

SOME SOCIO-ECONOMIC ASPECTS OF ENVIRONMENTAL DEGRADATION WITH SPECIAL REFERENCE TO LANDSLIDES

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INTRODUCTION

Landslides are of common occurrence in Sri Lanka particularly in the recent past. Landslides represent one aspect of what we commonly refer to as environmental degradation. While it is mainly a geological phenomenon and hence an area of curiosity for the natural scientist, it is contended that various socio-economic features of societies or special groups may have an impact on the intensity and frequency of occurrence of landslides. The aim of this paper is to gather some random thoughts from the social science perspective which may have some relevance to landslides. The position taken in the paper is that various socio-economic factors cause or accelerate environmental hazards and that landslides are one of them.

THE GENESIS OF THE ENVIRONMENTAL PROBLEM

Environmental problems arise due to contradictions between economic production and the assimilative and regenerative capacities of natural systems. The human ecosystem because of its complexity and inherent contradictions is in a state of tension. The results are environmental problems, such as soil erosion, landslides, earthslips, siltation of rivers etc. The human ecosystem (Fig 1) has three parts of the production system, the natural system and the social system. There are many inter-relations between and among these three systems.

The box labelled natural system depicts the totality of the physical

and biological environments of the country. The productive system represents agriculture, industry, and all other activities related to the production of goods and services that utilize environmental resources in one way or the other. The social system represents the human organization which allocates resources, delineates roles and provides controls over flows and feedbacks. In order to clarify the concept of human ecosystem as used in this paper, various indicators will be specified for each subsystem.

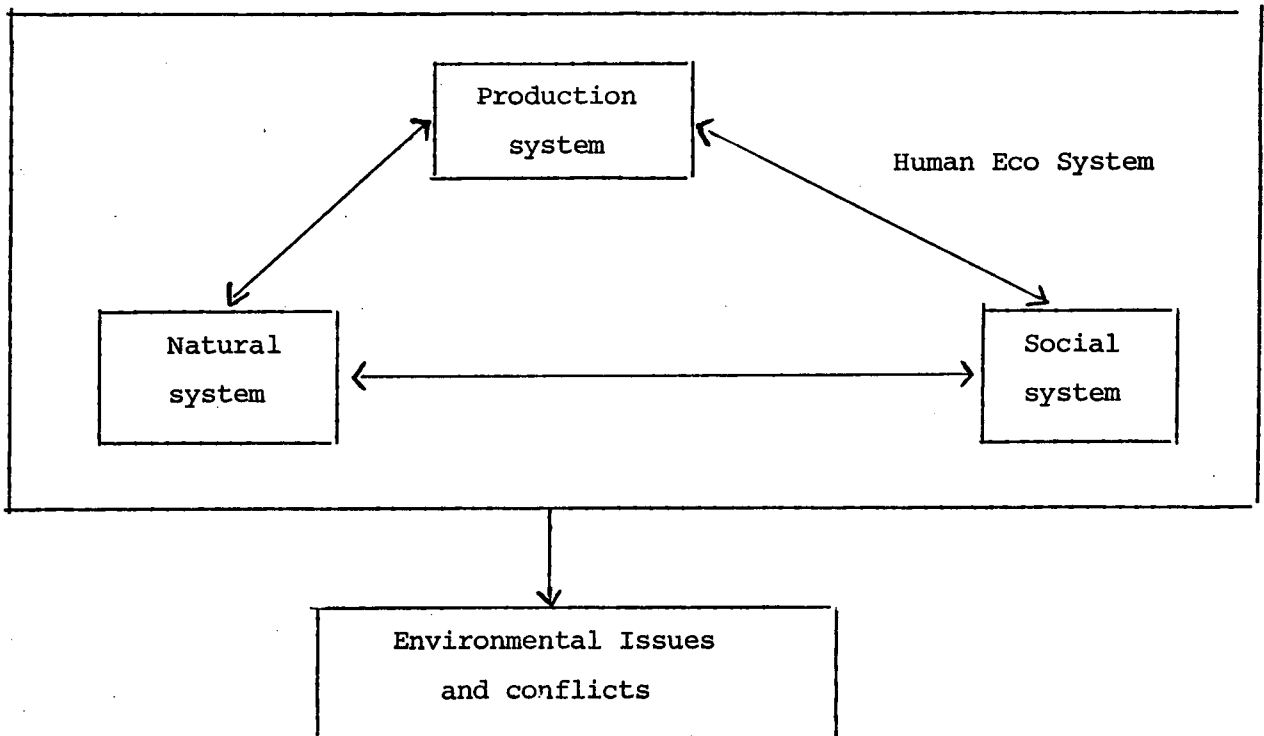


Fig 1

The natural system is characterized in terms of the following:

- hydrology
- meteorology and climatology
- geography and topography
- geology

In general the production system could include these activities that involve trauma to the natural system. These include the following:

- extraction, processing and transport of raw materials
- disposal of wastes
- agriculture
- generation of power
- construction of infrastructure
- patterns of consumption
- patterns of recreation

Perhaps the most difficult to describe is the social systems. This is characterized in terms of human and social conditions.

In terms of human conditions, the following indicators may be used:

- size, distribution, and growth rate of population
- density and mobility of population
- mortality and life expectancy rates
- sanitary conditions
- disease and health
- fulfillment of basic needs
- patterns of land use

The indicators of social conditions are:

- levels and distribution of income
- unemployment levels
- literary and educational levels
- stage of development
- ethnic and age composition
- social cohesiveness

- ideological and intellectual activism (presence of advocacy groups)
- patterns of communications
- scientific resources

SOCIO-ECONOMIC FACTORS IN THE ENVIRONMENTAL DEBATE IN DEVELOPING COUNTRIES

The conflicts between production system, and social system and the natural system precipitate various environmental problems which require identification, study and correction. Thus long term government policies are an imperative. However, before we examine the evolution of policy various factors particularly in the developing world which exacerbate environmental problems are discussed.

1. POVERTY AND ENVIRONMENT

High Subjective Discount Rates

Man has throughout history faced the twin problems of providing adequate sustenance and how to manage the environment. However, in developing countries greater emphasis was placed in sustenance and development. The current environmental crisis in Sri Lanka represents a scenario where the management of the environment lagged behind relative to the emphasis placed on growth. This emphasis appeared justifiable in view of the stark poverty apparent in many societies. Poverty breeds survival mindedness among the people. Environmentally vulnerable areas are invaded, exemplified by shifting cultivation, encroachments, farming of reservations etc. This short term logic is diametrically inconsistent with basically long term ecological considerations. Smallholder farmers who form the majority of the poor in Sri Lanka have very high subjective discount rates. This emphasizes that early incomes are much valued and that

long term preservation of the production environment is beyond their comprehension. The spatial and temporal separation of environmental phenomenon further exacerbate this. On the part of the government, there is no will to enforce measures that would impinge on the short-term interests of the poor. The reasons given are lack of means or humanitarian considerations. The qualms of social justice dilutes the will of authority. Thus, any solution to the environmental problem throws up the issue of people living within the precipitous limits of subsistence.

High Income Elasticity of Demand for Food

It is also relevant to point out that the income elasticity of demand for commodities related to sustenance is high in poor communities and this declines as incomes improve. But the income elasticity of demand increases for a better environment as incomes increase. However, in view of the low levels of income in poor communities, the demand for a better environment is not felt. No environmental consciousness is created until incomes improve. The environmental crisis in affluent societies stems mainly from the dramatic growth of incomes which enhanced the demand for environmental amenities.

Inverse Relationship between Land Size and Intensity of Use

Another factor that is important is that smaller farmers tend to be highly intensive in their cultivation pattern. Their input use, particularly the use of labour in small microparcels of land is more intensive. An inverse relationship between intensity of land use and land size is noted. This can exacerbate environmental problems in societies which have predominantly small farmers such as ours.

2. RAPID POPULATION GROWTH

The capacity of a society to solve either the problem of sustenance or the problems posed by the environment is inversely related to population density and the rate of population growth and positively related to its capacity for innovation in science and technology. Population growth is competitive with improvements in the quality of life in poor countries and that achievement of a population growth rate of 1.0 percent within the next generation is highly desirable. The rapid population growth that still besets the country is a serious constraint for the improvement of economic well being in Sri Lanka as well as a reduction of environmental problems.

3. ADVANCES IN SCIENCE AND TECHNOLOGY

The advance of science and technology has enabled modern society to achieve a more productive and better balanced relationship to the natural world than in the ancient civilizations or in the earlier stages of Western industrial civilization. Continued technical advance is essential for further advances in both the material and aesthetic dimensions of culture. The fundamental significance of technical or of less expensive and more abundant resources for more expensive resources, or it releases the constraints on growth imposed by inelastic resource supplies. In this perspective the rhetoric about "finite earth" is clearly misleading. The impact of science and technology has been to expand the size of "spaceship earth" along those dimensions that are most significant for human existence.

In Sri Lanka's case the advances in agriculture have hardly addressed the issue of hill agriculture. No serious innovation with highly visible productive gains have been developed. The technology

should be land biased for Sri Lanka's context. Technological innovations are being attempted for favourable areas and not for the more difficult and hostile hill agriculture where majority of the farmers live. Thus scientific advancements are called for in this area which at present has a big void.

ENVIRONMENTAL POLICIES

1. Evolution of Policies

Environmentalism spread to the developing countries with rapid speed and in 1981 to Afghanistan, Iran, Maldives, Pakistan and Sri Lanka. In spite of the rapid spread it was not translated into effective action. Environmentalism is a universally accepted issue in the abstract but difficult to implement in practice. It is important to create environment awareness among the leadership as well as among the population in order to create appropriate policies.

It is generally considered that for rapid implementation of environmental protection policy they have to be adopted by the highest levels of government. It is also contended that environmental policy should be integrated and inter-disciplinary in approach.

2. Failures of Policies

While the emergence of environmental institutions in the region is a salutary development for the environmental cause, the general assessment is that, in reality, most of these agencies are without too much authority. This is especially true for those agencies whose mandate is rather broad - in general, such agencies have too little clout to influence the course of actual decision making. They

are underfunded and inadequately staffed and have little influence in formulating important development projects.

It is generally acknowledged that a huge implementation gap with regard to environmental policy exists in many of the developing countries in the region. As well, there are ~~very~~ visible signs of shortcomings in enforcement. This could be due to a host of factors: organizational ineffectiveness, poverty, inappropriate laws, quality of personnel, etc.,

It is not surprising that most of the environmental laws have been based on Western models. Moreover, these laws are grafted to legal systems which are themselves legacies of the colonial past. The present critical implementation gap is one indication of inappropriate ideology transfer. Radical adjustments in the philosophy and strategy of environmentalism would have to be made to suit the environmentalism to Third World context - solution to the problems of poverty, unemployment, the dual economy, high population growth rates, unfulfilled basic needs, and the other forms of direction and focus of environmentalism.

Poverty itself is a feature which has nullified the implementation of policies. Poverty represented by low standard of health, lack of education, lethargy, inertia has disarticulated a large segment of the population from participative planning. All these influence the formulation and effectiveness of environmental policies.

Socio-economic dualism in developing countries further exacerbates the separation of the policy-making apparatus from grass roots participation. The other factors that create implementation problems are lack of political clout, poor resource allocation etc. (Table I).

Purely environmental laws are futile unless they also induce changes in all social conditions and all socio-economic instrumentalists. The reality in the developing countries is that there are no purely environmental problems, or even purely economic problems. What is needed is a policy menu that simultaneously addresses the inter-connected problems of under-development. In formulating policies in the developing countries, it is pragmatic to keep in mind that ethical and aesthetic norms are often overwhelmed by the forces of hunger and want on one hand, and by the opportunistic appeal of private gain on the other.

Table I Ratio of Expenditure in Environmental Administration to GNP: For Some Selected Countries

Country	Ratio of Environmental Adm. Expenditure to GNP
India	0.0122*
Indonesia	0.381 ^{a/}
Papua New Guinea	0.836 ^{b/}
Singapore	1.087 ^{c/}
Philippines	0.005 ^{d/}
U.S.A. (pollution control only)	2.00 ^{e/}

* Based on 1982 figures at current market prices

a/ Based on environmental expenditures for fiscal year 1982-1983 over GNP for 1982

b/ Based on environmental expenditure for 1985 over GNP of 1983

c/ Based on environmental expenditure for fiscal year 1983-1984 over GNP figure for 1983

d/ Based on NEPC and NPCC budget over GNP for 1983

e/ Average for 1975-1984

RECOMMENDATIONS

Since the situation in developing countries calls for the consideration of an expanded policy menu, an inter-disciplinary team of analysts, would of course be required. A professional group within the principal environmental agency in alliance with the country's prominent university or think tank should be established. Interdisciplinary policy studies, which is definitely the ideal to pursue, is very difficult in practice. Many efforts have degenerated into multi-disciplinary chaos. One way out of this danger is the use of integrating methodology. Systematic dynamic modelling provides a framework, wherein various disciplinary contributions could be focused on a single set of coordinated objectives.

The principal environmental agency should emphasize more of monitoring, policy analysis, and coordinating roles rather than its regulatory function. In other words, it should enhance its advocacy role rather than act as environmental apologists for the government. The idea behind this recommendation is to strengthen the dialectic process by assisting the very weak private-sector advocates in developing countries.

To improve implementation, there is a need for a clear, unambiguous articulation of policy. Policy statements are conceptual abstractions that acquire meaning and reality through institutions and individuals that allocate resources. In many developing countries, policies are mere statements of idealistic intentions without too much influence on the day-to-day operations, whose main source of energy and direction is the power of vested interests. A favourite cliché in developing countries is that "the policy is good but the implementation is lousy". In other words, policy fails to achieve its objective. It must be kept in mind that a policy must pass through several bureaucratic transmutions before it becomes action. Ambiguity often times results in arbitrary interpretations by corrupting forces in an unimaginative, tradition-bound bureaucracy.

MAJOR AREAS OF STUDY FOR THE FUTURE

What are the relationships between landslides in the physical system and the sectors of society at risk?

While we have models of landslides and environmental degradation and models of economies, very little work has been done in linking them together. This interfacing of physical and socio-economic systems may offer a research opportunity with potentially large returns.

What are the pathways through, and linkages between, sectors which translate landslides into impacts on human well-being?

The eventual human impacts of environmental problems depend upon the ways in which direct effects on certain sectors filter through the political, social and economic fabric of society. Knowledge of these pathways and linkages, and how they change over time and differ across cultures is fundamental to the evaluation of strategies for dealing with anticipated events.

What is the range of mechanisms by which societies adjust to rapid environmental change? And what are their costs and effects?

As society faces the prospect of a possible climatic upheaval in the future the issue of what mechanisms could be employed to cope with the effects has more than academic implications. Understanding of adjustive mechanisms can be gained from other times and places, for example, through historical case studies or cross-cultural comparisons.

How is information (scientific and otherwise) on landslides or other environmental phenomenon and the impacts perceived, interpreted, valued, and channeled into strategy evaluation?

We know relatively little about the consequences for policy of

different types of scientific information or of different modes of presentation. The ways in which information is incorporated into the decision process has critical implications for eventual decision outcomes.

What are the dynamic relationships of response between natural environmental decay and society?

This is the ultimate question: how does the whole system work? Methodologically, the question is difficult to address, although systems modelling has potential for combining the major components and examining their dynamic feedback effect.