costs. There were in the mid 1990s proposals at the Helsinki Convention fora to establish a Baltic-wide fund to stimulate an improved allocation of abatement effort. Even though the proposals were very modest ones (corresponding to mere 5 percent of abatement costs), they have not gained much political support so far. This casts serious doubts on whether the signatories of the Helsinki Convention are ready to cost their public good adequately.

2. SWAPPING DEBT FOR NATURE: MONETARY VERSUS ENVIRONMENTAL INTERESTS

Debt swaps as an instrument of international cooperation in the environmental field were conceived and first applied in the 1980s. They were once thought of as 'win-win' arrangements solving environmental and economic problems at the same time. In the 1990s it became clear, however, that (1) debt-for-environment swaps attracted as little as 1-2 percent of debt swap schemes (with debt-for-equity swaps taking almost all the rest), and (2) the effectiveness and efficiency of those carried out was sometimes problematic. The paper addresses the question of why — despite high expectations — debt-for-environment swaps have not emerged as a major international environmental policy tool.

A debt swap can be considered a game. Its players include not only a creditor and a debtor government (typically represented by finance ministers), but also a number of other stakeholders such as producers of abatement equipment, environmental agencies, and environmental NGOs. Specific design of a swap, comprising project selection and procurement rules among other things, determines whose interests are directly served by its mechanism, whose are left to the market forces, and whose are not served at all. Thus alternative design features are reflected in payoffs from the game. The analytical model developed in this section is applied to the Polish debt swap negotiated with the Paris Club in 1991.

2.1. History

Indebtedness and the natural capital destruction are ranked among the most acute global problems affecting the present and future well-being of a large part of the world. First proposed by Lovejoy [1984], debt-for-environment swaps were once considered a wonderful tool to address the two problems simultaneously.

The first swap was implemented in Bolivia in 1987. Despite the publicity this precedent-setting agreement received in the media [Shabecoff 1987], and despite a significant scale of the environmental improvement involved, the volume of the transaction was minimal. In Bolivia 650,000 USD of the country's debt (a fraction of a percent of the country's substantial indebtedness) was bought for 100,000 USD (roughly 15 cents on the dollar) in the secondary financial market and retired. In exchange, the Bolivian government agreed to expand protected areas around the Beni Biosphere Reserve by 1.5 million hectares. It contributed 100,000 USD to the protection programme which also received a 150,000 USD grant from the United States Agency for International Development [Cody 1988, pp. 29-30].

Not much has changed within the next couple of years. To the frustration of many environmentalists, despite a potential envisaged by some economists [Hansen 1989], debt-for-*environment* swaps (including so-called debt-for-*development* swaps which cover environmental projects, but may also address health care, education, and so on) accounted for only 1-2 percent of approximately 38 billion USD channelled through debt-for-*equity* swaps [UNCTAD 1992, p. 43]. The latter focused the attention of financial analysts, politicians, and international investors almost exclusively.

Moreover, some politicians and analysts have concluded that debt-for-environment swaps are not an adequate instrument for environmental management. This assertion is based on two premises. First, there may be no correlation between bilateral indebtedness and the creditor's *environmental* interest in its debtor country. Second, a debt swap is a very indirect, and thus probably inefficient, way to subsidize environmental protection; a direct side-payment would be a more straightforward method to proceed. Whilst either of the arguments has its own merit, they can be questioned on purely theoretical grounds. They can also be questioned on practical grounds as prematurely rejecting an instrument which — when properly fine-tuned and targeted — may significantly improve countries' ability to manage the global commons.

Quite different reservations were voiced by some environmentalists who realized that most of the swaps concluded by the early 1990s did not result in any transfer of resources from the rich to the poor. What happened was that a 'First World' environmental group gave money to a First World commercial bank in exchange for a 'Third World' government decision to give money to one of its environmental groups [Mahony 1992, p. 100]. Thus, at best, debt swaps helped to avoid some of the current net wealth transfers from South to North which would otherwise have taken place. This implies a question, whether it is worthwhile for scarce environmental budgets — both public and private — to contribute to endeavour which only results in assisting Northern

banks to improve their current balances, as well as to increase the likelihood of recovering the rest of their money in the future.

This skepticism was justified. Indeed, one could have easily given up with debt-for-environment swaps, if they were to be arranged on an *ad hoc* basis, and if they were not to be a part of a complex policy to solve the indebtedness problem, revert the net current flow of wealth, and create *local* institutions to manage the *global* commons. In an earlier paper [Żylicz 1992] I discussed the institutional dimension of a debt-for-environment swap to conclude that a swap facility might be in a unique position to serve certain international environmental purposes.

In 1991-1992 the government of Poland launched a large-scale debt-for-environment swap intended to ease the country's indebtedness problem and to address a couple of global environmental problems at the same time. The swap was remarkable not only in terms of money (it aimed at more than 3 billion USD, 10 percent of the debt to the 'Paris Club' countries), but — even more importantly — in terms of its careful design. Substantial efforts were put to developing an arrangement free from deficiencies indicated above. In addition, at that time, Poland had gained some experience with bilateral environmental assistance and understood that the cost-effectiveness of spending crucially depends on the design of an appropriate facility. Consequently efforts were also put to avoiding deficiencies of traditional bilateral mechanisms.

In 1992 the Polish Minister of Environment established the EcoFund, a non-government organization (NGO) registered as a foundation under the Polish law. It has managed all debt-for-environment swaps that have been negotiated by the government since 1991. In 1997 the foundation was subject to two independent reviews: by the OECD [1998] and by KPMG [1997]. The former was undertaken by the OECD on its own initiative while the latter was commissioned by the international Council which supervises the EcoFund. Both reviews confirmed the outstanding performance of the EcoFund, the adequacy of its original design, and the timeliness of its mission. The OECD and KPMG reviews were not the first independent international studies of the EcoFund. In 1994 the Economic Commission for Europe of the United Nations officially recognized the Polish EcoFund as 'an innovative and promising pilot project' to serve as a pattern for other heavily indebted economies in transition [UN ECE 1994, pp. 3-4]. Despite that the participation of the creditor countries has been rather unimpressive. Two countries entered the swap soon after its launch in 1991. They were joined by a third one a year later. The next two countries — one of them 'on a trial basis' — came in 1997. They were followed by a sixth one in 1998. Given

that the number of potential participants is seventeen, that is, the entire Paris Club, the response should be seen as lukewarm.

2.2. Swaps or Payments?

It could be argued on theoretical grounds that there is no correlation between indebtedness and the environmental interests of a creditor in its debtor. The 'no-correlation' argument was actually applied by one of Western European Environment Ministry officials in 1991, to justify their government's lack of support for the Polish proposal to swap a portion of the debt. However, the notion of an environmental interest is a broad concept, and deserves to be examined. Country A can be said to have *an environmental interest* in country B under several alternative circumstances listed below.

1. *B* is an 'upstream' (or 'upwind') polluter affecting *A*;
2. *B* is a provider of a public good whose supply is of interest to *A*;
3. *A* and *B* exploit the same common resource stock;
4. *A* and *B* consume services provided by the same common environment, but the value attached to these by *A* is higher than that attached by *B*;
5. *A* appreciates the option, vicarious, or existence value of a resource owned by *B*.

Indeed, it would be unreasonable to expect to find too many examples of the type (1) correlation. With the creditor countries clustered in the North, and the debtors in the tropics, there are little, if any, chances that a debtor may also happen to be a significant polluter affecting its creditor. Poland *vis à vis* Sweden may provide such a rare example. However, in the case of, for instance, Germany and Poland, the former, that is, the creditor, is the upwind party. The type (2) correlation, best exemplified by present concerns to preserve the global biodiversity, is commonly observed. Despite the establishment of exclusive economic zones, harvest quota, and so on, many renewable resources still possess typical characteristics of a commons. One can think of global warming in terms of carbon dioxide emissions which originate mostly from the North now, but whose long-term trends depend on development and energy policies carried out in the South. Hence the likelihood of observing a correlation between indebtedness and the type (3) interest is definitely higher than under (1). The ozone layer depletion provides an example of a situation, where 'the North' (including Australia) attaches a much higher value to ozone protecting measures than the rest of the world and, therefore, it is interested in vigorously stimulating such measures elsewhere. This can be viewed as the type (4) relationship. Lastly,

there exists wide interest in assisting low-income countries in their struggle with poverty and hunger. Also, there exists a recognition of the fact that this struggle will never succeed unless the hungry and the poor prevent their natural capital stocks from further decline. Thus the North's willingness to assist — if materialized consistently — must manifest itself in its appreciation of vicarious values derived from those distant environments and resources. This explains much of the potential type (5) interests other than, say, the concern with biodiversity, which could also be classified under (2).

In sum, to the extent that the indebtedness problem affects first of all those

- who control biodiversity (type 2),
- who can offer inexpensive carbon sinks (type 3),
- whose production and development plans do not undergo the same domestic checks as in the North (type 4), and
- whose survival very much depends on saving their resource base (type 5),

its correlation with environmental interests *is*, in fact, implied.

To be precise, in order to claim the correlation between bilateral indebtedness and environmental interests, one needs an additional assumption that the volume of credit activities in the past (leading to the present indebtedness) was roughly proportional to the size of the creditor's economic activities, the latter being indicative for its readiness to participate in global environmental programmes. At the same time, one should stress that these hypothetical interests cover global issues like biodiversity, climate change and ozone depletion, as well as maintaining debtor countries' natural resources rather than transboundary pollution externalities.

Nonetheless, even if environmental interests are related to indebtedness, then it could be questionable whether debt swaps are any better than direct side payments. Here the argument should address the preferences of both parties: a creditor and a debtor.

If a debt swap were simply a one-time subsidy to free the debtor of (a portion of) its current debt service in exchange for a domestic environmental expenditure, then certainly a direct subsidy to finance the expenditure would be a much more natural way to go. The idea of a swap, however, is to change the future flow of payments so as to assist the debtor in a more permanent manner. From the creditor's point of view such a deal may be perceived as an inflexible tool, as it requires a long-term commitment, typically of ten years or more depending on the time profile of the debt swapped. For the very same reason, from the debtor's point of view a swap is a more convenient form of assistance, since it secures a more stable source of funding than aid

packages which typically have a much shorter time frame. It is assumed in this analysis that otherwise the debt would have been serviced. Here we do not address the question of a possible unilateral debt moratorium decision by the debtor. Such decisions free the economy from the immediate burden but simultaneously they cut it from international capital markets. Still the debtor may hesitate to negotiate a swap, as long as there is a chance for an unconditional debt reduction. In fact this was the case in Poland before 1991. The government was involved in negotiating an extensive debt-rescheduling package with the Paris Club. The debt-for-environment swap initiative was launched only after the extent of negotiated unconditional debt reduction was perceived as final.

The considerations above suggest that creditors may have an inherent bias against the swaps, while debtors may demonstrate an inherent preference for these, at least when they see no chance for reducing the debt burden otherwise. This leaves aside the fact that some debtors — for example Brazil — are opposed to debt-for-environment swaps as impairing their sovereignty over the national resource base. A declaration adopted at an international seminar hosted by the Brazilian Institute for Economic and Social Analysis (IBASE) states, among other things, that: 'The mechanism which exchanges foreign debt for environmental benefits does not contribute to the development of environmental policies which are consistent with democratic management of natural resources, and which might lead to environmental conservation and a better quality of life for the local population. Instead, it forms part of a general strategy for reaffirming the creditors' political and economic domination over the debtors, within a development model which commercializes life in all its aspects.' [Mahony 1992, p. 102]

This, however, is not an argument against the swaps specifically, but rather against any form of sharing their control of resources, and it would equally apply to direct payments (tied to certain environmental requirements), should such an offer be made. An additional reason why creditors may prefer direct payments (especially in the form of conventional aid programmes with tied procurement) is that these payments are for the most part recaptured by entities from the donor country who receive contracts. It is therefore quite natural that aid packages rather than swaps are more likely to win support by political constituencies in creditor countries.

This prevailing philosophy assumes that environmental protection, or sound resource management is a technical question which can be solved once the money is there. It overlooks the fact that protection and management are carried out by institutions. Moreover, if they are to be carried out on a self-sustained basis, these institutions should be local ones, run by local

professionals, and contributing to the emergence of local constituencies for environmental and resource stewardship.

Seen from this point of view, debt swaps are an interesting tool because of three reasons. First, unlike direct payments coming in the form of aid packages, swaps provide a long-term source of financing; thus they make it possible to design long-term programmes aimed not only at fixing concrete technical problems, but also at establishing required institutions [Żylicz 1992]. Second, by raising environmental issues at the debtor country's government forum, swap negotiations elevate the status of environmental departments, and make them partners to financial and industrial agencies. Third, swaps are more likely to achieve leverage in terms of money spent on the environment per dollar invested in debt reduction; this is evident if the swap takes advantage of the difference between the face value of the debt and its price in secondary markets, but even if the debtor's commitment corresponds to the actual payment made by the creditor, the leverage can result from the requirement that the expenditures of the former are *additional* to its long-term spending plan. All in all, there is tremendous potential inherent in debt-for-environment swaps which could make this instrument for the developed countries more attractive than direct side-payments.

2.3. Designing an 'Economically Sound' Debt-for-Environment Swap Facility

There are two aspects to a successful design of a debt-for-environment swap: its general layout, as determined by debt conversion agreements, and specific institutional arrangements establishing a facility to administer converted funds. In what follows we will briefly discuss both aspects.

The crucial difference between debt-for-environment and debt-for-equity swaps is that in the latter the creditor can recapture its assets at least partially and, perhaps, with some delay. It is therefore no surprise that 98-99 percent of all debt conversions are confined to this particular form. Whilst successful in solving some of the financial problems in some of the Latin American countries (especially in Chile [UNCTAD 1992, pp. 38-42]), debt-for-equity swaps cannot contribute to the capacity building in the same way as outlined in Section 2.2 above. Hence the first principle that the design of a debt for-environment swap should start with is a clear identification of the swap as an environmental one. It should be clearly determined that the discharge of the debtor government's debt service obligations is linked to its financing domestic projects (previously agreed upon with the creditor), and not to the creditor government satisfying its domestic financial institutions affected by the debt conversion. Convincing creditors to switch from their myopic

preference to fix their financial problem to a more comprehensive approach is thus the first challenge the architect of a debt-for-environment swap has to face.

An important issue needs to be clarified here, namely the *additionality* of the debtor's expenditures claimed as the fulfillment of its obligations under the swap. Even though it is conceivable that creditors may agree to honor any expenditures demonstrated by their debtor (both in the public and the private sector), a more typical requirement would be to ensure that more projects are undertaken as a result of the swap. There are many different ways to approach this problem, but the most practical one is the macroeconomic test, namely to require that the country demonstrates increased overall environmental expenditures with respect to a historical baseline.

Assuming that a certain number of creditors agree to a swap, the next step is to avoid establishing a series of bilateral facilities each administering funds released in a given swap. There is a natural tendency for creditor governments to prefer such bilateralism, as they feel in this way they can have a better grip over the resources that will be spent on their behalf. But it would be clearly inefficient for the debtor country to establish a whole array of swap facilities — each handling only a portion of the resources made available through conversions. An additional disadvantage of a bilateral set-up is that in such circumstances, it would be extremely difficult to avoid procurement tied to the creditor country. This is, perhaps, the major factor explaining creditor governments preference for bilateral schemes: if the face value of the debt cannot be recovered in the form of equity shares, then, at least, its firms should benefit from contracts. Studies show that tying procurement to any given geographical location may increase the cost of contracts by as much as 30 percent [Laurson *et al.* 1995]. For that reason, the administration of swapped funds should take advantage of an international competitive tender (either open or limited), which of course is difficult to defend within the framework of a bilateral facility.

At the same time, however, the financial interests of creditor countries should be recognized too. A compromise can be arrived at by adopting a *geographical distribution* rule. The rule — widely applied in the European Union (EU) programmes — offers every participating donor the possibility to recapture (in the form of contracts awarded) its share (with some flexibility margin) of the effort.

The main difference between the geographical distribution and tied procurement principles is that in the former, the contracts are *not a priori* assigned to any given location. Awarded on a competitive basis, the contracts are periodically reviewed, and their geographical distribution is assessed. If this turns out to be sufficiently close to the desired one, no corrective action

is taken. Otherwise, the administration of the programmes may take either of two steps: (1) to modify the 'shortlists' of potential bidders so as to constrain the number of firms from the countries 'over-represented' in contracts; or (2) to modify the selection of projects so as to offer a better chance to those firms which have not found an opportunity to show their specific competitive advantage so far. Even though this is not a perfect solution, the geographical distribution of contracts is a much better alternative than tied procurement, and it proved viable in the EU practice.

Assuming that the multilateral profile of a debt-for-environment facility has been successfully secured, the next issue is to find a viable institutional form for representing creditors' interests without impairing the debtor's sovereignty. A natural way to go is to establish a supervisory board with a *collective minority* representation of creditors, offering the rest of the seats to debtor country nationals carefully selected from the government, NGOs, and the academia.

An ideal way to take decisions regarding general policy, project selection, and spending would certainly be a unanimous vote. For obvious reasons, this cannot be adopted as a charter principle, even though it may be actually followed most of the time. Requiring a qualified majority vote for a decision to be valid, and ensuring that the debtor's party cannot achieve such a vote unilaterally, is a solution which may let the creditors accept their minority representation. It does not seem to be appropriate to provide for a full representation of creditors on the board (with, say, votes proportional to their commitments), since this would inflate the size of this organ and increase costs and bureaucracy substantially. There are many international-regional institutions (Paris Club, OECD, EU, EFTA, World Bank, EBRD, and so on) where an initial aggregation of creditor preferences can be achieved, and which can be invited to represent groups of creditors, especially those with minor stakes.

2.4. The Polish EcoFund Initiative

The idea of a debt-for-environment swap was not quite novel in Poland in 1991. In 1990 the World Wildlife Fund (WWF) converted 50,000 USD (purchased in a secondary market for 11,500 USD) of the Polish debt into a Mazurian Lake conservation project. Also in 1990, a bilateral Polish-Finnish agreement was reached to swap a substantial portion of the official bilateral debt for a subsidy (up to 30 percent of the contract price) for Polish importers who buy Finnish environmental protection and energy saving equipment. The latter was a typical bilateral agreement with all the disadvantages of tied procurement and of an *ad hoc* institutional structure. Initially the

implementation of the agreement was slow due to bureaucratic and procedural failures on the Polish side. Eventually, however, it became clear that because of the lack of appropriate incentives (a result of the tied-procurement philosophy) the potential projects are not competitive compared with their open-market alternatives even after the 30 percent budgetary subsidy for Polish importers. Hence the project pipeline was virtually empty for more than a year.

In 1990-1991 the government of Poland was negotiating the scale of the general debt relief untied to commitments to domestically spend on something negotiated with the creditors. No swaps were discussed openly at that time. By the end of February 1991, it became apparent that this scale — with respect to the Paris Club debt — would reach 50 percent. Based on that, in his Memorandum of March 5, 1991, Dr Maciej Nowicki, Minister of Environment, outlined Poland's environmental protection programmes of international relevance [Nowicki 1991]. These programmes would allow Poland to apply (with respect to the remaining 50 percent of the debt) to redirect its debt service for environmental protection purposes.

In particular, in the Memorandum four main problem areas were identified as international priorities:

- long-range transboundary air pollution abatement;
- improved control over contamination and eutrophication of the Baltic Sea;
- carbon dioxide (and other greenhouse gases) abatement mainly through promoting new energy efficient technologies; and
- preservation of biological diversity through sound development assistance to regions with ecological systems of international importance.

This served as the starting point for further delineating the initiative.

On April 4, 1991, Prime Minister Jan Krzysztof Bielecki appointed an Interim Interministerial Committee in charge of the debt-for-environment swap chaired by a Deputy Minister of Finance. The Committee was responsible for establishing an environmental fund, the EcoFund, managing the selection, development and financing of projects undertaken within the framework of future debt-for-environment swaps.

Subsequent activities were based on the April 21, 1991 decision of the Paris Club which determined that additional reductions of the Polish debt — up to 10 percent of the initial amount, that is, up to 20 percent of the level reduced by a half — may be achieved in a series of voluntary bilateral agreements with creditors. Hence, if all of the creditors positively responded to this option, the EcoFund would have received more than 3 billion USD (in net present value terms as of April 1, 1991) to be disbursed over 18 years.

The scale of the arrangement would be much larger than anything in the past. Taking into account the time profile of the debt, the EcoFund's annual budget would have started with 120 million USD, and would have reached about 400 million USD by the year 2000, when peak debt payments are due. These are significant figures, even though they are much less than what the Polish economy spends on the environment domestically. It was estimated that the EcoFund's budget would never exceed, say, 15 percent of the total domestic environmental expenditures [Republic of Poland 1992c].

In order to reinforce the Polish initiative, Prime Minister Bielecki approached Ms Gro Harlem Brundtland, the Prime Minister of Norway, who has also earned worldwide acclaim in environmental matters (as the chairperson of the World Commission on Environment and Development among other things), for her support. Norway positively responded to this initiative.

The Polish Interim Committee — in close collaboration with representatives of the Norwegian government, and with the assistance of Coopers & Lybrand, a British consulting firm — drafted a comprehensive Concept Paper [Republic of Poland 1991a] explaining the main points of the proposed solution. On June 11, 1991, at a special meeting attended by the ambassadors of the Paris Club countries in Warsaw, Prime Minister Bielecki presented the concept paper. Thus he officially launched the initiative to coordinate prospective bilateral swaps within the framework of a new multilateral environmental fund that would add value to Poland's own efforts in areas of international and global concern. On the same day, Prime Minister Brundtland announced at a press conference that the Norwegian government would host the meeting of representatives of the Paris Club countries with representatives of the Polish government (as well as of key multilateral agencies) to be convened in Oslo on July 1, 1991. The aim of the conference was to discuss the Polish proposal for implementation of the Paris Club's April decision, and thus to pave the way for the series of bilateral negotiations [Republic of Poland 1991b].

The Oslo conference revealed far-reaching support for the proposed model, the core financial mechanism of which is as follows. The EcoFund initially selects and evaluates projects eligible for funding (or co-financing) through the debt for environment swap. Next, the choice has to be approved by the participating Paris Club countries' representatives. The actual expenditures eligible for reimbursement from the EcoFund are then subtracted from a special escrow account with the Bank of International Settlements where the Polish government services its external debt, or with an otherwise selected commercial bank. The amount invoiced — instead of being transferred to creditors' accounts — flows back to Poland to credit the

EcoFund, which is therefore able to reimburse the successful project applicants.

From the very beginning, there have been three basic principles of the Polish debt-for-environment swap programme: (1) additionality, (2) cost-effectiveness, and (3) 'club approach'.

Ad (1) The projects selected are to be additional in the sense that, without the assistance of the swap programme, they would have either not proceeded at all or only proceeded at a substantially later date despite their international importance. In practice it is very difficult to assess additionality on a purely project basis since this presumes the existence of a clearly identified baseline programme with a specific timetable for each individual project over the time horizon of two decades or so. For this reason the more relevant concept of additionality was defined in terms of total expenditure on environmental projects. The year 1991 — the most successful one until then — was declared as the benchmark for assessing future additionality.

Ad (2) The cost-effectiveness approach — that is, maximizing the programme's objectives of addressing international environmental problems given available resources — was the core of the proposed financial mechanism. It assumed that projects would be selected and financed in such a way as to achieve maximum results (in terms of pollution abated, habitats saved, and so on) per dollar spent. This implied competitive bidding, among other things, which was also a condition to attract important multilateral co-financiers.

Ad (3)The cost-effectiveness principle underpinned the Polish government's view on how the allocation of available money be best achieved. This should be on a 'club' basis. By this, the government meant that each participating country would be able to indicate its preference between the different four areas of activity (that is, in short, acid-rain/transboundary pollution, Baltic, climate change and biodiversity), and that the individual preferences would then be added together to create an overall allocation of fund resources. Then, however, the detailed allocation between individual projects would be determined taking into account technical considerations including cost-effectiveness criteria.

In order to emphasize the financial benefits for the creditor countries resulting from the swaps — in addition to the environmental ones — specific rules for procurement to be financed by the EcoFund were developed. On the one hand, for efficiency reasons, there should be no import purchases automatically tied to a creditor's commitment. On the other hand, however,

there is a need for the creditor countries to perceive financial benefits, which should be proportional to the commitments.

To resolve this dilemma, the Polish government offered to perform regular, periodic assessments of the geographical distribution of (import) contracts triggered by the EcoFund projects in the course of the competitive bidding process. Such a solution allowed the elimination of any 'unfair' distribution of financial benefits accruing to the contractors whose governments do not proportionally participate in the EcoFund initiative [Republic of Poland 1992b].

There is an important difference between the approach outlined above, and a typical tied procurement scheme:

(a) the scale and the time profile of projects can be optimally adjusted to specific needs, and they do not have to follow the particular pattern of the debt service to a given creditor;
(b) projects may typically require diversified import components, and the overall efficiency of an investment can be maximized only if various components are purchased from different contractors; this geographical differentiation would not have been possible under the tied procurement regime;
(c) the EcoFund expenditures — as a result of the principle of seeking co-financiers for the project (including import components) — generate an *additional* demand for imports; this additional demand is greater than what could have been sustained if the import were to be financed from the Polish budgetary sources.

From the economic theory point of view, the 'club approach' proposed by the Polish government can also be interpreted as a way to overcome the inefficiency of free-riding obviously preferred by non-participating countries. Some Paris Club members complain about constraining the procurement to the 'EcoFund Club'. Apparently they would like to take advantage of other creditors' swapped funds without contributing to the EcoFund.

The club approach has been consistently adhered to by the Polish government not only because of its efficiency advantages (*vis à vis* tied procurement), but also because of the incentive it gives the non-participants to join. Occasional political pressures exerted by some creditors on Poland to withdraw from this approach, as well as the motivation informally acknowledged by the latecomers, confirm that this has been an important design element. Initially it was only the Polish government who insisted on the club approach. Now the participating countries have stakes in keeping this status as well.

2.5. The Model

International environmental agreements have been discussed in terms of game theory concepts at least for a decade [Mäler 1989]. Debt-for-nature swaps were the subject of many analyses, but there were only a few attempts to interpret them as games. Chambers *et al.* [1996] develop a game-theoretic model of a debt-for-nature swap. They portray it as a second best solution to the problem of global deforestation in the absence of a supranational entity to enforce the global optimum. The key players in that game are environmental NGOs who let their members pay for saving tropical forests. In contrast, in the Polish EcoFund case, the initiative is on the debtor side, and the swaps are carried out by creditor governments rather than NGOs (even though the latter may interact with their governments and with each other).

The Polish debt-for-environment swap initiative can be interpreted as a sequence of two games. The first game relates to whether equity or environment is to be swapped. This game was played by the Polish government with its creditors in 1991-1992. The second one relates to the participation of a given creditor in the debt-for-environment swap facility that was already established. That one has been played (with non-participants) until now. While a more realistic representation of both games would require a much more complex analytical framework [Folmer *et al.* 1993], quantification problems would render this approach impossible to validate in this case. Therefore this paper applies a simplified method that separates the two stages of the swap development.

In the first stage, Poland played the same game with all creditors separately. The games took place during bilateral debt rescheduling negotiations. The Paris Club decision mandated the 50 percent reductions, but technical details were left to bilateral agreements. The Polish government took this opportunity to approach each creditor individually and suggested taking advantage of the additional 10 percent clause. Three main options were available for either party:

- no swap (NS);
- debt-for-equity swap (EQ); and
- debt-for-environment swap (EN).

One can contemplate the following payoff matrix for the parties involved in such a game.

Hypothetical payoffs in a creditor-debtor game

		Creditor		
		NS	EQ	EN
Debtor	NS	0,0	0,0	0,0
	EQ	0,0	a,b	c,d
	EN	0,0	0,0	e,f

The payoffs are understood as perceived by swap decision makers — mainly finance ministers, governments and parliaments. That is they may not necessarily reflect full costs and benefits of various strategies. Both creditor and debtor are considered homogeneous entities. Given the logic of political process a homogeneous creditor may therefore tend to focus on financial benefits rather than environmental ones.

It is assumed that a swap takes place if parties agree on the debt-for-environment swap (EN-EN), or if the debtor chooses the debt-for-equity swap (EQ-EQ or EQ-EN). In the latter case the swap takes place even if there is a mismatch between the preferences of both parties. For if the debtor accepts a debt-for-equity swap, then a debt-for-environment swap can be carried out as well, with the creditor not only providing environmental benefits, but also retaining the ownership of a facility (project) producing such benefits. In other words, swaps take place unless a party chooses the no-swap option, or the debtor insists on a debt-for-environment swap while the creditor accepts an equity swap only.

The payoffs are understood as incremental with respect to the no-swap option. Apart from the trivial outcome (NS-NS), the game has a Nash equilibrium (EN-EN) with the payoffs (e, f) as long as $e \geq c$, and $e, f \geq 0$. If, in addition, $a < 0$, then (EN-EN) is the only non-trivial equilibrium. If $a,b \geq 0$ and $b \geq d$, then (EQ-EQ) is another Nash equilibrium with the payoffs (a,b).

A solvent debtor may perceive the incremental benefits from a debt-for-equity swap as non positive, since a creditor is presumably interested in assets that would have found a buyer anyway. Moreover, unless the creditor buys assets in a competitive bidding procedure (a rather unlikely arrangement under the swap), the purchase price can be lower than the market value. Hence one can assume that $a < 0$.

Now, assuming that a creditor is 'environmentally biased', then an equity swap can include an asset whose market value does not capture all the benefits provided through its operations. Hence $c > a$ seems a justified conjecture (although it does not necessarily follow from this that $c > 0$). Moreover, a debt-for-environment swap provides a debtor with maximum

and positive benefits, as it does not require any ownership transfers. Hence $e \geq c$ and $e > 0$.

The analysis of costs and benefits from a creditor's point of view looks certainly different. It can be argued that $b \geq d \geq f$ owing to the fact that the less constrained the creditor is in spending decisions the more profitable spending mix will be selected. Nevertheless even under the most constrained regime — that is, a debt-for-environment swap without any transfer of the debtor's assets — the creditor may receive some net benefits. This justifies the conjecture that $f \geq 0$.

In assessing their benefits, creditors take into account both environmental and financial gains from a swap net of expenditures. Environmental benefits depend on a number of circumstances as explained in Section 2.2. In particular, *ceteris paribus*, they are higher for a downwind/downstream party than for an upwind/upstream one. Financial benefits depend on how successful in triggering additional contracts is the swap programme. This additionality, in turn, is caused by the so-called leverage the swap can achieve. The leverage is observed whenever an expenditure from a given source — here from the creditor's budget — activates someone else's spending, for example, the spending from the debtor's budget or from the private sector. Other things being equal, financial benefits are higher for a country whose firms have not been very successful in the debtor's market so far. The swap may open up the market for them. On the contrary, the country whose presence in the local market has been firmly established will not gain as much from the stimulus provided by the swap.

To sum up, the model predicts a debt-for-environment swap as a Nash equilibrium in a game between a solvent and environmentally conscious debtor and a creditor without a strong established presence in the debtor market. At the same time the model anticipates that no swap will take place if the creditor is successful in the local market anyway. Finally the model explains why a debtor may be better off without a swap rather than with a precedent-setting debt-for-equity arrangement which makes other creditors expect a departure from the debt-for-environment preference.

In the second stage all the creditors have recognized the firm preference of the Polish government to negotiate debt-for-environment swaps rather than alternative arrangements left open by the Paris Club 1991 decision. Once the Polish strategy has become fully disclosed and known, the only remaining game is that to be played by the creditors. Given the multilateral design of the EcoFund, the outcome of participation of any given creditor depends on the total number of participants (and their commitments). Therefore our analysis of the second stage draws from the analysis of self-enforcing agreements as developed by Barrett [1994].

Each member of the Paris Club takes a decision whether to participate in the EcoFund or not. To this end both payoffs from the participation and from the non-participation need to be assessed. It can be assumed that in the first case the payoff decreases with the number of participants while in the second case it increases.

For any given creditor, the payoff is the difference between the benefit from the swap and its cost. The latter is independent of the number of participants while the former is not. For a participant the cost is the amount of debt forgiveness, and for a non-participant the cost is zero. Both participants and non-participants derive environmental benefits from swaps. The level of such benefits is perceived as low by creditors. Financial benefits are by and large perceived by them as essential for the participation decision.

The benefits from participation include, most importantly, the value of contracts obtained through the EcoFund. Thanks to the co-financing requirement each dollar spent by the EcoFund generates three to four dollars from other sources. Hence creditors can count on this 'leverage' mechanism providing more revenues than the funds swapped. As long as the EcoFund is a small facility the demand for its support is much larger than the supply and project applications are usually accepted only when they demonstrate significant co-financing from other sources. The creditors may be afraid of weakening the leverage effect if the supply of the EcoFund resources is increased. This would lead to lower financial benefits from participation.

The non-participants face the barrier of the club approach. Only those who contribute to the EcoFund are eligible for contracts supported by the debt-for-environment swap. There is, however, an efficiency-motivated provision which softens this barrier. Up to 10 percent of the EcoFund's spending on projects can go to non-participating contractors who supply some complementary equipment or services at a price lower than firms from the participating countries. This provision lets non-participants enjoy benefits from the debt-for-environment swaps in a free-riding manner. Moreover, the larger the EcoFund's budget, the higher benefits of the (fewer) remaining free-riders. Hence the benefits from non-participation increase with the number of participants.

The argument just outlined warrants the following payoff functions for participants and non-participants, R_p and R_n, respectively:

$$R_p(s) = g - hs,$$
$$R_n(s) = j + ks,$$

where s is the number of countries participating in the swap, and $g, h, j, k > 0$ are constants. The notation implies that countries are identical with respect to their parameters of the functions R_p and R_n. We make this assumption just to obtain a preliminary insight into the mechanism of joining the swap.

A creditor country has an incentive to join the swap if the benefits from its participation outweigh the benefits from non-participation, that is, $R_p(s) > R_n(s-1)$. Solving this inequality for s, we obtain $s < (g - j - k)/(k + h)$. Let us define $s^* = [(g - j - k)/(k + h)]$, where $[x]$ denotes the *entier*, the largest integer not greater than x. Then s^* is the largest number of countries that the EcoFund can sustain.

If $g \geq j + k$ then $s^* \geq 0$. Otherwise not a single country would have joined the swap. Apparently $s^* \geq 5$, since five countries have joined the EcoFund as long-term members of the 'Club'. If $s^* \geq 17$ then the entire Paris Club would have benefitted from joining the swap.

A more realistic analysis requires that creditors are perceived as non-identical. One way to depart from the assumption made earlier is to define s as the amount of money contributed to the EcoFund rather than the number of countries. The equilibrium condition for s^* would need to be reinterpreted as a condition for increasing a creditor's contribution to the EcoFund. This approach could shed some light on creditors' decisions to contribute less than the 10 percent of the debt. (Three countries out of the participating five indeed chose such an option.) Further improvements of the model require lifting the assumption that g, h, j, and k are the same for all countries. As in stage one, we can observe that, *ceteris paribus*, being a downwind or downstream country results in higher benefits from participation while having a strong established position in the debtor country's market results in higher benefits from non-participation. However, the lack of quantitative estimates of benefits would make such an exercise little revealing.

2.6. The Development of the Polish Swap Programme in 1991-1998

After the Oslo conference the Polish Interim Committee worked out the institutional shape of the EcoFund, drafted its charter [Republic 1992a], and — with the help of the consultants — wrote its detailed operations and procedures manuals [EcoFund 1992a, 1992b]. It was decided, among other things, that the EcoFund would be supervised by a Council with the collective (minority) representation of the participating creditor countries. On April 6, 1992, the Minister of Finance formally established the EcoFund as a foundation under the Polish law, and signed its charter. He also appointed the first six Polish members of the Council. The Minister of Environment appointed its Chairman. Chief Executive Officer and the rest of the Board of Management were hired soon after that. In the Fall of 1992, the institution was ready to administer whatever resources would become available as a

result of swap agreements. The Interim Committee was dissolved and its role was taken up by the EcoFund Council.

In 1991 and 1992 the government of Poland negotiated bilateral agreements with its creditors to practically implement the decision of the Paris Club (see Table 6.5). The American government confirmed as the first

Table 6.5 Poland's indebtedness to the Paris Club countries

Rank	Debt (as of April 1,1991)		Debt-for-environment swap	
	Million USD	%	Year	Million USD
3. Austria	3,719	11	-	-
13. Belgium	336	1	-	-
5. Brazil	3,403	10	-	-
6. Canada	2,899	9	-	-
15. Denmark	243	< 1	-	-
16. Finland	143	< 1	-	-
2. France	5,171	15	1992	51.7
1. Germany	6,000	18	-	-
7. Great Britain	2,762	8	-	-
8. Italy	1,647	5	1998	32.6
9. Japan	1,276	4	-	-
11. Netherlands	662	2	-	-
14. Norway	322	1	-	-
17. Spain	96	< 1	-	-
10. Sweden	613	2	1997	6.6
12. Switzerland	528	2	1993	52.8
4. United States	3,538	11	1991	367.0
Total	33,358	100	-	510.7

contributor that the EcoFund would receive 10 percent (367 million USD) of Poland's indebtedness to the United States (in fact, the bilateral agreement on debt rescheduling envisaged American contributions to the EcoFund slightly above the 10 percent amount). Also the French government agreed to swap its 10 percent, although it indicated that perhaps not the full amount of the swap would be channelled through the EcoFund. Agreements with other creditor countries were signed soon. However, apart from the Unites States and France, no other government took the advantage of the 10 percent option at that time. Some governments (for example, Austria and Switzerland) explicitly confirmed the swap as an option for the future. Others merely referred to the Paris Club agreement which leaves this open. In most cases,

domestic budgetary problems were identified by creditor countries as the reason for no commitments.

In 1993 the Swiss government signed an additional agreement to swap the full 10 percent (78 million CHF, that is, 52.8 million USD) of the debt. The French government decided finally to commit only 1 percent (280 million FRF, that is, 51.7 million USD) to the EcoFund saving the rest for equity swaps. The next commitments were finalized as late as in 1997 and 1998. In 1997 the Norwegian government donated 1 million NOK (130,000 USD) to the EcoFund, a gesture that was considered a 'test run' of how the organization performs. Simultaneously the Swedish government committed 50 million SEK (6.6 million USD) which corresponds to almost 2 percent of the Polish indebtedness to Sweden (the percentage of the Swedish commitment is related to the present indebtedness rather than the original one, as Poland repaid a part of the debt due before this swap took effect). In 1998 the Italian government agreed to swap 56 billion ITL (32.6 million USD), that is, 2 percent of the original debt.

Germany has been Poland's largest creditor. Consequently the German federal authorities — such as the government and the Bundestag — and environmental NGOs were an important target group of Polish lobbying efforts. At the same time they proved to be most reluctant to yield to such efforts. At the Oslo conference the German government representative clearly stated the preference for a purely bilateral assistance focused on the highly contaminated region of Silesia. Later on German officials rebutted the idea of a swap repeatedly on the grounds that in 1989 Germany forgave a substantial part of the so-called 'Jumbo Credit' (an export promotion financial arrangement guaranteed by its government in the 1970s) and established a special Polish-German Foundation to administer the rest of the amount. The Foundation finances a spectrum of activities ranging from fostering youth exchange, to preserving German cultural heritage in Poland, to environmental protection.

In response, the Polish government indicated that the Jumbo Credit rescheduling deal was struck on the very day the Berlin Wall fell and it was a part of a broader agreement to compensate Poland for the expected loss of contracts implied by the disappearance of GDR. Besides, some other creditors had also reduced the Polish official indebtedness prior to the Paris Club decision in 1991; the latter thus reflected a compromise between what all the creditors considered justified given their respective histories of the Polish debt agreements. Both the 50 percent and 10 percent clauses were understood by the Paris Club as independent of whatever was bilaterally negotiated earlier.

Before the Polish response was publicized by political channels and also informally among professional gremia, the Jumbo Credit argument was so popular that it influenced the overall German approach to the EcoFund. Even the German environmental NGOs were once convinced that the federal government had already made a debt-for-environment swap as envisaged in the Paris Club decision. This conviction was shared by the business community as well. The negative approach to the EcoFund proved fairly stable despite changing emphases. Later on German authorities stressed the severe budgetary consequences of any future swap and explained its financial impossibility.

Virtually all the other Paris Club countries revealed interest in the EcoFund. In the case of the Brazilian government it was just an indication of interest of another heavily indebted economy contemplating advantages of a debt-for-environment swap in solving its own predicament. Given the agendas of the official and business missions arriving in the Polish Ministry of Environment in 1991-1992, the rest of the group seriously considered some sorts of a swap.

Internal political developments in Poland did not help nurturing foreign interests in the EcoFund at that time. The government that negotiated the Paris Club decision collapsed in December 1991. The next government survived until mid-1992 only. The term of its successor was a bit longer, but 1993 witnessed another cabinet change. Between 1991 and 1993 the Ministry of Environment was led by four different ministers and one temporary administrator (that substituted a Minister who quit before the end of his term). This certainly must have created uncertainty regarding the seriousness of the Polish commitment to run the EcoFund according to the principles outlined in 1991. Perhaps some countries might have doubted if the Polish government was to maintain its declared preference to seek debt-for-*environment* swaps only. At least one European government was close to committing to the EcoFund in 1992, but it was discouraged by the political uncertainty.

All major Polish environmental NGOs declared their support for the EcoFund. They assisted the government by lobbying their fellow groups in the Paris Club countries. As a result, many international networks, such as the Worldwide Fund for Nature (WWF) and Friends of the Earth, gave their blessing and promised to encourage their national member organizations to push for the Polish swap. Indeed in several countries there were seminars, press releases and cabinet briefings arranged by local NGOs. For instance, the Swedish-Polish Environmental Organization (SPM) organized and financed two meetings with officials and Riksdag members devoted to presenting the idea of the EcoFund. Even in Germany, where the initial

response by NGOs was reluctant, environmentalists exerted some pressure by publicizing the EcoFund activities [Ribbe 1994].

Some NGOs tried to reach local business communities to discuss the club approach. In most cases business leaders did not see any merit in departing from the tied procurement philosophy applied in the conventional bilateral assistance schemes they were used to. Businessmen sensed that a debt-for-environment swap with Poland would divert resources allocated to bilateral assistance. It was clear from their reactions that they preferred their governments not to join the EcoFund. The only motivation for revealing any interest in the swap was linked to the possibility of losing potential contracts to firms whose governments did join the EcoFund. Any favorable business press coverage the EcoFund seemed to have enjoyed [for example, Rohwedder 1993, Bajsarowicz & Żylicz 1993] was not a factor to change this general attitude.

Several countries — for example, Sweden — indicated that if a swap was made, the money would be diverted from the existing bilateral assistance programmes. While this was precisely what the Polish government advocated for, the trade-off was considered unacceptable for some stakeholders in the creditor countries. Multilateralism was thus for some countries an important obstacle to participating in the EcoFund. This factor could be relevant especially for countries with extensive bilateral assistance programmes. One can speculate that vested interests linked to the tied procurement prevented Denmark, for example (the largest bilateral donor) from switching to the club approach.

Another interesting feature of the debt-for-environment swap diplomacy was issue linkage. Bilateral consultations took place at various fora, so that very different issues were discussed at the same time — perhaps informally. There was, however, at least one instance of a serious linkage; a creditor wished to connect the contribution to the EcoFund with a deal favoring its truck manufacturer. The Polish government did not accept the offer.

The model introduced in Section 2.5 above is consistent with the Polish experience. The EcoFund history confirms that environmental benefits provided through the swaps are of secondary importance for the creditors. The absence of Germany and Denmark — Poland's close neighbors, who share the same water resources — is remarkable, but there might have been very peculiar reasons for those countries not to contribute. A much more telling evidence is the total *désintérressement* of participants with respect to the rules of allocating money between the four areas of the EcoFund activity. It was envisaged in the original design that the creditors would state their environmental preferences by targeting their contributions at specific areas and determining in this way the money available for each of these. It turned

out, however, that none of the creditors has ever taken advantage of this provision thus demonstrating indifference towards specific environmental benefits.

The model also suggests that there may be a maximum number of participants (lower than seventeen) that the EcoFund can sustain due to free riding by non-participants. The provision that allows non-participants to bid for contracts up to 10 percent of the EcoFund spending was conceived as an efficiency-enhancing instrument. Nevertheless it weakens incentives to join the swap. As in the case of self-enforcing agreements, the larger the benefits available to free riders, the lower the number of participants. One practical recommendation that can be derived from this argument is to confine the procurement strictly to the 'Club' by eliminating even the 10 percent margin kept for efficiency reasons. The growing diversity within the 'Club' makes this margin less important.

2.7. Conclusions

The global experience with debt-for-environment swaps is severely limited, as almost 99 percent of debt conversion transactions took the form of debt-for-equity swaps. Creditors prefer the latter, since they are more similar to bankruptcy procedures which solve indebtedness problems at the national level in most jurisdictions. Nevertheless, it was argued that the former are potentially very useful as a means to address global environmental problems in countries whose economic performance and environmental awareness are unlikely to guarantee due appreciation of these problems.

Debt-for-environment swaps are uniquely suited to introduce global environmental priorities into consideration in low and middle income countries. They can help to articulate both international and national environmental concerns, and — by promoting the issue at national government fora — to seek available funds to address both. By establishing professionally managed facilities to administer swapped funds, they can also assist in local capacity building which is a prerequisite for carrying out environmental protection on a sustainable basis.

In the Polish debt-for-environment swap initiative of 1991, several issues were addressed in a way that made the EcoFund a model for a facility supporting projects of global importance:

- emphasis on creating a domestic professional institution, as opposed to ad hoc commissions, hired consultants who come and go, and so on;
- multilateralism as opposed to a series of difficult-to-coordinate bilateral deals;

- serving creditors' financial interests by *ex post* ensuring fair geographical distribution of contracts rather than inflating costs by *ex ante* tied procurement.

Praised by environmental NGOs and international financial institutions, the swap has nevertheless enjoyed a very limited support from the Paris Club governments. The game theoretic model discussed in this chapter explains why certain creditors may find it profitable not to join, especially when others do and thus let the EcoFund operate. Multilateralism, one of the key features making the swap a cost-effective mechanism, is responsible for the lack of support by many creditors at the same time.

Any sincere appraisal of a debt-for-environment swap must take into account its environmental benefits. The political reality is that decisions on whether to enter such a swap agreement are taken by finance ministers rather than bodies representing a fully balanced array of its effects. As a result, financial benefits tend to be the major factor guiding creditor countries' policies in this respect. Benefits of that kind do exist, but their distribution is not restricted to participants which provides non-participants with wrong incentives.

Looking from the debtor's side, one sees a mixture of environmental and budgetary consequences of a swap. Both are important and both were taken into account by the 1991 government — the greenest of Poland's governments after 1989. One can speculate what would have happened if a swap opportunity was debated by one of the other seven Polish governments that ruled in the 1990s. While a swap would have been accepted, it is almost certain that this would have been a kind of the conventional debt-for-equity arrangement advocated by the strongest interest group at a time (privatization? highways? agriculture?).

The prospects for replicating the Polish EcoFund pattern are shadowy. The (limited) success of this debt-for-environment swap required strong commitment by the debtor and a fair degree of trust on behalf of participating creditors. Neither of the factors is easily replicable. The Swiss government established a similar debt-for-environment swap facility in Bulgaria, but no other creditors were willing to participate. Both the lack of strong pressure from the Bulgarian government and the free-riding of other creditors could be factors that prevented this initiative from developing into a larger scale arrangement. This illustrates how difficult it is to establish a cost-effective multilateral mechanism to provide an international public good.