most popular media. The total number of respondents who listen to the radio is 1096 or 91.4%. 1090 respondents say they watch television.

As to frequency of use, 722 or 60.2% say they regularly listen to radio. In the case of newspapers, the total number of readers is 1,072 or 89.4%. As to frequency, the results show there are 625 or 52.1% regular readers of newspapers.

The next area of concern is the general awareness of the respondents of the over-all condition of the Pasig River and of efforts to rehabilitate it.

When asked about how important the river was to them, 647 or 53.9% said "Mahalagang-mahalaga"; 314 or 26.2% said "May kahalagahan"; 122 or 10.2% said "OK lang." 90.3% of total respondents considered the Pasig River important in their lives.

85.8% of the total respondents also indicated willingness to participate in the cleaning-up of the Pasig River with HANDANG-HANDA (44.8%); PWEDE NA RIN (24.4%) AND MEDYO HANDA (16.6%).

Respondents' reasons for indicating willingness to help clean-up the river include PARA SA IKABUBUTI NG LAHAT (15.9%), SANITATION (13.9%) and WALANG PANAHON (7.3%).

When asked of their knowledge on any work being done on the Pasig River, 479 residents said "HINDI KO ALAM," (39.9%); 379 or 31.6% said "Mayroon"; and 290 said no knowledge at all.

As to knowledge of barangay action concerning the Pasig River, 375 or 31.3% of respondents said "Mayroon"; 309 respondents or 25.8% answered "Wala"; 480 respondents or 40% said "Hindi Ko Alam".

When asked whether their barangays were active about environmental issues, 637 respondents or 51.7% said "Oo"; while 303 respondents or 24.6% said "Hindi Ko Alam." A total of 183 respondents or 14.9% said "Hindi."

VI. Conclusion, Recommendations

Based on the results gathered, it can be concluded that there is a need to strengthen the community-based interpersonal communication network within the respective areas of the respondents in the study. A strong network will lead to a more effective manner of sustaining the level of awareness and certain attitudes or behaviors beneficial to

the ecological state of the Pasig River.

This need is evident in the respondents' preference for the barangay and school as sources of additional information about the environment and the Pasig River. Mediated forms of communication remain as the primary source (s) for any kind of information (health care, water pollution).

To sustain the level of awareness and the attitudes and/or behaviors beneficial to the Pasig River, the people need to see the relevance and significance of the river to them. This can be effectively channeled through the community.

For interpersonal communication to effectively work in these areas, it is deemed necessary for the various communities to be mobilized since interpersonal communication is rooted in the community.

The weak communication network present in the areas surveyed is evident in the following: 1) the perceived low frequency of barangay meetings; 2) the inconsistency of the respondents in terms of attendance of barangay meetings; and; 3) the respondents' preference for mediated forms of communication as the primary source of information.

Although the institutions such as the barangay are perceived to be active in terms of working for environmental issues, a major factor missing is the support of the people.

The respondents realize the importance of cleanliness and the importance of the Pasig River. This is manifested in their willingness to participate in any activity connected to the clean-up

of the Pasig River. Thus, it is necessary to work on this positive attitude for the rehabilitation of the river.

The rehabilitation program should be implemented on a community level for it to be effective. The respondents' preference as to the leader of the project should be considered to facilitate better interpersonal communication and effective implementation of rehabilitation projects.

The respondents' concern for the cleanliness of their surroundings and the well-being of other people was manifested in the study. This will serve as effective entry points for the sustaining campaign.

One important aspect to take note is the role of media reinforcement in the sustaining strategy for three reasons: 1) as immediate sources of information; 2) respondents rely on them for awareness information; 3) mass media can be very effective tools in reinforcing the interpersonal communication process.

In conclusion, proper media reinforcement and the use of community-based interpersonal communication as the backbone of the strategy will effectively sustain the level of awareness and the attitudes and/or behaviors beneficial to the ecological state of the Pasig River.

The recommendation is to implement a communications networking strategy in disseminating environmental issues. This strategy will involve institutions like the media, school, church and barangay to work hand in hand and act simultaneously.

This communications strategy will aim to disseminate infor-

HEALTH, ENVIRONMENT AND ECONOMIC PRODUCTIVITY

• Alejandro N. Herrin

Introduction

Environmental factors constitute one of the major determinants of health. Environmental factors include environmental contamination of water, air and soil by biological and chemical agents that contribute to morbidity and mortality, and physical and chemical hazards that increase the risks of injuries and subsequent disabilities.

Health in turn affects economic productivity by reducing the quantity and efficiency of labor and entrepreneurial inputs. Environmental contamination and degradation also affect production directly by reducing the quantity and quality of natural resource inputs. For example, infected water bodies could limit access to cultivable land resources if they discourage human settlements in these areas; water pollution reduces fishery resources; and soil erosion reduces the fertility of the soil.

The interrelations run full circle when the nature of the

production processes and the pressure to exploit existing natural resources due to rapid population growth affect health through environmental contamination and future production through poor health and environmental degradation.

This paper explores only some of the above interrelationships, in particular, the impact of environmental factors on health and the subsequent impact of health on economic productivity. While it is generally conceded that poor health and malnutrition adversely affect economic productivity by reducing the quantity and efficiency of labor inputs, hard empirical evidence is difficult to come by, and we briefly discuss why this is so. In the foregoing discussion, the need for improving disease surveillance and reporting that explicitly consider the environmental determinants of health and the need for more studies on the productivity impacts of environmentally-related health outcomes will become readily apparent.

Health Impacts of the Environment Leading Causes of Morbidity and Mortality. Data on the leading causes of morbidity and mortality provide some clues as to the importance of environmental factors, interacting with various aspects of human behavior, and in determining health. Certain diseases such as diarrheal diseases are associated with water contamination, while malaria is transmitted by water-related insect vectors. Respiratory diseases such as tuberculosis are transmitted via the aerial route and are associated with crowding and poor housing environment. Accidents are associated with various physical and chemical hazards at home, in the work place, or in the general environment.

Health Impacts of Water Contamination and Water Shortage. Most of the diseases associated with contaminated water are communicable and classified as waterborne, water-washed, water-based and water-related (WHO, 1992). Waterborne diseases arise from the contamination of water by human or animal feces or urine infected by pathogenic viruses or bacteria. These pathogens are directly transmitted when the water is drunk such as in typhoid and diarrheal diseases, or may be acquired through skin contact

"While it is generally conceded that poor health and malnutrition adversely affect economic productivity by reducing the quantity and efficiency of labor inputs, hard empirical evidence is difficult to come by..."

with infected water as in leptospirosis. Water-washed diseases arise from poor personal hygiene which is exacerbated by the lack of water for washing or bathing. These diseases include some diarrheal diseases and contagious skin and eye infections. In water-based diseases, water provides the habitat for intermediate host organisms where some parasites spend part of their life cycle. These parasites are, later, the cause of diseases in people as their infective larval in the case of schistosomiasis. Finally, in water-related diseases, water provides a habitat for the water-related insect vectors of disease. Mosquitoes breed in water and adult mosquito may transmit malaria, filariasis, and virus infections such as dengue.

Diseases associated with shortage of or contaminated water are still the leading causes of morbidity in the Philippines. Of these, diarrhea, malaria and schistosomiasis are the most prominent. Diarrheal diseases are the third leading cause of morbidity and the seventh leading cause of mortality in 1989 affecting mostly infants and young children.

Diarrheal diseases are closely related to household access to safe water supply and to sanitary toilets. Data from the National Health Surveys of 1981 and 1987 reveal that only 64 percent of households in 1987 had access to tap or deep well water. This rate varied from 88 percent in the National Capital Region to 25 percent in Southern Mindanao. Data on households with sanitary toilets also show large regional variations. Past studies have revealed, however, that in areas without access to water, the reported presence of sanitary

toilets in the household did not necessarily mean the regular use of such facilities.

Malaria and schistosomiasis are important diseases in specific regions. Compared to other regions, morbidity and deaths from malaria are relatively high in the Cordillera (Ifugao and Kalinga Apayao), Cagayan Valley (Isabela, Cagayan and Quirino), Southern Tagalog (Palawan, Mindoro Occidental and

"Diseases associated with shortage of or contaminated water are still the leading causes of morbidity in the Philippines."

Quezon), and the Mindanao regions. Morbidity and deaths from malaria increase with age and are higher for males than females, which suggest that infection is related to intensity of exposure mosquitoes in the workplace (farms).

Schistosomiasis is highly prevalent in only a few regions, namely Eastern Visayas (Leyte del Norte and Northern Samar), Southern Mindanao (Davao del Norte and Davao Oriental), Northern Mindanao (Zamboanga del Sur). The population affected are mostly males, and young and older adults, which reflect intensity of exposure to infected rivers and streams through bathing, wading or fishing exposure to infected irrigated canals and other water bodies in the farm. Schistosomiasis has been associated with the expansion of irrigation systems without adequate provision for the

control of snail habitats. The situation is aggravated by poor sanitation among the population.

Health Impacts of Airborne Pathogens and Air Pollution. A variety of viral, bacterial and parasitic agents cause pneumonia, which is the leading cause of morbidity and death in the Philippines, affecting mainly infants and children and to some extent the elderly. Since such agents cannot be eliminated in the environment, adequate nutrition, better sanitation and less crowding, in addition to timely health care, can significantly reduce morbidity and deaths (Berman and McIntosh, 1986).

Tuberculosis is caused by an organism (*mycobacterium tuberculosis*), which is transmitted entirely via the aerial route. Infectious persons produce aerosols of minute droplets in which tubercle bacilli form nuclei; upon evaporation these nuclei remain suspended in air for long periods of time, which could then be inhaled by persons leading to primary infection (Daniel, 1986). The organism, however, is rapidly killed by ultraviolet light, including daylight, thus, transmission usually takes place in confined areas of poor ventilation. Most people who become infected do not develop the disease: they become immune and the infection remains dormant in the scar tissue. However, at a later stage, the scar tissue may breakdown due to such factors as a reduction in the immunity arising from poor nutrition, and reactivation occurs. Clinical tuberculosis is usually of the reactivation form.

Morbidity and deaths from tuberculosis vary per region, although some, if not most, of the variations might simply be due to differences in case finding efforts

of health personnel and in the completeness of death reporting. Those affected by tuberculosis are mainly adults in their economically active lives and the death rate rises sharply after age 40. The death rate from tuberculosis is usually of the reactivation form.

With respect to air pollution, three specific problems have been noted for their effect on health: excessive urban particulate matter levels (airborne dust and smoke), high level of lead primarily from vehicle emissions, and smoke and fumes from indoor use of biomass fuel such as wood (World Bank, 1992). Studies reviewed by the World Bank indicate that exposure aggravates the effects of existing diseases among older people such as chronic obstructive pulmonary diseases, pneumonia, and heart diseases.

Exposure to lead has been found to affect the mental development of children. Estimates cited by the World Bank revealed that in Bangkok, for example, "the average child has lost four or more IQ points by the age of seven because of elevated exposure to lead, with enduring implications for adult productivity" (World Bank, 1992: p. 5). Moreover, a study cited by WHO (1992) showed that "young adults exposed to high levels of lead in their infancy tended to be under-achievers; they had a slower standing in school, increased absenteeism, lower vocabulary and grammatical reasoning scores, poorer eye-hand coordination, and longer reaction times" (Needleman, et al., 1991 cited in WHO, 1992: p. 154). Exposure to lead in adults also increases the risks of higher blood pressure and of heart attacks and strokes.

Studies on the health impact of exposure to indoor air pollution

"young adults exposed to high levels of lead in their infancy tended to be under-achievers; they had a slower standing in school, increased absenteeism, lower vocabulary and grammatical reasoning scores, poorer eye-hand coordination, and longer reaction times"

from biomass burning suggest that such exposure contributes to acute respiratory infections among infants and children. Moreover, "recurrent episodes of such infections lead to permanent lung damage that shows up in adults as chronic bronchitis and emphysema, eventually contributing to heart failure" (World Bank, 1992, p.52).

Urban pollution has become a major problem in the Philippines, especially in the metropolis. However, the health impacts have not yet been fully documented, although it is common to attribute air pollution emitted by vehicles as contributing to the increasing number of cases of such respiratory disorders as bronchitis. The concern for possible lead poisoning among those constantly exposed was recently expressed by the Health Secretary who recommended that traffic cops and metro aides be made to wear gas masks to protect themselves from such poisoning.

Health Impacts of Physical and Chemical Hazards. Exposure to physical and chemical hazards increase the risk of accidents and poisoning. Exposure to chemicals among those working in agriculture arises from the use of fertilizers and pesticides. In industry, workers may be exposed to a variety of industrial chemicals in the work place. Although it is often difficult to separate the effect of a particular chemical from other occupational exposures, it is reported that high

exposure to specific chemicals may contribute to diseases affecting most organs of the body: different chronic lung diseases (silicon, asbestos), kidney diseases (cadmium, mercury), diseases of central nervous system (organic solvents, lead, mercury), and malignant diseases of different organs (asbestos, arsenic, benzene) (WHO, 1992: p. 182). On the other hand, exposure to physical hazards increases the risk of accidents, which could lead to permanent disability or death.

Accidents are a major cause of morbidity and death in the Philippines. Deaths from accidents increase with age starting from early adulthood, and are much higher for males than females, reflecting different exposures to physical hazards among others.

One consequence of physical accidents is orthopedic disability. Data show that the rate increases with age starting from young adulthood, and increasing even more among older adults. The rate is also higher among males than females. Although it is difficult to link physical accidents directly to such disability (many may be handicapped due to the effects of polio), the pattern is consistent with cumulative exposure to physical hazards.

Productivity Impacts of Poor Health

There are several ways of looking at the social and economic

impact of disease and other health outcomes. A convenient starting point is the typology suggested by Andreano and Helminiak (1988) where the social and economic impacts are categorized as: (a) *health consumption effects* – the pain and suffering associated with the disease; the grief of persons affected by either physical incapacity or stigma of the disease; and the grief of friends and relatives of those affected by the disease; (b) *social interaction and leisure effects* – the stresses and constraints imposed on interactions between infected persons and other members of the household and the community; and the reduction of leisure time and recreation of those affected by the disease; (c) *short-term market production effects* – includes the reduction in the quantity and efficiency of labor inputs due to illness; (d) *short-term non-market production effects* – reduction in time and effort in the production of commodities for home consumption, e.g., child care; and (e) *long-term production and consumption effects* – includes the effects and health and nutrition on intellectual development and, innovative behavior and effects on land and labor supply (e.g., diseases which have especially high transmission potential in certain lands may reduce the supply of productive land because the settlement and cultivation of land are discouraged).

Although the productivity impacts of disease are conceptually and intuitively clear, it has been difficult to establish the links empirically. There are several reasons for these, including: (a) *different disease states* – an infected person is not necessarily diseased (functionally impaired); (b) *different physiological reserves among individuals* – allowing

some to maintain customary levels of work and activity in the short-run; (c) *household work adjustments* – the impact of disease may be partially or wholly offset at the household level by intra-household adjustments in work assignments, e.g., healthier members could substitute for those who are ill in order to maintain labor inputs or household earnings; and (d) *long-term effects of certain diseases* – the effects of certain health outcomes are long-term, often involving many intervening factors that are difficult to measure.

Recent studies in the Philippines provide some insights into the nature of the economic and social impacts of environmentally-related diseases such as schistosomiasis. In a study conducted in 10 villages in two municipalities in Surigao del Sur, Herrin (1988) reported on data concerning individual perceptions on disease (schistosomiasis) impacts provided by the adult respondents. The data suggest that individuals, whether currently infected or not, were generally aware of the potential adverse consequences of schistosomiasis on various aspects of individual and household welfare, including those aspects which are seldom measured, i.e., health consumption and social interaction effects and non-market production effects. Among the dimensions of short-term health consumption and social interaction effects that are revealed to be important are pain and stigma. In the long run, infection is perceived to seriously affect marriage prospects, social mobility through marriage, and longevity. With respect to non-market production effects, infection is perceived to adversely affect the home production activities of mothers and the

school performance of children. Finally, with respect to short-run production effects, the data reveal a very high agreement (70 percent or more) among the respondents that schistosomiasis adversely affects productivity in terms of level of effort, speed, and number of days worked. Moreover, the infection of the household head is perceived to seriously affect household income and material welfare.

The second set of analysis from the same study dealt with examination of the effect of infection of a particular family member on the allocation of time of both the infected member and the other (non-infected) members of the household in both market and non-market production (Herrin, 1990). In general, the results support the hypothesis that disease presence in the household do result in intra-household reallocation of time. Such reallocation takes on a variety of forms depending on who in the household is infected and whether a particular individual's time in specific market or non-market production activity is a complement or a substitute to the infected member's time.

Some of the more interesting results (after controlling for individual, household and community level factors) are as follows: (a) the father's time allocation does not change much with disease presence in the household; in fact infection of the father leads to increases in his market production time, probably spent in less strenuous farm work to compensate for reduced vigor; (b) with respect to the mother (i) infection of the father increases the mother's market production time and reduces her non-market production time; (ii) infection of

the mother reduces both her market and non-market production time; (iii) infection of the daughter increases mother's production time and time for some household chores; (iv) infection of any member of the household reduces mother's child care time, perhaps because more time is devoted to care for the sick member; and (c) with respect to daughters, infection of other daughters increase the index daughter's time in market production (farm work) and time in certain household chores (laundry and house cleaning).

Needless to say, the above results are tentative. Several methodical and measurement issues still remain to be fully resolved. However, the results point to the complexity to household responses to illness among household members, which makes it difficult to measure productivity impacts of poor health of any one member.

A third set of analysis from the same data source sought to examine the effect of schistosomiasis on rice production (Rabai, 1991). The analysis finds that infection among adult household members reduced family labor inputs, thus reducing rice output. In fact, the study revealed that infection of adult household members reduced all factor inputs including hired labor, suggesting that the schistosomiasis variable may be capturing the potentially adverse effect of infection of the household head on the overall management and supervision of the production process, thereby affecting overall level of effort (factor inputs).

Other studies on productivity impacts of poor health in the

Philippines relate mostly to the effects of nutrition on children's performance (Popkin and Ybanez, 1982; Florencio, 1988), the effect of chronic illness on the children's schooling attainment (Paqueo, 1985), and the effect of childhood nutrition on adult agricultural productivity or wages (Bouis, 1989). To the extent that nutrition is affected by illness that are mainly due to environmental factors, one could speculate (due to the absence of data) on the effects of environmental factors on productivity as working through their effect on illness, then the effect of illness on nutrition, and then the effect of nutrition (short-run and long-run) on schooling and learning, and finally, the combined effects of schooling and past nutrition or worker productivity.

Of all the health and development relationships, empirical evidence on the social and economic impact of various health outcomes in general, and those that are proximately environmentally related in particular, is most limited. Yet this is probably one area where strong evidence is needed to justify the demand for a greater allocation of scarce resources in health-promoting activities and environmental quality.

References

- Andreano R. and T. Helminiak, 1988, "Economics, Health and Tropical Diseases: A Review", in Herrin, A.N. and P.L. Rosenfield, eds., 1988, *Economic, Health and Tropical Diseases*, Quezon City: University of the Philippines School of Economics.
- Berman, S. and K. McIntosh, 1986, "Acute Respiratory Infections," in J.A. Walsh and K.S. Warren, 1986, *Strategies for Primary Health Care*, Chicago and London: The University of Chicago Press.
- Bouis, H.E., 1989, "The Relationship Between Nutrition and Income Sources for the Rural Poor in a Southern Philippine Province," *International Food Policy Research Institute*, mimeo.
- Daniel, T.M., 1986, "Tuberculosis," in J.A. Walsh and K.S. Warren, 1986, *Strategies for Primary Health Care*, Chicago and London: The University of Chicago Press.
- Department of Health (DOH), 1992, *Philippine Health Statistics 1989*, Manila: Department of Health.
- Florencio, C.A., 1988, "Nutrition, Health and Other Determinants of Academic Achievement and School-Related Behavior of Grade One to Six Pupils," University of the Philippines, unpublished manuscript.
- Food and Nutrition Research Institute (FNRI), 1984, *Second Nationwide Nutrition Survey*, Philippines, 1982, Manila: Food and Nutrition Research Institute.
- Herrin, A.N., 1988, "Perceptions of Disease Impacts: What Can They Tell Us?", in Herrin, A.N. and P.L. Rosenfield, eds., 1988, *Economics, Health and Tropical Diseases*, Quezon City: University of the Philippines School of Economics.
- Herrin, A.N. and M. G. Bautista, 1989, "Health and Development: A Review of the Determinants and Consequences of Health Improvements in the Philippines", in Survey of Philippine Development Research III, Manila: Philippine Institute for Development Studies.
- Herrin, A.N., 1990, "An Analysis of Socio-Economic Consequences of Schistosomiasis", unpublished report submitted to WHO Special Programme for Research and Training in Tropical Diseases.
- Herrin, A.N., 1990, "Nutrition: Consequences, Determinants and Policy Interventions", unpublished report prepared for National Nutrition Council.
- Lec, J.A., 1985, *The Environment, Public Health and Human Ecology: Considerations for Economic Development*, Baltimore and London: The Johns Hopkins University Press.
- Needleman, H.L., et al., 1991, "The Long-term Effect of Exposure to Low Doses of Lead in Childhood", *New England Journal of Medicine*, 322:83-88.
- Over, M., R.P. Ellis, J.H. Huber and O. Solon, 1991, "The Consequences of Adult Ill-Health", in Feachem, R.G.A., et al., eds., *The Health of*

POPULATION CARRYING CAPACITY OF POTENTIAL FOOD PRODUCTION FROM LAND AND AQUATIC RESOURCES*

• Dr. Candido A. Cabrido, Jr.**



1. Introduction

As the country's population continues to grow in an accelerated pace, agricultural planners and decision-makers face many uncertainties about the capacity of the land and aquatic resources to sustain the numerical consequences of population growth. Foremost among these concerns is the capacity of land and aquatic resources to produce the volume and type of food needed by the projected populations. This concern is inextricably linked to the inherent natural limitations of these resources, their quality and quantity status, and the level of technology and management employed to realize their production potentials. These parameters have to be analyzed before any meaningful assessment of the capacity of land and aquatic resources can be undertaken.

By knowing the capacity of land and aquatic resources to support the food requirements of projected populations, targets of food self-sufficiency and food security could be credibly established and the necessary development strategies to harness the potential of these resources could be pursued.

An assessment of the population carrying or supporting capacity of food production therefore becomes a pre-requisite to medium and long-term agricultural development planning. Information generated by such assessment serves as a basis in determining the necessary production policies, strategies, and investments that should be adopted by the government in order to avoid future food scarcity and shortages and associated problems of malnutrition and high food prices among others.

Population supporting capacity studies also generate baseline data and computer-aided system of processing agricultural information which are useful in production target-setting, scenario-building, and policy simulation for agricultural development planning exercises. Such studies also provide an index of the margin for growth of a particular resource (i.e., land and aquatic) or a specific food commodity (i.e., specific crops, livestock, or fish species) in a given geographic area.

A study sponsored by the National Economic and Development Authority (NEDA) and the United Nations Fund for Population Activities (UNFPA) was undertaken by the Save Our Future Foundation (SOFFI) to answer several interrelated basic questions:

* A synopsis of the project report entitled "National Population Carrying Capacity Study" submitted to the Integrated Population Development Project (IPDP) of the National Economic and Development Authority (NEDA) on September 1992. The project was funded by the United Nations Fund for Population Activities (UNFPA).

**Associate Professor, School of Urban and Regional Planning, University of the Philippines, Diliman, Quezon City. He is a consultant to the following institutions: Land and Water Development Division, Food and Agriculture Organization (FAO) of the United Nations, Rome, Italy and Bureau of Soils and Water Management. He holds the following degrees: Ph.D. Environmental Science; M.Sc. Environmental Engineering; Diploma, Environmental Science and Technology; and M.Sc. and B.Sc. Biology.

1. What is the food production potential of the country's land and aquatic resources under different technology levels?
2. What maximum population level could be sustained by this potential food production under different technology levels?
3. When will food deficiency years most likely begin under different production assumptions and population projections?
4. What regions and provinces have the greatest potentials in producing specific food types?

Because of the unpredictable behavior of most variables that have to be considered in projecting food production, the results of this study could never be considered to yield exact figures but rather rough estimates of population supporting capacities.

II. Objectives of the study

The primary objective of the study is to provide agricultural planners and decision-makers the baseline information on the potential productivity and population supporting capacities of land and aquatic resources. More specifically, the study aims to:

1. assess the potential sustainable production level of the country's land and aquatic resources under given technological and management scenarios;
2. determine the sustainable level of population that can be supported by the potential food production from land and aquatic resources; and
3. determine the comparative advantage of the different regions in terms of land

suitability for specific crops and population supporting capacities of food production.

III. Outputs of the Study

The main outputs generated by the study and their general uses include the following:

1. Land suitability maps which serve as input in land use planning. The spatial and geographic information displayed in these maps serves as crop development guides for agricultural and land use planners.
2. Data base on food production

4. Population supporting capacity of potential food production. The results of the assessment could be used in determining food self-sufficiency levels on the basis of nutrition standards and actual level of consumption. Another useful application of the results is in strategic planning for the spatial distribution of future populations.

IV. Scope and Limitations of the Study

An assessment of the population supporting capacity of potential food production which

"The primary objective of the study is to provide agricultural planners and decision-makers the baseline information on the potential productivity and population supporting capacities of land and aquatic resources."

which provides statistical information on crop, livestock, and fishery production at the regional and provincial levels. This data base could be used in regional and provincial agricultural development planning.

3. Computed potential sustainable production of crops, livestock, and fisheries under given scenarios. These data and information could be used in setting targets for food production and in investment planning. It indicates the infrastructural as well as production inputs that are required to attain targeted production levels.

includes crops, livestock and fisheries was conducted at the national, regional, and provincial levels. This report, however, will limit its discussion on the national and regional level of analysis. Provincial results are only presented in the discussion when deemed significant.

Twenty-five different food and cash crops were included in the land suitability assessment and in the computation of the population supporting capacity. In projecting meat production, six animals were considered in the study, namely: carabao, cattle, swine, goat, chicken, and ducks. For fisheries production, both marine and freshwater fishery animals were included. Nearshore and offshore or deep sea marine

fisheries production were also accounted for in the population carrying capacity assessment.

Computation of the population carrying capacity took the assumptions that: 1) food will be equally distributed or people will have equal access to food; and 2) food trade will be negligible especially food imports since the objective of the exercise is to attain food self-sufficiency.

Either due to lack of data or established assessment methods or both, the following were not covered in the study:

1. other minor agricultural crops
2. egg and milk production
3. seaweeds and other edible aquatic plants.
4. other animals which have very limited population such as horses and sheep
5. wildlife animals such as birds, monkeys, deers, wild boars, etc.

It is relevant to note at this point that the study was confined to agricultural areas (lands within 0-18% slope) and potential expansion areas for agriculture (by definition include lands within 18-30% slope). Areas with slopes of 18-30% were included in the assessment as expansion areas for agricultural production inasmuch as portions of these areas are already settled by upland farmers who now practice agro-forestry. Two scenarios were adopted in this regard, namely:

- 1) Only 20% of the area will be devoted to food crops (annual and permanent) and the rest will be planted to forest species tolling the agro-forestry schemes, and

- 2) All suitable lands will be planted to food crops (annual and permanent) with the adoption of necessary soil conservation measures.

The study did not cover the food production potential of forest lands especially those with slopes above 30%. It is appropriate for a separate research study to be conducted in assessing the population supporting capacity of forest lands inasmuch as this will require a different set of policies, objectives, approaches, and methods.

Aside from lands above 30% in slope, non-arable lands and urban or built-up areas were also deducted in the inventory of lands that were assessed for crop suitability. The net arable land for food production was estimated by deducting the area utilized by the production of non-food cash crops, and the area projected to be converted into non-agricultural uses.

The assessment of the population supporting capacity of rice production in Region III took into account two conditions:

1. Pre-eruption condition. Potential production of rice prior to Mt. Pinatubo eruption.
2. Post-eruption condition. Potential production after Mt. Pinatubo eruption.

The results of the two conditions were compared to determine the potential production foregone as a result of the destructive effects of lahar, floods, and ash deposition on agricultural lands.

The post-eruption's potential production of rice was estimated on the basis of the extent of areas affected by lahar, mudflows, and varying thickness of ash deposits.

V. Approach Adopted in the Study

A simplified diagrammatic scheme of the approach adopted in the assessment of the population carrying capacity of food production from land and aquatic resources is given in Figure 1.

The first step in the accounting process is the computation of the potential production of crops, livestock and poultry, and fisheries using official statistical data as benchmarks. Various models and techniques were employed in computing for the potential production of these food commodities. A highly sophisticated model, the FAO's AEZ model, was employed in calculating potential crop production since data and information which fit the model are available. There are also available quantitative models for fish stock assessment, for example, but these models were not employed in the study due to the lack of nationwide data/information and unified level of data aggregation needed to run these models. Instead, the computation of fisheries, and projected livestock and poultry production was done using simple accounting techniques that relied on historical data and statistical trends.

The computation of the potential production of crops considered three levels of input and technology. The attributes of these input/technology levels are provided in Table 1.

After deriving the gross potential food crop production, the reduction factors such as wastes, losses due to typhoons, requirement for feeds, seeds, and other non-food uses, were

Table 1. Attributes of the Input Levels and Land Utilization Types

Attributes	Low Input Level	Intermediate Input Level L.U.T.	High Input Level L.U.T. L.U.T.
Production	Rainfed cultivation with part change to optimum mixture of crops	Rainfed cultivation with most parts changed to optimum mixture of crops	Rainfed cultivation of optimum mixture of crops
Technology Employed	Local cultivars. No fertilizer or chemical pest and disease control. Fallow periods. No conservation measures	Improved cultivars as available. Sub-optimum fertilizer application. Simple extension packages including some chemical pest and disease control. Some fallow period. Not and conservation measures.	High yielding cultivars including hybrids. Optimum fertilizer application. Chemical pest, disease and weed control. No fallow measures are fully adopted including use of crop residues. Complete mechanization including harvesting.
Power Sources	Manual labor with hand tools	Manual labor with hand tools and/or animal traction with improved implements	Low. Family labor costed if used
Labor Intensity	High including uncosted family labor	High including uncosted family labor	Commercial production
Market Orientation	Subsistence production	Subsistence production plan	High
Capital Intensity	Low	Intermediate with credit on accessible terms	High
Infrastructure Requirements	Market accessibility not necessary. Inadequate advisory services. No storage facilities required.	Some market accessibility necessary with access to demonstration plots and services. Storage facilities required.	Market accessibility essential. High level of advisory services and application of research findings. Storage facilities required.
Land Holdings	Small, sometimes fragmented	Large, consolidated fragmented	

Source: FAO, 1984

accounted for to obtain the net annual potential production.

The net production was then translated into calorie and protein output using standard conversion values. On the basis of the per capita nutrient requirements and actual consumption of specific food types, the population supporting capacity of crops, livestock and poultry, and fisheries are separately determined. The final step in the process is the computation of the total population carrying capacity which is simply the sum of the population supporting capacities of the three food categories. Calculation was done at the regional and national

level of data aggregation to be able to get a picture of the food self-sufficiency possibilities in the distant future.

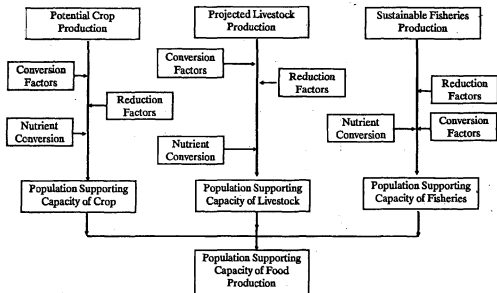
In summary, the population supporting capacity of crop, livestock and poultry, and fisheries production was determined on the basis of real demand or standard nutritional requirements and effective demand or actual per capita consumption. The former is a more reliable and relatively fix measure of population supporting capacity than the latter which is more elastic and varies according to income, dietary preference and relatedly, geographic location.

VI. Highlights of Main finding

The highlights of the main findings of the study are as follows:

1. Luzon has the highest rice production potential with a share of 45% of the total production followed by Mindanao with 32%, and Visayas with 23%. In terms of regional percentage contribution, Region IV tops the list with 17.4% followed by regions VIII (11%), VI (9.4%), IX (9.3%), X (7.9%), I (7.4%), XI (7.3%), V (7%), and XII (5.8%). At the bottom of the list are three regions which have the least potential for rice

Figure 1
Approach Adopted in the Assessment of the
Population Carrying Capacity of Food Production



production. These are regions II with a share of 3.7%, CAR with 1.8%, and VII with 1.3%.

2. Because of projected potential production loss caused by the Mt. Pinatubo eruption particularly its ash deposits and lahar, Region III which formerly ranked third with a potential share of 10.2% (i.e., result of pre-eruption potential assessment) now belongs to the lower half of the list occupying the ninth position with a share of 6.3% (i.e., result of post-eruption potential assessment) of the country's potential rice production foregone in terms of population supporting capacity is about 6.2 million persons under high level of input, technology, and management.

3. The results of the carrying capacity assessment show that the country has a vast potential to achieve self-sufficiency in rice production in the long term future if all highly suitable lands are planted to palay under the best technological and farm management conditions. Enough rice could even be produced for export that could earn revenues for the country.

4. Roughly, for every hectare of irrigated riceland converted to non-agricultural uses, the population supporting capacity is lowered by 70-100 persons on the basis of effective demand. If land conversion is not successfully regulated, there is a possibility that it may eat up a substantial portion of our prime ricelands within the next 40-50 years.

5. If the actual conversion rate for every Filipino added to the population is about 0.015 to 0.025 hectare, which is low compared to the FAO estimate of 0.05 hectare per capita for Asian countries, the total area that will be needed by the additional projected population in the year 2030 is about 830,000 hectares. This is more or less equivalent to a food carrying capacity displacement of about 20 million persons in terms of real demand.

6. If their soil nutrient limitations are properly managed, the provinces with very high potential for lowland and upland rice production will be as follows: Palawan, Negros Occidental, Pangasinan, Samar, Tarlac, Zamboanga del Sur,

Zamboanga del Norte, Marinduque, Surigao del Sur, Leyte, Bukidnon, Iloilo, Davao del Norte, Pampanga, and Northern Leyte. However, about 8 of these 15 provinces were reported to be beset with problems brought about by water-based vector borne diseases. Leyte, Samar, Zamboanga del Norte, Zamboanga del Sur, Davao del Norte, and Surigao del Sur have many areas infested with schistosomes. Palawan has a prevalence of malaria, and Marinduque has some areas infested with filaria. The presence of vector borne diseases in these provinces will somehow limit irrigation development in infested areas thereby constraining their productive potentials for rice production.

7. The top potential producers of corn are regions IV, VIII, X, XI, and XII. Most of the top potential corn producing regions are located in Mindanao. Future support for the development of this commodity should therefore give priority to the Mindanao provinces which have the greatest potential. These provinces include Zamboanga del Sur, Davao del Norte, Zamboanga del Norte, and Surigao del Sur.

8. In summary, Regions IV and VIII have the biggest potential in supplying most of the future food needs of the country particularly rice, corn, most fruits, and vegetables. The next two potential food bowls are Regions VI and III for rice, and Regions X and XI for corn, most fruits and legumes, and some vegetables.

9. The meat products with present (1990) supply

deficit at the national level include chicken and duck with a sufficiency ratio of 0.48 and 0.26, respectively. Present chicken production could only support about 29 million people on the basis of effective demand or actual consumption. Hence, the demand of an equal number of people is left unsatisfied assuming that they have the financial capability to purchase such commodities. In actual situation, the deficit in supply could probably be much lower if the Bureau of Agricultural Statistics (BAS) inventory was able to account for all backyard production. On the other hand, the present supply of beef, carabeef, pork, and chevon is adequate to meet the present level of actual demand.

10. Unless the animal population will grow by about 2-3%, the supply of beef, chevon, pork, chicken and duck will be inadequate in the years 2030, 2000, 2010, and 1990, respectively. Region IV tops the list in the production of beef, pork, and chicken while Region II is the top producer of protein from carabeef followed by Region VI. Region VII ranks first in the production of protein from chevon and similarly Region III in duck production.

11. Based on historical average annual catch landings and potential production from aquaculture, the net sustainable fisheries production was estimated to be about 1.05 million metric tons per year; a figure which is quite close to the estimate of about 1.02 million metric tons provided by fisheries expert. The present fish supply is adequate to meet the actual demand of present population (1990). In the next decade,

however, this level of supply will no longer be adequate to meet the actual demand of projected populations. Since demand for fish meat is somewhat elastic, effective demand would possibly adjust downward in the future as the rural income rises.

12. It will be difficult increasing fish supply in the future since present production level is already nearing the maximum sustainable yield estimated by experts. Increasing fish catch beyond the maximum sustainable yield will deplete the stock and decrease sustainable yield in the long term.

13. In terms of nutritional sufficiency of potential food supply that could be produced within the region, all regions except Region VII have the capacity to meet the nutritional (calorie and protein) requirements of their projected 2030 population under high input/technology level. Under intermediate level of input, Regions III, IV, and VII are projected to experience deficiency in protein supply by the year 2030. The requirements of the projected population of Metro Manila was computed under the production capacity of Region IV.

14. On a food self-sufficiency basis, the population carrying capacity of potential food production is estimated to be about 245 million (calorie basis) and 206 million (protein basis) persons under high input/technology; 152 million and 134 million persons under intermediate input/technology; and 60 million and 63 million persons under low input or zero culture. These estimates, however, did not account for reduction factors that will possibly be brought about by environmental quality

deterioration such as soil erosion, water pollution (chemical pollution of fresh water and marine fishing grounds), drought, soil pollution (e.g., mine tailings, pollution of irrigated lands in Pangasinan, La Union and other provinces with mining industry), sedimentation of coastal fishing grounds, deforestation, destruction of coral reefs and mangroves, and other types of environmental degradation. If these projected environmental quality degradation would be factored in the final computation, the foregoing population carrying capacity estimates would further be reduced significantly (possibly by as much as one half or even greater depending on the severity and extent of environmental degradation). What should be emphasized is the fact that mismanagement of our natural resources will put us in a very precarious situation in the next three decades.

VII. Conclusions and Caveats

The results of the study show that even if we fully utilize all our arable lands according to their crop suitabilities under high level of input and technology, we will not be able to attain self-sufficiency in food beyond the year 2038 under an average population growth rate assumption of 2.5%; and beyond 2050 under an average population growth rate assumption of 2.0%. On the other hand, under present level of input and technology, (i.e., intermediate level of inputs), the computed critical years are 2020 and 2028 under an average population growth scenarios of 2.5% and 2.0%, respectively. These scenarios imply that we will probably no longer be self-sufficient in food

before reaching our zero population growth target year (2075).

Extension of critical or "hunger" year may be made possible if we attain a low population growth rate of an average of less than 1.5% in the next 40 years. Another option is to increase our food supporting capacity by adopting improved technology and management practices (i.e., high input/ technology level). However, this option has two main constraints: 1) a large amount of financial investment is needed which may not be readily available; and 2) the time required to develop and adopt a high level technology, and to institutionalize the necessary organizational structures and mechanisms may possibly overlap with the critical decade.

If the country's economic condition will not improve significantly within the next two decades, we will face difficulties in financing the shift from intermediate to high input level. Also during this period, our productive ecosystems will be most vulnerable to degradation as the resource-extractive activities of our burgeoning population intensify.

The results of this study should be interpreted within the context of the assumptions adopted and the limitations of its scope, methodologies, and data/information. Carrying capacity assessment only provides a rough estimate or approximation of the population supporting capacity of a resource system under study. Thus, the results of such assessment should only be used as benchmarks rather than as absolute figures.

Overall, the results of the study imply that food is possibly

not the most limiting or critical factor in terms of supporting future populations if all suitable agricultural lands will be cultivated under the best technological and management inputs. Other resource systems such as energy, forestry, and water which greatly influence land productivity may be more limiting than food in meeting the demand of projected future populations. Degradation of these resource systems, particularly forest and water, has direct and indirect impacts on the productivity of agricultural resources (land and aquatic resources) and therefore will lower the population supporting capacity of food production. What was measured in the study is the population carrying capacity level of potential food production without accounting for the cross-effects of aforementioned resource systems inasmuch as the quantitative determination of their effects on food production is extremely difficult at this stage. As these impacts are quantified in the future, the assessment of carrying capacity can be made more accurate.

The estimated population supporting capacity of potential food production in this study will only remain valid under two major conditions: 1) the level of technology and management input is met; and 2) the quality of land and aquatic resources will not significantly deteriorate and be marginalized in an accelerated pace. Otherwise, iterative carrying capacity assessment must be undertaken to periodically update and validate the capacity of land and aquatic resources to support a certain level of population. The accuracy of the resultant estimates in this study depends, of course, on the validity of the assumptions

'WHEN SISTER EARTH SUFFERS, WOMEN SUFFER TOO': Women's Perspectives on Sustainable Development

• Amaryllis T. Torres



"I know I am made from this earth, as my mother's hands were made from this earth, as her dreams came from this earth and all that I know, I know in this earth... all that I know speaks to me through this earth and I long to tell you, you who are earth too, and listen as we speak to each other of what we know: the light is in us."
(From Katherine Davies, *What is Ecofeminism?*)

I. "Caring for the Earth"

'Caring for the earth' is the battle cry of development activists today. It is an advocacy for strategies that improve the quality of human life within the carrying capacity of the ecosystem. It is an aspiration to meet the needs of present humanity without jeopardizing the heritage of future generations, through harmony and interdependence with other people and with nature. It is a commitment to progress unfettered by the mindless

exploitation of human and natural resources.

'Caring for the earth' has traditionally been the concern of women. Food, fuel and fodder are resources in the natural world which are important to women's work (Black, M., 1989). All over the world, but especially in developing and underdeveloped nations, it is the women who grow, tend, herd, milk and process food. Many continue to rely on open streams for water supply needed in cooking, washing and sanitation. Fuel is obtained from the forests, fields or from animal dung. Fodder for work animals are provided by grasses and other wild vegetation. Even the family's health is sustained by nature: traditional remedies using plants, weeds and herbs in the natural environment are passed on by village women from older to younger generations.

The close communion between women and nature is recognized by our societies, who apply the feminine principle in

symbolizing 'mother nature' and its processes. Land is characterized as 'virgin', 'fertile' or 'barren'. Animals and plants are prized when they are 'productive' strains, or are 'pleasing to the eye'. Air and water are best judged by their 'purity'.

By way of contrast, the exploitation of nature is characterized by the male element. It is men who 'domesticate' animals (and the farmer is a male!). Technology advances through a science that has achieved 'mastery' over nature. At the same time, we now speak of the 'rape' of the earth because of the excesses of modern living, of 'violence' attendant to the massive destruction of forest and marine life, of genetic 'domination' brought about by the green revolution.

II. "When Sister Earth Suffers, Women Suffer Too".

There are obvious parallels between the treatment of women and of nature by males. Through

the permeation of patriarchal values in many societies, women have been considered subordinate to the will of men, deserving their 'care' and 'protection'. At the same time, women are oftentimes treated as property or chattel, and their destinies have been subject to the wills and caprices of men, who may choose to abuse and neglect these submissive 'creatures'.

Similarly, nature has been subjugated by modern men, who behave as though nature exists for their willful consumption and exploitation. At the hands of men, priceless species of trees have been felled to make way for human settlements and 'civilization'. The resources of the sea are imperilled with the effluence of man-made industrial and agricultural pollutants. The diversity of plants and animals has diminished considerably through human abuse or neglect, coupled by the effects of monoculture and selective breeding. These resources are all essential to women's concerns, which is why "when sister earth suffers, women suffer, too."

If loss of biological diversity has resulted from male-dominated science and technology, so also do we see a lack of diversity in the economic activities of women as an outcome of patriarchal thinking. Work opportunities for them are replicas of domestic activities confined to serving, entertaining, cooking, and nursing. Even in areas of work where women make significant contributions, their presence is generally unrecognized or undervalued (for instance, in agriculture). In contrast, males enjoy a variety of work opportunities, with a wide latitude of remunerative possibilities: from contractual work to managerial and executive positions; from

agriculture to manufacturing to services.

While there are parallels in the conditions of women and the rest of nature, there are also interdependencies. We've shown how women's work depend heavily on the use of natural resources. As such, women themselves have been guilty of depleting nature's store. The sustenance and reproduction of food and fodder resources, therefore, hinge heavily on the educated use of mother nature by daughters of the earth.

III. Ecofeminism and Ecology: Parallel Principles

In 1974, Francoise d'Eaubonne coined the word 'ecofeminism' to refer to the emerging idea that women's struggle against oppression runs tandem to the struggle against the destruction of the environment (Davies, K., 1989). Ecofeminism asserts that there are common features in the manner by which nature and women have been controlled and exploited in male-dominated cultures. It suggests that these connections must be understood to stop the exploitation.

The guiding principles of ecofeminism echo those of ecology. To begin with, both streams of thinking acknowledge that the planet is a "single interacting ecosystem, comprised of smaller human and non-human subsystems. (These) are responsive to internal and external forces. Actions in one component influence other remote and apparently unconnected components" (Davies, K. 1989: 14). The world and its components, therefore, are caught up in a holistic system, and actions in one

arena necessarily have impacts on other spheres of living.

For instance, the adverse effects of overlogging is not confined to the forest ecosystem. It affects the state of agricultural and coastal resources as well. Even the rhythm of human society is affected by forest degradation. Moreover, women are active in the various subsystems of the ecology — interacting with nature in the uplands, in the lowlands, as well as at sea. Their contributions to society, therefore, should be assessed in its totality, and women's accepted roles should not be confined to their domestic and reproductive functions.

Related to the first principle, both ecological studies and ecofeminism emphasize the *interdependence* of life forms.

Ecology states that all forms of life are important, and that the separate subsystems must operate in synergy. Thus, humanity cannot assume superiority over nature, because their actions produce results which will affect them later. The chemical pollution of water systems emanating from human misuse, for example, return to haunt the human species by way of the food chain. Nature needs human care to nurture and nourish it; men and women require the nourishment and shelter provided by natural resources.

Similarly, men and women are interdependent human beings. Each one must understand and acknowledge his unique contributions to life on earth, and move as partners rather than as unequals. In this perspective, there is no reason for the oppression of one sex by the other, no explanation for women's so-called 'inferior position' in society.

The principles of inter-dependence and holism imply also the need for maintaining *diversity*. If each sub-system is essential to the totality, then all efforts must be exerted to protect their components. The monoculture of particular strains of grains, trees and vegetables, for instance, has resulted in their invasion by unpredictable insect blights. These insects have become pests because other insect forms with which they have interdependent relations have been lost.

Similarly, it has been established that planting of legumes between rice production seasons rejuvenates the lost

notion that ecological systems are *non-hierarchical*. Each part of every system is important, with its own role and contributions in the natural world. Humanity and nature are equally important components of the ecosystem. Hence, the first cannot be allowed to ravage 'lower' species at will.

In a system with equality among its elements, there is no reason for one nation to subjugate another, for any race to feel it has primacy over the rest, or for a sex to assume domination over the other. The degradation of natural resources can be linked to these expressions of domination and subjugation.

way, the adage that 'the end justifies the means' is rejected as a non-sustainable strategy. If we are to allow future generations to enjoy the planet, utmost care must be taken to preserve and conserve resources.

Technologies used must not only be appropriate to the needs of men and women. They must also be appropriate to nature. Regeneration, reproducibility, diversity and vitality of species must be respected. Similarly, technologies addressing basic human needs (such as food, clothing and shelter) should be developed through an initial process of gender consultation, adequately

“Technologies used must not only be appropriate to the needs of men and women. They must also be appropriate to nature. Regeneration, reproducibility, diversity and vitality of species must be respected.”

nutrients of the soil. Diversity, in this case, ensures productivity.

A dynamic ecosystem fuels creativity and spawns the emergence of higher-level ecosystems. To the extent that nature is varied, new adaptations to emerging forces evolve faster. Similarly, women's potential energies are unleashed better by affording them diverse opportunities to exercise control, to make decisions and to take stands, to develop innovative skills, and to partake of emerging frontiers of knowledge. Women, therefore, must fully participate in the mainstream activities of science, culture and socio-political life, to be freed from the fetters of ignorance, indecisiveness and low self-esteem, rising instead to parallel achievements as men.

The next principle logically follows from the first ones: the

Colonization has always been a deliberate effort by 'more civilized' nations to conquer areas with rich natural resources. In the Philippines, for example, vast forests were felled by both the Spaniards and Americans alike for settlements, coral reefs were cut by the friars for their churches, and traditional crops were substituted with those desired for consumption by the European and/or American masters. World Wars have been fought over spices, gold and oil, resulting in both the despoilation of the environment and of women. If the ecosystem is no longer deemed sustainable, it is because its elements have been held in disrespect.

Finally, ecofeminism and ecology stress the finite nature of living resources. The *process* by which we make use of resources is of paramount importance. In this

addressing the unique requirements of both men and women as they are geographically and socially situated in the ecosystem.

IV. Women's Actions to Reclaim the Earth

Women's continuing concern for the environment finds expression in many ways. Several examples will be cited here.

One of the most dramatic movements in recent history rooted in environmental concerns is the Chipko Movement in India. In 1974, village women in Uttar Pradesh decided to act against a commercial enterprise about to cut some 2,500 trees in their forests. The women were alone because their menfolk had gone to the lowlands to work. When the cutters arrived, they went to the forests, linked hands and encircled

the trees (IDOC, 1989). The loggers were told that if they wanted to cut the trees, the men would have to cut off the heads of the women first. Faced with this human barricade, the loggers withdrew, and the forest was saved. Hearing of their actions, female villagers in other settlements surrounding the forest decided to do likewise: they guarded the forests and wrapped their bodies around trees scheduled to be felled. As a result of these actions, Indira Gandhi issued a 15-year ban on logging in the Uttar Pradesh forests.

Women's groups in Sarawak have similarly been mobilized to protest the massive destruction of their forests, and to protect their tribal settlements. In the past several years, they have lobbied with government to stop the grant of logging concessions, launched mass actions against logging companies, and have undertaken informational and educational programs for the Sarawak people. They have also fought for solidarity with indigenous peoples in other parts of the world, who are similarly being ousted from their forest settlements.

In the Philippines, women also have been engaged in actions for environmental protection.

In the late '70s, Igorot women were at the forefront in the protest movement against the construction of the Chico River Dam in the Cordilleras. The tribal people did not want the dam because it would inundate their sacred grounds. Besides, the benefits to their own settlements were unclear.

The women organized themselves and trekked to the site where the surveyors set camp (Cordillera Women's Education and Resource Center, n.d.). They

dismantled the tents and carried them to the town's capital. For their continued protest actions, the women and men of the Cordilleras were arrested and harassed by the military. Nonetheless, through their persistent protest actions even with the risk of death, the indigenous people of the Cordilleras won their cause: the project was eventually aborted.

Filipino women have also been engaged in other less dramatic but equally significant actions concerning ecology. In many organized coastal communities today, women join their menfolk in protesting against illegal fishing practices, especially against the use of fine mesh nets which catch immature fish, or the use of dynamite or cyanide for fishing. In a coastal town of Antique, a community association which uses a stationary fishing device called the *otoshi ani* for fishing is managed by women leaders.

In some organizations adopting sustainable agricultural technologies in Central Luzon, women join the men in seed production and conservation of traditional rice varieties. Composting has also become the focus of many women's projects. A woman's group in Luzon also has a proposal in the pipeline to do reforestation and forest nursery management.

In the urban areas, waste management projects are becoming popular with women's groups, along with garbage sorting and recycling. Consumer education groups are extending their work among the poor communities, and allow women to make better decisions about their purchases. A large women's group in Manila is engaged in soap-making, using only pure soap

ingredients. Its laundry bars are marketed as a counterforce to the more destructive enzyme-based detergents, while its bath soaps products are inexpensive though well-packaged alternatives to the more expensive foreign brands.

Many other Filipino women routinely help in sustainable development. Those who have continued to breed and cultivate our native plants are unwitting conservators of our ecology. The *herbolarios* whose traditional medicine has been rediscovered carry with them the secrets of plant life and forest diversity. The recipes of our *lolas* describe as well the rich variety of native foods which are nutritious and inexpensive. Someday, we hope these natural foods will effectively replace processed and less nutritious snack products now on sale.

Even our indigenous weavers do their part in ecological conservation. Not only do they make use of local materials for their work; they transmit as well the patterns and designs of our forebears. In this manner, weavers continue to enrich our culture with "local" ideas and patterns, emanating from traditional Filipino lifeways.

V. Foresight: An Agenda on Women and Sustainable Development

Ecofeminism describes the interrelatedness between the oppression of women and the degradation of the environment. For social science, this perspective can provide the basis for examining further the nature of the relationships between men, women and the natural world.

To begin with, one may ask: are the ways of knowing the

secrets of nature linked to gender roles? Do male farmers, for instance, experience the universe in ways peculiar to their work? Are women's designs in their weaving representational of their feminine experiences? Are these experiences mirrors of egalitarian or oppressive existence? Are there parallels in the ways that various generations of women respond to aspects of nature, because of their feminine socialization? Are these responses different from those of the men?

Secondly, it would be interesting to discover the variety of lore and traditional technologies of our women concerning plant and animal life, or regarding the forest, farm and marine ecosystems. Which traditional practices in agriculture and fishing emanate from gender experiences? Why are there numerous taboos concerning the participation of women in some economic activities (like fishing, for instance)? What traditional skills did our women have in pre-colonial times related to the use of natural resources? Do these knowledge and skills exist today? Why are they displaced or lost to current generations?

Third, it is important to document the specific effects that

new technologies and environmental degradation have had on the lives of women. For instance, what have been the effects of the green revolution on the available food resources of rural women? What are the diverse effects of pesticides and inorganic fertilizers on women's reproductive health? on her offsprings? Among urban women, one may well ask: What ailments and diseases are female scavengers in the garbage dumps susceptible to? What are the effects of chemical additives, preservatives, and specific technologies on women who process meat and fish? In what ways have women's work opportunities and work load been affected by the loss of forest cover, by drought and flooding?

Finally, the social science scholar may well ask: In what ways can women contribute to the continuing sustainability of the universe? How can we make their contributions socially and economically significant? How can the Daughters of the Earth bring back to Mother Nature its vitality and creative energies, so that the interdependence of humanity and the planet can remain in homeostasis for the future generations?

The sustainability of the universe is everyone's agenda today. It can be achieved by developing harmony and wholeness among the inhabitants of the planet. A sustainable future is for us — the human race — as much as it is for the earth. And humanity includes women. Greater harmony, equality and interdependence, therefore, should characterize the nature of future relationships among males and females of this race. ■

REFERENCES

- Black, M. "Mothers of the Earth." IDOC, 20 (3), 1989, pp. 17-19.
- Cordillera Women's Education & Resource Center. "A Primer on Peasant Women in the Cordillera." April 1991.
- Davies, K. "What is Ecofeminism?" IDOC, 20 (3), 1989, pp. 14-16.
- IUCN, UNEP, WWF. Caring for the Earth: a strategy for sustainable living. Switzerland, October 1991.
- Rodda, A. Women and the Environment. London: Zed Books, 1991. "Seeds of hope for a different future." IDOC, 20 (3), 1989, 20-23.
- Shiva, V. Staying Alive: Women, Ecology, and Development. London: Zed Books, 1988.
- Shiva, V., et al. Biodiversity: Social and Ecological Perspectives. Malaysia: World Rainforest Movement, 1991.

PSSC Desktop Publishing Unit

For:	Rates per page*
Text already encoded	P35.00
Text not yet encoded	50.00
Text with tables or charts	50.00
Laser printing	10.00



* Regular and associate members of the PSSC are given lower rates. For your desktop publishing needs, please call 9229621 loc. 319 (ask for Elvie or Jacob) or visit us at 2nd Floor, PSSCenter, Commonwealth Avenue, Diliman, Quezon City.

ENVIRONMENTAL IMPACT ASSESSMENT: A POLICY NEED FOR SUSTAINABLE DEVELOPMENT

• Telesforo W. Luna, Jr., Ph.D.*

For sustainable human development to succeed in the Philippines, i.e., the challenge of reconciling capacity for growth, the opportunities and constraints that arise in interactions with the natural environment must be faced squarely. The country has a finite resource base and as evidenced by a series of continuing natural disastrous events, an environment that is susceptible to rapid deleterious changes.

Efforts to manage the interactions between people and their environment can be traced back to earlier human civilizations. What must be looked into closely is the transformation of the management problem by unprecedented increases in the rate, scale and complexities in the interactions. Straightforward confrontations between environmental conservation and economic growth now involve multiple linkages such as the feedbacks among energy consumption, agriculture and climatic change. What were once local incidents of pollution like acid precipitation now involve a number of nations particularly the developed countries. What were once thought of to be cases of relatively reversible damage now affect several generations, e.g., chemical

and radio-active waste disposal are not just current problems, they will affect future generations.

All of these changes stem from the interdependence between human development and the environment. Over the years it became generally accepted that interactions between human development and their environment must be managed with the goal of sustainable development. Admittedly, different people who live in different circumstances have different values. Whatever it is, people in the Philippines must learn to relate local development to the national level and eventually to a global environmental perspective. In the end though, programs and strategies must translate into action if they are to have any impact at all.

Legislative Framework of the Environmental Impact Statement

The legislative framework for the environmental policy of the Philippines is Presidential Decree No. 1151 (PD 1151) entitled "Philippine Environmental Policy" enacted and made effective on June 6, 1977. The details of the policy are set forth in PD 1586 entitled "Establishing An Environ-

mental Impact Statement System, Including Other Environmental Management Related Measures And For Other Purposes." This decree was enacted and made effective on June 11, 1978. Under Section 4 of this decree, the preparation of environmental impact statements is necessary for all environmentally critical areas and projects prior to issuance of an Environmental Compliance Certificate (ECC). Under Section 5, all other projects, undertakings and areas not considered as environmentally critical are not required to submit environmental impact statements although they may be required to provide additional safeguards as deemed necessary.

Other environmentally related legislation includes PD 1121 creating the National Environmental Protection Council; PD 1152, the Philippine Environment Code which established specific environmental management policies and environmental quality standards; Presidential Proclamation No. 2146 identifying certain areas and types of projects as environmentally critical and within the scope of the EIS System; the Local Government Code of 1991 which states among others that for the maintenance of

*Professor and Chairman, Department of Geography, CSSP, U.P. Diliman. Also President, Philippine Geographical Society and member of The Environmental Impact Assessment Review Committee, Environmental Management Bureau, DENR.

ecological balance, consultations shall be conducted with, and approval be obtained from, appropriate local government units, non-governmental and people's organizations, and other concerned sectors of the community before any project or program is implemented in their respective jurisdictions; and Executive Order No. 368, which requires proponents of projects or undertakings to seek local clearance from the Housing and Land Use Regulatory Board, to insure that projects are in accordance with the land use plans and zoning ordinances of respective local government units. The PDs are further supplemented by the Department of Environment and Natural Resources (DENR) Administrative Orders revising and amending specific rules and regulations.

At present, the DENR is charged with the implementation of national environmental policies. All environmental impact statements or assessments are submitted to the Environmental Management Bureau (EMB), specifically the Environmental Impact Assessment Processing Unit for review and evaluation. Eventually, this unit makes the recommendation for an ECC putting down the provisions that the specific project must follow in its operations. The Office of the Secretary of the DENR makes the final approval of the ECC.

What Is An Environmental Impact Statement?

The environmental impact statement (EIS) is a mechanism to ensure that major projects or programs undergo comprehensive review prior to construction or implementation. The EIS entails a multidisciplinary assessment of

the environmental, economic and social impacts of a project or program proposal for accomplishing interest goals.

An underlying premise of the EIS is that decision making will improve and a better balance will emerge between interest goals, public or private, and environmental concerns if a broad range of environmental attributes and alternatives to a proposed undertaking are reviewed and evaluated before final decisions are solidified and implemented. The EIS process, therefore, aids decision makers in identifying actions likely to degrade environmental quality. Thus, adverse impacts will be avoided or at least minimized. It should be pointed out that in the process of preparing the EIS, the formal procedure for determining possible impacts of a certain project is the environmental impact assessment (EIA). When the EIA, prepared by the project proponent, is finalized taking into account the comments of government agencies and interested parties, public hearing proceedings, if conducted, the document becomes the EIS.

Scope of the Environmental Impact Assessment

An EIA submitted by a project proponent should enable agencies or individuals reviewing the document to make a complete and balanced assessment of the potential impacts of the project being considered. Regardless of the degree of technical analysis, an educated lay person should be able to understand the conclusions and reasoning which led to the preparation of an EIA.

Generally, the breadth and depth of an EIA are determined by the specific proposal. Because

each project is unique, the level of detail in its EIA must be based on its characteristics. Some of these include the geographic extent of the proposal, the potential future ramifications, the generality versus the specificity of the proposal, and the complexity of primary and secondary effects. Although more extensive projects generally will require more extensive EIAs, one should not overlook the fact that even a small project may destroy an important historico-cultural site or a unique wildlife habitat. Overall, the extent of research and information data in the EIA should, in some way, reflect the potential cost to society of the adverse impacts.

Specific projects and the environmental resources they use determine not only the overall dimensions of an EIA but also the area of emphasis within the project proposal. For example, a manufacturing in an urban area would likely have crucial impacts on social, economic and aesthetic conditions, whereas the impacts on the flora and fauna of an already significantly altered natural environment might be minimal. On the other hand, a proposed dam in connection with a hydroelectric energy project would require greatly expanded analysis of flooding and water quality, and the relocation of inhabitants whose settlements are affected by the reservoir. Therefore, the EIA must be comprehensive enough not to miss any significant impact, and must identify the areas of greatest concern and concentrate on them. To this extent the review and evaluation later on of the EIA will be somehow enhanced. At any rate, the preparation process varies in each proposal.

“Sustainable human development is dependent on the availability of organized information on the physical state of the environment as well as social and economic factors.”

General Areas Covered By An EIA And Needed Expertise

Preparing an EIA could be difficult because the concept and scope are broad. Thus, the team preparing the EIA must by all means be multidisciplinary in training and expertise. Such a composition should greatly reduce the possibility of overlooking important impacts.

The most common areas covered in the preparation of EIAs with their associated disciplines are: 1) Air — meteorology and climatology; 2) Land — agriculture, geography, geology, geomorphology, soils, land use planning; 3) Fresh water — water resources, hydrology, limnology; 4) Marine water — marine biology, marine geology; 5) Flora — botany, forestry, ecology; 6) Fauna — zoology, biology, ecology; and, 7) Socio-economics — anthropology, economics, geography, sociology, demography and health service.

Topics Generic To The Preparation Of An EIA

The first of these is the description of the existing environment. Subtopics include the general geographic location of the project for which maps are needed showing the physical and cultural features. These maps will also serve as references when the important issue of environmental impacts are discussed. The land

aspect must include information on soil and its characteristics; topography; geology; water bodies, quality and drainage features; air in which the climatic and meteorological characteristics, air quality and odor are considered. Another subtopic to be covered are human settlements including physical infrastructures, the socio economic structures, health and the aesthetic environment.

Another topic generic to the preparation of the EIA is the future environmental condition without the project in which the same subtopics covered under the existing environment are again taken into account.

The third topic is the assessment of the probable impacts of different aspects of the project on the existing environment. This information is important to an EIA. If possible checklists and evaluative devices must be presented to help identify and weigh the relative importance and effects of the expected different impacts. Both probable adverse and beneficial impacts must be presented. Benefits may be to individuals, neighborhoods or the country in general; adverse effects may be felt by the same or other entities. Probable construction period impacts, probable short-term impacts and probable long-term effects should be presented.

Another topic is the mitigating measures that are to be taken in

cases of adverse construction period impacts and operational phase impacts. Again, it must be remembered that different project proposals may induce different impacts physically or socio-economically. Mitigating measures which are intended to minimize adverse impacts are usually construction methods and designs that are widely used, although some unique methods may be developed for a specific project.

Admittedly, no matter how detailed or comprehensive the EIA may be, there appears to be no way of ensuring that all significant, scientifically ascertainable impacts will be included. At the outset of the preparation of the EIA, it may be discovered that some required reviews included in the guidelines issued by the EMB cannot be undertaken simply because information or data are lacking. It is at this instance where the expertise of the individual members of the multidisciplinary team preparing the EIA comes in.

The EIA is very important to the implementation of the proposed project or program for the issuance of the ECC depends on its acceptance or approval.

In conclusion, sustainable human development is dependent on the availability of organized information on the physical state of the environment as well as social and economic factors. However, decision making continues to be made on the ignorance of the changing state and capacity of the environment and its implications for human well being. Most developing countries like the Philippines, still face the constraint of limited access to modern technological facilities and to the necessary expertise to collect and interpret environmental data. ■

PHILIPPINE ENCYCLOPEDIA OF THE SOCIAL SCIENCES

The Philippine Social Science Council, marking its 25th anniversary, is launching the first of the five-volume Philippine Encyclopedia of the Social Sciences. The entire book is devoted to the disciplines of history and statistics prepared by the Philippine Historical Association (PHA) and the Philippine Statistical Association, respectively. The book boasts of the articles authored by outstanding social scientists which delve into the history of the discipline, state of the art, and outstanding personages who have contributed in the development of the discipline. Noted historians and statisticians in the Philippines pooled their resources and expertise to finally produce the first volume of the Encyclopedia. The second volume is now being processed by the PSSC Desktop Publishing unit.

Dr. Armand V. Fabella, Secretary of the Department of Education, Culture and Sports endorsed the Philippine Encyclopedia of the Social Sciences as "an ideal source of educational and reference material to everybody." In his Foreword to the Encyclopedia he noted that it "is one among the numerous projects done by the PSSC for the promotion of education.... This Encyclopedia can help enrich the basic texts available in the hands of our students. May this material help in improving the quality of learning of our graduates."

Dr. Domingo C. Salita, Chairman of the Council Editorial Board of the Encyclopedia Project, says of the Encyclopedia as "the biggest scholarly project of

the PSSC in its twenty-five years of existence." Excerpts of his Preface read:

"This monumental task was undertaken by the fourteen member associations of the PSSC which took upon themselves as a challenge to bring together their collective knowledge of the various disciplines comprising the broad division of the social sciences... They include the disciplines of anthropology, communication, economics, geography, history, linguistics, political science, psychology, public administration, social work, sociology and statistics.

"Considering its coverage and the number of scientific organizations that participated, this special encyclopedia is the first of its kind in the country. It is hoped that this modest effort of our social scientists and scholars in producing this encyclopedia will serve as a worthy and lasting legacy to our people."

Dr. Rosario Mendoza Cortes, Editor-in-Chief of the PHA Disciplinary Board, wrote in her Introduction:

"The writing of this Section of the Philippine Encyclopedia of the Social Sciences dealing with the discipline of history was wholly prepared by the Board of Governors and members of the Philippine Historical Association (PHA). As the discipline of the history is the oldest and is in fact regarded as the mother of the social sciences, it seems highly appropriate that the first of the five volumes that will

constitute the Encyclopedia should contain the discipline of history.

"The structure of this work...divides the write-up into three Parts: Part I, History and State of the Art; Part II, Outstanding Practitioners; and Part III, a Glossary of Terms and Concepts and Personages in Philippine History. While the other disciplines contain only a Glossary of Terms and Concepts, it was believed necessary to include historical personages in this particular Glossary for history would not be history without the personages who make history."

PHA's section of History boasts of "Dr. Salamanca's thorough review of the historiographical literature, whether by Filipino or American scholars, that all the historians who have ever done research on any aspect of Philippine history are mentioned herein. The wealth of Philippine historiography as revealed by Dr. Salamanca indicates the vigor of and bodes well for the discipline. A complementary essay presenting other trends and views in Philippine historiography is presented by Dr. Jaime B. Veneracion. These reviews should be gratifying... because Part II which covers the Outstanding Historians includes, except for Encarnacion Alzona, the *doyenne* of Filipino historians, only the non-living historians.... Part II... includes brief discussions of all the major periods in Philippine history, major events, historical terms and important personages who have played significant role in the country's history, not the least

of whom are the Muslims in the Philippines."

Dr. Cristina P. Parcel, Editor-in-Chief of the PSA Disciplinary Board, discussed in her Introduction what statistics really is, in contradistinction to the layman's understanding of the term. Says she:

"To the average layman, statistics is believed to be just a set of data represented by charts or graphs which are usually found in the business section of newspapers. The clerks in different government offices who assemble these figures and represent them in tables or charts are often called 'statisticians'. But a statistician

is not the one who does these chores; a statistician designs scientific studies, analyses and interprets results of these studies, and presents these results in such a manner that they can be used as the basis for logical decisions needed for policy making.

"Statistics permeates practically all fields of study - agriculture, business, economics, education, medicine, biology, sociology, psychology, etc.... Statistics embraces many aspects of research and management operations. However, it is to the design of experiments and survey that statistics as a field, makes many

and notable contributions. For this reason, statistics is often referred to as the 'tool' of all sciences, and was one time called the 'language of research.'"

These and a lot more are in store for you when you buy the first volume of the Philippine Encyclopedia of the Social Sciences featuring History and Statistics. Get yourself surprise gifts from the PSSC Central Subscription Service, the exclusive distributor of the Encyclopedia. See or call Ms. Lydia Wenceslao at PSSCcenter, Commonwealth Avenue, Diliman, Q.C., with telephone number 922-96-21 local 338.

NEW PUBLICATION LAUNCHED BY THE PHILIPPINE NATIONAL HISTORICAL ASSOCIATION (PNHS) AND HERITAGE PUBLISHING HOUSE (HPH)

The Philippine National Historical Society and the Heritage Publishing House have launched a new book focusing on Local History.

The book *Story of a Province: Surigao Across the Years* by Fernando A. Almada, Jr. is the history of the Surigaonons seen through the eyes of a native son. In this work, Mr. Almada has made a significant contribution to local history by tracing the social, cultural, political and oral history from the grassroots. He also founded the Surigaonon Heritage Studies and Research Center Foundation which is dedicated to the promotion of history and other aspects of the cultural legacy of Surigao.

The PNHS, in its commitment to foster recognition of our cultural heritage through research,

particularly the study of local history, has offered Filipino scholars the opportunity to bring up the latest findings in the field through its publications. For the past 50 years, PNHS has continuously published its *Journal of History* which serves as a venue for research work of Filipino scholars. Lately, it has broadened its venue through its monograph series among which is the recently-launched book by Mr. Almada - *Story of a Province: Surigao Across the Years*.

Copies of the book can be obtained through the PSSC Central Subscription Service, PSSCcenter, Commonwealth Avenue, Diliman, Q.C., telephone number 922-96-21 local 338.

REQUIEM

The PSSC condoles with the bereaved families, relatives and friends of noted social scientists—Dr. William Henry Scott, Historian and Anthropologist and Dr. Mario M. Zamora, Anthropologist and public luminary, Dr. Salvador P. Lopez. PSSC will pay tribute to the exemplary contributions and dedicated service of Drs. S.P. Lopez, W.H. Scott and M.D. Zamora. Together with the highlights of the PSSC Silver Jubilee, features of their professional lives will comprise the 4th issue of the PSSC Social Science Information.

Office Holders 1993-1994

GOVERNING COUNCIL

Carmencita T. Aguilar
Chairperson
Allen L. Tan
Vice-Chairperson
Ruben F. Trinidad
Secretary

Leslie E. Bauzon	Telesforo W. Luna
Emma S. Castillo	Nelle R. Marquez
Ibarra M. Gonzalez, S. J.	Angela L. Pangan
Milagros C. Guerrero	Corazon M. Raymundo
Mario B. Lamberte	Patricia A. Sto. Tomas
Corazon B. Lamug	Lerna D. Yambot
Amaryllis T. Torres, ex-officio	

EXECUTIVE BOARD

Amaryllis T. Torres
President
Teodoro M. Santos
Vice-President
Ma. Concepcion P. Alfiler
Treasurer
Ruben F. Trinidad
Secretary

Shirley C. Advincula	Eliseo A. de Guzman
Clemen C. Aquino	Generoso de Guzman
Della R. Barcelona	Gonzalo H. Jurado
Erlinda A. Cordero	Fe T. Otanes
Rosario M. Cortes	Sabino G. Padilla, Jr.
Socorro L. Reyes, ex-officio	
Carmencita T. Aguilar, ex-officio	

SECRETARIAT

Ruben F. Trinidad
Executive Director
Lorna P. Makil
*Senior Coordinator, Project Development and
Publication Division*
Alana Gorospe-Ramos
*Coordinator, Project Development and
Publication Division*
Leo F. Malinay
Administrative and Finance Division