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<td><strong>Author(s)</strong></td>
<td>Amir, Harry; Rauf, Maswadi</td>
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The State Of Environment In Indonesia

By

Harry Amir
&
Maswadi Rauf
THE STATE OF ENVIRONMENT IN INDONESIA  
(Country Presentation)  
By Harry Amir, Maswadi Rauf

Introduction

I would like to begin this presentation by emphasizing the size and the diversity of environmental problems that confront us in Indonesia. I will first mention some general features of the Indonesian environment such as ecosystem diversity, species richness, and cultural heterogeneity; and then I will discuss briefly some major factors that affect the environment and the impact they are having upon the environment. Finally, I will describe some of our efforts to cope with these problems through environmental management and a variety of institutional support mechanisms.

The geographical setting, ecosystem and human diversity

The Indonesian archipelago is a large group of islands said to number some 13,000. These islands vary from small sandy atolls to such vast land masses as Sumatera, Java, Sulawesi and Irian Jaya, each as large as the average European country.

Much of Indonesia is mountainous, with a massive chain of ranges stretching across the Nation. In many places this chain culminates in volcano cones that occur along the west side of Sumatera, through Jawa to the Lesser Sundas. There are also extensive highland area in central Kalimantan. In Sulawesi, the highland areas consist of broken mountainous
terrain. In Irian Jaya the central highlands form a great east-west watershed and reach the peak at Puncak Jaya, the highest peak in Indonesia. We have three different climatic zones in Indonesia. The first of these can be classified as tropical wet climate where rainfall is high throughout the year and exceeding 60 mm even in the driest month. The second we might call a tropical wet/dry climate; rainfall has a marked seasonal rhythm with distinct dry period. And the third is the tropical monsoon: rainfall high throughout the year but with a short dry period.

Climate in Indonesia is chiefly influenced by two monsoon seasons: the northwest monsoon brings winds and heaviest rainfall during period November - March; and the dry winds of the southeast monsoon during period May - September that result in a marked dry season at this time of year in Sulawesi, East Jawa, and Lesser sundas.

Biogeographically Indonesia is a part of the Malesian botanical region which also includes Malaysia, Singapore, Brunei, the Phillipines and Papua New Guinea. The flora of Malesia is extremely rich, a very conservative estimate being at least 25,000 species of flowering plants, including some 3,000 - 4,000 orchids. Among the commercially important Dipterocarpaceae alone are some 500 species.

Indonesia’s rain forests vary considerably from place to place. It is possible therefore to classify distinct types of forest which occur in different habitats such as
tropical lowland evergreen forest, kerangas (heath) forest, mountain forest, and peat swamp forest which is unique in the tropics.

Indonesia also has a unique zoogeographical zones: the Indo-Malayan which can be regarded as a subregion of the Oriental region, the Australo-Papuan of the Australian, and the Indo-Australian as a transitional zona between these two major zoogeographical regions.

Mangroves and coral reefs are interacting ecosystem that occur widely throughout the region. Mangroves occur in association with rivers, estuaries, and sheltered bays or coast and are extensive along particular coasts. Coral reefs, in contrast, occur along more exposed coasts on around small islands, well removed from rivers, estuaries and silt-laden shores.

Mangroves represent one of the world's most productive and biologically fertile ecosystems in both gross primary productivity and leaf litter production. Its play a role in the cycles of certain key elements such as nitrogen and sulfur, particularly in trapping organic nutrients carried down from watersheds by rivers and converting them into organic compounds, which then enter mangrove- associated food chains. Because of their high productivity and phisical structure, mangroves are a source of food and shelter during parts or all of the life cycles of many edible coastal land
and marine species. Mangroves also are direct sources of firewood, some medicinal extracts, minor foods, and tannin. In their natural state, mangroves help stabilize coastal zones by reducing wind and wave damage during storms and by checking soil erosion. Similarly, mangroves build land through slow, long-term sedimentation.

The largest concentration of mangrove forest remaining in South East Asia is in Indonesia with an estimated 3.6 million hectares; three-quarters of it is in Irian Jaya and Sumatera. Other major mangrove forest are found in Kalimantan.

Coral reefs serve humans as sources of food production, coastline protection; non food products such as medicines, decorative shells, construction materials, sponges; and scientific and educational consideration such as the study of population dynamics, community interactions, species diversity and ecosystem stability. Coral reef fishes constitute a significant portion of the recorded catch in most countries in South East Asia. Thirty-two out of the 132 fish species listed as being of economic importance in Indonesia are reef associated. In addition, reefs harbor mollusks, crustaceans, echinoderms, and algae of nutritional or other use to humans. Coral reefs supply food for fishes harvestable in nonreef areas as well.

The most extensive coral reef area for any one of south Asean country is in Indonesia, reflecting its 81,000 km coastline.
Coral reefs are well represented along the southern rim of Indonesia, in the eastern archipelagos, in the Mentawai Archipelago, along many most coasts in Sunda Archipelago, Banda and Mollucas seas.

Indonesia is also a land of extraordinary cultural diversity. Well over 200 different ethnic groups, speaking different languages and possessing distinctive cultural traditions live scattered unequally over our more than 13,000 islands. They represent almost every type of subsistence pattern and level of socio-political integration. There are small lands of hunters and gatherers, slash and burn horticulturalists, peasants who practice traditional wet-rice agriculture, and peasants who practice triple-cropping with the most up to-date technological inputs. About 20 percent of our population is now urban. The urban population too, ranges from urban hamlets composed of barely literate laborers and service workers to high technology industry to a cosmopolitan elite that is well-integrated into an international social and intellectual network.

Factors affecting the environment

Countries in Asia which have not yet reached the advanced industrial stage, have the following common demographic features: large population, high population clemly, high population growth rates and low life expectancy.

The case of Indonesia is similar. Population estimate in mid 1984 is 161,6 million, the maximal increase is
2.1% and life expectancy is 49 years. Population projected to year 2000 is 2.82 million. This growing population require more food. At the same time the other consumption needs will also increase as time progresses and as our development efforts continue. To achieve a degree of welfare that the populations deserve and demand, the overall production should be increased and more income must be generated; from the agricultural sector as well as from the industrial and service sectors.

Increased food production and accelerated industrialization, if not carefully managed, may have a serious and negative impact upon the environment and upon our natural resources.

Indonesia has achieved great success in rice production. Ten years ago there were gloomy forecasts of widespread famine in many countries of the so-called developing countries. Indonesia with a very high population growth rate and over 75 million people crowded into Java alone seemed, at that time, a prime candidate for future Malthusian disaster. Yet today, Indonesia has achieved near self-sufficiency in rice, its major staple food crop. Rice production currently standing at over 20 million tons per year, has risen by an average annual rate of about 4.5% over the past decade. About a quarter of the increased rice production in Indonesia over the past decade has come from extending
rice cultivation to marginal land. For example, about 400 thousand hectares of tidal swampland in Sumatera and Kalimantan have been opened up for paddy cultivation by spontaneous and government-sponsored transmigrants from Java, Bali and Sulawesi. Most of the increased production, though, has come from doubling and trebling yields on existing paddy fields.

Such intensification of rice production is clearly not without risks, such as pest and disease outbreaks.

The Brown Planthopper outbreaks, for example are caused by several factors: continuous and overlapping cultivation, increased application of nitrogenous fertilizers and induced by resistance to pesticides. There is also evidence that a major factor may have been the destruction of the natural enemies of BPH by non-selective insecticides.

In addition to the direct effects (both positive and negative) of intensification on rice production, there are side effects, particularly from the chemical inputs, on other components of the environment. The use of fertilizers and pesticides has greatly increased, that there is a danger of contamination of subsurface waters, particularly by nitrate and pesticide compounds.

Many modern compounds are short lived in surface waters but apparently persist in the subsurface waters, which are particularly critical in Indonesia since they are a principle source of domestic water via individual and
communal wells. The difficulties in researching in problem lie in the detection of compounds which may be toxic at very low concentrations.

There has been a very large increase in the use of pesticides, notably carbamates and organophosphates, in association with the rice intensification program. But in general, pesticide residue analysis indicates that average concentrations are still low, although in some cases the amounts in water bodies are sufficient to cause harm to several species of organism.

Indonesia owns almost 10% of the world's total of tropical forest ecosystem and about 50% of that in South East Asia. Indonesia exports almost 50% of the world's tropical hardwood logs. As a result of this, it is estimated that recently about 23 million hectares of forests have been damaged and that excessive cutting very often results in soil erosion, floods, loss of fertility or destruction of valuable forest resources. Another estimate indicates that 44 million hectares of forest land are in bad shape and need reforestation. Improved access to these lands provided by logging roads encourages shifting cultivation, which further retards regeneration of forest. Forest are also felled for various other reasons. Forest are sometimes felled to provide wood for domestic fuel and for construction material. Sometimes they are felled simply to provide land and space for agriculture, human settlements and industrial location.

In 1980, 74% of all households in Indonesia used wood for fuel.
Shifting cultivation has commonly been condemned for its destruction of primary forest, for its low agricultural productivity, and for the long-term damage which it causes through accelerated erosion. Actually, under some favorable conditions, regeneration may take place naturally after an area that was used by shifting cultivation has been abandoned. Shifting cultivation has therefore been a natural way to use the regenerative properties of the rain forest for the benefit of man.

However, as human population increases and land becomes even more scarce the peasants will have reduce the period of fallow time that has been in cultivation cycle and this will result in an accelerated loss of forest covers, soils and water.

Same grasslands, especially the noxious alang-alang (Imperata) are the result of shifting cultivation which was not in harmony with the ecological condition. The total area covered by this noxious grass is about 40 million hectares.

The course of industrial development followed by Indonesia will open opportunities to broaden our economic base which has been limited to agriculture, mining, and producing raw materials only. It will broaden to include industries producing finished products, providing the opportunity of gradually changing the structure of our economy. As the rate of industrialization in particular
and of economic growth in general has recently gained speed, several problem have already arisen. Beside agrochemical run-off, sewage and household waste, obviously industrial effluent is a major source for river and ground water pollution. Reports of high mercury and other heavy metals such as Pb, Cd, Cr etc in Jakarta Bay have been a recurrent source of anxiety and recrimination in recent years. Several reports show the polluted areas of various rivers, such as Ciliwung river, polluted downstream after passing Jakarta city, and Citarum river where pollution starts at the upstream part due to industrial and domestic waste from Bandung and surroundings. The industries that are located upstream along the Citarum river mostly are textile industries that account for more than 50% of the total textile production in Indonesia. Other kinds of industry such as a paper plant, steel pipe industry, etc are situated in locations spread upstream of the river.

Ecodevelopment: Challenge for environmental management

The basic needs approach starts from demographic realities, taking population and its predicted growth largely as "givens", and seeking ways to manipulate resources to meet its needs. The ecological approach starts from natural realities, taking the biosphere and local ecosystem largely as "givens" and deriving implications for carrying capacity and the need for behavioral adjustments to conform to these constrains. Both views of reality evidently
have to be taken into account in the management of national resources to achieve satisfactory and sustained development.

The conservationist "limits to growth" approach lost much of its appeal during the 1970s when economic growth itself seemed to become an endangered species around the world. Ecodevelopment, or economic growth with population planning and environmental enhancement, provides a more positive approach. Pollution control has matured into resource management.

Indonesia faces some of its most acute environmental challenges in relation to watershed and river basin management. The vast majority of people (in the order of 90%) live in one of 69 major river basins, where the rivers are generally short, heavily sedimented, subject to multiple uses and sources of pollution, and virtually devoid of effective regulation. High settlement densities and competing demands for land and water use create conflict situations, and make optimal resource use difficult to implement. Land erosion and depletion are critical in many watersheds, with landslides causing local disasters, with millions of tons of topsoil being lost to forestry and agriculture, and with siltation clogging and destroying rivers, irrigation systems and coastal zones.

Spatial and regional planning appear to offer a logical approach to watershed management, seeking to integrate competing demands on resources with broader environmental concerns. 36 watersheds have been selected for integrated management studies, with 11 identified for urgent action. In these 11, lands designated as critical are calculated to be around 90 million ha and to be increasing by 180,000 ha/year.
The objective is to increase and sustain the productivity of land, to improve water quality, and to seek optimum multiple resource use.

At present, land use planning operates on a somewhat ad hoc basis. Regional development plans are prepared for most provinces by the provincial government but these do not deal with issues of land use in any detail. City plans, prepared by the municipal government and approved by the Minister of the Interior, are prepared for most urban areas.

Pollution such as releases of liquid effluents, air emissions, solid waste discharges and noise from industrial and other activities are often controlled by licensing systems or by discharge standards.

Some provincial governments (including West Java and DKI Jakarta) have issued regulations on liquid effluent standard for water pollution control. In theory all discharges to water should meet these standards and monitoring should be carried out by the discharger and the local authorities.

In practice, these regulations have little impact because of the lack of monitoring and enforcement capability.

There are parallel regulations for noise and air emissions in some provinces but these are also of little effect in controlling pollution.
Some subsidies for pollution control are granted through the national investment scheme administered by BKPM (National Investment Co-ordinating Board). Pollution control equipment may be covered by investment assistance measures such as tax holidays.

The other sanction available to the authorities to control pollution from existing activities is the threat of withdrawal of the various permits.

These sanctions are applied in very severe cases where there have been many complaints from the local community.

Institutional supports for environmental management

It is just over a decade since the U.N. Conference on the Human Environment in Stockholm (1972) raised environmental concerns to the status of national agenda items in economic planning in most countries. Indonesia was among the first developing countries to incorporate the new perspectives, establishing a Ministry of State for Development Supervision and the Environment in April 1978, under Dr. Emil Salim. A legal framework for environmental regulation and management was introduced by Act No. 4 (1982), outlining "Basic Provisions for the Management of the Living Environment". This now forms the basis for a whole series of regulations and guidelines for resource and environmental management, pertaining to specific sectors and problem areas.
in process being implemented by central and local government agencies.

The mandate for KLH includes responsibility for designing overall policy, monitoring implementation, and coordinating the campaign to improve environmental awareness and protection.

The complexity of operations and division of responsibility was -- and still remains -- one of the major difficulties in coordinating what is, of necessity, an inter-sectoral and inter-disciplinary task. KLH has developed many networks of influence and consultation with central, provincial and other agencies, with universities and NGOs, and with the consultant and business community.

A network of BKLH (bureaus for population and environment) has been established at provincial level which helps link environmental concerns of provincial governments with those of local offices of central Departments. Two networks of university-based Environmental Study Centres (ESC) and Population Study Centres have been created to undertake environmental and demographic training and research, information gathering and dissemination, and problem-solving extension work. And a network of environmental NGOs is being encouraged, to enhance public awareness of environmental concerns, and to promote participation and self-reliance of local communities.
The ESC network concept was developed on the initiative of KLH, and is in process of expansion from the original three, to 28 now established, to an eventual 42, with at least one for each of Indonesia's provinces.

Regular training courses on environmental impact assessment, integrated resource management, and related tropics are now being offered at several ESCs for government officials and university staff, and occasionally for private sector consultants, high school teachers and NGO staff.

The network of environmental NGOs is an equally vital component. These organizations include "nature lover" and outdoor clubs, professional associations (landscape architects, marine engineers and oceanographers, agricultural scientists, public health practitioners), and self-reliance, public awareness and advocacy groups. Development NGOs are also increasingly involved in environmental work, such as clean water supply, regreening, and appropriate technology.

The main umbrella organization for environmental NGOs is WALHI (Wahana Lingkungan Hidup Indonesia, Indonesian Environmental Forum), with participation list now in excess of 700 separate organizations. At least 120 of these are actively involved in community development, cadre training, problem-solving, "action research", monitoring the effects of local industry and development projects, and promoting campaigns to enhance public awareness and support for
environmental protection and participatory involvement.

Public awareness of the extent to which society depends on the environment is also engendered by the Ministry of the Environment through several pathways. Almost for the first three or four years of our existence the Ministry have concentrated on raising awareness of environmental issues. We have tried to make each and every person in Indonesia be aware of and concerned about the environment. While many programs were generated toward the general public, we have also devoted considerable effort to influence strategic sectors such as government officials and planners, and business community.

Many different channels have been employed to spread the message of environmental concern. We have produced a series of television programs introducing the viewing public to various environment issues and activities. For example we have had programs on many topics ranging from nature conservation to pollution.

We have also worked to stimulate more writing about the environment, briefing journalist and authors about the environment. In addition to this, we have established a national program to provide recognition to individuals who have made exceptional contributions to preserving or improving the environment. These "Tree of Life Awards", Kalpataru have been very successful. President Soeharto himself has presented these awards, thus
ensuring that the awards confer wide publicity and confer a high degree of status.

Finally, and with considerable success, we have encouraged and cooperated with a growing number of Non-Governmental effort in Indonesia.

During these early years we began by reaching out to communities through existing channels. We have worked with Islamic and Christian groups, with religious schools. We have sent the message of environment across Indonesia through many different sectoral extension services: fisheries, forestry, public health, and so on.

As a result of these efforts, environmental awareness in Indonesia is increasing. We may, in facts, say that it has already increased very significantly. Minister Emil Salim is a famous man in Indonesia, and his message has been widely heard. Many Indonesians now know about the environment. They talk about the environment. But, I am sorry to say, not many people actually do very much about the environment. We have enlarged peoples knowledge and their vocabularies; but we still haven’t had much influence upon their behavior.

As we became aware of this state of affairs, it was naturally a little disappointing. We had to ask ourselves: why? Why don’t people do what we think they should do even
after we have informed them, explained to them, and try
to persuade them using all sorts of modern techniques and
technologies? Part of the answer, we came to realize, must be that cultural factors are involved in ways we don't really understand.

We recognized the need to communicate much more effectively about the environment, and we thought that to do that we had to take cultural factors into account in at least two ways. We had to study cultural factors that impinge on peoples relationship with the environment, and we had to study cultural factors that impinge on communication style and effectiveness. This leads to a view of environmental communications as flowing in two directions, both from the government to the people and from the people to the government planners and officials. From this perspective it quickly becomes a complex task, one requiring the work not only of communication specialists, but also specialists on culture and the environment. And in October 1983 we organized a workshop on Environmental Communication, jointly sponsored by the East-West Center, to which we invited specialist from many disciplines. Tomorrow morning you will hear more about what has happened over the past 18 months as a result of that conference.