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Intereconomics

Suggested Citation: Uhlig, Christian (1992) : Environmental protection and economic policy decisions in developing countries, Intereconomics, ISSN 0020-5346, Verlag Weltarchiv, Hamburg, Vol. 27, Iss. 2, pp. 86-93,
<https://doi.org/10.1007/BF02926180>

This Version is available at:

<https://hdl.handle.net/10419/140341>

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Christian Uhlig*

Environmental Protection and Economic Policy Decisions in Developing Countries

In view of the extent of environmental destruction in the Third World, it is necessary to make urgent use of all the instruments available in order to protect the environment and conserve natural resources. However, the priorities both of the people there and of their governments are more often aimed at economic growth than environmental protection, due to the low standards of living prevailing in these countries. How can this conflict of interests, which will be one of the main issues being discussed at the United Nations Conference on Environment and Development (UNCED) in June 1992 in Rio de Janeiro, be resolved?

A change in the degree of importance assigned by society to the environment and environmental protection is not only necessary from a national point of view, nor merely from the point of view of industrialized countries – it is a global necessity. Naturally, environmental problems are not a phenomenon restricted to industrialized countries. Countries in the Third World are affected equally, if not more so in some cases. M. K. Tolba, Director of the United Nations Environmental Programme (UNEP) emphasized that the ecological North-South divide has seriously widened so that, as Simonis has underlined, dialogue between the North and the South has been given a new ecological dimension.¹

At the same time, some modern civilization critics should be aware that people in the southern hemisphere have by no means always lived and worked in harmony with nature and the environment throughout the course of history. In spite of some examples of economic systems which have been well adapted to the natural conditions, many autochthonous, traditional economic systems have been responsible for considerable damage to the environment over thousands of years. Deforestation, karst development, soil erosion, flooding or the extinction of species all bear witness to some lasting effects of ancient civilizations. However, it cannot be denied that the "catching up" approach to development² which involves adopting the "modern" standard-of-living model of European-American civilization and the methods of production linked to it has considerably accelerated the degree of exploitation and, inevitably, destruction of the

environment by human beings.³ Population growth combined with a rise in production and consumption lead to a more extensive use of land, to greater exploitation of mineral resources and to the expansion of industry, which in turn add to the pollution of air, water and the soil. We are witness to an increasing destruction of forests, karst development of mountain regions, the spread of deserts, the over-exploitation or over-grazing of land with the resulting decline in soil fertility and increased erosion. The increasing use of chemicals in industry and agriculture as well as the effects of urbanization are now making the lack of precautionary measures for soil conservation and waste disposal all too obvious. These are just a few of the problem areas which are currently most pressing. A recent addition to this list is the problem of the additional pollution caused by the dumping of toxic waste by industrialized countries which, having failed to resolve their own waste disposal problems, are now offloading them on to the

¹ U. E. Simonis: Environmental Crisis – The Missing Dimension in the North-South Dialogue, in: Economics, Vol. 30 (1985), pp. 48 ff.

² For a discussion of this concept and its ecological consequences, cf. H.-J. Harborth: Ökologiedebatte und Entwicklungstheorie, in: U. E. Simonis (ed.): Entwicklungstheorie – Entwicklungspraxis. Eine kritische Bilanzierung, in: Schriften des Vereins für Socialpolitik, New Series, Vol. 154, Berlin 1986, pp. 104 ff.

³ On this, cf. H. C. F. Mansilla: Die Trugbilder der Entwicklung in der Dritten Welt. Elemente einer kritischen Theorie der Modernisierung, Paderborn etc. 1986, p. 27; Gunnar Myrdal had in 1956 already drawn attention to the problems of the "revolution" in developing countries resulting from the export of the Western system of values. Cf. G. Myrdal: An International Economy. Problems and Prospects, London 1956; Karl Schiller has pointed out both the consequences linked with this, e. g. the promotion of the sense of "being underdeveloped" amongst people in the Third World and also the irreversibility of this process (cf. K. Schiller: Zur Wachstumspolitik der Entwicklungsländer, in: Der Ökonom und die Gesellschaft, Stuttgart 1964, p. 205).

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countries of the Third World, thereby burdening the latter with even greater environmental pollution and the related costs.

Susceptibility

Thus it is obvious that all types of environmental pollution affecting industrialized countries, which have arisen through the greater use of available resources, have the same or possibly even greater significance in developing countries due to the less favourable basic ecological and social conditions prevailing there at the outset. The particular susceptibility of many countries in the Third World to environmental damage, the effects of which are felt over a longer period of time, is due partly to the following circumstances:

□ The majority of countries in the Third World are found in subtropical or tropical climatic zones in which climatic conditions are a great hindrance to the regeneration of "nature" such as forests or soil fertility. Unchecked deforestation rapidly leads to the destruction of the thin layer of humus, and consequently to a deterioration in soil fertility and an increased risk of soil erosion. On the other hand, only secondary regrowth occurs, if any at all.⁴

□ The historical destruction of the environment by earlier generations and civilizations has left behind extensive and in some cases permanent damage, the effects of which are still felt today. These cannot be generally eliminated but can, to a certain extent, be checked in the long term by measures such as reafforestation, flood control, soil conservation or improvement.

□ Traditional methods of production and utilization such as shifting cultivation with slash-and-burn clearance,⁵ overgrazing, timber felling to obtain wood for burning and traditional methods of procuring drinking water have not been sufficiently adapted to the changed situation (greater pressure through increased population, transition from subsistence-based shifting cultivation to sedentary small-holdings or even growing produce for market because of diminishing possibilities of migration, changes in property law). The consequence of this is that these traditionally handed-down forms of cultivation, which do not take account of the ecological conditions now encountered, cause damage to the environment and pollution for third parties or for a society as a whole.

□ Urban settlements, and particularly industrial developments, are responsible for the emergence of new types of technological relationships between new and old types of resource utilization, with the risk of external diseconomies. For example, the discharge of domestic and industrial effluents into the water system impairs the supply of drinking water to the local inhabitants with the

result of damage to health. This means that the development of industrial conurbations linked with a higher rate of urbanization and an increase in private consumption causes (in some cases, dramatically) increasing levels of environmental pollution, if the area has hitherto been primarily agricultural with a traditional way of life and if it does not therefore have adequate infrastructure which is ecologically and technically capable of dealing with the problems of supply and waste disposal.

□ This applies equally to all types of large-scale projects, regardless of whether it is a case of uncontrolled tree felling without any concept of forest management, the development of virgin land or the building of dams. They may initially seem profitable not only from a business management but also from a general economic point of view. This assessment is frequently based on a lack of regard for the negative side-effects in the form of long-term damage to the ecosystem. Another factor to be taken into account is the lack of knowledge regarding the way in which the ecosystem reacts to technical interference, e.g. the cause-and-effect relationships between road construction and the landscape, water pollution and the drinking water supply, deforestation and the conservation of soil fertility, influences on the climate etc., and also regarding the associated problem of the emergence of new technological interdependencies.

□ However, it is not only the lack of knowledge or unwillingness which makes developing countries more susceptible to damage through overexploitation of resources and self-exploitation with consequential effects on the ecosystem, but also the prevailing social circumstances of poverty. People living at subsistence level are hardly in a position to perceive ways of preserving the environment for future generations. Success can only be achieved in such cases through long-term consciousness-raising and projects which take account of the living conditions of those affected and are coupled with an overall improvement in the standard of living.

Technological Interdependencies

With the expansion of economic activity and the diversification of social and economic structures, technological interdependencies which are external to the

⁴ For an interesting case study, cf. H. Liedtke: Bodenerosion auf Feldern der native Fijians im Umkreis von Suva (Fidschi); and D. Glatthaar: Naturbedingte Grenzen der Entwicklungsmöglichkeiten auf vulkanischen Inseln des Südpazifik, in: H. Liedtke, D. Glatthaar: Fidschi – Studien zu einem Entwicklungsland, Materialien und kleine Schriften, Institut für Entwicklungsforschung und Entwicklungspolitik der Ruhr-Universität Bochum 126, Bochum 1990.

⁵ Slash and burn clearance accounts for the destruction of 70% of forest land in Africa, 50% in Asia and 35% in Latin America; cf. J. Hauser: Bevölkerungs- und Umweltprobleme der Dritten Welt, Vol. 1, Berne/Stuttgart 1990, p. 111.

market are gaining in significance, even in developing countries. As early as the 1960s, the author drew attention to these links and the extent of economic losses or social costs incurred through human interference with the environment in the Third World.⁶ It was shown that the need to recognize the "practical implications" of social costs caused by exploitation of the environment, as demanded by Salin,⁷ can be clearly demonstrated in the case of developing countries too. Thus even in 1980 Frey's assertion that "in comparison to the supply of goods, environmental protection is initially still unimportant in developing countries"⁸ demanded vehement challenge, simply as a matter of objective necessity. It is another matter how political priorities are actually defined by a society or its government.

The concrete analysis of cause-and-effect relationships in developing countries can generally be based on the same phenomena visible in developed countries – water and air pollution, interdependencies in the area of transport, consequences of soil use, etc. But some symptoms of interdependency may have far more serious consequences in developing societies than in areas with a more advanced stage of economic development, because these symptoms may have been catered for technologically or have become economically irrelevant in the latter. For example, one single factory in a developing country which discharges only relatively small amounts of waste water into a river can cause considerable additional (external) social costs, if neighbouring villages still depend on the river for their drinking water supply. Moreover, the particular climatic or ecological circumstances can greatly magnify causal relationships which are unknown or less relevant in industrialized countries. This applies, for example, to deforestation of tropical forests which, without appropriate precautions in the form of resource management or re-afforestation, can lead to much more rapid and thorough soil destruction with greater risks of soil erosion, desertification and a general disruption of the ecosystem, in comparison to more moderate climates. Radical changes are produced in the ecosystem through the building of dams, the complex technological and social effects of which are extremely difficult to assess. Under prevailing climatic conditions,

artificial lakes may prove to be a breeding ground for pests to a much greater degree than the river systems in their natural form, so that the likelihood of a greater incidence of diseases such as malaria, sleeping sickness, bilharzia or river blindness must be reckoned with. The raising of the groundwater level and the – improper – construction of canals and drainage systems may not only turn agricultural land into marshland, endanger wells and damage housing and other buildings; there is also an acute danger of soil salinization, resulting in increasing loss of fertility. In agriculture, insufficient pest control on the one hand or the uncontrolled use of pesticides on the other often cause harm not only to local inhabitants but also to the whole society. Inappropriate methods of tilling the soil without proper conservation efforts mean that the soil is eroded and subsequently blown or washed away, thus also leading to the silting-up of rivers and reservoirs. Accordingly, considerable social costs are suffered by third parties and the public at large.

Internalization

In developing countries too, therefore, the basic problem of a rationally based economic policy consists of assuring that all costs and benefits generated by the activities of the various economic entities – individuals, firms, governments or collectives – are assigned as far as possible to the entities responsible or to the projects and processes set in motion.⁹ Such internalization means that all resources consumed by a community are correspondingly priced, and correspondingly evaluated in the cost accounting of economic participants. This causes a shift in the relative prices of various production or consumption processes, thereby bringing corresponding repercussions for the exploitation of existing resource potential. The desired optimum level of economic activity for the whole economy or society can be more easily achieved and the overexploitation of the complete ecosystem of a society can be prevented. However, it is obvious that any form of human interference with natural or social relations, whether caused by production or consumption, has considerable feedback effects on the whole system – because of resource depletion or other damage – which are particularly difficult to evaluate economically.¹⁰

Concrete Measures

The establishing of effective environmental policy, in developing countries too, is a question of implementing a series of concrete measures to combat the causes of environmental damage and destruction and the external diseconomies these involve, such as:

⁶ Cf. C. Uhlig: *Das Problem der Social Costs in der Entwicklungspolitik. Eine theoretische und empirische Analyse*, Stuttgart 1966, pp. 27 ff.

⁷ Cf. the foreword to K. W. Kapp: *Volkswirtschaftliche Kosten der Privatwirtschaft*, Tübingen 1958, p. VII.

⁸ B. S. Frey: *Umweltökonomie*, Göttingen 1972, p. 56.

⁹ Cf. also M. Bohnet: *Die Konzepte der "External Economies" unter besonderer Berücksichtigung ihrer Bedeutung für Entwicklungsländer*, Berlin 1968.

¹⁰ On this, cf. K. W. Kapp: *Für eine ökosoziale Ökonomie. Entwürfe und Ideen – ausgewählte Aufsätze*, Frankfurt 1987, pp. 149 f.

- ☐ setting up properly functioning, effective environmental bodies;¹¹
- ☐ defining and evaluating the common good of "the environment" and establishing standards and methods of measurement to determine the level of damage suffered;
- ☐ ascertaining and documenting the source of external diseconomies, i.e. detecting relevant technological interdependencies and determining who or which party is causing the damage;
- ☐ evaluating the external or social costs either of damage done or of its prevention;
- ☐ considering useful strategies to prevent damage whilst taking account of other social aims, such as well-balanced, sustainable growth or increasing employment;
- ☐ taking decisions on meeting (internalizing) costs caused externally through expenditure on repairing damage or, even better, avoidance of damage¹² based on one of: (a) the "polluter pays" principle, (b) the "common burden principle", i.e. the costs are borne by the public or by government bodies, (c) the "injured person principle" or "beneficiary principle", i.e. acceptance of the costs by the injured party, who may possibly also be the beneficiary of any measures taken, or (d) a mixture of principles in the form of internalization by the polluter or the affected parties with simultaneous financial assistance (subsidies) from public funds;
- ☐ inducing measures to protect the environment among producers and consumers in line with the "precautionary principle", possibly subsidized by public funds;
- ☐ organizing consciousness-raising and educational measures for those involved, following the "principle of environmental policy cooperation", with the aim of helping both to pre-empt possible future damage and to repair some of the damage already done, and finally
- ☐ setting up environmental research institutions.

Policy Problems

The problems faced and the tasks involved are, in principle, the same in the Third World as they are in industrialized countries. It is crucially important to perceive the problems and set up fully functioning environmental authorities. These must, however, be able to implement effectively measures to take account of, i.e. to internalize, the external effects in order to protect the environment. This is also a problem of political power

depending on what essential interests of which influential pressure groups are being affected.

Depending on the situation in each case, economic and development policy-makers are often confronted with extremely difficult problems of evaluation, trade-offs and final decision-making. It is not sufficient merely to undertake scientific research into the technological interdependencies of economic actions as regards the environment: it is also essential to determine the degree of harm to society as such, taking account of the need to secure welfare in the long term.

If we draw up a welfare function (W), then a target variable for "Quality of the Environment" (Q) should be included in this function.¹³ The function can then be expressed as

$$W = W(C_1, C_2, Q, E, B)$$

where the variable Q is related to other variables such as goods production (C_1, C_2), employment (E) or balance-of-payments equilibrium (B). An improvement in Q based on the rule of optimization which is "marginal costs of pollutant removal = prevented marginal damage" would involve a certain injection of funds. These funds would be diverted away from measures to optimize the other variables, thus generating opportunity costs in the form of a lesser achievement of goals E or B . A trade-off therefore needs to be made between the different variables.

Weighing these priorities against each other is a difficult matter in view of the pressure to satisfy short-term needs. Economic policy-makers in developing countries are often faced with the decision on whether to attach priority to the assurance of a higher level of employment or economic growth involving supposedly tolerable environmental burdens or the assurance of a higher degree of environmental protection with possible sacrifices of growth and employment. The same question arises in conjunction with the promotion of new industrial development or the creation of suitable production conditions with the help of investment in infrastructure (e.g. roads, or dams to supply energy and irrigation), either of which tends to limit traditional living space with its well-established social relations and potential for agricultural production. Can the use of land for roads and dams and the other damage to national resources, caused by activities such as the use of fertilizers and pesticides, be made good by the anticipated increases in production and growth in the national product?

¹¹ On this, cf. among others K. Horstmann: *Förderung nationaler Umweltschutzorganisationen in Entwicklungsländern*, doctoral dissertation, Dortmund 1991.

¹² On this, cf. L. Wicke: *Umweltökonomie. Eine praxisorientierte Einführung*, 2nd ed., Munich 1989, p. 29.

¹³ This follows the arguments presented in H. Siebert: *Ökonomische Theorie der Umwelt*, Tübingen 1978, pp. 66 f.

Different Priorities

This same question of the opportunity costs of particular measures is repeated for all instances of interference in the ecosystem by humans. It is also in evidence in the present discussion about the exploitation of tropical forests and the economic development of the Amazon Basin. In view of the low standard of living, it is understandable that the priorities generally of both the public and governments in the Third World more often lie in the direction of economic growth than in that of protecting the environment and quality of life. The costs of environmental exploitation from an aggregate economic point of view are felt to be lower than the positive effects of additional economic activity. The hope is also linked to this point of view that the environment's capacity for absorption¹⁴ in these countries is still sufficiently high to be able to keep the level of economic damage to a minimum whilst allowing the realization of gains in welfare.

Siebert¹⁵ gives an example which illustrates the situation. One of the growth opportunities seen by developing countries is their so-called "environmental abundance", i.e. better environmental endowment for certain types of production than that of industrialized countries. This means that the developing country has a comparative advantage in the production of goods containing a high level of pollutants. With open markets, these types of production would, therefore, be transferred

to developing countries and would bring with them, following the development of a corresponding export industry, considerable increases in the variables C or E and B quoted in the welfare function above, with tolerable costs for Q.

These relationships serve partly to explain not only the establishment of export industries or production relocations aimed at the world market, but also "waste tourism". Many countries in the Third World do not always regard such types of activity negatively, if they are assessed on the basis of short and medium-term welfare benefits. The question is, however, how the costs to the environment (Q) ought in fact to be evaluated in the long term, i.e. whether this is not a flagrant underestimation of future needs. As things appear with the present level of knowledge, there is a great danger that this is more often than not "poisoned growth".¹⁶ The question remains as to when, from a technological point of view, the limits will be reached beyond which the damage can no longer be absorbed. Once again, the laying down of minimum standards based on the law of marginal cost comes into play.

¹⁴ Absorptive capacity is divided into "assimilative capacity" (natural decomposition of waste substances) and "storage capacity" (permanent deposition of residual substances = pollutants). Cf. D. Bender: *Makroökonomik des Umweltschutzes*, Göttingen 1976, pp. 11 f.

¹⁵ Cf. H. Siebert, *op. cit.*, pp. 116 f.

¹⁶ Cf. F. Nuscheler: *Lern- und Arbeitsbuch Entwicklungspolitik*, 3rd ed., Bonn 1991, pp. 202 ff.

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Environmental Impact Assessment

The essential, immediate conclusion from this is that in developing countries, too, the technological interrelationships and possible consequences of economic activities for third parties, for the community and for the ecosystem in general must be consistently uncovered for all projects and that the corresponding externalities, particularly the diseconomies, must be included in individual firms' and in aggregate economic cost-benefit analyses. If it is not possible to quantify the effects concerned, the economic calculations should at least be accompanied by corresponding qualifying notes drawing attention to the dangers.¹⁷ This approach is based on the instrument of environmental impact assessment (EIA), which is increasingly applied today when examining projects in both the private and the public sector.¹⁸ In any case, a rational decision on the overall economic effects of a measure can only be made if the externalities generated are also taken into account.

When carefully considering how to apportion (internalize) the costs arising from damage, the question arises from a development policy point of view as to whether it is always effective to charge the polluter for all costs arising, with the risk of negative effects on the levels of production and employment, or whether the community too, including later generations and even the injured parties themselves can or should be called upon to pay a portion. An important role in these considerations, particularly in the context of developing countries, should be played by the question of the ability to pay as well as that of the potential for mobilizing additional productive factors. If it is true that the availability of investment capital is limited in both the private and the public sector in the majority of developing countries, while labour as a factor of production, partly in the form of under-utilized capacity, is in relatively plentiful supply, this fact must be taken into account in decisions affecting internalization. The "polluter pays" principle would thus have to be applied in a more circumspect way to take account of the aspect of additional mobilization of labour for purposes of capital formation. Priorities need to be determined and

corresponding decisions about the assignment of costs to be made on a case-by-case basis depending on the particular circumstances.

Assignment of Costs

The problem can be illustrated using a few examples in the context of development policy:

Case a: In the traditional production sector of agriculture, the avoidance of external damage through precautionary action against erosion, by adapting cultivation methods and reafforestation using own funds according to the "polluter pays" principle, should always be compulsory for those responsible for pollution, i.e. the individual users of the land. State subsidy programmes for reafforestation, advisory and educational measures may limit the burden of costs for individual enterprises. A clear decision regarding the degree of support is only possible if account is taken of the production structure, the size of individual enterprises and the level of income of the affected parties.

Case b: The "polluter pays" principle basically also applies, of course, to whatever investment is carried out in the modern sector. However, investment projects such as the establishment of a new industrial location often represent a high entrepreneurial risk in developing countries due to the high capital and infrastructure costs involved. This raises the problem that it might cause the investment project to fail if all external costs arising through technological interdependencies have to be internalized by the polluter. If, for example, discharging effluents produced by the industrial site into a river causes pollution up to a level at which the river water, though no longer suitable for drinking, can still be used for other purposes by nearby inhabitants, it may be economically expedient – provided that appropriate minimum standards are met – to arrange for the externally disadvantaged persons, i.e. the neighbouring village communities, to develop their own avoidance strategies, possibly with government assistance. Through the use of available, underemployed labour as well as available materials, the village community could construct drinking water wells which would not be dependent upon the river. As a result, several goals would be achieved simultaneously: the technological links between those using the water for industrial purposes and those drinking it would be removed, the inhabitants of the village would now benefit from a source of drinking water which did not come directly from the river, the productivity of the economy would be raised by the additional industrial output, and sanitary standards would be raised, while also making use of excess labour. Via the process of capital formation in the

¹⁷ On this, cf. C. Uhlig: Die Bedeutung der Social Costs in Entwicklungsländern und ihre Berücksichtigung in der Kosten-Ertrags-Analyse, in: R. Meimberg (ed.): Voraussetzungen einer globalen Entwicklungspolitik und Beiträge zur Kosten-Nutzen-Analyse, Schriftenreihe des Vereins für Socialpolitik, New Series, Vol. 59, Berlin 1971, pp. 138 ff., esp. pp. 151 f.

¹⁸ Cf. Federal Ministry of Economic Cooperation: Umweltwirkungen von Entwicklungsprojekten. Hinweise zur Umweltverträglichkeitsanalyse (UVP), Bonn 1987; for a critical view cf., among others, H.-J. Karpe: Umweltverträglichkeitsprüfung von Agrarprojekten – Systeme und Modelle, in: *Entwicklung und ländlicher Raum*, Vol. 20 (1986), No. 4, pp. 26 f.

field of environmental technology, the capacity for economic growth would be extended. This example corresponds to a dynamic model of the economics of environmental protection according to which the capacity for growth can be created through the use of more environmental technology – even of the simplest kind – financed by forgoing consumption or by mobilizing previously underutilized resources.¹⁹ A similar rule also applies in the case of road maintenance or school construction. In such cases, municipalities or village communities are also obliged to pay the costs of repairing the roads used by through traffic or for the construction of schools which will also be attended by other people's children in order to relieve the government budget. The justification for this measure lies in the fact that the affected persons are also the beneficiaries of these self-financed infrastructural measures.²⁰

Case c: Another possibility exists in which costs are paid in full by the community or from public funds. This is often the case with large-scale reforestation or landscape conservation schemes, or infrastructure projects to deal with effluents or clean up rivers. However, even in cases such as these the injured parties may contribute to the costs by being asked to supply their labour. The justification for this lies once again in the fact that these injured persons are also the beneficiaries of such measures.

Case d: Consideration must also be given to the opportunity costs of forward-looking damage prevention as against the subsequent repair of damage already caused. In quite a lot of developing countries which only have scarce investment funds available, it may be more beneficial in some cases to use resources and the environment at the expense of future generations in the hope that these will later be able, at least partly, to replenish or rehabilitate it. It may even be the case that the efforts of future generations are no longer necessary since the environment's assimilative capacity may have limited damage to a greater extent than originally assumed. On the other hand, it must be considered that rehabilitating past environmental damage may only partly be possible and is extremely expensive, added to which it is normally the community which has to bear the costs and not the polluter.

Case e: To avert serious environmental damage, also that of global significance, caused by the extensive

economic exploitation of national resource potential, there may be a transfer of funds based on international treaties in exchange for refraining from certain types of environmentally damaging economic activity. The assessment assumes a global or international welfare function. An appropriate instrument of this type is the "debt-for-nature swap"²¹ some of which have now been arranged to help preserve tropical forest and implement nature conservation measures. This is an interesting example of an environment policy strategy which follows the beneficiary principle – in this case in a global context.

These distinctions with regard to how best to internalize external diseconomies must not, however, divert attention from the fundamental demand which applies to developing countries as it does to any others: that all possibilities available must be used to achieve more careful treatment of the environment and of available resources. It can be seen that the complete range of instruments available in environmental policy, which extend from environmental regulations to the use of market-based mechanisms,²² including increased taxes and tax relief,²³ can also be used to encourage ecologically oriented economic activities in developing countries. In the sense of a dynamic concept, the underpinning of the factor of "technological progress" by making use of improved environmental technology based on the restraint of consumption or a better use of resources, is of considerable importance. As a result, the optimum scope for economic growth can be widened.²⁴ However, even partial realization of urgently needed measures to prevent damage will require investment programmes at huge costs.

Objectives

Rational, careful use or conservation and regeneration of natural resources as part of an ecologically oriented equilibrium is an economic policy goal of high priority even in countries of the Third World. Measures to repair or prevent environmental damage must pursue various objectives:

- ☐ The significance of the asset of the environment must be generally recognized and administrations must acknowledge the need to manage resources in a discriminating manner. The harmonization of economy

¹⁹ Cf. D. Bender, op. cit., pp. 271 ff.

²⁰ In this respect, the "beneficiary/injured party" principle brought into the discussion by W. Meisner and criticized by Wicke for its lack of fairness, is by all means justifiable under certain circumstances. Cf. L. Wicke, op. cit., pp. 137 ff.

²¹ Cf. H. Schreiber: "Debt-for-Nature-Swap" – An Instrument against Debt and Environmental Destruction?, Institut für Europäische Umweltpolitik, Bonn 1989.

²² For a summary, cf. L. Wicke, op. cit., pp. 167 ff.

²³ Cf. also the proposals made on this in, for example, E. U. von Weizsäcker: *Erdpolitik. Ökologische Realpolitik an der Schwelle zum Jahrhundert der Umwelt*, Darmstadt 1989.

²⁴ Cf. D. Bender, op. cit., pp. 271 ff.

and ecology demands an institutional base in the sense of a "better market and better state".²⁵

☐ Approaches to planning which take account of environmental issues must be evolved on the basis of, among other things, data from environmental impact assessment studies.

☐ Standards and methods of measurement must be developed which can be adapted to take account of the actual circumstances of a country or region.

☐ Measures to determine and quantify environmental damage caused by production and consumption must be intensified.

☐ The difficulties of attaining an appropriate trade-off between economic policy goals, especially in the light of the situation as it exists in Third World countries, need to be rationalized both by the responsible decision-makers and by the (international) advisory institutions. Taking international competitiveness into consideration, the conflict between environmental protection on the one hand and growth and employment on the other is usually much more marked in developing countries than in industrialized countries.

☐ The development of prevention strategies cannot, therefore, take place solely on the basis of globally oriented objectives designed to achieve maximum impact, but must also take account of medium and even short-term goals (where positive effects can be expected in the long term) as part of a strategy for survival.

☐ The assignment of costs (internalization) can usually only be carried out using a mixture of the "polluter pays", "beneficiary pays" and "common burden" principles.

☐ The search for alternative solutions which allow a compromise to be reached based on the step-by-step principle should be subject to the rule of "precautionary prevention of damage where possible, subsequent combating of the damage where necessary".

☐ There must be more applied research in Third World countries, e.g. with regard to alternative forms of construction and energy generation, recycling, methods of cultivation etc. However, problems are often experienced with the introduction of such programmes and the start-up costs.

☐ Measures must be introduced to educate and train those affected as well as to reinforce the degree of cooperation between those affected and the state.

☐ As part of bilateral and multilateral development aid policy, concrete environmental protection programmes or corresponding projects of developing countries should be

encouraged by means of financial and technical aid (such as environmental impact assessment studies, "debt-for-nature" programmes, establishment of research and administrative bodies, assistance with waste disposal and recycling programmes) for a forward-looking environmental policy. The comment of the former British Minister of Overseas Development, Chris Patten, is surely appropriate to the fields needing to be addressed by development aid policy, "The environment is our new aid imperative, replacing perhaps some of the ideological and strategic arguments for aid which were often used to justify it in the Cold War years".²⁶

☐ Greater efforts must be made to achieve international agreement on environmental protection measures and standards.

Conclusions

The drafting of criteria for an environmental protection policy which takes account of concrete situations is of great significance to developing countries. As a matter of principle, the aim of state intervention must be to strive for an internalization of external diseconomies, in order to achieve a true evaluation of the costs of production or consumption processes, and then to plan accordingly. However, discriminating action is required in order not to overtax the low absorptive capacity of the economic system but, nevertheless, to trigger a series of adjustment processes. Another crucial point which has to be considered is that a general improvement in the conditions of poverty of people or economies in the Third World is needed, and that this in itself will constitute an important contribution to the conservation of the environment. Finally, from a global point of view, it is necessary to recognize that it is absolutely necessary to exert influence on societies and individuals in "rich" economies to restrain their consumption expectations or at least to orient them in a way which is more acceptable ecologically. As Simonis demands, the "industrialized countries ... must set an example to the developing countries by showing that environmental protection and economic prosperity, ecology and economy are indeed mutually compatible, and that a secure future is thus made possible."²⁷ This would not only greatly contribute to stabilizing the global ecosystem but also give developing countries some leeway for catching up on the industrialized world.

²⁵ Cf. U. E. Simonis: Harmonisierung von Ökonomie und Ökologie?, in: Ökologische Konzepte, No. 21, 1985, p. 26.

²⁶ Overseas Development Institute (ODI): Environment, Markets and Development, ODI Briefing Paper, London, February 1990, p. 1.

²⁷ U. E. Simonis: Globale Umweltprobleme und zukunftsfähige Entwicklung, in: Aus Politik und Zeitgeschichte, supplement to Das Parlament, No. 10/91, 1st March 1991, p. 12.