A FRAMEWORK FOR ENVIRONMENTAL POLICY

Jan A Suurland
Policy Advisor Central Environmental Authority

Around the world there is a growing awareness that sustainable development can only be achieved by a more effective protection and management of environmental resources. There is ample evidence that the on-going over- exploitation of environmental resources will result in the collapse of economic systems and communities. The number of 'ecological refugees' due to desertification, floods, salination is increasing every year. So are the morbidity and mortality rates of especially the urban and rural poor due to contamination of water resources and air pollution.

Though it can be argued that the main causes for environmental degradation havtion have their roots in the excessive consumption of energy and other resources in the developed world, it is obvious that it will be people in the developing countries who will suffer most of any failure to balance economic growth and the carrying capacity of the environment.

Moreover, many of the environmental problems developing countries are facing have been caused by inadequate land use planning and mismanagement of their natural resources. Such practices are often justified by pointing to the pressures on natural resources due to population growth and poverty. Those pressures are tremendous indeed, but one may question the rationality of policies that try to cope with such pressures by allowing processes which only result in a further loss and degradation of resources essential for the sustenance of the poor.

There is of course, not a simple solution to complex problems like the interaction of poverty and the use of environmental resources. One can only say that politicians and policy-makers should recognize that *environmental degradation and poverty are two sides of the same coin; that is an unbalanced and short-sighted exploitation of natural resources.* Unbalanced because there is a large discrepancy between the overall income generated by the supply of natural resources (forestry, agriculture, livestock, etc) and the benefits that accrue to developing countries and the farming/resource producing communities within these countries. Therefore, sustainable development requires a substantial change in the terms of trade in favour of the suppliers of natural resources. Short-sighted because over-exploitation of natural resources, inadequate land use or pollution of the environment may relieve some financial and social pressures of today only to become more severe and more difficult to solve (finance!) tomorrow.

From this perspective *environmental protection and management is not a luxury (above the means of developing countries) but an absolute necessity to survive.* The key word is 'sustanalbe development' and this has already become a fashionable phrase in many speeches of politicians everywhere. However, the only way to achieve sustainable development is by adjusting development planning and economic decision-making in such a way that it will not deplete the environmental resources base. This requires a serious effort and political commitment to built up environmental expertise, to establish appropriate co-ordinaiton, planning and decision-making procedures, to integrate environmental considerations into decision-making processes and to design and implement regulatory instruments, incentives and funding mechanisms to control the exploitation of environmental resources. Such institutional measures has to be supported by a broad awareness among the public about the importance

Though it can be argued that the main causes for environment degradation have their roots in the excessive consumption of energy and other resources in the developmed world, it is obvious that it will be people in the developing countries who will suffer most of any failure to balance economic growth and the carrying capacity of the environment.

Environmental degradation and poverty are two sides of the same coin; that is an unbalanced and short-sighted exploitation of natural resources.

of environmental management for a balanced socio-economic development and can only succeed if the people themselves are involved in the decision-making processes. Hence, environmental education and public participation should be part and parcel of sustainable development processes.

First, we will discuss types and functions of ecosystems and their significance for sustainable development. Secondly, we will present a number of objectives and guiding principles with regard to the development of environmental control strategies to be followed by a discussion of some major aspects involved in the implementation of source control strategies. Finally, we will introduce some models that may be used to guide the organization of the formulation and implementation of environmental policies.

II ECOSYSTEMS AND SUSTAINABLE DEVELOPMENT

The World Commission on Environmental Development has described sustainable development as a path of socio-economic development that is not jeoparadizing the opportunities for development and well-being of future generations.

Basically, development is the result of an interaction between human and natural resources. Natural resources can be distinguished as inrenewable and non-renewable resources. Non-renewable resources consist of available supplies of minerals and metals. Extraction of these materials automatically means depletion of the resource base. Renewable resources are all sources of organic material (biomass) being used for production and consumption such as plants, livestock, wood, fish, etc.

By definition there can be no sustainable exploitation of non-renewable resources. We may slow down the rate of exploitation but this will only postpone the time of their depletion. To what extent there should be a control on the rate of exploitation and consumption of such resources in order to ensure sustainable development is impossible to tell. It all depends on the prospects there are for the development of alternatives. One might argue that such prospects will be enhanced by an increasing scarcity and therefore, prices of energy, metals and other minerals. This would imply that governments should stimulate the development of such alternatives and also discourage any use of such materials for applications for which feasible alternatives are available, rather than trying to control the rate of utilization by imposing quantitative constraints on the exploitation of such resources.

Economic development (or more basically human life) is only possible with an adequate supply of organic material. This supply is dependent upon the stability of ecosystems. The stability or regenerating capacity of ecosystems is being determined by each and all of the three following conditions:

1. The density and diversity of organic life;
2. Air, water and soil conditions; and
3. Reservation of adequaste space for the functioning of different types of ecosystems.

Therefore, the objective of environmental management is to provide the basic conditons for ecosystem stability by means of:

(a) Protection of the density and diversity of genetic resources in adequate quantities;

(b) Protection of the quality of air, water and soil; and

(c) Reservation of adequate space for the functioning of different types of ecosystems.

Co-ordination and integeration of these three sets of policies will have to take place by means of an **ecosystem oriented approach.** This is the unifying concept of environmental management. It implies that policy makers should be prepared to design and adjust their policies in such a way that they will be compatible with the objective of ecosystem stability – as much as possible.

Ecosystems vary in form and scale. At one extreme we can view the whole earth and atmosphere as one ecosystem. At the other extreme a small pond or lake also forms an ecosystem. In between we can distinguish ecosystems of continental importance (oceans and land-masses); inter-regional importance (large river basins and mo unıan areas); regional

Continued on page 36

16.

Continued from page 17

importance (catchment areas, medium size wetlands); and local importance (small nature reserves but also human settlements).

Though many human activities have only a **direct** bearing on the functioning of local or regional ecosystems, it is because of the cumulation of such activities and the interaction between ecosystems that ever continental and global exosystems are now under threat (ozone depletion, global warming, desertification). Therefore, environmental management can only be successful it we take the interactions between the various ecosystems into account. This calls for the development and co-ordination of environmental control measures at the local, regional, national and international levels. **(Integration of Environmental Management Policies)**

At each scale we find a multitude of different ecosystems, mainly determined by specific soil and water conditions, climate, altitude and geological history (e.g., relic fauna in Sri Lanka) and of course, by human interference. For instance, the Natinal Conservation Strategy of Sri Lanka distinguishes seven vegetation zones, which, in combination with the three climatic zones and different levels of altitude results in 24 agro-ecological zones. In addition, there are various types of coastal ecosystems (lagoons, marshes, mangroves, mud flats) inland wetlands and marine ecosystems. this variety of types of ecosystems requires the tuning of policy measure to the specific conditons governing the stability of such ecosystems. **(Differentiation of Environmental Management Policies)**

In dealing with environmental management issues, the main question is how to balance socio-economic use of ecosystems with the need to protect ecosystem stability. This implies that we should have a fairly good idea about the impacts of various types of activities on different ecosystems. It also implies that in deciding whether or not such impacts are acceptable in the context of sustainable development we must have an idea about the functions of a particular ecosystem.

Generally, we may distinguish the follwoing functions or capacities:–

(a) To provide food and other organic materials for different purposes (Production Capacity),
(b) To absorb (decompose) waste materials (Absorption Capacity),
(c) To carry on and regulate cyclical processes with regard to climatic conditions, water supply and biomass generation (Carrying Capacity), and
(d) To store or conserve certain species of flora and fauna which are considered to be special value (Genetic Resources Conserving Capacity).

Each and every natural ecosystem has the capacity to fulfill all four functions but only to a certain extent. If we are going to use a natural forest as a source of supply for timber this will automatically reduce the capacity of that forest to harbour a variety of genetic resources. If we discharge waste water into a lagoon this will undoubtedly affect the capacity of this lagoon to produce fish.

Environmental protection and management is not a luxury (above the means of developing countries) but an absolute necessity to survivie.

If we clear parts of a forest to make land available for agriculture we may have enhanced the food producing capacity but are reducing the capacity of the forest to regulate water flows. If we extract substantial have to make the choice as to which particular purposes we would like to use a specific ecosystem. Such choices should be made on the basis of a proper assessment of the suitability of an ecosystem to serve particular purposes and the impacts this will have on the various functions as well as on the ecosystem as a whole (the whole being greater than the sum of its parts.)

It goes without saying that for the major part of available space, such choices have already been made in the past and have resulted in vast changes of many ecosystems, without much

amounts of sand from river beds this reduces the sand nourishiment of beaches.

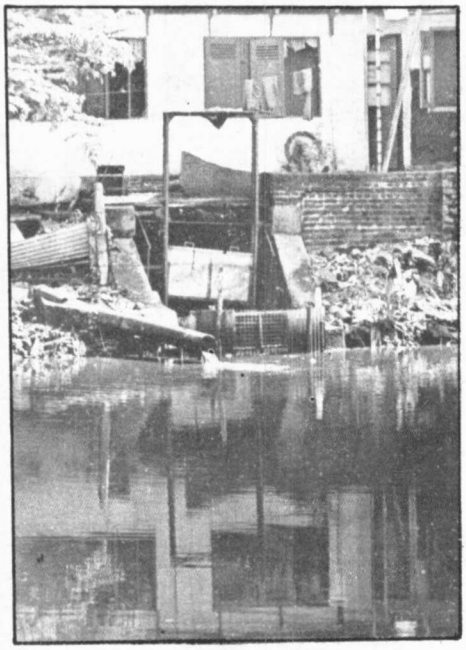
However, because space is limited and people are abundant, it is impossible to maintain all four functions at the same level for all ecosystems. We

regard to the impacts of such changes on the various functions (natural values) of those ecosystems.

This continuing process of reducing the space available for natural ecosystems and the increasing intensity of activities in combination with the disregard of ecosystem functions and the interaction between ecosystems has severely undermined the stability of ecosystems and made many communities and the world at large very vulnerable to ecological disasters.

To mention one example of environmental mis-management in Sri Lanka, I may refer to the recurrent floods and landslides. The loss of human life, property, crops and livestock caused by such diasters is tremendous. A UNDP Mission rather conservatively estimated the damage of the floods of June 1989 at approximately US$ 46 million. Flocks of politicians swarm out every time to hand out relief packages but very little has been or is being done to abate the structural causes of such disasters – that is to prevent deforestation of hillsides, to prevent encroachment on such hills and riverbanks, to apply soil conservation measures and so on. Why is this happenig? I think it is partly because of the way the political system operates in Sri Lanka and other (developing) countries. But also and hopefully, more significant for the future, it is because of the fact that we only recently have started to understand the significance of natural functions of ecosystems and still have a lot to learn as to how to avoid adverse impacts when interfering with such functions.

At this stage, it should be emphasized that environmental management does not mean that we should preserve natural ecosystems at any cost, but rahter that we try to balance our demand for space and natural resources with the value ecosystems and ecosystem functions have for the society at large. This means for instanee that , if we value an ecosystem as a habitat for endemic species or as a habitat for migratory birds any reduction in the size of such areas automatically reduces the capacity of that ecosystem to harbour such species. Therefore, we should not interfere with such systems unless we are convinced that the use we want to make of the system is of greater value to society than its function as a genetic resource basis. To the extent that a forest is regulating local or regional climatic conditions the same applies for any clearance of such forest. However, the value of a natural forest to regulate the flow of water and to prevent erosion can be taken over to a certain extent by forest plantations and agro-forestry. The same is true for the function of a forest to supply timber, fuelwood and fruits.



One step further and we may clear a forest for agricultural purposes provided we construct and maintain adequate structures to ensure a regular water supply and to prevent erosion. In other words, any interference or major change of an ecosystem should be backed up by artificial measures to compensate for or take over crucial natural functions of the ecosystem. The more intense our interference is the more we shall have to invest in the construction of artificial means to prevent a disruption of the functioning of the socio-economic system by a 'kick-back' of nature. In some instances, the costs of such artificial regulation may not weigh up against the benefits of a project or development plan and it may be more cost-effective to let nature do it for free. Whatever choice is being made it should be imperative that it is being based upon a proper assesment of natural ecosystem functions and followed up by adequate control measures. It may be evident that such control measures does not only mean the investment and operation of artificial structures but also should be accompanied by certain restrictions on activities and rules of behaviour.

We may sum up by stating that we should balance development activities and our behaviour with the purposes and functions ecosystems have for society at large. We may classify ecosystems according to their purpose and on a scale ranging form exclusively natural (not to be used for any socio-economic purpose and of which the stabil-

Continued on page 39

Continued from page 37

Continued from page 38

Table 1
Savings During One Month by Sectors

Sector	No. of Spending units (1)	Monthly Income per spending Unit (2)	Consumption per spednig Unit (3)	savings (2)-(3) (4)	Savings as a percentage of income (5)
Urban	1,667	2,320.55	1,921.67	398.88	17.2
Rural	6,147	1,498.90	1,324.71	174.19	11.6
Estate	574	1,098.47	1,331.11	-232.64	-21.2
asll Island	8,388	1,098.79	1,443.73	191.06	11.7

Source: Report on Consumer Finances and Socio-economic Survey 1981/82 Sri Lanka, P.274

Note: In 1982, US$ was equal to S.L. Rs. 21.32

Table 2
Currency and Deposits as a Percentage of GNP

Year	Currency/ GNP ratio GNP ratio 1/	Time and Savings/ Deposits/
1970	7.3	15.2
1978	7.7	21.4
1979	7.6	24.7
1980	6.8	26.8
1981	6.2	27.8
1982	6.7	33.3
1983	6.5	35.1
1984	6.3	34.7
1985	6.8	38.1
1986	7.2	36.4
1987	7.8	38.0
1988	9.3	31.7

1/ Time and savings deposits of the private sector with commercial banks, the National Savings Bank, Finance Companies, Co-operative Rural Banks, Foreign Currency Banking Units, and Regional Rural Development Banks.

To be continued