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## International financing of environmental protection: North-South conflicts on concepts and financial instruments and possible solutions

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INTERNATIONAL FINANCING OF  
ENVIRONMENTAL PROTECTION

North-South Conflicts on Concepts  
and Financial Instruments and  
Possible Solutions

by

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## I. Introduction\*

Much of the current debate on worldwide environmental protection resembles the traditional North-South confrontation on poverty alleviation and economic development in the Third World. Again there is a wide consensus on the goals to be reached. However, when it comes to responsibilities and instruments by which to achieve the desired results, the well-known battle-array is re-instated. In the first instance, this refers to the questions of who has to pay for the preservation of the environment, by which financial means, and under which conditions. As experienced in former North-South negotiations, economic fundamentals are again neglected by both parties:

- Industrialized countries are reluctant to meet the South's demands for external financing of environmental protection in the Third World. This appears to be mainly because these demands are largely based on the debatable proposition that former exploitation by the North requires compensation today. But there may well be an economic justification for financial compensation if developing countries are asked to preserve the environment (Section II).
- Economic fundamentals must also be taken into account when assessing the effectiveness of optional financing instruments. As argued in Section III, the proposals advanced so far largely ignore past experience with regard to the effects of concessional transfers to the South. Most of the options currently discussed are ill-suited to contain environmental degradation and to achieve an economically adequate financial compensation.

Finally, suggestions are presented on how financial support for developing countries could be organized so that the incentives for environmental protection are strengthened effectively (Section IV).

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## II. The Economic Rationale for Financial Compensation

On the agenda for the UN Conference on Environment and Development (UNCED) in June 1992, issues such as the protection of the atmosphere, the conservation of biological diversity, the fight against deforestation, desertification and land degradation, as well as the sound management of hazardous wastes and toxic chemicals figure prominently [Willums, Golücke, 1991, pp. 467ff.]. The reason for an international agreement on these topics is that the production of the public good "environmental protection" remains below optimum in the case of cross-border externalities. As concerns deforestation, for example, the economic benefits of exploiting or burning the tropical rainforests fully accrue to the country in question, whereas the social costs in terms of long-term climate changes are not only shifted to future generations but also to other nations. Hence, the critical economic problem is to internalize external effects so that production decisions are based on international social costs [Coase, 1960].

At the national level, the internalization of external environmental effects is aimed at by various command and control measures as well as market-based instruments such as ecological taxes (eco-taxes) [Pearce, 1991]. Principally, similar approaches may be applied at an international scale. However, international regulation suffers from serious shortcomings. Agreements on environmental protection among sovereign states are subject to considerable enforcement problems. The breach of international contracts and earlier commitments to reduce the production of environmentally damaging goods is difficult to be sanctioned effectively [Mohr, 1991].

International coordination of environmental protection is particularly difficult with regard to developing countries. In the current debate on the agenda for UNCED, industrialized countries appear to be tempted to "force" more environmental quality on the Third World than the latter is willing to supply. This conflict is not surprising insofar as the demand for environmental quality

risers more than proportionately as per capita income grows.<sup>1</sup> In other words, citizens of highly developed economies assign a higher priority to worldwide environmental protection than citizens of poor countries whose major concern frequently is to survive in the short term.

Given that natural resources are typically underrated assets in developing countries and damages are largely external, Third World governments face strong disincentives to join and adhere to international agreements. Contract stability may be enhanced by foreign transfers that are linked to environmental protection by the recipients. Such transfers represent a financial compensation by which countries with low time preference rates may induce countries with high time preference rates to surrender the option of an excessive exploitation of natural resources.

The concept of financial compensation raises various problems. Most evidently the overall amount of transfers, its distribution among the potential beneficiaries and the payment obligations of individual donor countries have to be determined. Three factors must be taken into account when deciding on these questions [Ame- lung, 1991]: (1) the opportunity costs of developing countries forgoing the option of environmental degradation;<sup>2</sup> (2) the costs of environmental degradation which accrue to these countries themselves; and (3) the external costs suffered by other countries. The need for financial compensation increases, *ceteris paribus*, with higher opportunity costs (1), lower local costs of environmental degradation (2), and higher external costs (3). But the amount and distribution of transfers could only be quantified easily if all cost functions were identified unambiguously.

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<sup>1</sup> This assumption reflects the conventional wisdom [see e.g. Baumol, Oates, 1988]; it is critically discussed by Pearce, Barbier, Markandya [1990, pp. 11ff.].

<sup>2</sup> In the case of containing deforestation, the opportunity costs relate to e.g. forgone exports of tropical wood, the abstention from using the respective areas for agricultural production or mineral extraction, and the substitution of domestic energy sources.

Practically, the required information is incomplete so that transfers have to be negotiated on the basis of approximated costs and benefits. Strategic behaviour is to be expected during the bargaining process.<sup>1</sup> From the UNCED negotiations it is evident, for example, that potential beneficiaries have an incentive to understate the local costs and overstate the economic benefits of environmental degradation in order to maximize transfer payments. In addition, developing countries are pressing for a wide and vague definition of the so-called "incremental costs principle" [World Bank, 1990; World Bank, UNDP, UNEP, 1992].

This principle is only consistent with the concept of financial compensation if concessionary and additional funding is restricted to the extra costs for achieving global environmental benefits. There may be cases where distinguishing global from national benefits is difficult.<sup>2</sup> However, it would be clearly inappropriate if incremental costs and, thereby, external funding were determined against a reference case of business-as-usual. Consider an economy where the existing policy framework has resulted in severe macroeconomic and ecological distortions. Corrective action undertaken in the context of sustainable national development strategies might involve considerable adjustment costs [World Bank, UNDP, UNEP, 1992, p. 8]. But financial compensation is not required for adjustment costs that are matched by national welfare gains in terms of greater economic efficiency and local ecological improvements in the aftermath of policy reforms.

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<sup>1</sup> Strategic bargaining positions may have to be abandoned when additional information on costs and benefits becomes available during negotiations [Amelung, 1991, pp. 172ff.].

<sup>2</sup> On further difficulties to make the incremental costs principle operational and on possible solutions with regard to the Interim Multilateral Fund of the Montreal Protocol, see World Bank [1990]. It is shown that incremental cost computations are extremely sensitive to changes in world market conditions for ozone-depleting substances and possible substitutes, changes in the national policy design, and the choice of the discount rate.

Furthermore, financial compensation requires that the global environmental obligations of the beneficiaries are clearly defined and enforceable. Irrespective of the overall amount of transfers, it cannot be taken for granted that ecological improvements will take place in the recipient countries. This is only to be expected if an effective linkage is established between environmental protection in and transfers to developing countries. Hence, the concept of financial compensation also requires a careful design of financing instruments. As argued in the subsequent section, the critical issue of contract stability, i.e. the interplay between adequate financial transfers and ecological improvements, has not yet received appropriate attention in the current debate on international environmental agreements.

### III. A Critical Review of Financial Instruments

Demands for additional international transfers to finance environmental protection in developing countries are abound [e.g. South Commission, 1990, pp. 258 ff.; Miller, Reid, Barber, 1991, pp. 107ff.; ECLA, 1991, pp. 113ff.]. Vastly different estimates are presented with regard to the overall amount of transfers required to compensate developing countries.<sup>1</sup> It is difficult to assess the economic justification of these estimates. Typically, the underlying objectives, i.e. the type and scope of conserva-

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<sup>1</sup> Social democrats in Germany claim that the industrialized countries must raise US\$ 10-20 billion per annum [Frankfurter Rundschau, February 21, 1992]. The World Resources Institute estimated in 1989 that the annual requirement for environmental investment in the Third World amounts to US\$ 20-50 billion [quoted in: Rosebrock, Sondhof, 1991]. According to Maurice Strong, developing countries will need as much as US\$ 125 billion per annum to introduce the measures likely to be approved at the UNCED summit in June 1992; 60 per cent of this sum must be new money, while the rest could come from existing aid programs [Financial Times, February 14, 1992]. In the global tax scheme considered by Whalley and Wigle [1989], developing countries would receive nearly US\$ 500 billion worth of side-payments to participate in a scheme intended to cut CO<sub>2</sub> emissions by 50 per cent.



tion measures to be financed, remain unclear. Furthermore, financial compensation, which relates to the global external effects of conservation measures, is frequently confused with the total financing needs. The latter include the local costs that are matched by internal benefits.<sup>1</sup> It does not make much sense to quantify the amount of transfers unless the environmental obligations of the recipients are specified. Therefore, the following discussion concentrates on the question whether recently proposed financial instruments are consistent with the basic principles of the concept of financial compensation.

The "creative and innovative" financing techniques proposed so far [Brundtland Commission, 1987, ch. 12; Development Committee, 1988; Mattos de Lemos, 1991, pp. 340f.] have in common that they address only specific aspects of financial compensation. International eco-taxes may provide a funding mechanism, while the distribution of funds among developing countries is left open (Section III.1). Conversely, the suggested increase of development aid and project lending for environmental purposes as well as debt-reduction schemes focus on the distribution of transfers, implicitly assuming that sufficient funds could be raised by the donors (Sections III.2-4). The second common characteristic of recent proposals is that the relative merits and flaws of different financial options are hardly discussed and previous experiences with similar instruments are largely ignored.

#### 1. Funding by International Eco-Taxes: Old Wine in New Bottles

As concerns taxation for environmental purposes, major differences exist with regard to the underlying motivation of tax measures. A first group of proposals focuses on identifying subjects for taxation which would provide a taxation base broad

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<sup>1</sup> For example it might well be in the interest of countries with tropical rainforests to contain deforestation. The stabilization of local ecological systems helps a sustainable agricultural development and a sufficient water supply. Moreover, the chances for revenues from tourism in the future may be improved by containing deforestation [Siebert, 1991, pp. 10f.].

enough to raise substantial new funds for financing environmental protection. A second group suggests to introduce specific taxes that would reduce the emission and production of environmentally damaging goods. It goes without saying that financial compensation cannot be achieved by taxation alone. Tax proposals have to be supplemented by an incentive-compatible distribution of tax revenues (see Sections III.2-4). The critical question to be discussed in this section is whether the funding mechanism of recent tax proposals is consistent with the earlier presented concept of financial compensation.

When the aspect of financing dominates, the proposed tax measures largely refer to suggestions that figured prominently in various rounds of North-South negotiations over decades. The only difference is that the focus is now on environmental protection as the major purpose for which the mobilization of additional resources is required. The most frequently suggested subjects for taxation are: ocean fishing and transportation, seabed mining, the exploitation of antarctic resources, trade surpluses, and international trade in general [see e.g. Willums, Golücke, 1991, pp. 661f.; Brundtland Commission, 1987].

Taxation of economic activities in the above fields is justified economically only to the extent that natural resources are exploited excessively because of external costs, e.g. in the case of ocean fishing and seabed mining. Even if this condition is met, it has to be taken into account that tax schemes involve relatively high administrative costs [Mohr, 1991]. Moreover, the effects of taxation on the conservation or recovery of natural resources remain uncertain because of incomplete information on the reaction of taxpayers (for an alternative approach, i.e. to issue tradable permits for a limited use of natural resources, see Section IV).

The argument of external costs is not applicable to a general taxation of trading activities. The appealing property of trade taxes is rather that substantial public resources could be

generated easily. International trade constitutes a fairly broad tax base. Annual transfers to developing countries of US\$ 125 billion (the figure given by Maurice Strong) could be financed if world exports were taxed at a rate of 3-4 per cent.<sup>1</sup> Arguably, the fairly low tax rate would contain the international welfare loss resulting from distortions in the international division of labour. Nevertheless, the funding of environmental protection through a general taxation of external trade is seriously flawed in several respects:

- The incidence of trade taxes may largely fall on economies which, according to the concept of financial compensation, should rather be financed by tax-related transfers. The share of funding provided by the developing countries themselves may significantly exceed their share in world exports of about 25 per cent in 1990. This applies especially to developing countries which heavily depend on imported intermediate and capital goods. The price elasticity of their import demand is probably fairly low. Hence, trade taxes would result in a higher import bill for these countries. Similarly, export-oriented economies in the Third World would have to shoulder a significant part of the funding of tax-related transfers when the demand for their export goods is highly price elastic.
- It is open to question whether environmental conditions will improve when international trade is taxed. Domestic producers favoured by trade taxes may even absorb more environmental inputs than discriminated exporters so that the quality of the environment would deteriorate. Moreover, transfers financed through trade taxes do not necessarily result in environmental protection in the recipient countries. This would only be the case if transfers were closely linked to protective measures by the beneficiaries and problems of monitoring and enforcing conditionality were overcome.

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<sup>1</sup> World exports amounted to US\$ 3310 billion in 1990 [IMF, International Financial Statistics].

- Developing countries may reject the required conditionality from the beginning, if they anticipate that the tax-related public transfers offered to them will only replace inflows of private capital. Considerable substitution effects are likely, in particular if taxes are levied on trade surpluses. To the extent that trade surpluses of developed with developing countries are curtailed by taxes, private financing of the corresponding deficits of developing countries becomes superfluous. Under such conditions, the incentive of the recipients of public transfers to protect the environment is reduced to the grant element of official capital inflows.

Typical examples of the second group of tax proposals are taxes levied on specific emissions of hazardous wastes and toxic chemicals, e.g. CO<sub>2</sub> emissions [see Mohr, 1991, pp. 192ff., and the literature given there], as well as specific goods such as tropical wood [see Amelung, 1989, p. 155, and the literature given there]. Financial compensation of developing countries is difficult to achieve by specific taxes, the underlying motivation of which is to reduce environmental damage. Consider the case of an emission tax to be raised in industrialized countries, which are the major polluters. A tax scheme aiming at gradually reducing emissions requires progressive tax rates over time. The amount of tax revenues, which may then be transferred to developing countries, declines as soon as the positive funding effect of higher tax rates is overcompensated by a shrinking tax base. In the extreme case of the tax scheme succeeding to stop emissions, tax revenues will be zero. The prospect of declining transfers adds to the disincentives of the recipients to join an international agreement on the reduction of emissions and adhere to ecological conditionality.

This argument also applies to product-specific trade restrictions. If import taxes are becoming prohibitive, the foreign demand for the taxed good and, therefore, tax-related transfers approach zero.<sup>1</sup> Specific trade taxes have further drawbacks

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<sup>1</sup> Prohibitively high import taxes are comparable to an outright import ban which would not generate any revenues out of which transfers could be financed.

especially if the taxed good is supplied by developing countries. An import tax on tropical wood, for example, will have limited environmental effects at best if the conservation of rainforests is only achieved at a cost in terms of intensified deforestation elsewhere. It is to be expected that timber exports by Scandinavian countries and the states of the former Soviet Union will largely replace exports of tropical wood by developing countries. Moreover, trade taxes only constrain foreign demand, whereas the domestic demand remains unaffected. The smaller the proportion of deforestation that is due to exports of tropical wood, for example, the weaker would be the effect of taxes on the preservation of rainforests.<sup>1</sup> And, finally, the incidence of import taxes may largely fall on exporters in developing countries, rather than consumers in industrialized countries. Under conditions of a highly price-elastic foreign demand, tax-related transfers would be "financed" through lower export proceeds by the developing countries themselves. Hence, financial compensation would not take place. All in all, developing countries can not reasonably be expected to join an agreement on environmental protection when transfers are based on specific eco-taxes.

## 2. Unconditional Transfers: Lessons from Development Aid

The preceding discussion leads to the conclusion that international eco-taxes are an inadequate means to mobilize funds for financial compensation. The call is for funding mechanisms which ensure adequate financial compensation, while minimizing the distortionary impact of fund raising. This might be achieved if industrialized countries mobilized additional aid payments by general tax increases or, preferably, compensating cuts in government spending.

The need to increase aid payments is frequently emphasized [e.g.

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<sup>1</sup> Amelung and Diehl [1992] have estimated that forestry accounts for 10-15 per cent of deforestation in developing countries, of which roughly one third can be attributed to exports of tropical wood.

Brundtland Commission, 1987; South Commission, 1990]. But the implicit assumption that environmental conditions in the recipient countries will be improved in this way is hardly discussed. Externally imposed conditionality is often explicitly rejected.<sup>1</sup> The rationale for unconditional foreign aid rests on two debatable propositions: (i) more aid alleviates poverty, and (ii) poverty alleviation enhances environmental protection.<sup>2</sup> The second assumption is plausible to the extent that time preference rates decline with rising per-capita income. It is open to question, however, whether the relationship between the income level and environmental protection is unambiguously positive over the whole range from least developed to newly industrializing countries. The functional form may rather reveal a U-shaped pattern if the early phases of industrialization are characterized by an intensified use of environmental resources. Furthermore, environmental problems that are poverty related are typically of a local character. Financial compensation is not required to strengthen the incentives to environmental protection as long as the benefits fully accrue to the developing country, i.e. in the absence of international spillovers.

Even in the case of a strictly positive income-environment nexus, higher aid transfers will not live up to the expectations of environmentalists as long as poverty in the recipient countries is not alleviated considerably. Previous experience with development aid justifies scepticism:

- Official development assistance (ODA) by DAC countries totalled about US\$ 100 billion in 1989-1990 [OECD, 1991a, p. 171]. For

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<sup>1</sup> See e.g. South Commission [1990, p. 260]: "A new, environment-related form of conditionality - to be added to that imposed on the South by the international financial institutions - is utterly unacceptable".

<sup>2</sup> The latter proposition follows directly from the argument that environmental degradation, e.g. deforestation and water pollution, is mainly due to poverty and economic backwardness [see e.g. the Declaration of Beijing adopted in June 1991 by 41 developing countries (published in: Beijing Rundschau 27/1991, pp. 11-15) and the communique of the Cartagena meeting of UNCTAD in February 1992].

low-income countries in Africa, the Middle East and Latin America, ODA receipts amounted, on average, to 11-12 per cent of the recipients' GNP [OECD, 1991a, p. 189].<sup>1</sup> Even doubled ODA payments could at best have a moderate impact on poverty alleviation, considering that ODA not only comprises outright grants, but also concessional credits which have to be repaid. Moreover, it is rather dubious that the lack of capital constitutes the major bottleneck to poverty alleviation in low-income countries.

- The idea that the Third World's economic situation could be improved substantially through financial aid has been increasingly disputed since the early 1980s. In the past, the correlation between the per-capita amount of ODA received and the growth of per-capita income in the recipient countries remained completely insignificant [Kostrzewa, Nunnenkamp, Schmieding, 1990, pp. 35f.].<sup>2</sup> More sophisticated econometric investigations revealed that positive growth effects of aid largely failed to materialize where they were most urgently needed, i.e., in the poorest Third World countries, in Africa and in strongly commodity dependent economies [see Hiemenz, 1986, and the literature given there]. Moreover, a number of studies demonstrated a quite obvious negative influence of foreign aid on domestic savings in the recipient countries.
- Some observers even consider development aid as one of the roots of deteriorating economic conditions in the recipient countries [e.g. Bauer, 1982]. Unconditional and permanent aid tends to reinforce misguided economic policies and adds to distortions in relative prices and production patterns. Typically, the ruling elites in the recipient countries exert strict control over the use of aid inflows. This leverage allows them to block policy reforms (e.g. land reforms) that

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<sup>1</sup> The respective share for low-income countries in Asia was only 1.4 per cent, due to extremely low shares for India and China.

<sup>2</sup> The correlation coefficients remain fairly stable if the sample heterogeneity is reduced. For example, the aid-growth nexus is also extremely weak for different income groups.

could help overcome economic backwardness. Furthermore, rent seeking of economic agents is encouraged, while making productive efforts of one's own may no longer be regarded worthwhile in aid dependent economies.

These arguments suggest that aid flows of whatever magnitude cannot be a substitute for sound economic and ecological management and appropriate policy incentives in the recipient countries [Hiemenz, 1989]. Any increase of aid does not make much of a difference if the ruling elites in developing countries are unwilling to remove the internal impediments to environmental conservation. However, external donors may play a catalytic role if aid recipients are committed to reduce poverty and contain environmental degradation. In the following, it is discussed whether the implementation of internal reforms could be supported by (i) foreign debt relief and (ii) new forms of project lending.

### 3. Debt Reduction: A Debatable Linkage

Environmental degradation in highly indebted developing countries has led to the appealing proposition that the solution of debt problems is a prerequisite for environmental improvement [e.g. Enquete-Kommission, 1990, pp. 368ff.; Schreiber, 1989]. It is argued that debt reduction provides a means of financial compensation since creditor concessions would remove the disincentives to environmental protection resulting from a high foreign debt burden [see also Trisoglio, ten Kate, 1991, p. 429]. The underlying argument is that natural resources are exploited excessively by highly indebted countries which have to generate foreign exchange in order to remain current on their debt-service obligations. Environmental degradation is considered to be the result of the developing countries' attempt to contain the risk of default and avoid the potential costs of default by exporting environment-intensive goods. The costs of default are related to sanctions which may be imposed by the creditors on non-performing debtors.



The relation between the degree of indebtedness and environmental degradation is no longer straightforward under more realistic assumptions on the behaviour of sovereign debtors. The credibility and time-consistency of sanctions proclaimed by creditors is highly debatable [see e.g. Froot, Scharfstein, Stein, 1988]. Actually, debtor countries have anticipated time and again the willingness of creditors to agree to reschedulings after payment problems had emerged, rather than to impose sanctions. We have also experienced unilateral defaults and payment suspensions. The incentive to service the foreign debt at the expense of environmental conditions no longer dominates as soon as the benefits of default, in terms of retained debt-service payments, exceed the costs of default [Amelung, 1991]. The same applies if debt obligations are high enough so that even an excessive exploitation of natural resources cannot prevent default. Under such conditions, partial debt relief may result in more rather than less environmental degradation.

Preliminary empirical evidence supports the theoretical reasoning on a weak and ambiguous relation between the degree of indebtedness and environmental degradation. A simple correlation analysis for various debt indicators on the one hand and the degree of deforestation in 21 countries with tropical rainforests on the other hand reveals no statistically significant relationship for the 1980s [Nunnenkamp, Amelung, 1991]. The results indicate that deforestation is not generally higher in countries with a higher debt burden, and increasing foreign debt is not necessarily associated with an intensified deforestation over time. Consequently, the effects of unconditional debt-reduction schemes on the preservation of the environment are uncertain at best, as was the case with higher unconditional aid payments.

In order to strengthen the effects of debt relief on environmental protection, it has been proposed to make relief operations conditional on conservation measures by the beneficiaries. Such a linkage is established in the context of debt-for-nature swaps [Schreiber, 1989]. Basically, the swaps involve three steps: (i)

foreign debt titles of the country in question are purchased in the secondary market at a discount on their face value; (ii) the debt titles are presented to the debtor government and converted into domestic currency, whereby the total amount of outstanding foreign debt is reduced; and (iii) the domestic currency equivalent is used to finance environmental projects in the debtor country.

Until recently, financial compensation through debt-for-nature swaps has played a marginal role. The face value of foreign debt involved in the swaps arranged in eight countries amounted to about US\$ 100 million; US\$ 60 million in local currency were generated for conservation purposes [World Bank, 1991, pp. 106f.].<sup>1</sup> The financial compensation achieved by the swaps is much lower than these figures suggest, and may even be negative.<sup>2</sup> The swap operations would offer foreign debt relief only if (i) the buyer of the debt title realized a greater discount on the face value than could be obtained by the debtor country through a direct buyback, and (ii) the higher discount were passed on to the debtor country. The debtor country does not benefit from secondary market discounts at all, if the foreign debt title is converted at par into domestic currency. Of course, the debt burden in foreign currency is reduced by debt-for-nature swaps. Nevertheless, the swaps may lead to an additional fiscal burden in the debtor country. This will happen to the extent that the government issues domestic debt paper to redeem the foreign debt, and if domestic real interest rates exceed the international rate (adjusted for exchange rate changes).

The chances for financial compensation through debt-for-nature swaps further decline if this instrument will be used on a larger

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<sup>1</sup> In early 1991, five more swap programs valued at approximately US\$ 500 million were in preparation [Rosebrock, Sondhof, 1991].

<sup>2</sup> In the following, it is assumed that environmental projects financed through swap operations would not be undertaken by the developing country in any case. This assumption is reasonable if the swap operations involve projects with considerable cross-border effects.

scale than in the past. An increased demand for debt titles would reduce the secondary market discounts,<sup>1</sup> thereby diminishing the potential for debt relief. Furthermore, a broader implementation of debt-for-nature swaps may result in higher macroeconomic instability in the debtor country. Inflation is fuelled if the domestic currency equivalent of the foreign debt is raised by money creation. Alternatively, the fiscal situation may deteriorate if domestic debt replaces foreign debt [Nunnenkamp, Amelung, 1991]. This is particularly likely in the case of narrow domestic capital markets.

It can be concluded that the financial compensation to be achieved by debt-for-nature swaps remains limited at best. Consequently, it will also be difficult to improve the environmental conditions in developing countries with this instrument. The incentives of debtor countries to conserve the environment are not strengthened effectively. The governments are rather tempted to violate the ecological conditions attached to the swap [for empirical evidence, see Page, 1989]. The breach of earlier commitments can hardly be sanctioned effectively, once the swap operation has been completed and the foreign debt title has been fully redeemed.

Furthermore, causes for environmental degradation which are not related to the foreign debt situation are not tackled by the swap concept. Even in highly indebted countries, an excessive exploitation of natural resources, e.g. in the context of deforestation, is largely due to internal factors such as local demand for energy, raw materials and agricultural products. Environmental degradation in countries without foreign debt problems is not tackled at all. Deforestation in countries such as Indonesia, Malaysia and Thailand may even accelerate to the extent that debt-for-nature swaps arranged in highly indebted countries with

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<sup>1</sup> Even though swap operations remained fairly small in the past, secondary market prices increased significantly as soon as market participants expected a swap to take place [Hansen, 1989].

tropical rainforests result in higher world market prices of tropical wood. In other words, financial compensation in the context of debt-for-nature swaps is not only insufficient, but the distribution of compensatory transfers is also biased and not effectively related to the causes of environmental degradation.

#### 4. Project Lending for Environmental Purposes: No Panacea

The conceptual shortcomings of project financing in the context of debt-for-nature swaps could be overcome if project lending for environmental purposes were adequately funded and not restricted to highly indebted countries. First steps in this direction have already been taken, the Global Environment Facility (GEF) representing the most notable example. The GEF is a pilot scheme for helping developing countries with a per-capita income of less than US\$ 4000 to solve global environmental problems.<sup>1</sup> The aim is to give developing countries a financial incentive to pay attention to externalities [Prowse, 1992]. Projects in four main areas are financed: reducing global warming, protecting international waters, preserving biological diversity, and preventing further depletion of the stratospheric ozone-layer.<sup>2</sup> The GEF may "set the stage for future funding mechanisms for global environmental projects" [Brugger, Cléménçon, 1991, p. 495; see also OECD, 1991b]. However, it has to be clarified in the ongoing negotiations (i) how to finance a global facility on a stable and economically sound basis beyond the pilot phase of the GEF, and (ii) how to decide on the distribution of available funds.<sup>3</sup>

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<sup>1</sup> The GEF was established in November 1990 and is jointly managed by the World Bank and the UN's Development and Environment Programmes. For a three-year experimental period, the GEF can commit up to US\$ 1.3 billion in grants and technical assistance to help developing countries tackle environmental problems. The available funding includes US\$ 200 million provided by the Montreal Protocol on ozone-depleting emissions [for details, see Finance and Development, 1991; World Bank, 1991a; World Bank, 1991b, pp. 100ff.].

<sup>2</sup> For detailed project information, see World Bank, UNDP, UNEP [1991, especially Part II: Work Program].

<sup>3</sup> For a broader list of issues to be discussed with regard to the future evolution of the GEF, see World Bank, UNDP, UNEP [November 1991, Part I, pp. 22f.].

As concerns the financing of sustained project lending for environmental purposes, it has been proposed to collect annual contributions by all countries, except the least developed economies, at a certain percentage share of their GDP [South Commission, 1990, p. 260]. Hence, contributions would increase with the size and per-capita income of countries. For two reasons, such a funding scheme is consistent with the concept of financial compensation. First, the size of a country reflects its share in the consumption of the public good "environmental protection". Secondly, the level of per-capita income provides a proxy for international differences in time preference rates [Amelung, 1991]. The degree of financial compensation to be achieved in this way hinges on the extent to which the contributions to the environmental facility are additional to traditional forms of ODA.<sup>1</sup>

A mere redistribution of existing ODA is feared by developing countries [ECLA, 1991, p. 113]. It is hardly realized, however, that the willingness of donor countries to mobilize additional resources is likely to depend on the institutional arrangements under which the distribution of project funds is decided upon. The Group of 77 (G 77) is against using the GEF, under the auspices of the World Bank, as the unitary financing mechanism for global environmental conventions that are currently being negotiated (e.g. on climate change and bio-diversity).<sup>2</sup> Similar to earlier North-South negotiations, the G 77 again favours the creation of new institutions for which the preferred "one country, one vote" principle would apply [Stahl, 1992; South Commission, 1990, p. 260]. Such a voting rule adds to the leverage of de-

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<sup>1</sup> By contrast, the overall degree of financial compensation is not necessarily affected if environmental projects are financed by concessional lending rather than outright grants. In the case of concessional lending, financial compensation for one particular project is reduced to the interest-rate differential between the market rate and the subsidized rate. However, more projects could be financed out of a given amount of donor contributions if credits had to be repaid by the borrowers.

<sup>2</sup> For the discussion of different options of future governance and funding mechanisms, see World Bank, UNDP, UNEP [1992].

veloping countries in deciding on the allocation of project funds. According to the G77, there should be a separate fund for each convention<sup>1</sup> and a general fund, the so-called Green Fund, to cover activities not included in separate conventions [United Nations, 1991].

The G77 wants the Green Fund to be separated from the existing GEF. The new fund should serve the "sustainable development needs of developing countries, including Agenda 21" [United Nations, 1991, p. 2]; beneficiaries should have access "without any conditionality" [ibid]. The funding of the Green Fund should be based on mandatory contributions from developed countries. However, the funding is seriously endangered if industrialized countries anticipate that the principles of financial compensation will be violated under a "one country, one vote" rule. Donors could no longer enforce that concessional financing is only provided to prevent negative spillovers of national policies on the environmental conditions in other countries. The overall environmental impact of project financing becomes uncertain if the local costs in the recipient countries are covered as well. Foreign financing of environmental protection benefiting the recipient country may merely replace domestic financing. Consequently, it depends on the use of the freed domestic resources whether the environmental conditions will improve or rather deteriorate. There is no way for industrialized countries to influence the allocative decisions of recipient countries.

The replacement of domestic by foreign financing is minimized if donor countries retain sovereignty with regard to the disbursement of project funds. A voting rule which mirrors the relative weight of donors in funding an environmental facility may considerably help the mobilization of sufficient resources. Never-

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<sup>1</sup> For the example of a Biological Diversity Fund, see Intergovernmental Negotiating Committee for a Convention on Biological Diversity [1992]; for the example of a Climate Fund, see United Nations [1992].

theless, replacement effects cannot be ruled out completely. In practice, it is often difficult to draw a clear dividing line between the internal and the external costs of national policies resulting in environmental degradation [Prowse, 1992]. Even under incentive-compatible institutional arrangements, the effectiveness of project lending remains limited unless the overall economic policy framework in the recipient countries ensures an efficient use of freed domestic resources.<sup>1</sup>

This leads to the conclusion that the financing of projects with environmental spillovers has to be complemented with a more general concern for the environmental behaviour of recipient countries [OECD, 1991b; World Bank, 1991b, pp. 109f.]. As argued in Section III.2, external support should be increased if - and only if - the ruling elites in developing countries are committed to remove the internal impediments to environmental improvements. The catalytic role of external support may then be enhanced if project lending is not confined to narrowly defined environmental purposes, as is the case for the present GEF. In the context of environmental protection, donors should also support institution building and human resource development. Deficiencies in these areas constitute major bottlenecks for the economic and ecological development of Third World economies [Hiemenz, 1989]. For example, external donors should help the establishment of courts and independent executive bodies so that property rights could be defined, protected and enforced. They may also help the transfer of managerial and technological know-how, in order to contain environmental degradation in the process of industrialization.

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<sup>1</sup> "There is a close relationship between economic policy and the environment. ... Hence, although the technical design of some investment projects may be sound, the environmental sustainability of these investments may be seriously jeopardized if policies are mutually contradictory" [ECLA, 1991, p. 120].

#### IV. The Way Forward: Some Suggestions on Financial Compensation

##### 1. Basic Guidelines

Financial compensation of developing countries is a necessity to the extent that industrialized countries assign a relatively high priority to worldwide environmental protection and international spillovers of national policies prevail. Presently, it is impossible to determine the overall amount of transfers required. Informational deficiencies render it also difficult to devise efficient mechanisms with regard to the funding and distribution of transfers, as well as to establish an effective linkage between transfers and environmental protection by the beneficiaries.

In practice, transfers have to be determined in a bargaining process on the basis of incomplete information on costs and benefits. However, the concept of financial compensation suggests some basic guidelines which appear to be largely ignored in the ongoing North-South negotiations:

- First, financial compensation is frequently confused with investment needs for environmental purposes in the Third World. Concessional external financing is not required to the extent that the investment-related welfare improvements accrue to the country itself. It can reasonably be assumed that the need for financial compensation is substantially below the overall costs of environmental conservation.
- Secondly, the financial instruments discussed so far focus on the mobilization or the distribution among beneficiaries of funds for environmental protection. An integrated concept addressing both issues in a way which is consistent with financial compensation has not yet been developed.
- Thirdly, recent proposals on international financing of environmental protection in developing countries largely ignore the experiences with similar instruments in the past.



## 2. Mobilization of Funds

As concerns the international mobilization of funds for environmental protection, most of the widely acknowledged eco-tax proposals are inconsistent with the concept of financial compensation.<sup>1</sup> A possible alternative to taxation would be to specify the total amount of admissible emissions or the admissible exploitation of natural resources and to issue a respective number of tradable permits [for the case of CO<sub>2</sub> emissions, see Grubb, 1989].

More research is definitively needed to evaluate the chances for the implementation of a scheme of tradable permits in different areas of environmental concern, and to assess in detail its pros and cons as compared to eco-taxes.<sup>2</sup> Generally, however, some advantages of permits stand out. First, international efficiency in containing global environmental degradation is relatively easy to achieve. The market exchange of emission permits provides an incentive to undertake abatement measures where they are most cost effective. By contrast, the full harmonization of eco-taxes would be a necessary precondition to equate the costs of further abatement across sectors and countries. Such a harmonization might be difficult to achieve.

Secondly, financial compensation is an integral factor in a scheme of tradable permits. This is most evident if permits are allocated on a per-capita basis to countries. Provided that monitoring problems were overcome, such a scheme would benefit countries in which per-capita emissions are relatively low and the exploitation of natural resources remains limited. Generally, developing countries would receive more permits than needed by

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<sup>1</sup> This is, of course, not to ignore that eco-taxes may have a role to play with respect to containing environmental degradation in a national context.

<sup>2</sup> Principally, an agreement on the overall number of permits corresponds to an agreement on eco-tax rates. The allocation of permits corresponds to the distribution of tax revenues. Common problems of eco-taxes and tradable permits relate to difficulties of monitoring and postcontractual instability [Mohr, 1991].

them. They may then sell permits to countries which are short of permits because of environment-intensive production. Compensation increases with intensified efforts of developing countries to contain environmental degradation at home, since the number of permits that could be sold increases. Transfers do not necessarily decline to the same extent that environmental degradation is contained in industrialized countries. Price increases in the market for tradable permits may counteract this effect if the overall number of permits is sufficiently reduced over time.<sup>1</sup> Finally, financial compensation arranged in this way may reduce administrative and transaction costs. The collection and transfer of payments does not require a large international bureaucracy, but at most a clearing agency.

Financial compensation through tradable permits provides an alternative in several areas of environmental concern, in which the discussions have traditionally focused on taxation. As concerns global environmental issues, the protection of the atmosphere through a reduction of CO<sub>2</sub> emissions provides a case in point. The permit scheme is also suitable to help resolve regional environmental problems, e.g. the pollution of international waters caused by seabed mining; an excessive exploitation of antarctic resources; and an excessive use of renewable natural resources such as over-fishing. However, both eco-taxes and tradable permits are not suitable to finance environmental protection in areas where monitoring is virtually impossible. This applies, for example, to the preservation of biological diversity.

To the extent that environmental protection in developing countries involves cross-border effects, the international funding must, in practice, be related to a meaningful proxy variable. It would be consistent with the concept of financial compensation to collect annual contributions as a percentage share of the donors'

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<sup>1</sup> Among the open questions, future research may indicate whether a reduction of the overall number of permits is easier to achieve than a corresponding increase of eco-taxes in all participating countries.

GDP. The contributions to an environmental fund would then increase with the size and per-capita income of countries. A country's size reflects its share in the consumption of the public good "environmental protection". The per-capita income provides a proxy for differences in time preference rates.

### 3. Allocation of Funds

The distribution of funds mobilized in this way among developing countries undertaking environmental measures that benefit the international community has to obey to the same principles. Disbursements should be concentrated on low-income countries with high time preference rates. However, experience with development aid in the past tells that unconditional budgetary transfers are unlikely to result in environmental improvements. Another debatable - though widely accepted - proposition is that environmental protection in developing countries could be easily achieved by foreign debt reduction. External transfers of whatever type and magnitude cannot be a substitute for adequate policy incentives in the recipient countries.

In order to establish an effective linkage between external transfers and environmental protection, financial compensation should take place in the context of lending for specific projects with international spillovers. As concerns the focus of project lending, the following points are noteworthy:

- First, external support must not be restricted to swap operations in highly indebted countries.
- Secondly, project financing should not be confined to narrowly defined environmental purposes. Donors should also support institution building and human resource development.
- Thirdly, project lending should be concentrated on developing countries the ruling elites of which are committed to remove the internal impediments to environmental improvements. Hence, selectivity and greater flexibility in aid allocations among low-income countries is required.

Even if these conditions were met, problems of monitoring and enforcing environmental protection in developing countries would persist. Contract stability may be enhanced by incentive-compatible institutional arrangements on the distribution and phasing of transfers. Decisions on the distribution of project funds should be based on a voting rule which mirrors the relative shares of donors in funding an environmental facility. Such a rule minimizes the risk that domestic financing of environment-related projects is merely replaced by foreign financing. Hence, it helps the mobilization of sufficient funds at an international scale. The phasing of transfers may provide another safeguard for external donors. The temptation of developing countries to renege on earlier commitments to environmental protection is particularly strong if financial compensation is granted as a once-and-for-all lump sum payment. This temptation may be contained if protective measures by the beneficiaries must precede the transfer of compensatory payments. In the case of pro-rata payments, the option is maintained to sanction the breach of earlier commitments by a reduction of overall transfers.

#### 4. Concluding Remarks

Economic fundamentals and past experience have to be taken into account in designing adequate instruments to achieve financial compensation. The focus of the ongoing North-South negotiations should be placed on overcoming informational deficiencies with regard to the costs and benefits of environmental conservation, and on evaluating the relative merits and flaws of optional financial instruments. Both issues have not received sufficient attention so far.

In any event, financial compensation should not be regarded by industrialized countries to be a substitute for trade liberalization. Trade restrictions for processed and finished goods add to the incentives of developing countries to deplete their natural resource base. The pressure on Third World economies to earn foreign exchange by exporting non-renewable raw materials could be reduced if escalating import barriers against manufactured

goods were removed. The links between trade, environment and economic development deserve particular attention in the ongoing UNCED negotiations. This also refers to the removal of barriers to market entry and the phasing out of export subsidies in agriculture. International trade policy must not be used to raise funds for an environmental financing facility, but as a means to stimulate export diversification of commodity dependent economies and induce a sustainable agricultural development in both industrialized and developing countries.

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