NATIONAL ENVIRONMENTAL ACTION PLAN

Philippine Strategy for Sustainable Development
Part 1
A Conceptual Framework

January 1990

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PHILIPPINE STRATEGY FOR SUSTAINABLE DEVELOPMENT

PART 1
A CONCEPTUAL FRAMEWORK

DEPARTMENT OF ENVIRONMENT OF NATURAL RESOURCES

JANUARY 1990

(approved by Cabinet November 1990)
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FOREWORD

The Department of Environment and Natural Resources initiated in 1987 the process of formulating a Philippine Strategy for Sustainable Development (PSSD).

Through a series of consultations with the different sectors of society, the concept took form and substance.

In a national workshop held on June 6, 1988, a formal resolution urging the President and the Congress of the Republic of the Philippines to adopt and implement a Philippine Strategy for Sustainable Development was passed.

Following the national workshop, the draft PSSD framework went through a series of regional and sectoral consultations.

On June 22, 1989 it was presented to the Cabinet Assistance System (CAS) Plenary for comments. CAS-CRD was then tasked to input PSSD principles into the formulation of the Strategy for Sustainable Development in the Rural Sector. A consensus was made to adopt the PSSD concept in a joint meeting of the CAS-CRD and the Cabinet Cluster A on Rural Development on August 3, 1989.

On November 29, 1989, the Cabinet passed Cabinet Resolution No. 37 approving the Conceptual Framework of the PSSD subject to the following approved modifications:

1. The Philippine Strategy for Sustainable Development shall address specifically the adverse impact of growth and development such as but not limited to pollution from factories and pesticide buildup from agriculture; and the depletion and degradation of natural resources due mainly to misuse and over-exploitation.

2. It shall consist of a set of general strategies to resolve and reconcile the diverse and sometimes conflicting environmental, demographic, economic and natural resource use issues arising from the country's development efforts; and sectoral strategies identified after a review of the current efforts being undertaken in each of the identified sectors.

3. The general strategies shall include the integration of environmental considerations in decision making, proper resource pricing, property rights reform, conservation of biodiversity, rehabilitation of degraded ecosystem, strengthening of residual management (pollution control), control of population growth and human resources development, inducing growth in rural areas, promotion of environmental education and strengthening of citizens participation.

4. The conceptual framework shall be the basis for the formulation of strategies for each of the identified sectors, namely:
population, environment and natural resources, agriculture, industry, infrastructure and energy.

The resolution also directs all the pertinent agencies to review the respective development programs and projects for consistency with the PSSD framework.

This document contains the PSSD conceptual framework incorporating the relevant modifications as directed in Cabinet Resolution No. 37.

Accompanying the volume are two other documents which contain the policy and institutional reform measures and action program initiated and proposed by DENR. These documents represent the efforts undertaken by DENR to operationalize the PSSD.

Pertinent sectoral agencies are now in the process of reviewing their policies, programs and projects for consistency with the PSSD framework. Initial outputs have been submitted to DENR and are contained in a separate document.

The same process will be undertaken at the sub-national levels for more accurate focusing of the areal dimensions/implications of the strategy.

The translation of the PSSD conceptual framework will have reached its final cycle with the preparation of a Government Action Program.

The GOP Action Program while specifically addressing the concerns of a strategy for sustainable development will be treated as an integral component of the country's national development plan.
THE PHILIPPINE STRATEGY FOR SUSTAINABLE DEVELOPMENT

PART 1: CONCEPT FRAMEWORK

GOAL: SUSTAINABLE DEVELOPMENT

ASSESSMENT OF MAJOR SECTORS

GENERAL STRATEGIES

GUIDING PRINCIPLES

PART 2: POLICIES / POLICY INSTRUMENTS

PART 3: ACTION PROGRAMS / INSTITUTIONAL REFORMS
1 RATIONALE: THE ECOLOGICAL IMPERATIVES IN THE PHILIPPINE CONTEXT

One of the more revealing lessons learned during the past two decades of environmental awakening in the Philippines is that the maintenance of the earth's delicate balance by the mere prophylactics of pollution control and other ecological mitigation measures cannot ensure sustainable development. There is now a compelling need to overhaul the traditional concepts of development, with its exclusive focus on economic principles and the political economy of natural resources. In 1979, Rafael Salas was already attuned to this emerging world view when he said:

"We are tending globally towards a more holistic view of development with its emphasis on relating environmental factors to programmes. Population growth and development patterns not only affect the demand for resources but also generate environmental changes which will have repercussions on the future carrying capacity of the earth. At the global level, it is not only necessary to take into account the resources required to feed, clothe and shelter a growing population but also the type of technology which will make this possible without worsening the environment. It is, indeed, proper to ask at this point how far population and development plans are consistent with the prudent use of resources, and do not bring about the degradation of our environment"(1)

Most Filipinos still depend on natural resource systems for their subsistence and must therefore confront the inexorable reality of ecological principles. Two thirds of the Philippine population live in the rural areas and depend on agriculture, fisheries and forestry. Soil erosion, deforestation, pollution and declining fish catch all point to the fact that the limits of the natural carrying capacity are already being exceeded. While it is true that we can extend the limits by technological fixes such as the green revolution and by industrialization, these responses take time and the galloping population growth extinguishes whatever little gains we make. Secretary Fulgenciao S. Factoran vividly describes the national situation:

"With a high population growth rate the country is like a patient on a treadmill furiously running faster and faster, each stride becoming more difficult, but not getting anywhere."(2)

Population Pressure

Indeed, there are strong coincidences between population growth, resource depletion, environmental quality, and the incidence of poverty. These apparent linkages are graphically portrayed in Figures 1, 2, and 3 for the Philippine situation. They are the result of the development efforts of the past which failed to consider both population and environment as resource bases that must be nurtured and taken care of as the central assets behind the development process.(3) Figure 1 shows the increasing population and the decreasing forest cover during the last five decades. Since the Philippines was almost all forest in its natural state and since the country's topography and ecology appear to be significantly controlled by the ecological dynamics of the forests, the state of the forests could serve as a qualitative surrogate of environmental quality. Figure 2 reinforces the observation of the connection between population and forest cover because it exhibits a clear correlation between population density and forest cover as they occur in the
various regions of the Philippines. The linkage between development and forest cover is shown in Figure 3. This figure exhibits the regional variations of the correlation between the incidence of poverty and remaining forest cover. There are a host of other quantitative and qualitative indicators that could testify to the ominous decline of environmental quality such as the ravaging of fishing grounds and coral reefs, the pollution of rivers, lakes, and bays, and the clearly visible air pollution in Metro Manila.(4)

**Economic Costs**

It is possible to get a rough estimate of the economic cost of deforestation. The conversion of one hectare of old growth forest amounts to a loss of about 100 cubic meters of commercial quality logs, not to mention its potential for sustained yield at a growth rate of about 2.4 cubic meters per hectare per year. If these are computed at the current price of about P2,900 per cubic meter, and assuming that profit amounts to 50% of gross revenue, this will represent a loss in net profit of around P145,000 per hectare.

Estimates show that some 119,000 hectares of natural forest vegetation were destroyed in 1988, amounting to a gross loss of around P34.5 billion per year, or a loss in net profit of about P17.3 billion. Even if these areas have been logged according to recommended practices, loss of future revenues would still amount to P5.7 billion or a total of US$12.98 million net per year.

Deforestation is responsible for erosion of all uplands. Here we also have an indication of the monetary cost of the loss. In the case of Magat watershed, annual erosion rate is pegged at 219 tons per hectare for open grassland and 71 tons per hectare for other land uses. Using the above erosion rates as basis, actual economic costs of soil nutrient loss amount to P1,068 to P3,392 per hectare per year. For the Pantabangan watershed the total value of soil nutrient loss was estimated at P2,541 per hectare if erosion takes place from the first 5 cm. layer of the top soil.(5)

Thus, the unecological use of forests entails huge economic losses.

Development policies, without the guidance of ecological principles, could go astray. This was clearly demonstrated by the past government's policy of converting mangrove swamps into fishponds in the hope of accelerating food production. The ultimate impact of this policy was the decimation of virgin mangrove swamps from 500,000 hectares in the 1950's to only about 38,000 hectares of original vegetation in 1985. Studies now show that we have lost more in terms of sustainable fisheries production with the loss of spawning grounds, rich nutrient pools and the protective values provided by mangrove ecosystems.

According to estimates, one hectare of a fully developed mangrove plantation could produce an annual yield of 100 kgs. of finfish, 25 kgs. of shrimp, 15 kgs. of crabmeat, 200 kgs. of mollusks, and 40 kgs. of sea cucumber in a direct harvest.(6)

The economic cost of air pollution is not yet well studied in the Philippine context. Experience from the US situation, however, shows that air pollution is costly. According to the World Resources Institute in the U.S. :
- Agricultural losses for 1987 due to increase of ozone concentration amounted to US$5.2 billion;

- On the other hand, the benefit of attaining standards for particulates and sulfur dioxide is estimated to be at US$500 million per year.

**Costs to the Ecosystem**

Concern, however, should not focus mainly on economic costs. An unquantifiable cost of forest destruction is the loss of species and genetic diversity. Even estimates for this tragic loss do not exist for the Philippines. Dr. Seymour Sohmer of the Bishop Museum of Honolulu, who has been studying Philippine flora for many years now, asserts that we have already lost about 40% of our endemic flora. Philippine losses contribute to the global loss of biological diversity estimated at about 100 species per year. By the year 2000, it is predicted that about a million species would have been lost forever. In general, a decrease in the diversity of flora and fauna makes ecosystems less stable.

Environmental degradation has other serious implications. According to Ganapin, "for a developing country like the Philippines, the impacts of environmental degradation are much more serious than simply erosion or pollution. In many cases, the social and political impacts are of greater dimension and are more direct. The poor become poorer. And as larger populations are pushed into a desperate struggle for survival, they wrought larger damage to the environment and the cycle continues. There comes a time, however, when this vicious cycle reaches a limit and the fragile fabric of a stressed society starts to unravel. The gun substitutes for the plow. The fire that used to burn forests becomes fire that will consume society." (7)
2 THE PHILIPPINE STRATEGY FOR SUSTAINABLE DEVELOPMENT (PSSD): THE CONCEPTUAL FRAMEWORK

The only rational way of planning the country's national progress is through sustainable development: meeting the needs of citizens of today without limiting the options of future generations to fulfill their needs. It is development without destruction; it is the achievement of material progress without compromising the life-support functions of natural systems; it is the pursuit of higher levels of quality of life while preserving or even enhancing environmental quality. It is the only true development.

2.1 GOAL AND OBJECTIVES

Goal

Sustainable development stresses the need to view environmental protection and economic growth as mutually compatible. This implies that growth objectives should be compatible not only to the needs of society but also to the natural dynamics and carrying capacities of ecosystems.

The goal of the PSSD is to achieve economic growth with adequate protection of the country's biological resources and its diversity, vital ecosystem functions, and over-all environmental quality.

Objectives

The following objectives have been identified toward the attainment of the PSSD goal.

1. To ensure the sustainable utilization of the country's natural resources such as forests, croplands, marine, and freshwater ecosystems.

2. To promote social and intergenerational equity in the utilization of the country's natural resources.

3. To develop management programs to preserve the country's heritage of biological diversity.

4. To promote the technologies of sustainable lowland agriculture and upland agroforestry through the encouragement of research and development (R and D) and demonstration projects.

5. To achieve and maintain an acceptable quality of air and water.

6. To promote and encourage an exploration program for economically important minerals.
7. To promote R and D in environmentally-sound and economically-efficient processing of the country’s mineral and energy resources.

8. To enhance the foundation for scientific decision-making through the promotion and support of education and research in ecosystems.

9. To promote and support the integration of population concern including migration variables and family welfare considerations in development programs with special emphasis in ecologically critical areas.

10. To expand substantially the family planning programs and responsible parenthood program.

2.2 GUIDING PRINCIPLES

Sustainable development, as defined by the World Commission on Environment and Development (WCED), is meeting the needs and aspirations of the people without compromising the ability of future generations to meet theirs. It is difficult, however, to make use of a general definition to guide actions with regard to particular development situations. This general definition needs to be further explained in operational terms.

Operationally, sustainable development can be further explained through the following principles, which form the guiding framework for actions under the PSSD:

- a systems-oriented and integrated approach in the analysis and solution of development problems;

- a concern for meeting the needs of future generations, otherwise termed as inter-generational equity;

- a concern for equity of people’s access to natural resources;

- a concern not to exceed the carrying capacity of ecosystems;

- living on the interest rather than on the capital or stock of natural resources;

- maintenance or strengthening of vital ecosystem functions in every development activity;

- a concern for resource use efficiency;

- promotion of research on substitutes, recycling, exploration, etc. from revenues derived from the utilization of non-renewable resources;

- a recognition that poverty is both a cause and consequence of environmental degradation; and

- promotion of citizens' participation and decentralization in implementing programs.
ENHANCEMENT OF ENVIRONMENTAL IMPACT ASSESSMENT

IDENTIFICATION AND EVALUATION OF ENVIRONMENTAL IMPACTS

SITE PREPARATION

OPERATIONS

ENVIRONMENT

HISTORICAL

Legend: ENVIRONMENTAL CONSEQUENCES

NATURAL AREAS
1. Removing water from reservoirs and coastal areas and affecting certain natural levels of water resources.
2. Damage to fish and other aquatic organisms.
3. Altering patterns of water flow and other aquatic organisms.

AGRICULTURAL AREAS
5. Altering soil conditions and fertility of land and the immediate environment.
6. Introducing new crops and plants to the area, potentially altering soil conditions and fertility of land and the immediate environment.
7. Introducing new crops and plants to the area, potentially altering soil conditions and fertility of land and the immediate environment.

DEPRT. Jobs for 3 Years only

The Department of Agriculture and Natural Resources is currently accepting applications for positions in the Department of Agriculture and Natural Resources.

"We should all be custodians of the Environmental Resources that are inherited from our Grandfathers and bequeathed to our Grandchildren."

—J.R. Pommer, L. Keenan, Jr.

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
2.3 GENERAL STRATEGIES

The PSSD has for its core a number of implementing strategies. This is aimed at resolving and reconciling the diverse and sometimes conflicting environmental, demographic, economic and natural resource use issues arising from the country's development efforts.

Integration of Environmental Considerations in Decision-Making

The underlying theme in sustainable development is that economic and environmental concerns must be addressed simultaneously in the planning/decision-making process. This is a deliberate shift from the conventional practice characterized as predominantly single sector planning exercises. The importance of pursuing a multisectoral approach in policy and plan formulation can never be overstated. For instance, policies that conserve the quality of agricultural land and protect forests improve the long-term prospects for agricultural development. Efficiency in the utilization of energy and raw materials in industrial processes reduces wastes and can also reduce costs.

Merging environmental and economic considerations in decision-making involves a fundamental realignment of the overall objectives of development planning in the light of a new awareness of the environmental implications of development activities. This means that the process of development should be viewed from the outset as a multipurpose undertaking that includes an explicit and defined concern for the quality of the environment. Within such a planning context, it is especially important that analysis and evaluation stress the key role that environmental quality can play in sustainable development.

To effectively implement this desired shift in economic decision-making, the refinement of analytical tools and methodologies is critical. For instance, to accommodate the social and environmental consequences of the misuse of the nation's natural capital in economic calculations, such tools as Natural Resource Accounting, Environmental Impact Assessment (EIA) and Land Use Planning must be properly installed and strengthened.

Natural resource accounting emphasizes the productive role of natural resources in the economic system. Natural resource assets must be valued in the same manner as man-made assets. Inasmuch as natural resources are principally the main assets upon which we depend for revenue, employment and foreign exchange, a system of national accounting and analysis must be instituted that recognizes them as such.

Like economic analysis and engineering feasibility studies, EIA is a management tool for officials, managers and affected citizens who must make important decisions about major development projects. In recent years, major development undertakings have encountered serious difficulties because insufficient account has been taken of their impacts on the surrounding environment. Some projects have been found to be unsustainable because they caused resource depletion. Others have been abandoned because of public opposition, financial encumbrance by unforeseen costs, very high liability for damages to natural resources, and the disastrous accidents they have caused.
Given this experience, it is clearly very risky to approve and finance a major project without first taking into account its environmental consequences, as well as the siting and project design considerations that will minimize, or better still, altogether remove adverse impacts.

At the local/regional level, Land Use Planning is also seen as a basic tool for incorporating environmental considerations in the decision-making process. Optional land-use allocations can be determined using an environmental quality perspective, which take into account ecological principles and the impact of human activities on natural systems as inputs, along with other economic and social demands.

**Proper Pricing of Natural Resources**

The most widespread opportunity for improving resource management is to treat natural resources as truly scarce, not as if they were free. This is done by proper pricing based on the cost of replenishment, increasing their supply and providing appropriate substitutes. In essence, this strategy aims to correct the gross underpricing of natural resources (e.g., logs, minerals) that is substantially responsible for the wasteful extraction and utilization of these resources.

The question of who pays for damages to the environment should be part of more wide-ranging policy reforms regarding the pricing of the country's natural resources. It has become obvious that natural resources such as timber and minerals are grossly underpriced. Underpriced in the sense that those given the right to exploit these resources for profit pay very little of the significant damage costs to society. They also share with the rest of society very little of the "rents" they get out of exploiting these resources ("rent" represents the surplus after all cost and reasonable profits are paid). The rents from the exploitation of natural resources are huge, and they have gone to only a few. The World Resources Institute, for example, has estimated that for the Philippines, only 20% of the more than P20 billion rent from logs harvested from 1979 and 1982 went to the Philippine government. To attain sustainability, the government should recover the full economic rent for natural and environmental resources.

A component of the needed price reform strategy involves charging a price on those environmental resources (e.g., air, water) which have until now been regarded as free resources and which have thus been polluted freely and indiscriminately. At present, polluters continue to view the environment as a mere sink, for which they pay nothing. This concept should be changed. A social price should be assigned to these otherwise free resources. The polluter must then learn to internalize this price within his profit-oriented decision-making process. If there is pollution, the polluter must pay for the consequent social costs. The choice can be made between cutting down on pollution by investing in pollution control devices or cutting down directly on pollutive aspects of an activity. In effect, the polluter regulates his own behaviour within the context of an environmental pricing system. The system is based on the so-called "polluter pays" principle.

In general, price reform provides a way to internalize environmental costs as part of decisions on how resources are used. The advantage of proper resource pricing in resource management is that, once in place, it provides a self-regulating system. Resource users still make choices in a way that maximizes real resource costs.
By establishing a fair valuation of natural resources and charging the users appropriately, an automatic economic restraint on the way environment and natural resources are used is created.

Relevant to the successful implementation of such pricing mechanisms is the development of capabilities in environmental economics and the conduct of measures in this field. In addition, there is a need to set up support funds and incentives for those willing to shift from pollutive or destructive technologies to those that are environmentally protective.

**Property Rights Reform**

Natural resources have a tendency to be exploited as free resources by individuals even though they are in effect scarce resources. This is the case for "open access" resources in which there is a strong tendency for misuse and depletion. It is difficult for an individual producer such as a shifting cultivator or an artisanal fisherman to conserve an open access resource and unilaterally regulate his exploitative efforts, since from his perception anything that he conserves will only be taken up by others. This is the famous "tragedy of the commons."

Self-regulation in the exploitation of natural resources can be achieved by assigning secure access rights perhaps even private ownership over these resources to responsible individuals and communities. Through secure access rights, the individual or community establishes a lasting tie with the resource and a long-term stake in its protection for sustained productivity.

The need therefore is to develop creative and secure instruments such as forest stewardship contracts, small-holder timber concessions, artificial reef licenses, community forests, community fishing grounds and mining cooperatives to ensure equitable access and tenure security in the utilization of natural resources. It has to be noted, however, that an essential condition for transferring control over resources or distributing resource rights is for recipient individuals or communities to demonstrate the capacity for the sustainable development of such resources.

**Establishment of An Integrated Protected Areas System**

The importance of the preservation of the variety of genes, species, and ecosystems cannot be overemphasized. The development of man and his civilization has always been based on the biological wealth of nature. Agricultural crops and livestock, virtually most of the country’s daily food intake, were derived from wild species. From wild species have also come many of the medicines available today. In biodiversity resides the new genetic pool of information needed to adapt to various environments. It can thus well provide the answers and increased capacities for man to deal with future questions of survival and development especially in the face of the rapidly changing local and global environments. Unfortunately, this is not generally recognized.

Ecosystems are composed of species, and species are composed of genes and all these are linked to one another. The stability of ecosystems ultimately depend on the diversity of genes and species.
Protected areas should therefore be established for the conservation of wildlife and unique ecosystems, with the end in view of conserving genetic resources for scientific, educational, cultural and historical values. The establishment of protected areas should be preceded by a reassessment of the status of parks and equivalent reserves. This will serve as the basis for developing rehabilitative strategies for degraded parks and at the same time identify new areas where conservation of genetic resources and preservation of biological diversity can be pursued.

Rehabilitation of Degraded Ecosystems

Rehabilitation of degraded ecosystems is a significant strategy given the massive destruction of ecosystems that has already occurred. Under such conditions, nature's regenerative capacity is not enough. Deliberate rehabilitative efforts are needed.

Rehabilitation must keep pace with the continuous degradation caused by the increasing demands for both raw materials and products that come from natural resources. As the pressures on these resources continue to intensify so must the country's commitment and capability for rehabilitative action. A concerted action, therefore, of a magnitude never tried before in the reforestation of denuded watersheds, mangrove re-plantation, clean-up and control of pollution and revival of biologically dead rivers, and seagrass transplantation should be vigorously undertaken.

Natural ecosystems, however, will continue to be threatened unless a more comprehensive program on ecosystems rehabilitation is undertaken. Rehabilitation, therefore, has to be linked to ecosystems protection programs and to policy reforms and institutional strengthening that decisively deal with the socio-economic roots of ecosystem degradation.

Strengthening of Residuals Management in Industry (Pollution Control)

The most commonly applied instrument for pollution control is "end-of-pipe" control systems that treat or attempt to limit waste products with standards and limits on the permissible emissions rate. Residuals management, however, looks at the pollution problem within a more comprehensive framework of materials policy which includes resource recovery, recycling, and appropriate by product design that save on materials and energy.

A move should be made towards adopting recent innovations in industrial process designs which are aimed at reducing waste streams, especially as increasing restrictions on disposal becomes more necessary. Reformulating products, developing saleable by-products from residuals, and redesigning or combining processes are some innovations that have often been found to reduce wastes and costs as well. A U.S. plant, for example, was able to reduce wastes by 66 percent by cutting on water use by 32 percent. The use of biogas digesters to recover methane from piggery or distillery wastes is another example of pollution reduction through technological innovations.

In the Philippines, resource recovery should prove highly economical because materials and energy costs are quite high relative to labor costs. Paper, glass,
PUBLIC AWARENESS
On Environmental Issues

"Our environment is what we are made of. As we destroy our environment in the pursuit of economic development, we must also search with equal vigor for the alternatives to an impending environmental apocalypse by marshalling the intellectual resources at our command and harnessing these with personal commitment, we might even bring back the Pasig river to life."

—Sec. Fulgencio S. Pimentel, Jr.

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
metals, plastics, oils and other materials could be recovered from waste streams and recycled by networks of workers.

In addition to and in support of technological innovations is the strengthening of enforcement of appropriate pollution control laws. Other policy instruments such as the use of economic incentives to encourage pollutive firms to install pollution control facilities and collective actions such as the installation of central collection and treatment facilities for wastewaters are needed to supplement current enforcement efforts. These are especially important given the relatively small capital base of enterprises involved. More conciliatory forms of pollution regulation involving persuasion and information dissemination aimed at altering polluter as well as end-consumer behavior should also be implemented to cause positive change in business attitudes towards the environment.

Integration of Population Concerns and Social Welfare in Development Planning

Population is the critical factor in any effort at sustainable development. Population and the values espoused determine the speed at which productivity can be increased or conversely the pressures on land and natural resources brought to bear by the process of development. For a developing country like the Philippines, it is important that the population factor—in all its dimensions—is turned into a real asset for building a strong industrial base, for multiplying productive forms of livelihood, and for preserving and improving fragile ecosystems and the overall natural resource environment.

The country's population program must not be limited to controlling numbers but must include improvements in health, education and values formation. It must be implemented as part of a comprehensive socio-economic program at the regional and community levels. The population program must be based on methods that are consistent with the cultural and religious norms of the population. Within our traditional rural society the benefits of additional labor will always outweigh the benefits of reducing family size. It is for this reason that our population policies must recognize the limitations of promoting fertility control in isolation from other incentives. To overcome social prejudices against birth control and suspicions of the motivations behind the national population control program, emphasis should now be placed on the benefits to each child and to the family of spacing births.

Managing population distribution and mobility should also be considered to limit the rapid and often uncontrolled population growth in urban areas. Promotion of programs and policies that lead to balanced regional development are important. The development potential of all regions should be assessed and programs to increase opportunities for livelihood should be implemented to encourage migration towards less densely populated and less environmentally sensitive areas.

Inducing Growth in the Rural Areas

Economic recovery and long-term stability depend on increasing incomes and employment in the rural areas, where a majority of our people reside. It should be again noted that the rural poor are linked very closely to natural resources. Their actions have a direct impact on natural resources. Conversely, any change in the actual and potential productivity of these resources have serious repercussions on their present and future welfare, even on their very survival. The sheer number of
rural poor already in place right on or beside fragile ecosystems make them a formidable force either for environmental destruction or protection.

Attention must therefore be given to rural development, as it has already been established that poverty forces the rural poor to be destroyers rather than caring stewards of the very resources that can liberate them from poverty. The economic, social and political potentials of the countryside must be harnessed to alleviate poverty and uplift the conditions of the rural poor. A rural development strategy which is characterized by the following elements must therefore be effected:

- Empowerment of the rural poor through greater participation in policy-making processes and project implementation;
- Accelerated implementation of land reform to achieve equity in the distribution of wealth and boost producer incentives;
- Grant of equitable access for the rural poor to natural resource use and benefits;
- Removal of economic policy and public investment biases against the rural sector;
- Provision of infrastructure and support services to increase rural productivity and expand markets;
- Establishment and reinforcement of "growth centers" to serve as base for industrial and commercial activities that can provide alternative livelihood and increased economic opportunities for the rural poor;
- Strengthening of social services such as education, health and nutrition.

Promotion of Environmental Education

Environmental education as conceived in the PSSD has two major objectives. The first is to enable citizens to understand and appreciate the complex nature of the environment, as well as the role played by a properly managed environment in economic development and to develop social values that are strongly supportive of environmental protection and which will create the commitment and political will to deal with difficult issues. Only a well-informed and motivated citizenry could provide the mass base necessary for the continued protection of the environment.

Decisions are ultimately a political responsibility, but the likelihood of the best choices being made is greatly enhanced when there is widespread knowledge and understanding of all aspects of the issues at hand. This could be achieved by integrating environmental concepts in the elementary and secondary schools. This will equip people with the basic capability to make up their own minds in an informed way and do something about their decisions.

The second objective is to develop the local knowledge base about the local environment and natural resources through the development and promotion of
THE NGO/PO CONNECTION

"Our common goal is to win the battle for our environment, as our fate is bound to ultimate survival. It would be best for our cause to gain the support and cooperation of local and national leaders to protect their country from destruction of environmental beauty. NGOs and community groups, such as we are in the department, or you in the NGO's do not have the monopoly on resources or expertise. Let us cooperate to win the battle against the advance of environmental destruction."

—Ano Palang-A. Fumaran Jr.

The DEWR-NGO Desk was created to provide a forum for Non-Governmental Organizations (NGOs) and People's Organizations (POs) concerned with the environment and natural resources. It is a meeting center for stakeholders, government, community and resource agencies. It is with this balance of DEWR and NGO interests, we can start the process and eventually work together.

OBJECTIVES:

NGOs/POs

- To create an appropriate policy framework on DEW and NGOs for the development of a participatory development process.
- To enhance the knowledge and awareness of local communities on DEW and environmental issues.
- To develop an appropriate policy framework on DEW and NGOs for the development of a participatory development process.
- To strengthen the capacity of NGOs to participate in DEW projects and programs.
- To promote a common agenda and purpose between DEW and NGOs, and to achieve their goals and objectives.
- To strengthen the role of NGOs in DEW projects and programs.
- To contribute to the achievement of the goals and objectives of the DEW.
- To provide support to NGOs and POs in their work.
- To contribute to the development of a common agenda between NGOs and POs.

LIST OF NGO/POs WITH EXISTING PARTICIPATION IN DEW PROGRAMS

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tertiary and graduate courses in ecology, environmental science, resource management and resource economics. Research and development in these areas should be promoted.

Strengthening of Citizens' Participation and Constituency Building

Lessons from both failures and successes in environmental and developmental efforts have shown that citizens' participation is an important decisive factor. Absence or lack of it has caused failures. Its active presence has resulted not only in efforts meeting immediate targets but also in the assured sustainability of positive trends that have been initiated.

People have the inherent capacity to improve themselves and their community. Problems confronting them can be solved through their own efforts. In cases where the poverty of their situation and the difficulties they face are too serious for them to deal with, initial assistance from government and non-government institutions may be needed. Their active participation in planning and implementation, however, is a must so that they will not be forever dependent on external support.

In promoting the active participation of the citizenry for sustainable development, non-government organizations (NGOs) can be the central vehicle in mobilizing people to participate. NGOs have certain advantages. They have less bureaucratic red tape and can thus move fast. They have already established strong direct links with the grassroots. Their members are the very citizens whose participation is needed and who see their NGO membership as a citizen's responsibility. They are thus imbued with the needed commitment and drive to deal with difficult sustainable development issues. A strategy in this regard is to develop a network among NGOs as well as NGOs and governmental organizations which will work on community organizing, public information campaigns, research/situation assessment, environmental surveillance and monitoring, science and appropriate technology and the like.
3 ASSESSMENT OF MAJOR SECTORS

The conceptual framework shall be the basis for the formulation of strategies for each of the identified major sectors, namely, Population, Environment and Natural Resources, Agriculture, Industry, Infrastructure and Energy. A review of each sector, except for the Infrastructure sector, has been undertaken as part of the formulation process. This section presents the preliminary results of this review, including current efforts, key issues and key measures needed.

3.1 POPULATION

Situation. The Philippine population in 1989 was estimated at 60.1 million and is expected to rise by 2.3 percent to 61.5 million in 1990. With regards to population distribution, Southern Tagalog, Metropolitan Manila, and Central Luzon are the country's highly concentrated regions, with a population of 8.1 million, 7.9 million, and 6.1 million, respectively. The most common type of internal migration in the Philippines is the flow of people from the rural areas into the urban areas. For the period 1975-1980, Metropolitan Manila received a total of 378,878 rural migrants followed by Southern Tagalog with 183,077 and Central Luzon with 101,844.*

The present population situation has already strained the government's capability to provide basic services such as education, health care and food for the nation. The critical issues to be discussed should therefore address the balance between population size and available resources; and the rate of population growth in relation to the capacity of the economy to provide the basic needs of the population.

Key Concerns

- Continued rapid population growth which usually leads to a decline in the quality of life for the majority

- Encroachment of population into marginal ecosystems, including population settlements in ecologically-sensitive uplands

- Continued influx of rural migrants into densely populated urban areas, which taxes the capacity of these areas to sustain concentrated populations resulting in congestion, urban blight, slums, and environmental degradation

Current Efforts. The direction for the population program in the country was drawn up in a population policy statement issued in April, 1987. It specifically addresses the following demographic concerns: fertility reduction, family formation, status of women, maternal and child health, child survival, morbidity and mortality, population distribution and urbanization, internal and international migration, and population structure. The policy also stresses the importance of a
consistent population growth rate in relation to existing resources recognizing the
strain imposed by the population on scarce resources.

Family Planning services continue to be provided by 3,545 family planning
clinics/service outlets of government and non-government organizations
nationwide. The remote areas are served by 39 Comprehensive Itinerant Teams.
Support systems for these activities include 1,753 full-time outreach workers
(FTOW's) and 50,000 Barangay Supply Point Officers (BSPO's).

The Population Education Program continues to work for the integration of
population education into the school curriculum at all educational levels. The
Adolescent Fertility Program through its twelve adolescent centers also continues
to provide information and counselling services.

In 1987, 87 medical personnel were trained on basic family planning and voluntary
surgical sterilization. Manpower development and continuing education, which
were mostly foreign-funded, were also conducted.

The Population Information Management and Dissemination Program also
conducted widespread dissemination activities on the new population policy.
These include the conduct of symposia and conferences, the release of two issues
of the Population Bulletin and the publication of a weekly newsletter.

The Population Policy Analysis and Coordination Unit of POPCOM is also
continuing its task of collecting, processing and analyzing various sources of
information for dissemination.

A National Consultation among 107 Natural Family Planning NGO's was
convened to formulate workable schemes with NGO's and with the church-based
Family Planning - Maternal and Child Health (FP-MCH) network. The "Ugnayan sa
Kababaihan" Project was also launched as a vehicle to promote women's welfare
and strengthen women's participation in planning and decision-making.

Support activities to the population program are also implemented by the
Department of Social Welfare and Development. These include daycare and
supplemental feeding program, family planning motivation, population awareness,
and sex education. The Department of Health also promotes/implements the
following programs: primary health care development, control of communicable
and non-communicable diseases, health promotion and specific protection, food
assistance, selective home food production, nutrition information and education
campaign, and the malnutrition prevention project.

Key Measures Needed

- Vigorous population program based on methods that are
  consistent with the cultural and religious norms of the
  population

- Broader scope of population programs to include
  improvement of the quality of human resources in terms of
  productivity, environmental consciousness, ability to manage
  communal natural resources, and social responsibility
- Intensification of rural development with emphasis on sustainable livelihood programs to reduce the push factor in rural-urban migration

3.2 ENVIRONMENT AND NATURAL RESOURCES

Ecosystems are life support systems. They are capable of renewal, even in the face of major man-made disturbances — but only up to a certain point. Beyond this limited threshold and carrying capacity, ecosystem functions are impaired; hence deterioration occurs. The challenge for resource management is to treat the ecosystem as the unit most suitable for analysis, so that the maintenance of vital life support functions may be ensured.

This sector is currently facing a lot of problems, among them: resource depletion, environmental degradation due to pollution, tenurial problems in the public domain, and inequitable distribution and allocation of lands and natural resources, among others.

**Forests**

**Situation.** The remaining forested areas of the Philippines (without brushlands) is 6.5 million hectares, which is 21% of the country's total area of 30 million hectares, and 40% of the legally classified forest lands of 16 million hectares. The country is losing 119,000 hectares each year or about 14 hectares per hour due to illegal logging, forest fires and slash and burn agriculture.

**Key Concerns**

- Degradation of forest lands due to logging as well as encroachment of slash-and-burn cultivators into logged-over areas;
- Settlement of ecologically-sensitive forest lands due to population pressure and lack of opportunities in the lowlands
- Poor enforcement of forest protection laws
- Lack of tenurial security, infrastructure support, and social services for upland dwellers which result in disincentives for adopting resource conservation measures

**Current Efforts.** The Department of Environment and Natural Resources (DENR) launched the National Forestation Program (NFP) in 1986 declaring as a policy "the perpetuation of forest resources for the benefit of present and future generations of Filipinos."

The NFP restates the key objectives of the government's basic policy in forestation as: adequate supply of industrial timber and fuelwood; provision of livelihood for upland communities; and, restoration and maintenance of a stable, functional and wholesome environment. The main focus of the 14-year forestation program is the development of production forest plantations for supplies of timber and fuelwood, while at the same time rehabilitating denuded watershed areas.
With the assistance of program loans from the Asian Development Bank (ADB) and the Overseas Economic Cooperation Fund (OECF) of Japan, the DENR is targeting to reforest through various modes and approaches about 300,000 hectares by 1992.

The main thrust of the policy framework of the NFP is to position the private sector communities and families as the vanguard of the country's reforestation efforts. Thus, apart from encouraging the private sector to invest in commercial forest plantations at its own risk, the policy also directs the employment of the private sector (to include, apart from entrepreneurs and enterprises in forestation, the NGOs, individual farmers and farmers' associations) in executing government-funded forestation projects on contract terms. The government considers that contract forestation would enable it to make use of the experience and commercial motivations of the private sector towards the expeditious and efficient accomplishment of NFP targets, and that the terms of the contracts would ensure that the planted areas paid for will actually grow into forests.

Projects under the direct administration of the DENR are: Timber Stand Improvement in second-growth forests, and protection and maintenance of existing forests. Private sector participation will be in contract reforestation; watershed rehabilitation; assisted natural regeneration; bamboo, rattan and mangrove plantations; industrial tree plantations, and integrated social forestry activities to rehabilitate forest migrants.

Contracts to reforest or manage specific activities in reforestation areas are open to qualified corporations, non-government organizations, communities, tribes and/or families. DENR pays these private entities and individuals for the reforestation activities they undertake in specific sites.

Key Measures Needed

- Reforestation approaches that actively involve the upland population, and which combine the goals of re-establishing forests as well as providing sustained livelihood for upland dwellers
- Intensified development of lowland resources to increase productivity and divert pressure away from critical uplands
- Preparation of site-specific resource management plans, based on inventory of resources, census of upland population, and assessment of carrying capacities
- Devolution of control over the management of forest resources to local communities and tribal groups based on of their ability to utilize the common resource properly
- Strengthening of resource access rights for small-holders through more secure tenurial arrangements and disposition of remaining A and D lands
- Intensification of environmental information and education
Protected Areas and Biodiversity

**Situation**. The Philippines has a total of 62 national parks and 7 wildlife sanctuaries encompassing some 1.3 million hectares, or about 4.3% of the country's total land area. However, some of these parks exist only on paper since there is a general lack of funds to implement protection activities and field management of the areas. Almost all designated reserves contain illegal settlements of "slash and burn" (kaingin) farmers and have been partially modified or completely degraded. Critically important areas, such as Bicol National Park in Camarines Sur and Mt. Apo National Park in Davao, have been heavily squatted and seriously denuded. Others, such as Mt. Pulog National Park in Benguet, Quezon National Park in Quezon Province, and Mt. Canlaon National Park in Negros Island, are seriously threatened by illegal logging and "kaingin".

The wide diversity of marine and terrestrial ecosystems form the habitats of five major forest formations (mixed dipterocarp, tropical montane, mossy or sub-alpine, molave and pine), 8,000 species of dominant angiosperms (orchids and roses), 960 species of terrestrial vertebrates (land mammals), 541 species of avifauna (birds), 252 species of herpetofauna (reptiles), 488 species of coral, 16 species of mangroves, and 1000 species of fish. Among the more notable of these are the following endangered species: the Philippine eagle, Black Sharna, Philippine crocodile, dugong, and marine turtles. The effects of hunting, trapping and trading of wildlife, aside from habitat loss, have continually threatened the reproduction capabilities and the survival of these endemic plants and animals in the Philippines.

**Key Concerns**

- Ineffective protected areas and parks management systems
- Threats to the existence of valuable flora and fauna as a result of habitat removal or modification
- Need to increase the level of public awareness and appreciation of the benefits of protected areas

**Current Efforts**. The DENR and the World Bank are undertaking a study and review of the country's protected areas in order to rationalize and develop an integrated protected areas system (IPAS) in the Philippines. The study will determine existing protected areas to be retained in the new system and recommend qualified sites for inclusion. The study shall also provide the basic information for the preparation of the legislation that will create the IPAS code as mandated by law. Also, under the Debt-for-Nature Swap Program between the DENR, the World Wildlife Fund, and the Haribon Foundation, the protection, management and development of two protected areas, namely, St. Paul Subterranean River National Park and El Nido Marine Sanctuary both in Palawan—are under way. Experience from the program shall serve as the basis and provide a model for the management, protection and development of other national parks in the future. The government is also currently conducting captive breeding programs for the Philippine eagle, tamaraw, flying lemur, crocodile and other...
endangered species. NGOs have also been tapped as partners in conservation projects.

The survey, rehabilitation, reproduction, conservation, information, training and research of the country's diverse ecosystems and wildlife comprise the proposed National Biodiversity Program of the DENR. The survey and rehabilitation of critical ecosystems such as coral reefs, mangroves, wetlands, lakes, rivers and lowland forests shall be undertaken. Ecological researches, surveys, captive breeding and re-introduction of endangered species into the wild shall be implemented. The program shall promote conservation awareness to the public and establish training opportunities for field personnel under the DENR.

Key Measures

- Assessment and evaluation of existing national parks and equivalent reserves towards the formulation of a systematic management and protection scheme
- Integration of protected area planning into the overall land use and regional planning
- Implementation of an intensive nature conservation education program
- Training of managers of protected areas

Urban Ecosystems

Situation. The migration of the populace to urban areas will continue to put pressure on limited urban land resources in the coming years. By 1990, about 21 million or 43% of the national population will be residing in urban areas. By the year 2000, this will increase by 40%.

In Metro Manila, 7 million of the total population crowd 636 square kilometers of land. With a population that is increasing at a rate of 3.6% annually, Metro Manila will be one of the mega cities in the world with a population of 11 million.

Generation and disposal of solid wastes, air pollution emitted by transport vehicles (60%) and stationary industrial sources (40%) will continue to be a major problem. High volume sample measurements of total suspended particulate (TSP) indicate that annual averages in Metro Manila can exceed 250 milligrams per cubic meter (mg/m³), exceeding the US annual average TSP air quality standard by over 200%.

Furthermore, jeepney, bus and taxi commuters are exposed to excessive concentrations of Respirable Suspended Particles (RSP) in the order of 1,000 mg/m³ while millions of Metro Manila residents are exposed to ambient concentrations of RSP in the order of 100 mg/m³. The long term health effects of such exposure need to be determined.

Sulfur dioxide (SO₂) does not appear to be a major problem in Metro Manila. There is relatively less concentration of heavy industry near urban centers and consequently the levels of SO₂ measured in Manila are all well below .05 parts per
million (ppm) on an annual average basis. However, since most of the major vehicles in Metro Manila are diesel-fueled the exposure of SO2 by people directly exposed to traffic exhaust are higher.

Water pollution in Metro Manila and other major urban and regional centers is caused by the general public and, to a lesser extent, by the industrial sector. All metropolitan areas in the Philippines have no efficient sewage collection and treatment except for some affluent subdivisions with residents who can afford an expensive sewage treatment facility. Only about 12% of Metro Manila's population is served by a sewerage collection system. The balance of unserved areas contribute about 70% of all the biodegradable organic pollutants that flow into the different river systems in Metro Manila. Untreated or partially treated industrial wastewater is also being discharged into rivers, lakes, or esteros. These wastes account for the other 30% of the organic pollutants that have all but killed Metro Manila's water systems.

Municipal solid wastes or garbage usually finds its way into the river system through open canals and culverts and end up in the river system and exert additional oxygen demand. Metro Manila alone generates about 3,600 tons of garbage per day and this is expected to reach more than 5,000 tons per day in the year 2000. There are no sufficient funds to finance a systematic and integrated solid waste management system although a very thorough solid waste master plan has been formulated and approved by a Presidential Task Force on Solid Waste Management.

Another problem is the disposal and proliferation of toxic and hazardous wastes from industries. This is especially true in Metro Manila where 69% of the country's 15,000 industrial firms are located. Most of the toxic substances are apparently discharged without treatment into natural water bodies and coastal waters.

**Key Concerns**

- Pollution from industrial effluents
- Solid waste disposal by domestic, commercial and industrial establishments
- Air pollution from gasoline/diesel fueled vehicles and industrial establishments
- Population migration to urban areas

**Current Efforts.** The DENR, in cooperation with other government agencies, the private sector and non-governmental organizations, is currently undertaking a rivers revival program, foremost of which is the "LOG KO, IROG KO" project aimed at lowering the pollution load of the Navotas-Malabon-Tenejeros-Tullahan river system. The DENR, being the lead agency, has committed to lower the industrial pollution load by 60% by 1992, from 32,777 kg. Biochemical Oxygen Demand (BOD) per day to about 23,200 kg. BOD per day. To date, the DENR has lowered the industry load by about 7%. The MWSS is committed to implement a basin-wide septic tank cleaning program that will lower the sewage load from the projected 1992 load of about 26,608 kg. BOD per day to about 9,978 kg. BOD per day. The National Housing Authority (NHA) is also
committed to remove all the squatter shanties lined along the 26 kilometer waterway and relocate them within the basin, thus lowering the pollution load. The Department of Public Works and Highways (DPWH) is committed to dredge the 26 kilometer waterway and build (2) parallel roads along the waterway.

The Inter-agency Committee aims to lower the overall pollution load in 1992 by 50%. The cost to implement these programs is about U.S.$25.75 million spread over the next three years, ending in 1992. The scenario beyond 1992 will involve the installation of a sewerage collection and a marine outfall which will increase the total cost to U.S.$236.8 million. It is expected that the river system will be fully rehabilitated and the entire 26 kilometer waterway will be capable of sustaining marine life.

Another component of the river revival program is the Manila Bay Clean Up Project. This will focus on six major river network systems which empty their wastes into Manila Bay. These are:

- Navotas-Malabon-Tenejeros-Tullahan River System,
- Pasig-San Juan-Marikina River System,
- Las Pinas-Zapote River System,
- Paranaque River,
- Laguna Lake Basin, and
- Meycauayan River.

The clean-up of Manila Bay will entail the clean-up of the individual sink systems. Among the projects lined up for lowering the pollution load of each of these sources are:

- septic tank cleaning and sewerage collection and treatment for domestic sewage,
- individual or combined wastewater treatment plants for industrial firms,
- dredging of rivers to remove accumulated debris, and
- transfer of squatter families along the river banks.

The current efforts for air quality management in urban regions are particularly addressed to the Metropolitan Manila area where most of vehicles and industrial firms are located. Other urban growth centers, however, have already started and are stepping up the air pollution control program.

Vehicle exhaust emission is the most pressing air pollution problem today. In the short-term, activities being implemented to alleviate the situation are stepped up efforts to enforce the anti-smoke belching law and educational campaigns to raise the level of awareness and knowledge of motorists and the general public of the air pollution problem. In addition to this, the air quality management program
for Metro Manila proposes the adoption of long-term policy options to minimize vehicular pollution. Such policy options would cover a wide range of concerns such as:

- Incentives for low-pollutant vehicles and additional tax for pollutive vehicles.
- Promotion of "environment friendly" fuel additives and appropriate pollution control devices.
- Regulation of importation of second hand cars.
- Development of an efficient mass transportation system.

Emissions from industries and power plants will also be a major concern as economic development progresses. Major policy options being considered to minimize the air pollution efforts from these sectors are the following:

- Providing disincentives for pollutive industries that are located in Metro Manila and other urban centers.
- Strict implementation of land use plans and zoning regulations.
- Promotion of energy conservation and energy efficient production processes.
- Adoption of low or non-waste technologies.

For an effective air quality management program, it is imperative that the monitoring and enforcement capabilities of the environmental agencies will also be beefed up. Thus, acquisition of monitoring equipment and manpower training are major components of the program.

The Solid Waste Management Plan for Metropolitan Manila as conceptualized by the Presidential Task Force on Solid Waste Management is in its initial stages of implementation. Sites have been identified to serve as sanitary landfills in lieu of operating open dumps. Engineering designs are now being prepared and reviewed based on the Environmental Impact Assessment made.

Key Measures Needed

- Rational planning of urban centers (dispersal of industries)
- Provision of workable air monitoring networks
- Rationalization of current environmental and pollution policies
- Implementation of a pragmatic information and education campaign on the effects of air and water pollution and solid waste disposal
- Stringent enforcement of laws, ordinance, rules and regulations
- Implementation of a sound monitoring system
Freshwater Ecosystems

Situation. There are a total of 384 major river systems and 59 lakes and more than 100,000 hectares of freshwater swamps in the Philippines. These are used either for domestic, industrial, irrigation and power-generation purposes.

Agriculture continues to be the heaviest water user, accounting for 60% of total withdrawals. The quality of water available for irrigation has been relatively good. However, the increasing sedimentation of river systems have resulted in the reduced water conveyance capability of irrigation systems and diversion facilities. The main cause of this problem is the destruction of watersheds and consequent soil erosion. Sedimentation caused by the dumping of mine tailings in the river systems is also a major contributory factor.

Another environmental problem which is becoming a major concern is saltwater intrusion. This problem is characterized by the movement of saline water into freshwater aquifers or surface waters. The general mechanisms responsible for the intrusion are the reversal or the reduction of natural barriers that prevent movement of saltwater, and the accidental or inadvertent disposal of waste saline water.

Official reports of the MWSS and NWRB reveal that the total area affected by saltwater intrusion (excluding Metro Manila) has reached 480,802 hectares. The most heavily affected provinces are Cagayan, Bulacan, and Cebu.

In Metro Manila, the affected areas may be categorized according to sources of contamination, namely: 1) seawater intrusion – 10,244 hectares; 2) seawater intrusion and connate water – 513 hectares; and 3) connate water – 5,674 hectares. The affected areas total 19,611 hectares. It should be pointed out that majority of the affected areas are urban and rural settlements, which is a real cause for alarm.

Hydrogeological investigation and economic analysis of the groundwater salinity intrusion phenomenon indicate the following impacts on water supply and the affected population:

- poor water quality
- corrosion of wells
- salinization of agricultural land due to inundation, subsequently reducing agricultural yield
- reduced revenues in some industries due to additional cost of water supply
- revenue loss in public water utilities due to replacement costs where wells became too saline to use
- additional cost for the acquisition of water from piped supply
Six particular areas in the Philippines, including the two major cities – Metro Manila and Cebu – were found to be subjected to continuous degradation of the groundwater supply due to saltwater intrusion.

**Key Concerns**
- Pollution due to domestic, commercial and industrial activities
- Agricultural run-offs from pesticides and fertilizers
- Siltation
- Saltwater intrusion

**Current Efforts.** The DENR, aside from its rivers revival program, is currently undertaking its river classification project. Of the 384 major rivers in the country, 261 have been presently classified according to their use.

**Key Measures Needed**
- Enforcement of laws, rules and regulations.
- Implementation of an information and education campaign
- Setting up of waste water treatment plants
- Implementation of a sound rehabilitation program for affected freshwater ecosystems

**Coastal Resources**

**Situation.** Because of pressures from an increasing population and the drive towards industrial development, coastal resources have been exploited indiscriminately and its conservation and protection have been overlooked. Dynamite fishing, siltation and human encroachment have led to the destruction of coastal resources. Pollution from industrial complexes continues to be a growing problem.

A recent satellite study reveals that mangrove and coral resources, two of the most important coastal habitats have been severely degraded. Of the 500,000 hectares of the original mangrove species vegetation in the 1920's, only 38,000 hectares are left today. However, satellite imagery shows some 149,000 hectares of secondary growth mangrove vegetation.

The estimated coral cover of the country's coastal resources is almost 33,036 square kilometer. Only 5 to 6 percent of this is classified as in excellent condition.

The coastal areas are also the final destination of most of the mine tailings generated by the mining industry. During the last 3 years, mine tailings generated totalled over 2 billion DMT. In addition to land-based pollution, pollution from ship and oil spills are common.
THE COASTAL ZONE ECOSYSTEM

"The coasts provide a wide variety of resources, such as food, fuels, and building materials. The coastal zone is a unique ecosystem, supporting a wide range of biological diversity and human activities."

From the point of view of environmental protection, the coastal zone is the most vulnerable and fragile ecosystem. The recent studies clearly reveal the following:

- DESTRUCTION OF COASTAL VILLAGES: In the past 20 years, 300,000 villages have vanished due to coastal erosion. In 1980, these villages supported 120,000 tons of fish, 20,000 tons of shrimp, and 10,000 tons of seaweed.

- ENVIRONMENTAL EFFECTS OF OVERFISHING: For example, the Philippines has seen a decline in fish populations and a decrease in fish catches."

"These trends are directly related to increased coastal development and overutilization of resources."

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NATURAL RESOURCES
**Key Concerns**

- Overfishing of nearshore fishing areas due to expanding coastal population
- Continued widescale use of illegal fishing practices
- Degradation of coral reefs which is due to a combination of silt deposition and destructive fishing methods (blast fishing and muro-ami)
- Disappearance and degradation of spawning areas, notably mangrove and mangrove areas, due to conversion to fishponds and other uses
- Encroachment of commercial fishing vessels into nearshore areas reserved for small (municipal) fishermen
- Ineffective administrative arrangements for regulating coastal and marine resources

**Key Measures Needed**

- Identification and quantification of point and non-point sources of pollution
- Setting up of centralized treatment plants for domestic wastes and wastes of similar industry types
- Containment of oil slicks
- Control of siltation by reforestation
- Granting exclusive rights to small fishermen
- Conduct of hydraulic studies in aquifers
- Stepped-up enforcement of fishing laws and zoning rules
- Common property management arrangements, i.e., assigning common property rights to coastal communities or fishermen organizations in the use and protection of coastal fishing areas
- Preparation of site-specific fishery resources management plans based on inventory of resources and assessment of sustainable fishing yields
- Rehabilitation of coastal resources (coral reefs and mangroves) to sustain fish yields, including measures to enhance productivity through artificial means, e.g., artificial reefs
- Provision of alternative livelihood opportunities for coastal communities to reduce reliance on fishing as a source of income
- Intensification of environmental information and education

Land and Mineral Resources

Situation. Pollution of land resources may be traced to three general sources: solid wastes from domestic, commercial and industrial activities; agricultural pollution from pesticides and fertilizers; and pollution from mining activities. The extensive use of fertilizers and pesticides is continuously polluting the country's land resources and is causing soil deterioration.

The land resources of the country are also vulnerable to soil erosion. Presently, at least 21 provinces are known to have more than half of their areas eroded. About 9 million hectares of alienable land are eroded in varying degrees and approximately 1 million hectares of agricultural lands have an 8-15% slope making it susceptible to severe soil erosion during the rainy season. Improper agricultural practices by farmers make these lands unproductive.

The Philippines is endowed with rich and varied mineral resources, much of which remains to be explored and exploited. With such a vast mineral resource, the Philippine mining industry has played a major role in the economic growth of the country. Concomitant with mineral exploitation however, are the environmental problems generated by mining, panning and milling activities. Huge quantities of waste and mine tailings have to be dumped. These can cause pollution of rivers and marine ecosystems, and damage irrigation canals and farmlands by siltation. Vegetative cover has to be removed to give way to an open pit mining operation, and for sites of waste dumps and tailing ponds. Toxic chemicals like mercury, used by thousands of small-scale miners, find their way to the river system even in urban areas. Landslides and flashfloods occur at alarming rates in areas defaced by unsystematic mining operations.

Key Concerns
- Unregulated importation, distribution and use of toxic and hazardous substances
- Incompatible land-use practices
- Unregulated mining activities and dumping of mine tailings and wastes
- Indiscriminate use of pesticides and fertilizers
- Lack of awareness and education on the part of the public regarding the ill effects of pollution
MINE RESOURCES

SUSTAINABLE DEVELOPMENT AS CIVILIZING POLICY

The world faces a classic conundrum as we approach the end of the century:

how to make the earth more profitable without depleting its life-supporting capacities for future generations. The current era is a time of opportunity and challenge. It is a time of opportunity to make a commitment to sustainable development, a commitment that will help ensure the future sustainability of our planet.

The challenge is to develop strategies that will enable us to achieve sustainable development without compromising the ability of future generations to meet their own needs. This requires a paradigm shift in the way we think about economic growth and development.

Policies that focus on short-term economic growth may undermine long-term sustainability. For example, policies that prioritize industrial development over environmental protection can lead to irreversible environmental degradation. The key question is how to balance economic growth with environmental protection.

A sustainable development strategy must address the following key areas:

1. Ecological sustainability: Ensuring that natural resources are managed in a way that allows for long-term regeneration and conservation.
2. Economic sustainability: Ensuring that the economy is driven by sustainable practices and technologies, with a focus on creating wealth for all.
3. Social sustainability: Ensuring that the benefits of development are distributed equitably, with a focus on poverty alleviation and social inclusion.

The challenge is to develop policies that balance these three dimensions of sustainability. This requires a holistic approach that considers the interrelationships between the economy, society, and the environment.

Environmental Impact of Mining Operations

The environmental impacts of mining operations can be significant. Mining activities can lead to soil erosion, water pollution, and habitat destruction. However, mining can also contribute to economic growth and development.

The key is to develop mining operations that are environmentally sound and socially responsible. This requires a commitment to best practices in mine planning, design, and operation.

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

Fulfilling our responsibilities to the environment.

Environmentally sustainable development is crucial to our future. This requires a commitment to best practices in mine planning, design, and operation.
**Current Efforts.** The DENR manages the mineral resources sector and is empowered to oversee the activities concerning geology and mineral resources exploration, development and conservation. The Environmental Management Bureau, a bureau under the DENR, administers the Environmental Impact Assessment System which has regulatory control over proposed mining projects. Pollution and other related problems generated by the industry are regulated by the field offices of the DENR.

**Key Measures Needed**

- Formulation of a national land use plan
- Implementation of an effective information and education campaign on the causes and effects of land pollution
- Stringent enforcement of environmental laws, local ordinances, rules and regulations
- Immediate enactment of a law for the sound management of toxic and hazardous substances
- Implementation of an efficient monitoring system to prevent or abate the degradation of land resources

**3.3 AGRICULTURE**

**Situation.** With the Filipino population nearing 60 million in 1989, and a total land area of 30 million hectares, the land area per capita is about 0.5 hectare. This per capita agricultural land is lower than the world average of about one hectare.

As of 1980, the Philippines has about 9.70 million hectares of agricultural land. An estimated 3.7 million hectares of these lands are planted to palay, 2.0 million hectares to corn, and 2.8 million hectares to coconuts. The remaining 1.2 million hectares of agricultural land are planted to crops like tobacco, sugarcane, citrus vegetables, abaca and others.

Until about 1960, agricultural growth was based primarily on land increase at the extensive margin with little changes in cropping intensity, technology, and total productivity. In 1979 and thereafter, there was a shift to increasing lar productivity at a very intensive margin.

The increasing demands by a growing population for higher agricultural production now threatens the very sustainability of the country's natural resource. Socio-economic factors such as inequitable distribution or lack of access to land aggravate further the problem.

The problem of soil erosion in the Philippines is quite pronounced due to geographical and climatic conditions. For example, 31% of the country's total land area is hilly and mountainous, and thus susceptible to erosion.
The recent shift from use of chemical fertilizers to organic fertilizers is gaining ground even among our farmers. The Integrated Pest Management program is similarly gaining attention.

**Key Measures Needed**

- Preparation of site-specific agricultural resource inventories to assess sustainable production potentials and population carrying capacities
- Efficient and intensive farming systems based on small-scale farm units and use of organic farming, nutrient cycling techniques and integrated pest management
- Multi-purpose development of forest lands to provide livelihood opportunities through sustainable upland farming
- Utilization of the agricultural development potential of the uplands through combination of appropriate farming technologies, provision of infrastructure, and establishment of institutional support (e.g., tenurial arrangements)
- Diversion of pressure away from the uplands through intensified distribution and development of agricultural areas in the lowlands
- Policy and fiscal measures to encourage or direct a long-term shift of agriculture away from reliance on chemical fertilizers and pesticides
- Intensification of environmental information and education

**3.4 INDUSTRY**

_Situation:_ Without doubt, industrialization must be pursued. It is the vehicle through which we expect to solve problems of mass poverty and unemployment. However, industry withdraw materials from the natural resource base and generates pollution. Depending on the overall framework of the policy to be adopted, industrialization has the power either to enhance or degrade the environment.

The industrial sector registered a positive gross value added (GVA) of 8.02% in 1987. Growth was principally attributed to the renewed business confidence in the economy due to the improved consumer spending and perceived political and economic stability.

The growth in the industrial value-added was accounted for by improved performance in manufacturing (7.12) and electricity, gas and water subsector (10.74). A strong domestic expenditure program, stable consumer prices and demand for manufactured export products in the world market enhanced the growth of manufacturing industries. Increases in the growth level of the electricity
gas and water subsector can be attributed to the higher consumption of power and water by commercial and industrial firms.

The construction industry recovered from last year's poor performance mainly because of the availability of credit at low interest rates which fueled government and private investments in the sector. The mining and quarrying subsector however, suffered from the inability to respond to metal price increases in view of increased production costs based on rising oil prices and the low grade of mills in most mines.

Investments also showed a strong turnaround in 1987. The Board of Investments (BOI) - approved equity investments grew by 165.7 percent from P3.15 billion in 1986 to P8.36 billion in 1987. This was brought about by the 217.7 percent increase in Filipino investments amounting to P3.43 billion and the 115 percent growth in foreign investments amounting to P3.43 billion. The U.S. Japan, and Hongkong were the Philippines' major investors accounting for 55 percent of the total foreign investments for 1987.

In terms of regional capital investment, the National Capital Region and Southern Tagalog registered a 95 percent increase in paid up capital stock of existing and new domestic stock corporations.

The industrial sector is projected to continually grow with the thrust towards export promotion and selective import substitution. The mining sector is expected to recover as a result of the promotion of small-scale mining, increased production of non-metallic minerals and expansion of foreign and local markets for mineral commodities. The growth of domestic resource-based industries is likewise expected to enhance the growth of the manufacturing subsector. Imports shall enjoy a steady increase and will come in terms of payments for raw- materials and intermediate goods, capital goods and oil requirements of large-scale industrial and other major infrastructure development projects. However, total import value is expected to decrease due to the utilization of indigenous energy sources and the adoption of energy conservation measures.

Key Concerns

- Build-up of industrial infrastructure resulting in necessary increases in energy and raw material requirements from the natural resource base
- Pollution and waste resulting from industrial activities
- Concentration of industrial facilities in urban areas
- Environmental risks of new industrial technologies
- Relocation of pollutive heavy industries from industrial countries to developing countries like the Philippines

Current Efforts. In order to enhance continued growth in the industrial sector, the government prepared a ten-year sectoral development program. In the program, ten (10) industry sectors were identified for short and long-term action plans. These are: agri-based industries, forest-based industries, wearables,
chemicals, construction, toys, gifts, furniture and housewares, services, mining and other extractives, metals, engineering, electronics and telecommunication industries.

The government continues to promote the development of Cottage, Small and Medium Enterprises (CSME’s) through a package of assistance programs consisting of financing, entrepreneurial development, research and marketing, and technical assistance. Support activities were also provided in the form of projects on technology transfer, training, productivity awareness seminars, technical and management information.

The government also created the Micro, Cottage, Small and Medium Enterprise Council (MICSMEC) in 1987 to coordinate efforts in the subsector and in the agencies involved in CSME development. Another effort to sustain industrial growth is the creation of 1,158 People’s Economic Councils (PEC).

Another program implemented which aims to provide financial resources and technical expertise for countryside development is the Agricultural, Small and Medium Industries Lending Programs (A-SMILE) along with the Agro-Industrial Technology Transfer Program (AITTTP).

The regional dispersal of industries is being promoted to distribute the benefits of industrialization to the countryside and encourage self-reliant and productive communities. The sub-components of the program are the National Program for Industrial Estate Development and the Livelihood Projects (e.g., KKK, KSS).

The government also granted fiscal incentives to deserving firms to make up for market distortions. Incentives include outright tax exemption, tax credit and preferential tax treatment.

**Key Measures**

- Establishment of environmental goals, policies and standards to regulate industry sector decisions involving location, pollution control, waste management, occupational health and safety of workers, energy and raw material usage, and disposal of toxic substances

- Support in terms of policy, research, economic instruments/market mechanisms for the promotion of recycling or reuse of industrial raw material and by-products

- Rural infrastructure development to promote dispersal of industries to the countryside

- Fiscal measures (e.g. tax incentives, subsidies, pricing policies) to encourage adoption of pollution control technologies by both large and small-scale industries

- Adoption of the “polluter pays” principle
- Vigorous enforcement of the Environmental Impact Assessment (EIA) System in making decisions in industry planning
- Establishment of a tracking system and capability to deal with toxic and hazardous chemicals and wastes

Among the projects needing priority attention in this sector are:
- Toxic Chemicals and Hazardous Wastes Management
- Environmental Carrying Capacity Profiles of Proposed Growth Centers Outside Metro Manila
- Intensification of Small-Scale Planning Operation for the Development of Ancillary Industries
- Development of an Information Base on Land Use and Fiscal Planning for Urban and Other Growth Centers in the Countryside
- Programs to Provide Technical Assistance on the Abatement of Air Pollution to DENR Regional Offices
- Air and Water Quality Monitoring Network

3.5 ENERGY

Situation. After the energy crisis of 1973-1974, energy development in the Philippines led to the partial replacement of oil by indigenous sources such as coal, hydroelectric power, geothermal, and other nonconventional sources. The non-conventional sources include bagasse, agriwaste, and dendrothermal.

The country's total energy consumption in 1988 reached 110.53 million barrel of fuel oil equivalent (MMBFOE), 10.3 percent higher than the 1987 consumption. Imported energy accounted for 62.3 percent of the total percent from the level attained in 1987. The increase in the total energy consumption is attributable to the efforts to sustain the country's economic recovery momentum.

Indigenous energy production amounted to 41.70 MMBFOE, accounting for 37.7 percent of the total consumption. Out of total indigenous energy consumption, geothermal accounted 7.6 percent, hydro - 9.8 percent, oil - 1.8 percent, coal -3.9 percent, and non-conventional - 14.7 percent.

The 1988-1992 Medium Term Energy Plan outlined the sector's policy thrusts as follows:
- Promotion of energy self-reliance
- Rationalization of energy prices to reflect the true cost of production and distribution
- Encouragement of energy conservation measures to promote efficiency
- Participation of the private sector in energy projects
- Maintenance of environmental and safety measures for energy projects

Key Concerns

- Need for growth in energy supplies and power generating facilities to promote and sustain economic development
- Potential adverse impacts of large-scale energy resources development
- Wasteful energy utilization due to old and inefficient generating facilities and distribution system
- Reduced lifespans of hydro-electric systems due to rapid siltation and degradation of watersheds
- The growing shortages of fuel wood in rural areas due to deforestation
- Several foreign exchange difficulties as a result of paying for imported oil
- Energy technologies have the potential to perturb critical environmental processes as well as threaten human health
- No energy technologies are free of environmental risk

Current Efforts: To assure the country of a stable supply of energy, the following activities are being undertaken:

- Oil exploration and drilling both on-shore and off-shore are continuously pursued. A total of seven wells were drilled in 1988. The oil discovery at North Masinloc, and Galoc increased the number of oil producing fields to six, bringing the total production to 2.18 million barrels or 6.9 percent from the 1987 production level.

- Coal exploration was intensified with the launching of the small scale coal mining program. The coal mining industry produced 1.29 million metric tons in 1988.

- Geothermal development activities have intensified in 1988, with the adoption of a new power program recognizing that geothermal steam could be a major power source. To date, there are 197 wells that are producing an estimated power potential of 1,228 megawatts.

- In the nonconventional sector, studies and promotional activities that cover a wide range of potential indigenous energy sources are being undertaken.

Key Measures Needed
- Environmental aspects should be integrated into energy policies both at the formulation and implementation stage.

- Promotion of energy conservation measures which have positive environmental effects.

- Accelerate the development and exploitation of new and existing energy sources, taking into consideration environmental requirements and precautions to minimize adverse environmental impacts.

- Active support in terms of research and fiscal measures (e.g., tax incentives) for the development and integration of non-conventional renewable energy systems (biomass energy, wind, solar, mini-hydro).

- Clarification of energy development alternatives (e.g., coal versus geothermal) to inform the public on the necessary trade-offs involved (economic, social, and environmental).

- Energy pricing scheme that includes payment for environmental damages or environmental rehabilitation costs directly attributable to energy development.
FOOTNOTES


(4) Ibid.


Appendix B

Figures
FOREST AREA AND POPULATION (1930 - 1984)

FOREST AREA (million hectares)  POPULATION (million people)

YEAR

FOREST AREA  POPULATION
CORRELATION OF POPULATION DENSITY AND FOREST COVER, 1980

Figure 2
POPULATION DENSITY AND POVERTY INCIDENCE
BY REGION, 1980

Persons per km²

No. of families

Regions

Population Density
Agri. Families in the bottom 30%