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Environmental Issues and the Developing Economies

by P. Luxton, Coventry *

The growing discussion on questions of environmental management has given rise to consideration of such matters in relation to the economic development of the Third World. Economic development is accompanied by damage and disruption to both the physical and social environment, and the extent to which these accompany the process of development is of growing concern to the developing countries themselves.

The pressing environmental priorities of the developing countries may constitute a different set of problems than those of the industrialised countries. The common environmental problems of the developing countries are considered to be the result of poverty and underdevelopment itself, for example, the lack of adequate provision of food, clothing, health, education, sanitation, etc. Hence, the transposition of the environmental needs of the rich countries onto the developing countries, it is argued, would ignore the pressing problems of the latter, problems development itself may help to cure.¹

Pollution the Lesser Evil?

Within the so called "new international economic order" the developing countries are treating the "environment" to mean something quite different to its meaning in the industrialised countries in the West. Such a distinction was made explicit in the 1972 United Nations Conference on the Human Environment and again the distinctive definitions were emphasised in the Cocoyoc Declaration. There is, however, no assurance that growth and development will automatically solve these problems and further to this, whilst many of the environmental problems of the developing countries are rooted in poverty and underdevelopment, problems of environmental degradation arising out of the process of development itself are of increasing evidence in these countries. For example, the process of increasing agricultural productivity involves the use of artificial fertilizers and pesticides, the construction of dams and irrigation systems, all of which have environmental implications. Industrialisation will result in the increased release of pollutants which may react on

the environment in a number of ways. Increased urbanization can and has led to environmental problems in developing countries similar to those in the more developed countries. The disruptions and damage to the environment associated with development are now beginning to emerge with increasing severity in the developing nations.

Despite this, the argument is put forward that in the long run objectives of the developing economies cannot entail the sacrifice of economic development in the interests of environmental goals given the pressing socio-economic problems of such countries. Their greatest concern is to increase national wealth to alleviate poverty, environmental problems are essentially regarded as something remote from the interests of the poor; to a man faced with slow starvation, the risks from a marginal increase in water or air contamination seem so remote as to be irrelevant. Pollution and environmental damage are regarded by many of the developing countries as a lesser evil than poverty and the feeling seems to exist among many of the developing economies that until such a time as reasonable levels of development are attained, they should be allowed to pollute as much as the developed countries did.

Carrying Capacity of the Eco-system

A basic consideration of the way in which development manifests itself in environmental disruption relates to the carrying capacity of the eco-

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¹ For the rationale of this view see A. L. Doud, *International Environmental Developments: Perceptions of Developing and Developed Countries*, in: *Natural Resources Journal*, Vol. 12, No. 4, 1972; M. F. Strong, *One Year After Stockholm*, in: *Foreign Affairs*, Vol. 56, No. 4, 1973.

system. This is the ability of the environment to receive waste matter, to degrade it and convert it to nutrients which feed the occupants of the eco-system. Because the turnover rate of the eco-system is limited, there is a limit to the amount and rate at which it can absorb wastes. Different segments of the eco-system have different turnover rates because of different limits to productivity. The significance of environmental disruption is that it is relative, not absolute, it depends upon the ability of various segments of the eco-system to absorb and neutralise the disruptive tendencies of development.

These intrusions onto the eco-system, through such agents as pesticides, have thrown major sections of the eco-system out of balance, resulting in damage to the eco-system leading to such stresses that its capability for self-adjustment is considerably reduced and in certain circumstances collapses. Environmental pollution is a symptom of the breakdown of the environmental recycling system. It should be noted that the agency causing the collapse must come from outside the eco-system because the cyclical nature of the eco-system automatically brings about the system's re-adjustment to any internal change in the number or activity of any of its normal biological constituents. The environmental dimensions of development are the extent to which such external factors intrude on the eco-system and thereby tend to degrade the system's capacity for self-adjustment.

Divergence between Economic and Biological Effects

It is argued that, as the developing countries are less industrialised, they are well below the threshold limit of their carrying capacity, and that attempts to remove pollution would hardly touch the pressing environmental problems of poverty and the disruption associated with underdevelopment. Indeed, many of the pollution problems of the developing economies are often the result of such poverty and ignorance. For example, nitrates in water courses due to the over-application of fertilizers, in turn due to ignorance of the correct application rates, application in the wrong weather conditions, etc. Directing expenditures towards education and farm management techniques may help to combat such pollution as well as tackling the fundamental problem of poverty and underdevelopment. On the other hand, the above argument ignores the fact that within many of the developing countries there are severe problems of localised environmental pollution similar to the problems of the industrialised countries and that these side-effects of an environmental nature are likely to increase in importance as the

level and rate of development expands, the Sao Paulo area of Brazil being a case in point.

The problem is that environmental spoilation associated with development may be a gradual and uneven process, partly attributable to the fact that below the threshold environmental pollution can be absorbed on a continuing basis but beyond which environmental damage becomes highly apparent. This arises because of the possibility of divergence between the economic and biological effects of pollution. The latter effect is the extent to which pollutants generate biological changes in organisms in the receiving environment, the former exists only if an external cost is present.² The possibility of divergence arises because individuals may be unaware of the biological effects, thus the stock of pollutants can accumulate unperceived to particular threshold densities. The resulting environmental damage caused stems from the stock of pollutants built up, only incremental damage results from the flow of pollutants.

It could be argued that the stock should be disregarded as this is an unavoidable fixed cost. Development should only be concerned with the flow, which should be subject to some form of control. However, unless the flow is drastically reduced or eliminated altogether, which is appropriate depending upon the speed and manner with which the receiving environment degrades the pollutants, the stock of pollutants will increase through time, shifting the costs of pollution forward to future generations. On top of this, an increasing stock of pollutants could also have the effect of reducing the carrying capacity of the system, increasing the extent of environmental disruption and leading to a situation which is ecologically unstable. To the extent that some of these environmental consequences of development can be avoided, the developing countries should profit from being late starters and gain from the experience of the present industrialised countries. The task can, except for a few localised instances, be seen as one of placing emphasis on prevention rather than reparation.

Need of a New Development Pattern

Hence, the developing countries must search for a development pattern less disruptive of the environment. All development takes place within a natural eco-system, development brings about varying degrees of modification to the system. But development must always remain subject to the ecological limitations which operate within natural systems; these limiting factors must be taken into

² For a taxonomy of pollution see D. W. Pearce, *The limits of Cost-Benefit Analysis as a Guide to Environmental Policy*, in: *Kyklos*, Vol. 29, No. 1, 1976.

account if development is to succeed. Man cannot bring about major changes to the eco-system without risking his own survival. The environmental limits to economic development are set by the carrying capacity of the system which is governed by a number of limiting factors; the whole complex of biotic factors, water, soil, climate, etc. Of particular importance is the manner in which these limiting factors interact, and such interaction is a frequent cause of failure in economic development when efforts are made to modify one limiting factor, for example the lack of water in an arid region, without considering it in relation to other factors, the food supply in the region where more water is being provided. Although the long run objectives of socio-economic development cannot be curtailed, the need is to evolve a style of development where growth and environmental goals complement and reinforce each other, for stability of the eco-system is fundamental for the success of any economic system.

Investment for the Future

The above brings into the discussion the supposed conflicts that arise between economic development and environmental quality. Development tends to stress the short term and de-emphasise the long run. The concern is more with quantity rather than quality, as much as possible now at the least cost. On the other hand, environmental considerations are concerned with long run factors that may show little evidence of operating in the short run. Care should be taken to ensure that short run decisions do not lead to irreversible environmental deterioration that will limit the options available for development in the future. Policies aimed at promoting economic development may, if appropriately defined, have beneficial effects on the environment and vice-versa. For example, raising productivity in the agricultural sector would prevent rural-urban migration and perhaps result in a less skewed income distribution that would help alleviate poverty as well as leading to consumption patterns in which products disruptive of the environment play a less prominent role.

However, the adoption of high yielding varieties of crops in many of the developing countries, an important aspect of the "Green Revolution", has threatened the existence of many native species which could prove crucial to the maintenance of high yield plants. Some high yielding varieties are proving susceptible to disease and knowledge about plant disease pathogens suggest that any resistance they now enjoy will collapse after fifteen years. Widespread planting increases the risk of disaster from disease, parasites or insect pests. Also, high yielding varieties need the com-

plementary inputs of fertilizers, water, etc. which increases further the possibilities of environmental disruption.

The narrow application of technology to raise agricultural productivity, without considering the wider environmental consequences, would, in the longer run, be self defeating. It could even be argued that allowing rural-urban migration, with the consequent pressure on water supplies, congestion, etc., might lead to less environmental disruption and pollution than ill-considered policies to raise agricultural productivity. To ignore environmental factors could store up serious problems for the future, problems that would impose serious constraints on the economic choice of subsequent generations. Viewed in this light, expenditure on the environment can be seen as a form of investment for the future.

Growing Awareness of Environmental Problems

It should be made clear at this point that the above analysis does not argue for developing countries applying the same environmental standards as industrialised countries. It is generally recognised that the level and depth of environmental protection will differ as between the industrialised and developing countries and will generally be lower in the latter. Indeed, the indiscriminate imposition of uniform controls may impose unacceptable costs and disruptions and result in higher costs than benefits.³ Given this, the question arises as to how much lower environmental standards should be in the developing economies. The two major considerations here would be the carrying capacity of the eco-structure and the preference for environmental quality.

With regard to the carrying capacity, it is generally assumed to be higher in the developing economies. However, as pointed out above, the developing countries have serious environmental problems of their own, all be it of different kinds, and if additional disruption is introduced on top of existing problems, overall environmental disruption may reach unacceptable levels. In certain respects, the environment of the developing countries may be even more fragile than those of the industrialised countries. The scarcity of resources and lack of knowledge and technical capacity to deal with environmental disruption means that even minor problems may cause severe dislocation. Indeed, the argument that developing countries have higher carrying capacities than industrialised countries is one of the myths of environmental discussion. It is far from evident that a pound of cyanide in the Ganges does less

³ J. H. Cumberland, *The Role of Uniform Standards in International Environmental Management*, in: OECD, *Problems of Environmental Economics*, Paris 1972.

damage than in the Trent. Moreover, many developing countries rely on resources such as fish and these can be quickly affected by pollution.

One of the greatest dangers to the developing countries is the failure to consider the broader environmental consequences of development projects. The Aswan High Dam in Egypt is a case in point. Whilst it seems to be an economic success, it is an environmental disaster.⁴ In a similar vein, massive irrigation projects of the Indus Plains had unanticipated environmental consequences that virtually nullified the original goals of the project, turning poorly productive agricultural land into an area of largely barren salt flats.⁵

The awareness, however, of environmental problems associated with development has been documented in the reports of the governments of developing countries to the United Nations Conference on the Human Environment held in Stockholm, 1972.⁶ Kenya, for example, reported that its fisheries had been affected by hydro-electric dams and forests thinned for large scale ranching, Iran, the explosion of urbanisation and Mexico, a country where the harmful effects of industrialisation in the form of water and air pollution are being felt without the full economic benefits of industrialisation being attained questioned whether the gains were worth the environmental costs involved. Hence there is an awakening to the environmental damage associated with development but the response to such problems varies widely, depending upon the preferences for environmental quality in the developing countries.

With regard to preferences it is persistently argued that in developing countries prices and costs should reflect the "true" social costs of production. Environmental disruption is just another of these costs and it would be inconsistent to argue, for example, that factor endowments should be reflected in prices and costs, but ignore environmental factors. If environmental factors are ignored, the true costs of production are understated leading to overuse of the environment and cumulative environmental disruption. However, it is by no means certain that the developing countries do have lower preferences for environmental quality. In the Philippines, a pollution control law was enacted in 1964 because of increasing complaints about industrial pollution. Similarly, the government of Taiwan has acknowledged a pollution problem and issued public statements to

this effect. The long and the short of it is that developing countries differ widely. Brazil may not care too much, whereas Uruguay does. India and Malaysia have high standards, Indonesia does not. Explaining why these preferences exist is another matter altogether and outside the scope of this paper.

Environment to Be Included in Development Planning

To summarise the above discussion, its general tone is that the environment should be taken into account in development planning. Indeed, all the environment is planned by someone somewhere even if it is a private owner who does what he pleases. The planning may be good or bad, but it is being done. However, the developing economies will probably select from the various growth-environmental combinations those that give a higher priority to growth than the richer industrialised countries. At the macro level, such considerations may involve the laying down of environmental standards and making them part of investment policy. Regional policies could be important here. By spreading industrialisation the potential environmental problem may be reduced as well as acting as an aid to rural development. At the micro level, environmental side effects should be included in project appraisal. Here, detrimental side effects must be weighed against the benefits projects may incur. To achieve this purpose, the developing countries need effective methods of measuring the impact on the environment of development projects.

It is important that the environmental costs should be determined before undertaking projects so that the developing economies can choose whether the environmental costs are worthwhile given the other socio-economic benefits of the project, whether the environmental costs could be minimised by redesigning the project or whether the adoption of alternative technology would eliminate some of these costs. A major drawback here is that the values of costs of many environmental changes are not readily estimable in monetary terms. In such cases, the best way to achieve environmental protection is to identify the options or alternatives available for the developing economies that would minimise environmental damage whilst allowing them to achieve their development goals. Trade-offs between other costs or efficiency and environmental factors may be necessary, but development goals can be reached by a variety of different paths some of which are better able to reconcile the conflicts that may arise between the demands of economic development and the environment, thus avoiding any irreparable damage.

⁴ R. F. Dasman, *Environmental Conservation*, New York 1972; M. Mesarovic, E. Pestel, *Mankind at the Turning Point*, Readers Digest Press, 1974.

⁵ M. Farvar, J. Milton, *Conference on the Ecological Aspects of International Development*, New York 1972.

⁶ U.N., *Report of the United Nations Conference on Human Environment held at Stockholm, A/CONF. 48/14*, New York 1972.