UNITED NATIONS **E**

Economic and Social Council

Distr.
GENERAL

E/CN.17/1995/8
24 March 1995

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Third session
11-28 April 1995
Item 4 of the provisional agenda*

FINANCIAL RESOURCES AND MECHANISMS

Financial resources and mechanisms for sustainable development: overview of current issues and developments

Report of the Secretary-General

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INTRODUCTION

1. The present report describes progress made in the implementation of the aims set out in chapter 33 of Agenda 21 (Financial resources and mechanisms) 1/ since the United Nations Conference on Environment and Development (UNCED) in June 1992, and provides a set of recommendations for action. The report was prepared by the Department for Policy Coordination and Sustainable Development of the United Nations Secretariat as task manager for chapter 33 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development at its fourth session. It is the result of consultations and information exchange between designated focal points in 19 United Nations agencies, government officials and a number of other institutions and individuals.

2. The report benefited greatly from meetings sponsored by Governments and from inputs provided by the Food and Agriculture Organization of the United Nations (FAO), the International Monetary Fund (IMF), the Organisation for Economic Cooperation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), the Department for Economic and Social Information and Policy Analysis of the United Nations Secretariat, the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO) and the World Bank.

3. In the follow-up to UNCED the Commission on Sustainable Development approached the issue of financing Agenda 21 at its first and second sessions by focusing both on the monitoring of commitments made at the Conference and on the development of policy options to overcome remaining funding problems.

4. In monitoring the commitments made at the Conference, the Commission has paid particular attention to the goal of raising the level of official development assistance (ODA) to 0.7 per cent of the gross national product (GNP) of the developed countries.

5. Furthermore, the Commission has intensified its discussions on mobilizing external resources in addition to ODA and has addressed various policy options with regard to access to international finance. Particular attention has been given to private flows and the issue of external debt relief.

6. In addition, the Commission has explored innovative financial mechanisms and stressed the need to make progress in this area with regard to tradeable permits, a tax on air travel and other mechanisms.

7. Moreover, the Commission has addressed national policies for the mobilization of resources and stressed the need to intensify the discussion with regard to the use of economic instruments and a stronger involvement of the private sector in the financing of sustainable development.

8. Finally, the Commission has successfully integrated the discussion on the financing of sectoral and cross-sectoral issues of Agenda 21 into the general discussion of financial instruments and policy options.

9. In response to the Commission's recommendations on financial resources and mechanisms made at its second session 2/ and to General Assembly resolution 49/111, in which the Assembly took note of the report of the Commission and endorsed the recommendations contained therein, the present report will address various issues related to the financing of Agenda 21 in order to make a contribution to the discussion of the Commission's Inter-sessional Ad Hoc Open-ended Working Group on Finance (6-9 March 1995).

10. Various Governments provided generous financial and logistical support for convening expert meetings on the financing of Agenda 21 as a contribution to the preparation of the meeting of the Working Group.

11. The Government of the Czech Republic organized a workshop on Economic Instruments for Sustainable Development at Pruhonice, near Prague from 12 to 14 January 1995; the Governments of Japan and Malaysia organized the First Expert Group Meeting on Financial Issues of Agenda 21 at Kuala Lumpur from 2 to 4 February 1994; and the Governments of Japan and Malaysia, in collaboration with the Department for Policy Coordination and Sustainable Development of the United Nations Secretariat and UNDP, organized the Second Expert Group Meeting on Financial Issues of Agenda 21 at Glen Cove, New York from 15 to 17 February 1995.

12. The meetings at Pruhonice and Glen Cove succeeded in clarifying numerous complex issues and policies related to the financing of sustainable development and provided various substantive inputs in the form of papers prepared by agencies and individual experts.

I. INTERNATIONAL POLICY ENVIRONMENT AND FINANCIAL FLOWS

A. Changes in the external environment

13. With industrialized countries either fully recovered or recovering from the recession that stalled activity in the industrialized world since the early 1990s, and many developing countries in Asia and Latin America continuing to perform well, global output is expected to increase by 3 per cent in 1994 and 3.5 per cent in 1995, twice the rate during the period 1990-1993. Increased activity in industrialized countries, rapid growth in developing countries, stronger import demand from economies in transition, and the successful completion of the Uruguay Round of multilateral trade negotiations are expected to give world trade a strong boost. World trade is projected to have increased by over 7 per cent in 1994 and 6 per cent in 1995, well above the 5 per cent average growth rate of the past 20 years.

14. Economic growth is, however, uneven and has continued to decline in Belarus, Russia, Ukraine and the Transcaucasian and central Asian countries in transition. Although the outlook is beginning to improve in some African countries as a result of stronger commodity prices and enhanced economic reform efforts, economic conditions remain difficult in most of the continent.

15. The significant movements observed recently in long-term interest rates are of relevance to economic policy, although they need to be interpreted with

caution, in view of the possible role of temporary factors. To some extent, the rise in long-term interest rates since the end of 1993 appears to reflect an increase in real interest rates that has been felt worldwide as a result of the general strengthening of growth and the firming of expectations that the recovery in industrialized countries is broadening and becoming self-sustaining. Such a rise in world real interest rates is normal during an economic upswing. However, high real long-term rates are indicative of a renewed intensification of competition for financial resources, both among private investors and between private and government borrowers. This underscores the need for Governments to reduce their absorption of private saving progressively in order to lower the path of real interest rates, allow room for private investments that are essential for longer-term growth and permit an adequate flow of financial resources to the developing countries and economies in transition.

16. Increases in international interest rates may have consequences for debt-servicing costs in heavily indebted developing countries, depending on how rapidly or slowly changes in long-term rates are passed through to debt-service payments. In addition, just as the period of low interest rates in industrialized countries was associated with large portfolio shifts that pushed emerging equity market prices up sharply, so this period of rising long-term bond yields has been associated with a moderation of capital flows to developing countries and a downward correction in many of the emerging stock markets.

17. Recent trends in trade policy have focused on several key areas. First, regional integration intensified, with a view to achieving various economic and political objectives. Second, unilateral trade liberalization was limited among industrialized countries, but was a fundamental aspect of reform efforts of developing countries and economies in transition. Third, protectionist pressures and trade frictions persisted. Finally, the linkages between trade policy and domestic policy, such as competition policy and environmental and labour standards, received increasing attention in national and international forums.

18. The conclusion of the Uruguay Round was a major achievement in international trade relations as a crucial element in promoting world trade and growth. The Round produced positive outcomes in several areas, including market liberalization, strengthening of rules and institutional structures, and integration into the trading system of new and dynamic areas, such as services and intellectual property, and traditional areas, such as agriculture and textiles and clothing, previously exempted from rules under the General Agreement on Tariffs and Trade (GATT). Global annual real income gains are estimated at $510 billion by 2005, of which some $116 billion would accrue to developing countries and transition economies.

19. Future multilateral trade policy will focus on many issues. These include continuation of negotiations in key service sectors, notably financial services, telecommunications and transportation. Furthermore, market liberalization in specific areas, such as agriculture, steel and civil aircraft, will be required because distortions will remain high despite the achievements of the Uruguay Round. Other issues that are coming to the fore include the interaction of trade and environment and/or labour policies; and the trade effects of domestic policies, such as competition policy and investment policy.

20. Stronger growth in industrialized countries will help to relieve some of the downward pressures in commodity markets, but it appears unlikely that it will be sufficient to reverse the decline of the past decade. Analysis of the major factors behind the observed behaviour of commodity prices reveals that conventional factors, such as the prevailing macroeconomic conditions in industrialized countries, are estimated to have contributed in only a limited way to the recent weakness in real commodity prices and that the expansion in the supply of commodities played a fundamental role. In addition, while output changes in Eastern Europe and the States of the former Soviet Union traditionally played a relatively minor role in price developments, they acquired an increasingly important role in the post-1988 period.

21. It is also useful to measure the combined changes of economic growth, interest rates and terms of trade. For that purpose IMF has constructed a composite "external conditions index" based on a weighted average of world interest rates, industrialized country growth and the terms of trade. A rise in the index indicates that changes in the external environment have contributed positively to growth.

22. The weights for the index are based on the long-run elasticities of output growth in the developing countries to each of the three factors, using the IMF developing country model.

23. The developing country model suggests that changes in the terms of trade have the greatest impact on developing country output growth, with long-run elasticities of about 0.5 for both low- and high-growth countries. The sensitivity of developing country growth to industrialized country growth is 0.4 for high-growth countries, four times as large as that for low-growth countries. The impact of the world interest rate is small for all groups, although it is large for some individual countries.

24. Using the elasticities underlying the external conditions index, the total effect of changes in the terms of trade, industrialized country growth and world interest rates on developing country growth can be estimated. The analysis suggests that the external environment reduced the average growth rate of low-growth countries by 3/4 of 1 percentage point during 1984-1993, while the average growth rate of high-growth countries was boosted by about 1 percentage point.

B. Trends in resource flows and debt

1. Overview

25. The 1994 report of the Chairman of the Development Assistance Committee (DAC) of OECD 3/ provides an update of recent trends in resource flows and debt. The main findings of the report are summarized below.

26. In 1993, total resource flows to the developing countries increased by over $14 billion to a record of $167 billion. Measured in terms of 1992 constant prices and exchange rates, this represents an increase of 12 per cent. As was also the case in 1992, the major force underlying this expansion was the strong

performance of private flows, which increasingly account for the largest share of resource flows, up from 53 per cent of total net flows in 1992 to 56 per cent in 1993.

27. Particularly noteworthy is the recent variation in the contribution of different types of private flows within the overall trend. In 1992, the striking growth in private flows was largely attributable to the strong surge in international bank lending to $31 billion, 38 per cent of total net private flows. In 1993, bank lending dropped back sharply to $9 billion, only 10 per cent of net private flows that year. In sharp contrast, bond lending tripled to over $36 billion to account for 39 per cent of private flows in 1993. In addition, foreign direct investment, which had been falling from its 1989/90 peak, expanded by $10 billion to a level comparable with that of bond lending.

28. The other main components of resource flows to the developing countries have also been in a state of flux. Net disbursements of official development finance (ODF) have been falling in real terms since 1991, standing at $68 billion in 1993. Gross flows of export credits represent an important source of export finance (1993 gross export credits are estimated at around $30 billion), but as a result of high levels of repayment for past lending, net resource flows are much smaller, representing only 3 per cent of total net resource flows. Net flows of export credits did, however, show unusual growth in 1993, increasing to $5 billion.

29. The debt situation of the developing countries as a group continues to improve. In 1993, the total stock of external debt (measured at current prices and exchange rates) rose by 5 per cent - much less than gross domestic product (GDP) - to $1,630 billion, with much of this attributable to growth of debt stocks in Asia as well as to valuation effects. While the growth of debt stocks has been slowing down since the beginning of the 1990s, actual (as distinct from scheduled) debt-service payments have remained relatively stable at around $155 billion a year and have declined relative to total foreign exchange receipts.

2. Official development finance

(a) Recent developments

30. At $68.5 billion in 1993, ODF had dropped by $2 billion from its 1992 level, a decline of nearly 1 per cent in constant terms. This fall had been expected following cut-backs in the aid budgets of several donors as a result of tight budget conditions, even although in many instances aid budgets fared better than other sectors under general cuts. The 1993 ODF statistics also reflect a number of special factors, including a reduction in capital subscriptions to multilateral development banks due to the timing of replenishment cycles and an easing in some parts of the world for emergency relief.

31. The decline in ODF in 1993 was mainly attributable to a fall in bilateral disbursements, particularly the more concessional (i.e., ODA) flows. The two largest donors, Japan and the United States of America, both registered sharp

reductions in net bilateral ODA. Part of the fall in ODA was, however, due to a change in the manner in which non-ODA debt forgiveness is recorded. In consequence, nearly $1 billion of military debt forgiveness by the United States was recorded as other official flows (OOF) rather than ODA, as had been the case in 1992.

32. In contrast, multilateral disbursements increased to $24 billion, up by $3 billion on 1992, although most of this was accounted for by the expansion of multilateral OOF.

33. ODF now represents only 41 per cent of total resource flows to the developing countries, although this reduced share is predominantly due to the welcome expansion of private flows.

34. ODF also remains the backbone of external resource flows to the vast majority of developing countries, especially the low-income and middle-income groups of African countries and least developed countries elsewhere. However, the recent shortfall in ODF is of increasing concern because it has had a disproportionate impact on the more concessional flows to the low-income countries and to areas such as sub-Saharan Africa.

(b) Official development assistance

35. Official development assistance from DAC members slumped from $60.8 billion in 1992 to $56.0 billion in 1993. The size of the fall was unexpected. A reduction by 8 per cent in current dollars, equivalent to a 6 per cent decline in real terms reduced DAC members' ODA as a share of their GNP from 0.33 per cent in 1992 to 0.30 per cent, the lowest level recorded for two decades. Current information on DAC members' plans and programmes, together with data on new commitments, suggests that this was a bout of weakness, rather than an incipient collapse. Recovery in 1994/95 will be possible for some DAC countries with the easing of budgetary pressures as they emerge from recession.

36. In 1993, the ODA performance of DAC countries in terms of reaching the United Nations target of 0.7 per cent of GNP for ODA was as follows: four countries reached the target (Denmark, Netherlands, Norway, Sweden); six other countries exceeded 0.35 per cent (Australia, Belgium, Canada, Finland, France and Germany). Eleven countries were below 0.35 per cent (Austria, Ireland, Italy, Japan, Luxembourg, New Zealand, Portugal, Spain, Switzerland, United Kingdom of Great Britain and Northern Ireland, United States of America).

37. Grants on average account for over four fifths of net disbursements of the ODA extended bilaterally by DAC members, a proportion which has been rising slowly but steadily in recent years as more donors have successively moved to a grant-only programme. The trend was reinforced in 1993; in aggregate, the decrease in bilateral ODA was entirely due to the decline in loans (-$2.5 billion or a fall of 30 per cent) whereas bilateral grants rose by less than 1 per cent. This had an impact on the geographical distribution of ODA.

38. DAC members' grant aid to the least developed countries declined by less than 1 per cent. Net loans to these countries fell by a striking 83 per cent, but this component ($0.1 billion in 1993) accounted for a mere 1.3 per cent of

DAC members' ODA to the group. The shift from loans to grants is revealed more clearly by the fact that gross ODA lending fell from $1,225 million to $976 million, a fall of 20.3 per cent.

39. Further interpretation involves allowance for the impact of debt forgiveness on the figures. It is estimated that some $780 million of ODA and non-ODA claims were cancelled in 1993, compared with $500 million in 1992. The implication is that the transfer of new ODA resources in the form of bilateral grants was of the order of $7.9 billion in 1992 and $7.6 billion in 1993. The remainder, recorded as debt forgiveness, represented an easing of the debt burden of the least developed countries through cancellations of debt obligations. To this should be added the disappearance of the corresponding liability to make interest payments in the near future, which is not reflected in the data.

40. Proportionately, donors' contributions to multilateral institutions fell more sharply (13 per cent in real terms) than their bilateral programmes (down 6 per cent). Despite the cyclical fall in contributions to multilateral institutions, developing countries' receipts from this source were cushioned to some extent by the fact that the multilateral institutions, especially the international financial institutions, can draw on income from previous years to make their current disbursements. These fell by 6 per cent, from $17.5 billion in 1992 to $16.5 billion in 1993. Replenishments in 1994 should refurbish multilateral commitment potential if the familiar cyclical pattern holds up, but if adequate funds are not forthcoming from donors, the level of the activities of the multilateral agencies could be impaired in later years.

41. Similar developments are seen in the statistics for sub-Saharan Africa. Almost all of the countries in sub-Saharan Africa are low-income countries and 33 of them are classified as least developed. To this extent, the same factors operated as those just described: a limited fall in grant volume (-2.4 per cent) and a sharp fall in net loans (-37.3 per cent). In dollar terms, net loans fell by $647 million, gross loans by $362 million (-14.7 per cent). Here again, the impact of debt forgiveness is evident; the greater fall in net lending reflects the effect of the removal of $730 million of debt from the loan record.

42. Proportionately, the brunt of DAC members' reduction in their total bilateral ODA flows was borne by the low-income countries other than least developed countries: this group experienced a fall of 19.7 per cent in their receipts of ODA, with a 24.8 per cent drop in grants and a 10.8 per cent decline in net loan receipts.

43. As regards net ODA loans, the fall in flows to the group of low-income countries other than least developed countries was a relatively modest 10.8 per cent, from $4.3 billion in 1992 to $3.8 billion in 1993. This does not reflect a reduction in loan activity, since gross lending rose by a significant 22.8 per cent to $8 billion.

44. For middle-income and high-income categories, the data show DAC members increasing their grants by 5.6 per cent in 1993 but reducing their net ODA lending by 45 per cent. Some of these countries received significant amounts of

debt forgiveness in 1993. Gross ODA lending to these countries fell by 7.7 per cent to $6.1 billion.

3. Debt and debt service

45. Financial market debt continues to be the largest single component of the debt stock of the developing countries as a group, but its importance has been falling steadily, although debt related to bond lending has begun to assume significance. The other rapidly expanding elements have been short-term debt and debt resulting from export credits.

46. Debt owed to bilateral creditors is much higher than multilateral debt and has also grown much faster in recent years. For both groups of debt, the greatest expansion has been in the concessional component. However, multilateral non-concessional debt still accounts for 65 per cent of multilateral debt stocks for the developing countries as a whole (and over 40 per cent for the multilateral debt stock of the low-income countries).

47. The proportion of debt contracted on concessional terms has been growing steadily, now standing at over 25 per cent of the stock of total long-term debt for the developing countries as a whole. While the trend towards increasing concessionality is found throughout all of the main developing country regions and income groups, it is especially pronounced in the least developed countries, where it is approaching 60 per cent. This is particularly welcome in the light of the need in these countries for highly concessional resources.

48. The balance of debt-service payments has swung in favour of amortization payments. Interest payments now account for 40 per cent of service payments, as opposed to over 50 per cent in the mid-1980s, largely reflecting the decline in short-term interest payments, which now stand at less than half their level at the end of the 1980s.

49. Payments on export credit debt are not only the largest but also the fastest growing component of debt service, up 40 per cent on their 1990 level. The other main categories of debt responsible for important levels of debt-service payments are financial market debt and multilateral debt (respectively, 29 per cent and 22 per cent of total service payments in 1993).

50. By themselves, statistics on levels and trends in debt and debt service say little about the severity of the debt burden and its sustainability. The essential debt problem is that of solvency; taking the ratio of debt stocks to exports of goods and services as a very rough measure of this shows considerable improvement for the developing countries as a whole, with the ratio now below 200 per cent, the threshold above which the solvency problem can be regarded as critical for countries whose debt is essentially on non-concessional terms. Nevertheless, the ratio increased between 1990 and 1993 before falling back in 1994 and is near the 200 mark.

51. A number of countries also continue to face liquidity or cash-flow problems, but this aspect of the debt problem (as measured by the ratio of debt service to exports) has generally improved throughout the developing countries,

especially in the poorest countries, including the least developed countries. This improvement is due not only to significant debt reorganization, major bilateral initiatives to cancel ODA debt and the growing importance of concessional debt in overall debt stocks, but also to the accumulation of arrears.

52. Additional information on the developing country debt situation and net transfers of resources between developing and developed countries is contained in the reports of the Secretary-General to the General Assembly at its forty-ninth session (A/49/309 and Corr.1 and A/49/338).

4. Outlook

53. The fact that total net resource flows to the developing countries in 1993 maintained the record levels achieved in 1992 is most welcome and reflects a growing recognition and endorsement of the reform and stabilization efforts of a number of countries. Indeed, policy performance is rapidly becoming the single most important determinant of country access to financing from all sources. Closer links between the provision of financial assistance and the economic and financial performance of recipient countries are increasingly being forged for bilateral ODA flows and multilateral lending in support of adjustment programmes. Some middle-income countries that have made progress in resolving their debt problems, often in the context of comprehensive macroeconomic adjustment and structural reform programmes, have regained access to spontaneous private financing. Low-income rescheduling countries that sustained their adjustment efforts and maintained broadly satisfactory relations with creditors typically made significant debt repayments. These countries found that the payments were more than offset by inflows of new direct financial assistance. In contrast, low-income countries with mixed records of performance, including the accumulation of external arrears for prolonged periods, saw their access to new financing reduced.

54. Virtually all the expansion in resource flows to the developing countries since the beginning of the 1990s is attributable to the growth of private flows. To a considerable extent, these flows have gone to countries which have undertaken reforms that enable them to regain access to international capital markets. Nevertheless, this development is accompanied by a number of concerns, including the sustainability of flows of this nature and magnitude as well as their concentration in a relatively limited number of countries.

55. Questions remain about the continued ability of countries to attract private flows of the current magnitudes. In part this is because of the role of external forces (e.g., economic growth and interest rates in the OECD area) in "diverting" funds from OECD economies to the emerging markets and also because other influences are of a transient or finite nature (e.g., resulting from privatizations and returning flight capital). In addition, the growing importance of short-term finance is seen by some observers as inherently volatile.

56. The recent decline in total ODF has not been associated with any major redirection of aid flows towards the poorer developing countries. The low-

income and the least developed countries are therefore increasingly dependent on aid budgets that are under pressure and are unlikely to see any significant expansion in real terms in the near future. These countries must therefore do much more to increase their attractiveness to private flows, since only private flows are expanding and have demonstrated that they can react positively and rapidly to improved prospects.

57. Recent trends in ODF flows, particularly the fact that they are adversely affecting the low-income countries and that the decline is largely concentrated on ODA flows, are of particular concern in the light of the need to maintain the flow of highly concessional resources and to ensure net positive resource transfers to the poorest and most heavily indebted countries. This is fundamental to the success of the overall debt strategy. The continued flow of new and highly concessional finance, preferably in the form of grants, is necessary to avoid future debt-servicing problems and in the meantime to permit debtors to avoid cash-flow problems and meet their remaining scheduled debt-service obligations. At the same time, bilateral donors will also be expected to increase the amount of debt forgiveness.

58. Overall, the debt situation of the developing countries continues to improve, but progress in placing the servicing of debt on a financially sustainable basis and regaining access to capital markets has largely been confined to the middle-income countries. Despite debt rescheduling and other relief from the application of the enhanced Toronto terms, debt buy-back schemes, bilateral debt forgiveness and new concessional money, a large number of the poorest and most indebted countries are still unable to meet scheduled debt-service payments. Arrears have accumulated and they have been locked into a process of repeated rescheduling. Even the full application of the enhanced Toronto terms by the Paris Club still leaves many countries with unsustainable debt burdens.

59. The need for deeper and more definitive action to remove the debt overhang and to permit a once-and-for-all exit from the rescheduling process has been increasingly recognized, culminating in the recent initiative on debt relief taken by the group of seven major industrialized countries at their Summit Meeting at Naples, Italy in July 1994.

C. The Bretton Woods institutions and the financing of sustainable development

60. Considering the important role that international financial institutions play in international finance and development, it is legitimate to ask what role they play in the financing of sustainable development.

1. Role of the International Monetary Fund

61. The primary mandate of IMF is to safeguard the stability of the international financial system and to support the worldwide application of sound and stable macroeconomic policies aimed at promoting high-quality growth. IMF does this in two ways. First, its staff and management periodically review the

macroeconomic policies and conditions of member countries and encourage them to adopt appropriate monetary and fiscal policies as well as realistic exchange and interest rates. Second, IMF provides financial resources in support of orderly stabilization and structural adjustment efforts to member countries. IMF does not lend for specific developmental projects nor does it advise on sectoral or microeconomic policies.

62. The successful implementation of a strategy for sustainable development greatly depends upon the existence of monetary stability and the availability of adequate financial resources. IMF helps achieve these fundamental conditions for sustainable development in its member countries by providing advice on macroeconomic management and financial support for adjustment efforts. Such programmes are also a condition for securing debt relief and are often catalytic in encouraging substantial private capital flows.

63. IMF helps support sustainable development in two other ways as well. First, together with the World Bank, it assists member countries in adopting desirable structural policies, including subsidy and price reform, trade liberalization and tax reform, which help mobilize budgetary and domestic resources necessary for sustainable development. Second, IMF helps countries in the design and implementation of social safety nets aimed at protecting the poorest in society from the effects of adjustment. Failing these, the poor would most likely be tempted to deplete natural resources and/or damage the environment, thus undermining the country's efforts to achieve sustainable development.

2. Role of the World Bank

64. World Bank support for borrower environmental stewardship centres on (a) assisting countries to set priorities, strengthen institutions and implement programmes for environmentally sustainable development; (b) minimizing potential adverse environmental and social impacts of development projects; (c) building on the positive linkages between poverty reduction, economic efficiency and environmental protection; and (d) addressing global environmental challenges.

65. The Bank helps its borrowers to improve their environmental management by providing funding for environmental investments, supporting national and regional environmental planning and enhancing the knowledge base about environmentally sustainable development.

66. Twenty-five new, primarily environmental, projects were approved in fiscal year 1994, involving total Bank and International Development Association (IDA) commitments of more than US$ 2.4 billion. This brings cumulative Bank lending over the past decade to roughly US$ 9 billion in some 120 primarily environmental projects. At least an equal number of projects have had significant environmental components, including about 30 such operations over the past 12 months.

67. The Bank has provided technical assistance to borrowers for the preparation of national environmental action programmes or equivalent documents since 1987.

By the end of fiscal year 1994, most active IDA countries and a number of Bank borrowers had completed such plans.

68. At the regional level, the Bank supports strategy papers such as those completed in 1994 for Central and Eastern Europe and Asia, and has entered into implementation focusing on the urban environment.

69. As part of its non-financial assistance to borrowing member countries, the Bank is expanding its analytical work on economic valuation of environmental resources and resource accounting and its work on environmental indicators and information systems. It likewise continues to help borrowers to improve their legal and institutional frameworks for environmental management. Much of this work is geared towards encouraging borrowers to rely increasingly on economic incentives and disincentives (such as pollution charges) and other market-based instruments (such as "eco-labels"), in addition to updating or improving more traditional "command and control" measures.

70. All Bank projects are screened for their potential environmental impacts and a full environmental assessment and detailed mitigation plans are required for all investment projects proposed for Bank financing that are expected to have significant adverse environmental effects. Recently, the focus of Bank environmental assessment work has been expanding to include the enhancement of environmental or socio-economic benefits, together with the minimization of environmental or social costs.

71. A fundamental concept of environmentally sustainable development is that the environment and development are closely linked and must be addressed together. In consequence, the Bank's specific environmental interventions are only one part of all Bank activities that contribute to sound environmental management. Increasingly, the links between these activities and environmental protection are being made more explicit.

72. Bank attention to regional and global environmental concerns has also expanded. The Bank's work in protecting the regional commons focuses primarily on regional seas and river basin programmes. Implementation of existing environmental action programmes for the Mediterranean Sea, the Black Sea, the Baltic Sea and the Danube River Basin accelerated over the past 12 months. The Bank also launched new regional initiatives for the Aral Sea in Central Asia and Lake Victoria in East Africa.

73. In addition to these programmes, the Bank has dedicated increasing effort to issues of soil degradation and desertification at the regional level, as illustrated by its active role in the drafting of the International Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.

74. A variety of channels are used for the work of the Bank on global environmental issues, but the largest is the Global Environment Facility (GEF). As one of its three implementing agencies (together with UNDP and UNEP), the Bank administered and chaired GEF during its pilot phase. The Bank has helped GEF to emerge as an important catalyst for the integration of global environmental concerns into national development goals. Through grants and

concessional funding, it enables developing country Governments to address global environmental issues that they would otherwise be unable or unwilling to address, in the process of demonstrating a new approach to global cooperation.

75. Awareness is growing in the private, as well as the public sector, regarding the high cost and potential liabilities of environmental cleanup. Businesses are increasingly considering environmental factors in decisions about production, investment and trade. By encouraging businesses to become more energy efficient, minimize resource use, waste and pollution, improve the workplace environment and identify new environmentally friendly products, the International Finance Corporation (IFC) is helping firms to pursue environmentally sound operations as they plan for expansion and new ventures. IFC has developed an extensive environmental programme that addresses not only the physical impact of economic development - the use of land, minerals, water and air - but also socio-economic and cultural aspects.

76. Established in 1988, the Multilateral Investment Guarantee Agency (MIGA) promotes foreign direct investment for economic and social development in borrowing member countries by guaranteeing investments against political risks, helping countries to create an attractive investment climate and providing promotional and advisory services. Under an agreement, IFC acts as Environmental Adviser for all MIGA projects and ensures that MIGA is aware of all relevant environmental guidelines that may apply to any specific operation.

II. NATIONAL POLICIES AND RESOURCE MOBILIZATION

A. Mobilizing public financing for sustainable development

1. Applying economic instruments

(a) Sustainable development policies and the use of economic instruments

77. The approach to economic policy in most developed and developing countries and countries with economies in transition has changed in recent years. More emphasis is being placed on the role of prices and market-based mechanisms in allocating scarce resources. For example, many countries have liberalized imports and capital flows, privatized public enterprises and shifted government functions (including taxation) to the local level. Furthermore, policies on subsidies are under review.

78. This change of approach to economic policy has begun to affect sustainable development policies. This is manifested, for example, in the complementary use of regulations and economic instruments intended to internalize external environmental costs to economic agents.

79. In contrast to a command-and-control regulatory approach, which imposes specific mandatory actions on economic agents, economic instruments use market signals for influencing their behaviour and are often highly efficient in achieving environmental targets chosen by regulators. Economic instruments leave it to market participants to choose their own measures to reduce external environmental effects and correct prices for negative external effects of

economic activities. In providing the signals that make economic agents aware of resource scarcity and environmental damage, economic instruments can mitigate such damage and thereby promote sustainable development.

80. However, there are also economic instruments, such as subsidies, that impose serious distortions and environmental damage. These policy-induced distortions need to be eliminated in order to achieve environmental gains and free more resources for productive purposes.

81. There are five categories of economic instruments: (a) charges and taxes; (b) deposit-refund systems; (c) emission trading schemes; (d) financial enforcement systems; and (e) public expenditures. It is assumed that these instruments are well known, so that it will be sufficient to briefly recall their basic features.

82. While taxes or charges on emissions (Pigouvian taxes) are paid on discharges into the environment and are based in principle on quantity and/or quality of discharged pollutants, product charges or taxes (indirect environmental taxes) are charges or taxes on products that pollute in the manufacturing or consumption phase or for which a disposal system has been organized.

83. Environment-related provisions in other taxes are the most commonly used instrument and have been introduced in personal income taxes, corporate income taxes, general sales taxes, fuel taxes and motor vehicle taxes.

84. In deposit-refund systems a surcharge is levied on the price of potentially polluting products. When pollution is avoided by returning these products or any residual to a collection system, the surcharge is refunded.

85. Under emission trading schemes an emission limit is set by public authorities for a certain area and individual emission rights are auctioned or distributed to the dischargers located in the area. If a discharger releases fewer emissions than his allowance, he can sell or trade the difference between actual discharges and allowable discharges to another firm, which then has the right to emit more than its initial allowance. Trades can take place within a plant or a firm or among different firms.

86. Financial enforcement incentives tend to complement legal requirements imposed on polluters by providing an economic rationale for compliance or non-compliance with regulations.

87. As to public expenditures as an economic instrument, there are three major categories of expenditures: subsidies, operations and maintenance expenditures and capital expenditures.

88. Subsidies may be environmentally unfriendly or environmentally friendly. Environmentally unfriendly subsidies are mainly found in the areas of agriculture, energy and forestry.

89. Agricultural output subsidies are damaging because they increase the derived demand for such agricultural inputs as pesticides, fertilizers and

irrigation (which are themselves associated with external environmental costs). They also provide incentives for land clearance, which can result in loss of wildlife, forests and public amenities and soil erosion. Agricultural input subsidies are common for products such as pesticides, fertilizers and irrigation water. Furthermore, most countries provide implicit or explicit subsidies for energy use, in particular for coal, gas and nuclear power.

90. Moreover, Governments provide a range of direct and indirect subsidies (or tax exemptions) for the forestry sector, which tend to have significant environmental costs.

91. Environmentally friendly subsidies benefit the environment. They include subsidies for reforestation projects, farming techniques or crops that raise soil fertility and such environmentally sound technologies as solar power plants, windmill farms, and building insulation.

92. Adequate operations and maintenance expenditures on public investment projects are required to preserve the flow of benefits of the project. Failure to provide adequate operations and maintenance expenditures not only reduces the efficiency of the initial capital investment, but may also result in adverse environmental consequences. For example, inadequate operations and maintenance expenditures on surface irrigation canals can lead to waterlogging and salinization of farmland because of excessive seepage from canals.

93. The effects of capital expenditures on the environment need to be incorporated in the cost-benefit analysis of project decisions. However, the monetary valuation of many environmental benefits and costs is difficult. For example, it is difficult to assign a monetary loss caused by the extinction of animal or bird species following deforestation. In view of the complexities involved, the effects on the environment are often not fully incorporated in project decisions, thereby leading to long-term environmental problems.

94. The experience with the application of this set of economic instruments in OECD countries, economies in transition and developing countries is discussed below, as well as ways and means of overcoming obstacles to their greater use.

(b) Promoting the use of environmentally friendly economic instruments

(i) Experience in OECD countries

95. Since the use of economic instruments as a means of achieving the goal of sustainable development was initiated in the industrialized market economies, it is useful to start with an overview of the OECD experience.

a. Policy context

96. The actual development of environmental policy instruments has followed different courses in different parts of OECD because of the diversity of policy contexts prevailing in OECD member States. For example, there may be differences in general political outlooks concerning market intervention, the political environments in which individual countries and groupings of countries

operate (e.g., European Union, North American Free Trade Agreement or political structures (e.g., federal or centralized government structure)).

97. Furthermore, there may be differences in administrative cultures and attitudes towards intervention, priorities attached to environmental problems and distribution of responsibilities for economic sectors (and environmental compartments) across ministries.

b. Current use of economic instruments

98. The use of economic instruments in developed countries is well documented in numerous publications, in particular those of OECD. It will therefore be sufficient to provide only a general overview, with a focus on current trends.

99. There are at least three main reasons for the increasing interest in the use of economic instruments for environmental management in OECD countries. First, it is recognized that regulations are becoming more and more difficult to implement, both because they are increasing in number and because of the administrative costs associated with their implementation. Second, at a time of sluggish economic growth rates and tight budgetary constraints, Governments are seeking new sources of income for financing environmental policies. Third, economic instruments are considered more and more a necessary condition of sustainable development since they are often a more cost-effective means of achieving regulatory objectives.

100. By the end of the 1980s, 150 cases of use of economic instruments in 14 OECD member countries were reported. Of these 150 cases, 80 were environmental charges or taxes, 40 were subsidies and the remainder were other types, such as deposit-refund systems and trading schemes. In the meantime the number of cases has increased substantially.

101. For example, the increased use of deposit-refund systems, particularly for packaging, reflects the growing concern among OECD countries about packaging waste problems.

102. The effect of economic instruments applied in OECD countries on behaviour has been modest to date owing to generally low levels of charge/tax rates. Recently, however, the rate of some incentive charges has increased substantially. Examples are the CO_2 charges in Denmark, Norway and Sweden, the NO_x and SO_x charge in Sweden, the waste disposal charge in Denmark and a number of product charges. Furthermore, tax differentials on sales prices of new cars with catalytic convertors and on unleaded petrol have been applied.

103. Various subsidy programmes support private pollution abatement investments in most OECD countries. These programmes are generally aimed at speeding up the implementation of environmental programmes and assist those industries that face sudden cash flow problems owing to the abnormally high costs entailed by new regulations. Assistance schemes are frequently transitory and introduced to tackle specific environmental problems with a pre-set time limit for operation.

104. The introduction of economic instruments in OECD countries is combined more and more with the adoption of fiscal reforms, which provide a good opportunity for "greening" the tax system. Increasing the total fiscal burden is quite unpopular. However, consideration of a restructuring of the existing tax system while keeping the total fiscal burden unchanged is attracting increased interest in a number of OECD countries.

105. Many OECD countries have been attempting to achieve a less distortionary tax system by increasing environmental taxes to broaden the tax base while simultaneously reducing the tax burden on labour. However, the role of environmental taxes is likely to be small in this respect. First, the environmental tax base is rather narrow. Second, it is likely to be less stable than taxing labour incomes.

106. For maximum effect, economic instruments must be used in combination with other policy instruments. For example, economic instruments can provide an additional incentive to that set by direct regulations for achieving performance over and above the minimum standard. Furthermore, combining different types of economic instruments might create a powerful set of instruments such as a combination of a deposit-refund system and a product charge on non-returnable products. Their effect can be reinforced even further by social instruments, such as eco-labelling schemes and consumer-awareness campaigns. These are discussed at length in the Secretary-General's report on changing patterns of production and consumption (E/CN.17/1995/13).

c. Overcoming obstacles to increased use of economic instruments

107. In order to increase the role of economic instruments as a tool of environmental policies, OECD countries need to overcome various obstacles that are associated with the implementation of economic instruments, in particular (a) insufficient political acceptability of economic instruments; (b) difficulties in the design of economic instruments; (c) administrative difficulties with economic instruments; (d) conflicts between environmental and other policy objectives; (e) anxiety about repercussions on the international competitiveness of the national economy; and (f) adverse economic and structural conditions that may be encountered in the application of economic instruments.

i. Insufficient political acceptability

108. Polluters are often small in number, with concentrated political power, while "victims" are often large in number, with little political power. This difference in political influence may mean that there is greater resistance in law-making bodies for introducing environmental laws that increase the costs of businesses that pollute.

109. Industry will often oppose environmental taxes because it suspects that the Government will retain the tax over time, even if the environmental objective has been reached.

110. Earmarking the revenues from taxes or charges for expenditures through national environmental funds is one way of increasing the acceptance of economic instruments by the business community. However, earmarking has also some

disadvantages, which are discussed below in the section on national environmental funds (paras. 169-184).

ii. Difficulties in design

111. The determination of the charge or tax rate requires information that is in many cases not available. For example, data on the marginal cost of damage are very difficult to obtain and information on the marginal costs of pollution abatement tends to be insufficient. As a result, public authorities often consider adopting second-best approaches, such as setting the rate according to a pre-determined target for the environment.

112. In addition, the definition of the tax base poses difficult problems. The use of a proxy is a way of overcoming this difficulty. For instance, instead of the tax base being determined by the emissions of sulphur or carbon, it is determined by the sulphur or carbon content of the fuel.

113. To ensure that the incentive effort of a tax or charge is not eroded by inflation, there is a need to readjust the rates periodically to reflect changes in the general price index.

114. Finally, emission trading schemes pose significant design problems. For example, the market needs to be sufficiently wide and expandable over time. In addition, sophisticated monitoring and compliance control procedures are required.

iii. Administrative difficulties

115. In the case of specific rate taxes on units of emissions or damage (Pigouvian taxes), it may be technically or practically difficult to measure and monitor physical quantities of pollution. For example, while it may be relatively simple to measure pollution from a single emitting source, such as a factory effluent pipe or smokestack, it is obviously quite difficult to measure pollution when there are many sources - automobile exhaust pipes, for example.

116. Moreover, in the case of Pigouvian taxes the incentive to effectively administer efficient environment taxes will be reduced if revenue per unit of administrative outlays is low. In addition, the fact that a great number of environmental problems require many individual taxes, makes for administrative difficulties.

117. Many administrative difficulties will not have to be dealt with if indirect environment taxes are introduced because such taxes will be calculated on the basis of market prices of productive inputs or finished products.

iv. Conflicting policy objectives

118. The use of economic instruments for environmental purposes needs to be balanced against other policy objectives, in particular income distribution (equity) and international competitiveness.

119. The implementation of economic instruments can result in different cost and distributional impacts for various firms, sectors, regions and income groups. For example, discussions of a national carbon tax often focus on whether the proposed tax would hurt the poor, put coal-miners out of work, or derail export industries. These were key considerations in the adoption of the carbon tax in Sweden and are still a central element of the energy-carbon tax proposed by the Commission of the European Communities.

120. Distributive issues have also been a key element of emission trading programmes in the United States. For example, the formula to allocate initial allowances was one of the most contentious issues in the debate over the acid rain provision of the 1990 Clear Air Act.

121. So far, relatively few empirical analyses have been done on the distributive impacts of economic instruments. However, the results of such studies suggest that environmental taxes tend to be regressive (particularly in the case of a tax on energy) and that both environmental taxes and trading programmes can lead to substantial wealth transfers. Therefore, offsetting or compensatory measures may be needed to ensure the political acceptability of economic instruments.

v. Anxiety about international competitiveness

122. The introduction of environmental charges and taxes is generally opposed by industry for fear of a resultant loss in international competitiveness and domestic employment. Moreover, it is feared that unilateral taxation may lead to "pollution exports", that is the measure may be ineffective in global terms. However, empirical analysis suggests that there is little systematic relationship between higher environmental standards and international competitiveness in environmentally sensitive goods. OECD countries with a high level of environmental expenditures have both gained and lost competitiveness in environmentally sensitive industries. Unfortunately, the opposition of industry to environmental taxes, particularly in the energy field, has led many Governments to introduce various exemptions or rebates which in the end erode the incentive effect of the tax and undermine the achievement of the environmental objectives.

123. In the case of deposit-refund schemes, the trade impact is mainly caused by the additional requirements and costs of participating in the scheme. Deposit-refund schemes can potentially act as non-tariff barriers to trade and give a competitive advantage to domestic producers.

124. Subsidies are likely to cause distortions in international trade and run counter to GATT/World Trade Organization rules. According to OECD rules financial assistance is subject to special conditions because it is contrary to the polluter-pays principle adopted in 1972 by OECD countries. The granting of assistance is limited to the following conditions: (a) it should be selective and restricted to those parts of the economy where severe difficulties would otherwise occur; (b) it should be limited to well-defined transitional periods laid down in advance and adapted to the specific socio-economic problems associated with the implementation of a country's environmental programme; and

(c) it should not create significant distortions in international trade and investment.

(ii) Experience in countries with economies in transition

a. Policy context

125. Countries with economies in transition are left with the environmental legacy of the central planning era. High pollution and over-utilization of natural resources in past decades has created a large gap between environmental financing needs and available resources.

126. During transition, the development of an effective environmental financing system has been negatively affected by the relatively slow pace of privatization, inadequacies of the banking system, underdeveloped capital markets and inadequate fiscal systems. However, in view of the economic reform under way and gradual improvements in the environmental policy framework, it is expected that countries in Central and Eastern Europe will build on their existing system of emission taxes and charges to create a strong incentive-based environmental policy regime.

127. The main challenges in the future include the definition of concrete and feasible qualitative and quantitative objectives, as well as harmonizing the aims of environmental policies with other policies.

b. Current use of economic instruments

128. As in OECD countries, there is an increased use of economic instruments in countries with economies in transition. The experience of Central and Eastern Europe is well documented and will therefore be the focus of the present section. In Central and Eastern Europe charges on emissions are widely used. The most important charges are those on air pollution, on waste and on emissions to surface water. For example, in the Czech Republic and Slovakia air pollution charges are levied on large and medium-sized industrial point sources, with the intention, in both countries, of providing economic incentives for pollution reduction measures and generating revenue. Estonia, Hungary, Poland and Russia all impose taxes on air and power emissions that take into account factors that affect the level of environmental damage, such as quantity and toxicity of emissions.

129. Furthermore, examples for charges on waste can be found in a number of countries. In Bulgaria, for example, a municipal waste user charge has been in force since 1951. In the case of Czech waste charges, it is noteworthy that municipal waste user charges were set up in many cases even before the Second World War.

130. Moreover, charges on emissions to surface water can be found in various countries. In Bulgaria, for example, user charges on waste water have been in force since 1951. In the Czech Republic, user charges for sewerage and sewage treatment have been in place for decades. The Hungarian charges for sewerage and sewage treatment are so called "regulated" prices. Since the cost of

providing waste water treatment varies for different regions, charge levels vary as well.

131. In addition, product charges are applied in a number of countries. The Hungarian fuel charge has been in force since 1992. In Bulgaria, an instrument is in place similar to a product charge. In both the Czech Republic and Slovakia, charges on ozone-depleting substances are expected to be introduced. Furthermore, in many countries in Central and Eastern Europe there is tax differentiation between leaded and unleaded petrol.

132. Furthermore, deposit refunds are being used in various countries of Central and Eastern Europe. In the Czech Republic, a packaging act is under preparation that will also address complex problems in the current deposit-refund system. In Poland, deposit rates depend on voluntary negotiations between industry and retailers.

133. Finally, enforcement incentives are applied in a number of Central and Eastern Europe countries. In Bulgaria, for example, fines are in place in the areas of air, water, soil, noise, electromagnetic fields and mineral extraction. In the Czech Republic, non-compliance fees are in place for both air pollution and waste water, in addition to existing emission/effluent charges.

c. Overcoming obstacles to increased use of economic instruments

134. Countries with economies in transition are confronted with most of the obstacles to an increased use of economic instruments that were discussed above in the context of OECD and various additional ones. Overcoming these obstacles is in general more difficult, as demonstrated by the examples given below.

i. Insufficient political acceptability

135. As in OECD countries, political acceptability is a major obstacle to increasing the role of economic instruments in countries with economies in transition. The sometimes quick and dramatic changes in the political landscape and government leadership adversely effect the continuity of ongoing work. The political will and courage to deal seriously with the issue of environmental protection need to be increased.

ii. Administrative difficulties

136. Major problems with the implementation of environmental policy in the economies in transition are connected with enforcement. The concept of the rule of law needs to be complemented by strong enforcement capabilities.

137. Local authorities are increasingly involved in the implementation of economic instruments. In some cases there are several different government levels and offices involved in the functioning of a single mechanism. The instrument may be designed and established at the national level, specific emission levels set by local authorities, with monitoring and money collecting conducted by regional inspectorates. While there are clearly benefits to involving local authorities who have direct stakes in the local conditions and

unique local knowledge, there are also added administrative expenses with each level of government involvement.

iii. Conflicting policy objectives

138. The various economic instruments in use in countries with economies in transition generally should serve both to raise revenue and to reduce pollution. While their ability to raise money is demonstrated with some clarity, their effectiveness as incentives to stop or alter polluting practices is less clear.

139. Setting user charges and fines generally at relatively low levels, however, does little to actually influence the behaviour of many polluters. Indeed, funds now being routinely extracted from polluters are often redistributed to the public sector to support such public service facilities as water treatment plants and heating and power plants. The charges are too low to encourage polluters to reduce emissions and at the same time they deprive the polluters of funds which they might otherwise be encouraged or required to invest in pollution reduction or prevention measures.

iv. Adverse economic and structural conditions

140. Even though the formerly centrally planned economies are transforming themselves into market-based economies at different rates and along different paths, they have characteristics in common that directly affect the efficiency of economic instruments. For example, advancement in the privatization process has a crucial influence on the practical effectiveness of economic instruments. Privatization of large heavy industries (often pollution-intensive), for example, has yet to take place on a large scale.

141. Furthermore, effective implementation of economic instruments is hindered by insufficient profitability of enterprises. Data indicating the differences between imposed charges and fines and amounts actually paid show a widespread inability of enterprises to pay. Moreover, inflation - still relatively high in all the countries with economies in transition - has the effect of eroding the value of fixed charges and tax levels. In only a few cases are there mechanisms in place to adjust for inflation.

(iii) Experience in developing countries

a. Policy context

142. The newly industrializing countries of South-East Asia and Latin America have pollution problems similar to those of Eastern Europe (but not necessarily the inefficiency). On the other hand, many countries, for instance in Africa, have the inefficiency but relatively little industrial pollution. Their environmental problems are more concerned with the basic management of sensitive natural resources such as soil, water, forest cover and biodiversity. Their top priorities focus on food, drinking water, energy, sanitation and shelter.

143. In many cases, the economies of developing countries are organized around raw material extraction or the export of agricultural products. These sectors can be extremely disruptive for the environment. Even relatively small

industries can pose severe environmental threats because of the lack of resources for abating, controlling or even monitoring pollution.

144. If industrial pollution in the classic sense is somewhat less prevalent in most developing countries, natural resource problems related to food, water, health and so forth are often more serious than in the economies in transition.

b. Current use of economic instruments

145. It is not surprising that countries at a relatively high stage of economic development, such as the newly industrialized countries of Asia, are experimenting quite extensively with the use of economic instruments in their environmental policies. The same applies to a number of countries in Latin America. However, even in less developed regions and countries, policy makers consider economic instruments an important tool complementary to regulations.

146. Many developing countries have provisions in their corporate tax systems that are intended to reduce environmental damage. For example, Kenya and the United Republic of Tanzania provide accelerated depreciation for investments that are intended to prevent soil erosion and for planting permanent or semi-permanent crops. In Latin America, incentives for reforestation are provided by Brazil, Chile and Colombia.

147. A number of developing countries use motor fuel tax differentiation to reduce environmental damage and have a higher excise tax rate on leaded fuels than on unleaded fuels. Such rate differentiation is intended to discourage consumption of fuels that are significant sources of heavy metal particulate matter. In Thailand, for example, to encourage substitution, the Government subsidizes the pump price of unleaded gasoline to make it slightly less expensive than leaded, with the subsidy on the former financed from a surtax on the latter. In Taiwan Province of China, unleaded gasoline also sells at a slight discount.

148. Motor vehicle taxes have been used with varying degrees of sophistication to discourage motor vehicle use and fuel consumption. Some countries, including Argentina and Côte d'Ivoire apply annual taxes on automobiles but vary the tax rates according to a measure of fuel consumption, such as engine horsepower, fuel consumption rate, vehicle weight or engine size. In other cases, vehicle taxes are designed to encourage the use of vehicles with lower emissions. For example, in Kenya the tax on vehicles with diesel engines is twice the tax on vehicles with non-diesel engines.

149. A number of Governments in Asia have begun to experiment with mixed tax-subsidy schemes. These schemes have the advantage of being largely self-financing. They balance the disincentive effect (the "stick") with a positive incentive to pollution control (the "carrot"). They may be more politically acceptable than straight taxes or charges in so far as they are perceived to be more equitable.

150. Deposit-refund systems can, for example, be found in Taiwan Province of China. With the 1988 revision of the Waste Disposal Act, Taiwan Province of

China has begun to implement a recovery/recycling system for solid waste, including bottles, aluminium cans and waste paper.

151. Public expenditures in the form of subsidies frequently supplement environmental regulations and charges that are typically not effective enough to induce the level of private pollution abatement investments necessary to achieve the required environmental quality. In India, for example, tax and interest rate incentives are used. In Malaysia, subsidies are provided for companies that establish facilities to store, treat and dispose of their wastes and import duty and sales tax exemptions have been extended for technology used for the storage, treatment and disposal of hazardous wastes.

152. In Thailand, import duties on pollution control and treatment equipment have been reduced to less than 10 per cent. A law enacted in 1977 in the Philippines allowed the waiver of the import tariff on pollution control equipment for a period of 10 years and rebates for domestically produced equipment were introduced.

c. Overcoming obstacles to increased use of economic instruments

153. Developing countries are faced with even greater difficulties than countries with economies in transition with regard to overcoming the set of obstacles to increasing the use of economic instruments discussed above in the context of OECD. This is demonstrated by the examples set out below, which focus on political acceptability of economic instruments, administrative difficulties and conflicting policy objectives.

i. Insufficient political acceptability

154. As in developed countries and countries with economies in transition, industry and other polluters in developing countries have resisted the introduction of economic instruments because they believe they have a greater influence over the design and implementation of regulations than they would have with economic instruments. Moreover, the perception of local industry is that it is easier to avoid compliance with a standard, assuming poor monitoring and enforcement capacity, than with fiscal and incentive mechanisms, where little flexibility exists. Furthermore, with economic instruments it is more difficult to appeal to the courts than it is with regulations. Finally, some economic instruments (especially charges) may impose a financial burden beyond the cost of complying with a regulation.

155. In many countries, there is a perception on the part of the private sector that laws are not applied evenly to all economic agents: State companies often do not pay fines, particularly for pollution, because they are either too poor or politically too powerful.

156. More important, there is a widespread belief among politicians and senior government officials that the adoption of sound environmental practices would result in lower rates of economic growth in the short run, that pollution control would divert scarce resources from more relevant social areas and that it would lead to price increases.

ii. Administrative difficulties

157. In order to administer the use of economic instruments in developing countries, institution-building needs to be accelerated and administrative skills developed. Initially, the best use should be made of existing structures. It has been argued for some time that as the introduction of environmental taxes may require new structures and mechanisms, it may be more efficient to introduce environmental incentives into taxes which have to be levied anyway (e.g., taxes on goods and services), while introducing environmental taxes progressively, as the administrative and technical capacity develops. It appears, however, that using existing tax structures to provide incentives for environmental protection has not met with much enthusiasm, especially if it implies restructuring the rates or bases of broad-based income and consumption taxes.

158. In many developing countries, environmental government institutions are underbudgeted and have therefore poor administrative and enforcement capacity in terms of equipment and staff. Moreover, in many cases there is a lack of policy coordination and institutional overlaps exist between and across different levels of government.

159. Furthermore, there is a general perception in environmental agencies that the use of economic instruments will not only result in their losing direct control over polluters, but that they will also have to cooperate more closely with economic finance ministries since their support is usually required for the creation of any new taxes or charges.

160. Coordination between environmental and economic ministries is in general weak and environmental agencies do not consider their policies and actions in broader economic terms. Conversely, economic ministries do not sufficiently take environmental effects into consideration when formulating sectoral or macroeconomic policies.

iii. Conflicting policy objectives

161. Like countries with economies in transition, many developing economies have inherited a large public sector which is being progressively privatized. Public and private sector industries should be treated equally. Soft budget constraints for public enterprises, as well as exemptions and waivers perpetuate distortions and block a wider role for economic instruments.

(c) Phasing out the use of environmentally unfriendly economic instruments

162. The above discussion of public expenditures as an economic instrument has shown that subsidization of inputs such as pesticides, chemical fertilizers and energy, as well as output subsidies and the underpricing of resources, can have adverse environmental implications. Furthermore, insufficient provision of operations and maintenance expenditures and improper valuation of environmental costs and benefits in different investment projects can have a negative impact on the environment.

163. Thus, one plausible way of addressing environmental concerns is to seek the removal of distortions in public expenditure policy. Besides improving economic welfare, this can have a favourable impact on the financial requirements for sustainable development.

164. Various steps can be initiated by policy makers to implement an environment-friendly expenditure policy. For example, on the output side, subsidies that encourage more than socially desirable production or consumption can be phased out.

165. Moreover, experience has shown that the nature and extent of input subsidies has been varied, ranging from the provision of below market exchange rates for imports, to subsidized credit and to keeping market prices for inputs below market clearing levels. Many of these subsidies cannot be justified on economic grounds, particularly over longer periods of time. In view of their environmental implications as well as the fiscal (or quasi-fiscal) burden that they impose, it is necessary to examine afresh the underlying rationale for them. A careful analysis may suggest that these subsidies can be eliminated.

166. Possible expenditure savings arising from subsidy reduction would create potential resources for the financing of sustainable development.

167. With regard to improving other public expenditure policies, it needs to be emphasized that the provision of adequate operations and maintenance expenditures is required not only to sustain the productivity of existing projects, but also to avoid adverse effects on the environment.

168. When choosing among projects and their scale of operation, environmental aspects - quantitatively or at least qualitatively - should be taken into consideration. This is necessary because of the irreversibility of capital expenditures and the potentially high cost of mitigating environmental damage once the project comes on stream.

2. Reviewing the usefulness of national environmental funds

169. National environmental funds (NEFs) are, to a large extent, an envelope within the expenditure budget or a segregated government fund dedicated to environmental expenditures. Sources of funds can be earmarked taxes, foreign grants on transfers from or allocation within the general budget. The funds can be used for a variety of environmental projects and various levels of government can be involved.

170. Many experts consider the earmarking that is implicit in NEFs a mixed blessing, at best, because there are strong arguments against it on efficiency grounds.

171. Broadly speaking, there are some very well-defined rationales for having a largely non-specific system of tax revenues, which are widely documented in the literature on optimal taxation. A system of earmarked revenues tends to be pro-cyclical because the spending follows the variation of revenues. Furthermore, given the narrow tax base of environmental earmarking, revenues and

therefore spending can fluctuate considerably and may therefore be at times insufficient to finance environmentally targeted programmes.

172. The following discussion of NEFs in OECD countries, economies in transition and developing countries analyses why, in spite of the misgivings, these funds have maintained some attraction as a source of environmental finance.

(a) Environmental funds in OECD countries

173. In a number of OECD countries earmarked financing mechanisms are used to secure a steady flow of revenues for certain environmental protection objectives. Typically, they have been used to finance investments in public environmental services to achieve compliance with regulations. The more direct the connection between the revenue source and its use, the more politically acceptable the earmarking system becomes.

174. Various examples of NEFs can be found in OECD countries. For example, earmarking budgetary revenues provided a stable source of financing for public wastewater treatment facilities in the United States in the framework of the Construction Grants programme during the period 1979-1989 and the State Revolving Fund programme from 1989. Frequently, "sin-taxes" levied on tobacco and alcohol appear to be the least difficult way politically to raise funds for environmental protection programmes. Washington State in the United States, for example, levies a cigarette tax earmarked for financing water quality programmes.

175. Among the best known local systems in Europe are those of the French river basin management agencies, which levy effluent charges in order to cover the costs of water supply and water quality management in the river basin. Similar mechanisms operate in Germany and the Netherlands.

176. Earmarked mechanisms established from environmental charges for air quality control exist, for example, in Canada, France, Portugal and the United States. Aircraft noise charges are earmarked to cover noise abatement costs in Belgium, France, Germany and Switzerland and waste disposal taxes are directed towards treatment and recycling expenditures in a number of countries.

177. The experience of OECD countries has shown that benefits of earmarking are more pronounced when direct environmental charges are earmarked in decentralized programmes. The main advantages of that scheme in OECD countries have been the incentive effect of charges, and the increased transparency and political acceptability of the system due to the close relationship between revenue sources and the spending of the revenues.

(b) Environmental funds in countries with economies in transition

178. In the countries with economies in transition, environmental financing through private sources and normal budgetary allocations is insufficient. Therefore these funds have played a significant role as sources of environmental financing.

179. The importance of NEFs in environmental expenditures appears to be growing in most countries. In Russia, for example, the share of NEFs in capital investments for pollution abatement increased from 6.6 per cent in 1990 to 29.6 per cent in 1991. In Poland, the share of NEFs in total environmental expenditures increased from 2 per cent in 1990 to 22.3 per cent in 1993.

180. The experience of countries with economies in transition has shown that NEFs are financing instruments that play a significant role in redistributing and allocating revenues to investments in priority areas that reduce environmental damage in a cost-effective way.

(c) Environmental funds in developing countries

181. In the past five years, more than 20 NEFs have been established in developing countries, mainly where economic growth was accompanied by serious environmental degradation that led to government intervention, and where outlays from the general budget for the environment sector were inadequate. Since emission charges and other environmental taxes do not play an important role in most developing countries, the revenue sources of NEFs are usually derived from or supplemented by (a) designated levies that are not directly environment-related (the National Environmental Fund in Algeria, for example, raises its revenues from a tax on international airline tickets); or (b) external sources (the Pollution Abatement Fund in Sri Lanka was created with the help of donor contributions). An exception is Costa Rica, which allocates two thirds of a tax on petrol to a fund for financing infrastructure projects to reduce CO_2 emissions.

182. In addition to NEFs funded by earmarked revenue sources, in a number of countries externally funded NEFs have been established. Although the majority of externally funded NEFs tackle nature and biodiversity conservation issues, several NEFs were established with pollution abatement objectives. In Sri Lanka, for example, a revolving pollution abatement fund was established by a contribution from the Government of the Netherlands. Similarly, OECD funding and budget allocations capitalized NEFs in Thailand. NEFs also received financial support from other donors, such as Canada, Norway, the United States and the Global Environment Facility. In addition, financial support has been provided through debt-for-nature swaps and debt conversions.

183. Externally funded NEFs are typically established through multilateral or bilateral grant contributions or debt-for-nature swaps. NEFs that are created as trust funds are most typical for nature conservation funds.

184. The experience of developing countries with NEFs has shown that the use of these funds is often based on ad hoc decisions, emergencies or political priorities. Although NEFs may function as catalysts to mobilize private enterprise resources, without significantly increasing the level of environmental charges the role of these financing mechanisms remains marginal.

B. Mobilizing private financing for sustainable development

1. Policy approach

185. As a result of strict environmental regulations, private expenditures on pollution abatement control exhibited a steady increase in several OECD countries during the past decade, both in absolute terms and as a percentage of GDP.

186. In developing countries, private expenditures on pollution abatement control have also risen in the past decade, in particular in the newly industrialized countries of Asia. Private expenditures in economies in transition are expected to increase in line with the pace of privatization.

187. To support private pollution abatement investment, Governments in OECD countries, economies in transition and developing countries have used a wide range of policy instruments, which may be divided into three main categories: directed credit programmes, financial incentives, co-financing arrangements and venture capital funds.

2. Access to credit

188. Well functioning financial and capital markets are necessary for an effective mechanism of raising and allocating financial resources for the prevention and control of negative effects of pollution of the environment. Under well functioning financial markets, investors have unrestricted access to various financing sources. Their choice of financing is mainly determined by their preferred capital structure.

189. In developing countries the menu of financing options available for industries is typically severely limited because financial and capital markets are underdeveloped and dysfunctional.

190. Although several countries experimented with financial liberalization by rapidly (e.g., Argentina and Chile) or gradually (e.g., Indonesia and Republic of Korea) abolishing interest rate ceilings, central credit allocation and market entry barriers in the late 1970s and early 1980s, financial markets have not yet been sufficiently liberalized.

191. Institutional financing is especially constrained for small-scale enterprises, which are frequently forced to turn to more costly, informal credit sources. Because of their high cost, such sources are not suitable for financing investments with relatively low returns and are therefore not adequate for the financing of investment in pollution abatement. To make up for inadequate formal and informal sources of finance, directed credit programmes have been established in several countries in order to support pollution abatement financing.

192. Typically, directed lending for pollution abatement has been carried out by financial institutions responsible for directed industrial lending. For example, in Mexico the earmarked environmental lending mechanism of the

Industrial Equipment Fund (FONEI) was capitalized by the Government. In India, development banks with majority state ownership provide directed credit to industries for various priority projects, including pollution control. However, the provision of directed credit at subsidized rates has favoured large companies, which can comply with bureaucratic conditions more easily than small enterprises.

193. Most Governments are aware that directed credit programmes are generally not well targeted and can cause substantial distortions.

3. Financial incentives

194. In OECD countries, private expenditures for pollution abatement control have been supported not only by the various subsidy programmes discussed above, but also by direct soft loans and temporary direct tax incentive schemes.

195. For example, investment tax credits that provide an outright tax reduction by subsidizing the purchase price of an asset have been widely used in Canada, the Netherlands and Norway. Other tax incentives have allowed the depreciation of certain assets at higher than normal rates or over shorter periods (or both), postponing tax liabilities in the early years of the life of the asset and reducing the net present value of future tax liabilities.

196. Germany, for example, allowed the accelerated depreciation of water, air and soil pollution abatement technology. In the United States, the Tax Reform Act of 1969 provided rapid amortization of eligible pollution control facilities over a five-year period for the first 15 years of depreciable life of the pollution control equipment at old industrial facilities for a limited time. In Canada, water and air pollution control investments at sites that started operation before 1974 and energy-saving equipment can qualify for accelerated depreciation or "capital cost allowance". In Japan, tax authorities similarly allow investors in pollution abatement, recycling, solar and energy-saving equipment to use accelerated depreciation of such assets.

197. Tax deductible funds (used, for example, in Japan) have effects similar to accelerated depreciation: when company income is set aside for environmental investment, such funds become tax exempt. Once the funds are withdrawn for environmental investments, they are subject to taxation. The main advantage of the system is derived from the deferral of taxes. In other cases (for example, in the United States), large industrial corporations could often save 1.5 to 2.0 percentage points on the cost of borrowing to cover pollution abatement investments by issuing tax-free industrial development bonds. In yet other examples, business property tax rates have been linked to the environmental records of enterprises.

4. Co-financing arrangements and venture capital funds

198. Governments, bilateral donors and such international institutions as the World Bank and GEF are experimenting with a variety of schemes aimed at leveraging significant private funds for investments in the environment.

199. There are financial (grants, co-financing), strategic (new business opportunities) and public relations reasons for private investors working with Governments, bilateral donors and international institutions. The latter can offer financial incentives to undertake projects that might not otherwise be attractive for private investors because of financial and technological risks.

200. Private investors can, for example, obtain GEF funds for projects co-financed by one of the international financial institutions that participate in GEF. GEF funds allow these agencies to finance GEF-type projects that they might not otherwise consider. In addition, GEF and the co-financing institutions may lend credibility to a project, making it easier to attract additional co-financing.

201. In addition to co-financing, publicly sponsored venture capital funds are a promising model of public-private partnerships. The three most prominent examples are the Global Environment Emerging Markets Fund (sponsored by the United States Government), the Nordic Environmental Finance Corporation (sponsored by the five Nordic countries) and the North American Environmental Fund (partly sponsored by the Japanese Overseas Economic Cooperation Fund).

202. Furthermore, the World Bank and the International Finance Corporation have begun to explore the establishment of venture capital funds for biodiversity and greenhouse gas mitigation in developing countries.

C. Cooperation on national sustainable development policies

203. Agenda 21 calls for a wide range of domestic policy reforms, referring to the application of the polluter-pays principle and the important role of regulations and economic instruments.

204. In some cases, the implementation of reforms may require only a cost-benefit analysis of domestic factors, so that the reforming country has no hesitation in acting unilaterally. However, since in most cases both domestic and international factors need to be taken into account, countries that consider reforms may wish to seek regional or multilateral cooperation to avoid negative consequences for their international competitiveness, should there be no parallel reforms on the part of their trading partners.

205. Cooperation on sustainable development policy reforms could take place at the regional or global level. While first attempts at cooperation at the regional level have already been made in Europe, no attempt at multilateral cooperation on national policies has yet been made.

206. It may be useful to briefly outline the European model of cooperation and then explore some options for multilateral cooperation on national policy reforms related to Agenda 21.

207. The need for a pan-European approach to environmental policies has been widely recognized. Efforts are under way to make national environmental policies and instruments compatible, and it is hoped that they will contribute to the goal of achieving convergence of the countries in the region.

208. The Environment for Europe process launched in 1991 plays an important role in that regard. The Ministerial Declaration adopted at the Conference on Environment for Europe held at Lucerne in April 1993 outlined the political dimension of that process and addressed major aspects of a convergence of environmental policies in Europe.

209. The Environmental Action Programme for Central and Eastern Europe, also adopted at the Conference, is an important step in promoting environmental convergence in Europe. The Conference endorsed the contribution of the United Nations Economic Commission for Europe on elements for a long-term Environmental Programme for Europe (EPE). These elements represent tools and mechanisms for the promotion of pan-European cooperation and convergence. Further development of EPE is under way in preparation for the Ministerial Conference on Environment for Europe to be held at Sofia in October 1995.

210. In 1994 OECD prepared a paper on the use of economic instruments in resolving global and transboundary environmental problems. The approaches proposed for consideration at the regional level included, for example, an internationally harmonized system of national taxes and regionally accepted tradeable permit systems.

211. In summary, despite the progress made so far, there are many unresolved issues, including problems related to the application of economic instruments. The resolution of these problems will require strong political impetus, which the Ministerial Conference at Sofia in October 1995 may provide.

212. In order to enhance cooperation in the design and implementation of sustainable development policies internationally, a multilateral consultation process would seem to be the logical next step.

III. INNOVATIVE INTERNATIONAL AND NATIONAL MECHANISMS FOR RESOURCE MOBILIZATION

A. Internationally agreed tax on air transport

1. Tax goals

213. It is argued that air transport, like other energy uses, contributes to global warming and may also contribute to stratospheric ozone depletion, in addition to a plethora of other environmental concerns.

214. As a result, an international air transportation tax (IATT) has been discussed at various international forums. The principles and details of such a tax (a more appropriate term may be "environmental user charge for air transport") are issues that require further clarification and discussion.

215. The underlying idea of an IATT is the application of the polluter-pays principle in order to internalize the cost of environmental pollution attributable to air transportation. It is hoped that such a tax levied, for example, on fuel will provide an incentive for accelerating the further development of environmentally sound technology for aircraft engines.

Furthermore, such a tax aims at raising revenues for the financing of sustainable development.

2. Tax design and expected revenues

216. Ideally, the tax base for an IATT should be the quantity of pollution emissions. Other alternatives for the tax base are the source of energy used (i.e., fuel) and the volume of air transport (i.e., passengers and freight). Finally, it has been proposed to levy a tax on every air ticket, starting with tickets for international transport.

217. Using the consumption of fuel as a tax base would contribute to internalization of the cost of air pollution and thereby provide an incentive for accelerating the development and installation of less polluting aircraft engines.

218. Estimates have been made of the potential revenues of a tax based on air transport volume, which range between US$ 0.8 billion a year (tax of 1 per cent of the price of all passenger tickets on scheduled international routes throughout the world) and US$ 2.2 billion a year (tax of 1 per cent of the price of all passenger tickets and freight on scheduled routes throughout the world).

3. Tax administration

219. If an IATT were introduced, a number of general principles could be applied, for instance, the establishment of new institutions should be avoided and a transparent governance structure should be created.

220. It would be desirable to explore the possibility of involving existing institutions in the collection of nationally levied taxes that could be transferred to an appropriate international authority.

221. There are various ways of distributing the collected revenues towards sustainable development. On the assumption that the political will exists to channel a certain percentage of the collected revenues to an appropriate international authority, a number of potential uses could be agreed upon.

222. For example, part of the revenues could be channelled to a "multilateral fund", whose goal would be to contribute to the development of less polluting engines and fuels. The balance of the tax revenues could be allocated to a newly established "grants window" at GEF.

4. Unresolved issues

(a) Issues related to the goals of the tax

223. Could an IATT be successful in internalizing the cost of pollution from air transportation? A choice has to be made between a tax based on fuel use and a tax related to the volume of air traffic. Indeed, there is no a priori reason

to expect that the volume of air transport is directly or proportionally related to greenhouse gas emissions or ozone depletion.

224. Could an IATT be successful in curbing emissions? Some experts argue that even a fuel-based IATT is unlikely to have a major effect on emissions because there are few, if any, abatement margins currently envisioned that the airline industry could exploit in order to reduce pollution.

(b) Issues related to the design of the tax

225. Is it fair to target the airline industry by imposing a tax aimed at internalizing the costs associated with environmental pollutants? Some experts argue that the proposed tax is inappropriate because air transportation makes only a small contribution to ozone depletion and to levels of greenhouse gases. Ideally, a tax that is intended to internalize the costs associated with greenhouse gas emissions and ozone depletion should be levied on all sources of emissions.

226. An alternative to levying an IATT on the volume of air travel, is to levy it on products that are closely linked to emissions such as jet fuels, motor fuels and other petroleum products. However, some experts argue that the feasibility of such a tax does not seem to exist at present because most countries already levy excises and sales taxes (value added taxes) on these products.

227. Would the introduction of an IATT affect the viability of airline companies? If the new tax is borne by the travelling public so as not to affect the financial situation of the airline industry, the elasticity of demand to price (which is assumed to be high) might have a negative effect on air transportation, particularly for charter flights.

(c) Issues related to the political acceptability and administration of the tax

228. How high is the political acceptability of an IATT? Some experts argue that an IATT would require international cooperation and agreement for implementation. This would be a significant precedent, given that there are currently no global taxes. Such a tax would require national authorities to agree to a harmonized taxation scheme and possibly to cede sovereign taxation powers to some international institution. It is not clear if national authorities would be willing to cede domestic taxation powers or if there is an international institution with the competence to administer a global tax such as an IATT. In any event air transport organizations such as the International Civil Aviation Organization and the International Air Transportation Association might have a role to play in administering an internationally agreed IATT system.

5. Alternatives to the proposed IATT

229. Considering the goals of the proposed IATT, what would be pragmatic alternatives? Some experts argue that if collecting revenue for some well-intentioned international environmental cause is the main objective of the

proposed IATT, it may be more pragmatic to pursue harmonization of domestic environment taxes, with an agreement for national Governments to contribute part of the revenue from these taxes to a common fund for addressing global environmental problems. The fund could, for example, be disbursed by GEF.

B. Tradeable CO_2 permits

1. Policy options

230. In 1992, the UNCTAD secretariat issued a report on how to design a global system of tradeable carbon emission entitlement (UNCTAD/RDP/DFP/1). It was argued that tradeable permits were both an efficient means of controlling man-made carbon dioxide emissions at minimum cost and an effective mechanism for transferring resources to developing countries and countries with economies in transition to help them contribute to the international effort to abate emissions of greenhouse gases. Since the signing of the United Nations Framework Convention on Climate Change in 1992 and its entry into force in March 1994, new studies on this subject by the UNCTAD secretariat have been completed. These studies focus on the themes of feasibility and implementation of a tradeable CO_2 permit scheme at the international level.

231. Among the policy options available for coping with climate change, a tradeable permit system is considered by many to be a cost-effective way of limiting CO_2 emissions. The Response Strategies Working Group of the Intergovernmental Panel on Climate Change has discussed various systems of tradeable emission rights. Those discussions raised concerns about global equity, which may be a serious impediment to the application of a tradeable permit system at the global level.

2. Technical aspects of trading

232. An international system of tradeable CO_2 permits need not begin with a comprehensive arrangement for trading in all greenhouse gases. Neither might it be necessary to negotiate from the outset a binding international agreement on emission targets and the allocation of emission allowances among all parties to the agreement. Rather, commitments by a number of countries to limit their greenhouse gas emissions might provide the basis for the adoption of an evolutionary process where it would be possible to begin with a simple scheme (e.g., a CO_2 emissions trading scheme among a small number of countries) and evolve gradually towards a more complete system.

233. A tradeable permit system might be introduced on a pilot basis among a small number of countries on the basis of a common goal. Each participating country could be allocated tradeable permits on the basis of its emission target. The system could be allowed to expand gradually. The pilot scheme could be voluntary, its main purpose being to collect information, carry out research and gain experience in this area.

234. It is appropriate to inquire into the minimum number of signatories and their assigned allowances that would be required for an efficient market.

Indeed, a market must be broad enough to ultimately attract other signatories. There is no scientific formula for determining these numbers. The lesson from other successful markets, ranging from Eurodollars to wheat, suggests a minimum of different trading blocs emitting altogether at least 20 per cent of the world's output. Thus, an emissions permit market between the United States, the European Union and Japan (accounting for roughly 40 per cent of world CO_2) based on the stabilization of CO_2 emissions at 1990 levels in the year 2000, could possibly generate more than US$ 8 billion annually at US$ 10 per ton.

3. Role of pilot schemes

235. Pilot schemes may be now the key to further progress. A tradeable CO_2 permits pilot scheme could be launched among the major emitters. Participants in the scheme would develop and test certain mechanisms that would be essential to the long-term viability of a fully-fledged system of tradeable permits such as certification, monitoring, trading, clearing, accounting, and dispute resolution. Since the use of markets can significantly lower the cost of controlling greenhouse gas emissions, it seems that it would be in the interest of the major emitters to act as "market leaders" willing to pioneer. Provided that equity concerns can be addressed in a satisfactory way, the participation of some developing countries would also be important, both for the credibility of the scheme and because appropriate mechanisms for the transfer of funds and technical assistance could be tested.

4. Unresolved issues

236. What are the major options concerning the allocation of initial quantities of "emission rights"? Schemes based on equity considerations, such as equal per capita emissions, are not likely to be accepted by developed countries. Schemes based on historical emission levels would favour countries with mature industrialized economies and would be difficult to accept by countries with growing economies. Trading schemes therefore seem to be most practicable when cooperative solutions such as a multi-tiered allocation formula can be found.

237. Would a number of detailed provisions of a potential global permit trading regime be unfavourable for developing countries? Oil-exporting developing countries fear, for example, that their commodity terms of trade will fall as a consequence of actions to limit carbon emissions, thus draining resources away from their more immediate development needs.

238. Would it be likely that trading of rights and credits would take place before carbon allocations become legally binding and enforceable? The launching of a global permit trading regime is complicated by the fact that there are no rules at all for setting the initial allocation of rights to emit.

239. What should be the lifetime of carbon credits? Participating countries potentially face a situation of changing "rules of the game". Parties facing future emissions limitations may find that they have already used the cheapest sources of carbon emission abatement. This would have to be taken into account in allocating rights, and it suggests the need for some kind of expiry or

controlled lifetime of carbon credits in order to avoid unfavourable baseline shifts and accommodate newcomers.

IV. FINANCING FOR SECTORAL AND CROSS-SECTORAL ISSUES OF AGENDA 21

A. Policy approach

240. Sections I to III of the present report dealt with macroeconomic and microeconomic policies aimed at mobilizing new and additional resources for the financing of Agenda 21, focusing on the major determinants of the availability of financial resources: first, the external environment, in particular the level of ODA, foreign direct and portfolio investment and the volume of lending by international financial institutions; second, national policies, in particular the role of the policy environment, the use of economic instruments complementary to regulations and the role of national environmental funds and private sector investment in sustainable development; third, the application of innovative financial instruments for increasing the pool of available resources for sustainable development.

241. Positive and negative developments in the external and national policy environments as well as successful and unsuccessful macroeconomic and microeconomic policies are reflected in the amount of resources available for the financing of cross-sectoral issues and sectoral finance.

242. As a result, the following discussion of financing cross-sectoral issues (financing the transfer of environmentally sound technologies and biotechnology) and mobilizing financial resources for the six sectors defined in chapters 10 to 15 of Agenda 21 is to a large extent a discussion of how to apply the policies and instruments discussed in sections I to III above to cross-sectoral and sectoral finance.

243. The same holds true for the cross-sectoral issues of poverty and demography, whose financial aspects are discussed in the report of the Secretary-General on poverty eradication and sustainable development (E/CN.17/1995/14) and the report of the International Conference on Population and Development (A/CONF.171/13 and Add.1).

B. Trends in sectoral finance

244. Current developments and trends in the financing of the six sectors defined in chapters 10 to 15 of Agenda 21 are described in reports of the Secretary-General that are before the Commission at its present session. 4/

245. The reports discuss finance in reference to the major determinants of the availability of financial resources for sustainable development and highlight specific sectoral problems in the mobilization of resources.

246. With regard to ODA, for example, the reports focus on its composition and refer to conflicts between donor and national priorities. Similarly, there is a

critical examination of the lending priorities of international financial institutions and GEF.

247. In discussing the national policy environment and its impact on sectoral finance, the reports focus on the role of economic instruments (including subsidies) and ways and means of increasing the share of private finance for sustainable development.

248. Furthermore, the reports address the potential role of innovative financial mechanisms and refer to a number of sector-specific mechanisms.

249. Finally, the reports discuss the importance of global conventions with binding financial provisions.

C. Financial resources for cross-sectoral issues

1. Financing the transfer of environmentally sound technologies

250. The debate on technology transfer is not new. However, it gained renewed international policy attention at the United Nations Conference on Environment and Development, where access to environmentally sound technologies (ESTs) was high on the political agenda.

251. Nearly three years after the Conference, it appears that a pragmatic approach is emerging, suggesting that the concept of "transfer" implied too narrow an understanding of the challenge and may even have led to some of the difficulties that plagued past transfer efforts.

252. The "new" approach to the issue of transferring ESTs underlines the need to look for cooperation in the form of technology partnerships rather than looking for "transfer" or hardware trade. Another feature of the new approach is the shift from "end of pipe" solutions to "reduction at source".

253. In view of these changes, the issue of financing the transfer of ESTs has changed, too; it is now primarily discussed in the policy framework suggested in sections I to III above.

(a) Role of external flows

254. Section I discussed the marked increase in foreign direct investment as a result of an improvement in the external environment and domestic policy reforms in recipient countries.

255. In general, most foreign direct investment is not directly oriented to transferring ESTs to developing countries. In fact, many experts worry that foreign direct investment serves to transfer environmentally inferior technologies to developing countries, as companies in more heavily regulated developed countries seek either to sell-off outmoded capital equipment and/or to shift production to jurisdictions with lower environmental standards.

256. Over the past decade, however, these fears have become less justifiable for a number of reasons. First, many developing countries are raising their environmental standards and hence are less willing to be a "dumping ground" for older, more polluting technologies. Second, larger foreign investors can no longer afford the risk of the bad publicity that comes from poor environmental performance at any of their operations. Third, technological innovations are making ESTs more economically attractive and hence there are few, or fewer, advantages to be gained from using older, typically more polluting, technologies.

257. As discussed in section I, there is also strong growth in portfolio investment, which has been stimulated by domestic policy reforms and the promotion of securities markets in the recipient countries. However, little research has been undertaken on the role of portfolio investment in transferring ESTs to developing countries. It appears, however, that its impact on the transfer of ESTs is less direct than that of foreign direct investment.

258. Developing country enterprises have raised funds on the global capital markets to finance modernization and efficiency, improvements that typically involve capital expenditure on ESTs.

259. As to the contribution of international financial institutions to the financing of ESTs, it appears that these institutions have devoted a relatively small amount of their total lending to that purpose. They recognize, however, that there is a need for a more targeted approach to financing ESTs. As a result, the World Bank, for example, will establish new programmes focusing on such financing.

260. The percentage of ODA projects that contributes directly to the financing of ESTs appears to be low, although some countries have explored supporting the transfer of ESTs as part of their trade promotion activities.

(b) Role of national policies

261. National policies for promoting the financing of ESTs are to create an adequate policy environment, put in place regulations, apply economic instruments, build institutions and provide direct incentives for private investment in ESTs.

262. Promoting the use of economic instruments will help to implement the polluter-pays principle and thereby create an incentive for exploring alternative sources of financing for ESTs. Accelerating appropriate institution-building, in particular in the financial sector, will improve firms' access to bank and capital market financing. Incentives for private investment in ESTs, in particular fiscal incentives (accelerated depreciation of assets etc.), may significantly reduce the financial burden of investing in ESTs.

(c) Role of innovative mechanisms

263. Major innovative mechanisms for the funding of ESTs include venture capital funds, publicly funded intermediaries for the transfer of ESTs and build-

operate-transfer (BOT) schemes. Recently, the establishment of environmentally sound technology rights banks (ESTRBs) has been considered.

264. Venture capital funds with a focus on ESTs are still relatively rare and the financial resources of existing funds are small. However, they have significant growth prospects and their effectiveness in transferring ESTs is substantial.

265. Among the more prominent funds are the Global Environment Emerging Markets Fund, the Nordic Environmental Finance Corporation and the North American Environmental Fund. Fund initiatives at an advanced stage of development are the Asia Sustainable Growth Fund (initiated by the Asian Development Bank), the Calvert Emerging Europe Fund for Sustainable Development and a southern Africa sustainable investment fund.

266. Publicly funded intermediaries for the transfer of ESTs assist in the development of projects that aim at transferring ESTs through pre-investment support. The support consists, among other things, in the preparation of proposals that meet the criteria of potential creditors. Among the important intermediaries are Sustainable Project Management, which is an autonomous, not-for-profit association registered in Switzerland, and the United States-Asia Environmental Partnership, which receives support from the United States Agency for International Development.

267. BOT and similar mechanisms are innovative financing techniques, particularly suitable to infrastructure investments, which have been successfully implemented. They encourage the use of ESTs and good environmental management. However, technologies are usually a fairly small component of such mechanisms. Furthermore, BOTs are usually applicable only to certain large-scale projects. The availability of capital for BOTs and skills to finance such projects are not fundamental problems. The chief obstacle is the provision of the necessary regulatory framework to allow such private sector participation. In certain markets, concerns over regulation change may inhibit access to finance.

268. ESTRBs have been suggested as mechanisms for accelerating the transfer of ESTs, through acquiring rights to ESTs and making them available to developing countries on favourable terms. At present, most development and ownership of ESTs is occurring in the private sector, and private companies are actively involved in marketing and disseminating such technologies. ESTRBs may therefore have difficulty in accessing the best technologies. It is also unclear whether ESTRBs would be more effective in actively marketing the technologies than the private sector. If it is felt necessary to support the transfer of ESTs, it can probably be more effectively done through direct assistance, either from bilateral assistance or through tax concessions in developing countries.

269. Further research is needed to investigate how ESTRBs can best combine a public sector technology ownership role with the commercial effectiveness of private sector companies.

270. Despite the innovative mechanisms outlined above, problems in financing ESTs may remain, especially for small and medium-sized enterprises requiring

relatively small amounts of capital for EST acquisition. Particular attention needs to be given to the encouragement and development of technology leasing.

2. Financing biotechnology

271. In addition to discussing the transfer of environmentally sound technology, Agenda 21 discusses the environmentally sound management of biotechnology, in chapter 16.

(a) Role of external flows

272. There is no comprehensive international survey of financial expenditure for biotechnology programmes. However, a 1993 survey on international initiatives in agricultural biotechnology conducted by Intermediary Biotechnology Services provides some useful indications. The survey states, for example, that bilateral and multilateral aid agencies, international organizations, private foundations, universities and commercial companies and national Governments are involved in the financing of international biotechnology initiatives for developing countries. Furthermore, the survey emphasizes that compared with biotechnology research and development in industrialized countries, the total financial efforts devoted to international biotechnology initiatives are far from sufficient.

273. Furthermore, the survey provides an interesting profile of financial sources. It appears that the bulk of financing is provided by foundations and bilateral and multilateral donors. Only a small fraction seems to be financed by national institutions (mostly in the form of "matching funds"), grants and national private firms.

274. In addition to the Rockefeller Foundation, there are a number of non-profit organizations and foundations in both developed and developing countries which have provided a small amount of financial and technical support to encourage local and community participation on the environmentally sound management of biotechnology, for example, A.T. International, M.S. Swaminathan Foundation and Biofocus Foundation.

275. The World Bank and other United Nations entities, such as UNDP, UNEP, FAO, the World Health Organization and UNIDO have been and continue to be a significant, although relatively small, source of funding and/or technical assistance for biotechnology development in developing countries. Examples include support for the various international agricultural resource centres and, more recently, the International Centre for Genetic Engineering and Biotechnology.

(b) Role of national policies

276. In general, financial support for biotechnology by Governments of developing countries is far below what is required to provide an adequate scientific and technical infrastructure for biotechnology development. There are encouraging trends, however. For example, the Governments of Thailand and

Viet Nam have stepped up their efforts in supporting biotechnology development, including a marked increase in financial support.

277. In developing countries, the financial contribution from the private sector for commercial biotechnology development is still low, mainly because of the high risk of investing in biotechnology but partly because of an unfavourable investment climate. This is unfortunate because the experience in developed countries demonstrates the importance of private sector involvement in the development of biotechnology.

(c) Role of innovative mechanisms

278. It appears that to some extent developing countries have been successful in promoting partnerships between the private sector and government agencies aimed at financing the development of biotechnology.

279. In developing countries and in developed countries in particular, venture capital funds, such as the Transtech Venture Fund in Singapore, can serve as a model for the mobilization of funds from banking institutions and industrial resources.

280. In view of the relatively high risk associated with biotechnology development and commercialization, more innovative mechanisms need to be developed. Cross-country strategic alliances have been particularly successful between companies in developed countries, and it may be just a matter of time until alliances between companies in developed and developing countries become viable.

281. In addition, a number of other innovative financial resources and mechanisms have been proposed, including the establishment of an international biosafety trust fund and an international venture capital fund for biotechnology.

V. MATRIX OF POLICY OPTIONS AND FINANCIAL INSTRUMENTS

282. It is evident from the discussion in sections I to IV of the present report that both international and national policy reforms offer the possibility of providing substantial new and additional financial resources for the financing of Agenda 21.

283. Given the broad scope of Agenda 21, there is need for a transparent conceptual framework for structuring discussions on international and national financial aspects of Agenda 21. The matrix in the annex below attempts to present such a framework.

284. The matrix shows most Agenda 21 issues and the principal financial resources and policy instruments related to them.

285. In the matrix, each row represents an individual sector or cross-sectoral issue and each column represents a particular instrument or policy instrument related to it.

286. By looking across any row, it can be seen that there are several financing options for individual sectors and cross-sectoral activities. These options are often complementary. By looking down any column, it can be seen that individual financing options are typically applicable to more than one sector.

287. The matrix is filled in in detail only for the issues that are on the agenda of the present session of the Commission.

288. It would be desirable to assess the effectiveness of the policy instruments listed in the matrix.

289. It would also be desirable to explore the most promising policy options and instruments for particular countries or regions. For this purpose, countries or groups of countries could launch pilot projects.

290. Finally, it would be useful to consider additional policy-relevant dimensions of the matrix, such as the public and private parties involved in decisions on and implementation of policy reforms, and the impact of different policy options on social groups.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. International policy environment and financial flows

291. The external policy environment has an impact on economic growth and hence on the availability of financial resources for sustainable development. Uneven economic growth, uncertainties about interest rate developments and continuation of the unsatisfactory terms of trade and the external debt situation will have adverse effects on the availability of resources for the financing of sustainable development, in particular in the poorest and highly indebted developing countries.

292. Trends in resource flows and debt are characterized by an average decline in ODA as a percentage of GNP, a concentration of private capital flows in countries that are less dependent on ODA and continued problems of debt servicing on the part of the poorest and highly indebted developing countries. Therefore, the Development Assistance Committee of OECD and other appropriate bodies should intensify their discussion on issues such as ODA fatigue, concentration and sustainability of private flows and the need to permit a once-and-for-all resolution of the debt crisis for the poorest, most indebted developing countries.

293. The discussion of the future role of the Bretton Woods institutions and other international financial institutions should provide an answer to the question of what can be done to increase their contribution to the promotion and financing of sustainable development.

B. National policies and resource mobilization

294. In future discussions on the role of economic instruments for sustainable development, the Commission could concentrate on offering solutions to overcoming obstacles to their implementation. In this regard, the Commission may address the insufficient political acceptability of economic instruments; difficulties in the design of economic instruments; administrative difficulties with economic instruments; conflicts between environmental and other policy objectives; anxiety about repercussions on the international competitiveness of the national economy; and adverse economic and structural conditions that the application of economic instruments may encounter.

295. In addition, the Commission could consider conducting a more concrete discussion on the specific problems of implementing economic instruments in economies at different stages of development - that is, OECD countries, countries with economies in transition and developing countries.

296. In view of the interest of many countries in switching from taxes on labour, for example, to environmental taxes in a thoroughgoing fiscal reform, more information is needed on the potential size of the tax base, how stable such a tax base would be over the business cycle and how it would behave over the long term. Regional international organizations might be encouraged to conduct national studies along those lines.

297. The phasing-out of environmentally unfriendly economic instruments, especially input subsidies, needs careful examination and the Commission should focus its discussions on the environmental impact of applying those instruments and the size of budgetary resources which could be redeployed.

298. Considering that in various regions there is continued interest in using national environmental funds for the financing of sustainable development, while at the same time there are serious misgivings about these funds on efficiency grounds, the Commission may further explore their benefits.

299. Considering the unsatisfactory mobilization of financial resources for sustainable development, in particular ODA resources, promoting the mobilization of private financing for sustainable development has become very important. It would be desirable for the Commission to discuss more deeply the current and prospective role of the private sector in this regard, develop policy options for enlarging its role and explore the potential of related innovative mechanisms such as co-financing and venture capital funds, in particular for leveraging ODA and public expenditures on sustainable development.

C. Innovative international and national mechanisms for resource mobilization

300. The discussion on levying an internationally agreed tax on air transport is to be seen as a step in the right direction, which could be followed by taxing other environmentally harmful activities with global effects. More studies need to be undertaken to prepare the ground for an international dialogue on such a tax.

301. The launching of a pilot project on tradeable CO_2 permits such as the one currently proposed by UNCTAD should be encouraged. The results of such a pilot project can be expected to increase the knowledge base for the further evaluation of such schemes.

D. Financing for sectoral and cross-sectoral issues of Agenda 21

302. The discussion of financing sectors and cross-sectoral activities is to a large extent a discussion of how to apply economic policies and instruments in a given international policy environment. Additional factors need to be taken into account, such as donor priorities, lending policies of international financial institutions, the availability of specific innovative mechanisms and the existence of international conventions.

303. As a result, future discussions of the cross-sectoral issues of financing environmentally sound technology transfer and biotechnology should focus on the availability of external financial resources, the adequacy of national policies with regard to creating an appropriate financial infrastructure and fiscal incentives and the availability of resources from innovative mechanisms such as co-financing and venture capital funds.

E. Matrix of policy options and instruments

304. Given the broad scope of Agenda 21, there is a need for a transparent, conceptual framework for structuring discussions on international and national financial aspects of Agenda 21. This is best provided in the form of a matrix.

305. It would be desirable for the Commission to consider a multi-year work programme to assess the effectiveness of the instruments and policy options listed in the matrix and to explore the most promising policy options and financial instruments for particular countries or regions for the implementation of Agenda 21.

F. International cooperation in the application of economic instruments and policy reforms

306. The Commission should encourage the development of mechanisms to enable developing countries to exchange experience among themselves and with developed countries and countries with economies in transition on the use of economic instruments. It should also encourage programmes intended to strengthen the capacity of developing countries to implement them.

307. The Commission should also begin a process of consensus-building regarding the need for harmonization in the application of economic instruments likely to have significant effects on competitiveness. This could take the form of a multilateral consultation process.

308. The consultations should be flexible and proceed in stages. They should address selectively sectors and policies that offer particularly promising opportunities for environmental, social and economic gains. Moreover, they

should be demand-driven and voluntary, country involvement being determined by interest in the specific matters under discussion. They could be organized at a subregional, regional or global level, as appropriate.

309. The consultations should respect the right of the countries to set the level of environmental standards. They should also allow countries at different stages of development to proceed at different speeds in implementing agreed-upon policy changes.

310. The Commission, supported by other organizations and financial institutions, should provide leadership in advancing such a process by developing a concrete proposal for further consideration. The Commission's growing efforts to encourage the voluntary presentation and examination of national experiences in developing and applying national sustainable development strategies can make an important contribution to the identification of, and agreement on, shared national goals that could form the basis for eventually implementing such a process.

Notes

1/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

2/ See the report of the Commission on Sustainable Development on its second session (E/1994/33), chap. I, sect. B.

3/ Organisation for Economic Cooperation and Development, Development Cooperation (Paris, 1995).

4/ Reports of the Secretary-General on an integrated approach to the planning and management of land resources (E/CN.17/1995/2), "combating deforestation" and the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests (E/CN.17/1995/3), managing fragile ecosystems: combating desertification and drought (E/CN.17/1995/4), managing fragile ecosystems: sustainable mountain development (E/CN.17/1995/5), promoting sustainable agriculture and rural development (E/CN.17/1995/6) and conservation of biological diversity (E/CN.17/1995/7).

Annex

MATRIX OF POLICY OPTIONS AND FINANCIAL INSTRUMENTS

	International policy environment				
Sector	ODA	GEF	Debt relief	Trade flows	Private financial flows
Sustainable development	X		Rescheduling	X	BOT
			Debt for sustainable development swaps		
Biodiversity		X	Debt-for-nature swaps	Biodiversity	Green funds
				Patent rights	Venture capital
Forest resources	X	X	Debt-for-nature swaps	Terms of trade	Green funds
Fragile ecosystems	X	X	Debt swaps	Non-resource based employment	Green funds
Fresh water resources	X	X		More efficient water use	Foreign direct investment
Land resources	X		Debt-for-equity swaps		
Sustainable agriculture	X		Debt-for-sustainable-agriculture swaps	Market access	Foreign direct investment
				Terms of trade	
Atmosphere		X	Debt relief for energy efficiency improvements	More efficient energy use	Foreign direct investment in the energy sector
Oceans		X			
Hazardous waste					
Toxic chemicals					
Solid waste					
Radioactive effects					
Health	X				
Urban environment	X				
Biotechnology				Market access	Venture capital
				Profit sharing	
				Technology transfers	

Sector	National policy reforms					
	Economic and financial reforms	Property rights	Resource pricing	Subsidy reduction	Taxation	Environmental charges
Sustainable development	Competitive capital markets	Secure property rights	Full-cost pricing	Reduce energy and capital subsidies	Green taxes	Depletion and pollution charges
Biodiversity	Environment funds	Biodiversity patents	Prospecting fees	Reduce land conversion subsidies	Habitat protection subsidy	Deforestation charges
Forest resources	Environment funds	Long-term concessions Bidding	Forest product pricing	Below cost timber sales Conversion subsidies	Forest concession taxes	Deforestation charges
Fragile ecosystems	Environment funds	Communal property rights		X	Differential land use taxes	Differential land use charges
Fresh water resources	Municipal bonds	Water rights	User charges	Subsidies for water conservation and irrigation		Sewage and effluent charges
Land resources	X	No titles for land clearing Secure land ownership		Agricultural subsidies Below-cost public land sale/lease	Property taxes Land use taxes Transfer taxes	Impact fees Waste disposal charges
Sustainable agriculture	Removal of interest rate ceilings	Secure land ownership	Water pricing	Water subsidies Agro-chemical subsidies	Agro-chemical taxes IPM subsidies	

Sector	National policy reforms					
	Economic and financial reforms	Property rights	Resource pricing	Subsidy reduction	Taxation	Environmental charges
Atmosphere			Energy pricing	Energy subsidies	Energy taxes	Emission charges
Oceans		200-mile EEZs				Effluent charges
Hazardous waste			X	X		Presumptive charges
Toxic chemicals			X	X	Taxes on chemicals	Feedstock charges
Solid waste			X	X		Collection and disposal charges
Radioactive effects						
Health	X					
Urban environment	X				Property taxes Relocation incentives for industry	Pollution charges
Biotechnology	X					

Sector	Innovative instruments	
	Domestic innovative mechanisms	Global innovative mechanisms
Sustainable development	Ecolabelling Ecofunds	Joint implementation
Biodiversity	Bioprospecting fees Ecotourism fees Scientific tourism fees	Patents Intellectual property rights TCCs
Forest resources	Watershed charges Tradeable reforestation credit	Tradeable forest protection obligations Carbon offsets
Fragile ecosystems	Relocation incentives TDRs	TCCs
Fresh water resources	Tradeable water shares	Water trading across borders
Land resources	Betterment charges Differential land use charges	
Sustainable agriculture	Differential land use charge Ecolabelling	International sustainability standards/price premiums Carbon offsets
Atmosphere	Tradeable SO_2 emission permits	Tradeable CO_2 permits Carbon offsets Carbon taxes Air travel tax
Oceans	ITQs	Oil spill bonds
Hazardous waste		
Toxic chemicals		
Solid waste		
Radioactive effects		
Health		

Sector	Innovative instruments	
	Domestic innovative mechanisms	Global innovative mechanisms
Urban environment	Betterment charges TDRs Tradeable emission permits TDQs	
Biotechnology		Bioprospecting Profit sharing

X: Important and self-explanatory contribution.

BOT: Build-operate-transfer.

IPM: Integrated pest management.

EEZs: Exclusive economic zones.

TCCs: Tradeable conservation credits.

TDQs: Transferable development quotas.

TDRs: Transferable development rights.

ITQs: Individual tradeable fishing quotas.
