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SERIE RESEARCH MEMORANDA

**INTEGRATION OF ENVIRONMENTAL EXTERNALITIES IN
INTERNATIONAL COMMODITY AGREEMENTS**

Henk Kox

Research Memorandum 1989-19

April 1989

**VRIJE UNIVERSITEIT
FACULTEIT DER ECONOMISCHE WETENSCHAPPEN
EN ECONOMETRIE
AMSTERDAM**

100

Integration of environmental externalities
in international commodity agreements

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SUMMARY.

A great deal of ecological damage in Third World countries is associated with commodity production for the world market. Competition in commodity markets prevents commodity-exporting countries from making the costs of environmental preservation and reconstruction a recurrent element in their price. In this paper it will be argued that an international commodity agreement (ICA) can be the institutional locus where environmental externalities associated with commodity production can be integrated in a price system. Existing international commodity agreements (ICAs) can be extended to include a price mark-up for environmental preservation and reconstruction in commodity-producing developing countries. This price mark-up can be levied in the form of an export tax or in the form of a surcharge on import tariffs. This extended function of ICAs could give a new impulse to international negotiations on ICAs, especially when this happens in co-operation with the Common Fund for Commodities.

Introduction

There is a growing international awareness that the environmental destruction, both in developing and in developed countries, has to be stopped. Otherwise, future generations will be charged with an immense burden and it is not certain that destruction of the natural environment is reversible. Rapid disappearance of tropical forests, desertification, pollution of subsoil and surface waters are all environmental problems which manifest themselves on a transnational scale. Long-term effects like a greenhouse effect in the atmosphere, perforation of the ozone layer around the earth, the acidification of the rain, and dwindling of species cannot any more be tackled on a national or regional scale.

The need for action against the global environmental degradation is manifestly increasing. Massive international financial efforts and investments are required , and probably also changes in consumption patterns to reverse these trends. Few people will deny that industrialised countries of the OECD will have to provide most of the required finance, for it is their welfare level and their historical share in environmental destruction that have tipped the ecological balance.

At present, hardly any institutional channel exists for a global allocation of funds for environmental preservation and recon-

struction. The World Bank and the United Nations Environmental Program (UNEP) do finance specific programs and projects, but only on an ad hoc basis. Most environmental resources are consumed unpriced by the current consumers. Pollutants produced as by-products lack a negative price. International trade further disturbs the geographical relation between production and consumption of pollutants and environmental resources. Unpriced environmental inputs are used but not counted in exported final goods, while at the same time most pollutants are willy-nilly 'consumed' domestically. Leontief (1973) designed a theoretical framework for the analysis of the implications of these uncounted externalities. If the latter were to be included in a price system, the real cost prices of all final products would be revealed. Such prices would invoke new forms of intersectoral and international transfers of funds. Most likely, these real prices would cause some kinds of production to be halted or minimized because their prices are unacceptable to consumers, companies and governments.

There is no reason to assume that internalization of environmental externalities cannot work on a global scale. This paper attempts to outline the steps necessary for a partial integration of environmental production costs in an international context.

Third World commodity production and environment

The Brundtland-report (WCED 1986) recently stressed the connection between forced development and environmental destruction. Enforcement of a rapid industrialization process, enhanced production of agriculture and mining, and disappearance of traditional rural structures often take a heavy toll in terms of environmental damage in Third World countries. Much of the damage arises from the production of agricultural and mining commodities destined for export to OECD countries.

An example can be found in the impact of international trade in tropical timber on tropical rain forests. The need for foreign exchange encourages many developing countries to cut timber faster than forests can regenerate. This overcutting not only depletes future timber sources, but also incurs the loss of other forest-based livelihoods, and increases in increases soil erosion and downstream flooding. Similar negative ecological effects have been reported as caused by cattle-ranching and fishing in both coastal and deep sea waters. Soil exhaustion, abundant use of fertilizers and pesticides in the production of staple crops, demolition of vegetation and soil structure caused by open-cast mining (e.g. for bauxite), waste disposal by mining activities, can in developing countries often be imputed to the production of export commodities.

Most of the directly harmful effects are felt only by the local population in Third World countries. The long-term effects such as soil erosion, or exhaustion of soil and water resources, manifest themselves felt through regular 'natural' catastrophes (like land slides, floods or drought) or in the form of a slow process of rural impoverishment caused by lower agricultural yields. Some effects (e.g. pesticide residues) trickle down along the production chain. They appear as health hazards for transport and manufacturing workers and, ultimately, also for consumers in developing countries.

Notwithstanding growing concern about the associated ecological damage, most Third World governments hardly have any option but to continue the production of export commodities. In 1985, seventy developing countries depended for more than 50 percent of their export earnings on export of primary commodities. In forty of them (including 23 African countries) commodities even represented 90 percent or more of their exports. (1) The period of low prices since 1980 urged many countries to produce and export even more primary commodities in order to finance their import needs and growing debt problems. The prescription to increase commodity exports often formed part of the IMF readjustment package for countries with debt problems, thus forming a factor that contributed to further international supply imbalance and

depression of export commodity prices. (2). Export diversification programs are difficult to realise and can work only in the longer term. Many countries tried to shift towards downstream activities in the production chain (industrial processing of primary products) in order to improve their export earnings. This export strategy is, however, hampered by tariff escalation in OECD countries. From a purely ecological point of view, industrial processing in many cases only worsens the environmental situation. OECD tariffs and international trade structures are so organised that Third World countries enjoy the dubious delight of a growing comparative advantage in pollution-intensive industries like alumina, and pulp and paper. The Brundtland-report explains this comparative advantage in the following way:

" Industrial countries have generally been more successful than developing ones in seeing to it that export product prices reflect the costs of environmental damage and of controlling that damage. Thus in the case of exports from industrial countries, these costs are paid by consumers in importing nations, including those in the Third World. But in the case of exports from developing countries, such costs continue to be borne entirely domestically, largely in the form of damage costs to human health, property and ecosystems." (3)

As a matter of fact, developing countries subsidise industries and consumers in OECD countries. Walter & Loudon (1986) calculated that OECD members for their 1980 imports from developing countries would have incurred direct pollution control costs of \$ 5.5 billion if

they had been required to meet the environmental standards then prevailing in the United States. If the pollution control expenditures associated with the materials that went into the final product are also counted, the costs would have mounted to \$ 14.2 billion in 1980. (4).

Some Third World governments explicitly face the dilemma of the need to produce export commodities, while at the same time being aware of the need to minimize damage to the environmental resource base supporting this growth. A solution for this dilemma would be to use other, less damaging production techniques, like integrated pest management, 'green' fertilizers, and systematic reforestation. Sometimes it will be necessary to complement commodity production with additional production that neutralizes occurring harmful effects, e.g. waste clearance and reforestation.

The feasibility of such techniques and the additional production costs involved can only be established on a commodity-specific, or even a region-specific basis. This being done, it is possible to establish the additional costs of such alternative techniques relative to current techniques. A price premium for commodities produced in this way will be required to cover the extra costs. The costs of environmental preservation and reconstruction must become a recurrent element of the production costs of commodi-

ties.

In a situation where many debt-ridden Third World countries compete each other with the same commodities and try to increase their export volumes, it will be hard to realize the necessary price premium. International trading houses, manufacturing firms, and other importers in developed countries skillfully play the 'Divide et Impera'-game, thus contributing to the same effect. The free market solution therefore seems to offer meagre prospects. Concerted international action and institutional arrangements will be necessary to realize the internalization of the environmental costs in commodity prices. In this context it becomes possible to give international commodity agreements a new, additional footing.

Changing climate for international commodity agreements

The tin crisis marked a crisis of international commodity agreements (ICAs) in more than one sense. In Third World countries and in UNCTAD circles ICAs were often considered as a means for the attainment of price stabilization and stabilization of export earnings of the producing countries. (5 The International Tin Agreement for a long time seemed to realize both these ends, and therefore was considered by many people as a success story for ICAs.

To characterise the current discussion on ICAs a brief excursus on the tin agreement is useful. The International Tin Agreement (ITA) was several times renewed since its birth in 1956. It held its position until 1985. Until then it succeeded not only in stabilizing the tin price, but also in maintaining the price level on a fairly high level, thus ensuring export earnings, even for high-cost tin producers like Bolivia. The market regulation effected by the ICA was at times reinforced and at other moments thwarted by releases of tin metal from US strategic bufferstocks. A destabilising factor was the strong production growth of non-members of the ITA: China and especially Brazil (became the world's largest tin producer in 1988). The artificially high tin price induced a substitution process in the main tin-consuming industries that because of the investments involved will be hard to reverse. (6). In 1985 it appeared no longer possible to resist market forces. A decreasing tin consumption and excess supply put a constant pressure on the free-market tin price. The ITA bufferstock manager kept buying tin to support the price. In the last months before the tin crisis the bufferstock manager was the only buyer at the London Metal Exchange. In November 1985 the member countries of the ITA refused to provide further financial means for the bufferstock manager. The overhanging bufferstocks at that time already amounted half the yearly world tin production. The

refusal led to an immediate breakdown of the price level. Because the bufferstock was mostly financed by bank loans with the stock-ed tin as security, ITA's bufferstock manager acutely became insolvent and the tin crisis was a fact.

It also was the breakdown of a symbol. The concept of international commodity agreements as a means for maintaining prices and export earnings on a high level became difficult to defend. This happened in a period that developing countries as a group experienced a fall in real commodity prices of 31 % (1980 - 1987). Their shortfall of export earnings over the same period could only be restricted to a 12 % level by substantially increasing their commodity exports. (7).

In the (re)negotiation process for new ICAs some major commodity-importing OECD countries exerted sustained and concerted pressure to orient the agreements more towards 'free' market forces. In this situation price stabilization was left as the only attainable goal of such agreements. The ICAs renegotiated since the collapse of ITA have a built-in 'mechanism' for a periodical readjustment of reference price levels, in order not to get too large deviations from the 'free' price level. In the latest cocoa agreement (1986-1989) readjustment of the reference price levels is regulated by a semi-automatic mechanism. The latest rubber agreement (1987-1992) includes an automatic mechanism

which ensures that the reference price closely follows the market prices. Current ICAs (8) are mainly aimed at market regulation and price stabilization, keeping its reference and intervention prices in close conformity with market prices. This leaves the pressing problem of commodity-related shortfalls in export earnings unsettled. (9). Other international arrangements like IMF's Compensatory Financing Facility and the ones provided within the Lomé Convention (Stabex, Compex) may in fact form better ways to deal with this problem.

Disappointment about ICAs failure to meet earlier expectations about stabilization of export earnings led to a decreasing appreciation for these arrangements. In a report to the UNCTAD VII meeting the UNCTAD Secretariat concluded:

"In respect of work on individual commodities (...) the results have been meagre and, in many cases (excepting renegotiations of operative ICAs) inter-governmental efforts have lapsed in recent years." (10).

Another author even declared the ICAs "dead as dinosaurs". (11). So far the actual situation around international commodity agreements.

Environmental issues in ICAs

International Commodity Agreements are among the very scarce international institutions capable of establishing a direct link between consumption, trade and production. Therefore, ICAs offer

a suitable institutional framework to link environment protection and international commodity trade. This can be realised in several ways.

Up to now only one commodity agreement, namely the International Tropical Timber Agreement, explicitly includes environmental aspects. In the timber agreement member countries are encouraged "to support and develop industrial tropical timber reforestation and forest management activities". Another of its seven objectives is "to encourage the development of national policies aimed at sustainable utilisation and conservation of tropical forests and their genetic sources, and at maintaining the ecological balance in the regions concerned". (12). For the realisation of these objectives R&D projects in the field of reforestation are promoted, while one of its three subcommittees concerns itself with reforestation and forest management. The Agreement encourages member countries only on a voluntary basis to promote environmental protection and reforestation. It includes no provisions to establish direct links between the costs of forest reconstruction and timber prices.

The terms for the integration of environmental protection elements in ICAs can be extended beyond those included in the timber agreement. ICA-negotiations can be used to come to an agreement on the price premium necessary to cover the costs of alternative

production techniques or environmental reconstruction expenses in producing countries. In this way environmental externalities of commodity production will be included in an international price system.

When countries assembled in ICA-negotiations agree on this principle a number of further steps have to be taken before implementation can be successful. In next section necessary steps preliminary to the integration of environmental externalities in negotiated reference prices will be discerned.

Towards integration of externalities

The first implementation phase will comprise rather detailed technical and economic studies for each separate commodity. The costs of this study phase might be financed by the Common Fund under the Integrated Programme for Commodities ('Second Account'), UNEP, and/or UNIDO. A number of topics for necessary partial studies can be identified:

- (a) A global inventarisation of the environmental effects of the production of a specific commodity in the main producing countries.
- (b) An assessment of available alternative production techniques or additional measures to limit the most important negative environmental effects. If possible, a time path for implementation of the available technical alternatives (on purely technical criteria) should be worked out. When necessary, the technical applicability of these techniques and measures in the main producing countries has to be differentiated.

- (c) A next study subject is the appraisal of the economic effects of alternative production techniques and additional measures. The effects on the level of production costs and production volumes have to be estimated, conditionally differentiated for the main producing countries. For the best alternative techniques the incremental cost price relative to costs under current techniques has to be established, thus indicating the magnitude of the gross price markup that will be necessary. For the main producing countries a tentative assessment of the effects on import requirements, employment and social communities has to be part of this study.
- (d) Another study subject will be the investigation of probable substitution effects that may occur in consuming countries and industries as a consequences of the gross price markup. How will the price elasticity of demand affect the various producing countries under different price markup scenarios ?
- (e) Last, but not least in importance, is a study on the form of the price markup. In a section below two main variants for the introduction of the price markup will be described, viz. an export tax versus import duty. Though the import surcharge variant seems preferable for some reasons, the ultimate choice will depend on the practical situation prevailing in a specific commodity market. This study subject also encompasses the outline of proposals for procedures, checks, monitoring agencies, and fund management.

For the second phase political decision-making round the negotiating table will be central. The outcome of the studies has to be the basis for the negotiation process. Most probably, the studies will contain a number of variants rather than clear-cut, unambiguous conclusions on the issues involved. Across various diverging interests - between producing and consuming nations, between producing countries with different production conditions, between ecological action groups, governments, and established interests in commodity chains (like transnational companies) - agreement

has to be reached on a number of issues. The most important of them are:

- * **The acceptable level of ecological damage.** For consuming nations there will be the trade-off between current cheap commodity supply versus tolerating ecological damage in producing countries that endanger the global ecosystem in the future. It is to be expected that on some issues the tolerance levels will be lower, namely in cases where immediate health damage may be caused in consuming nations, e.g. due to pesticide residues in agricultural commodities. For producing nations there is the trade-off between ecological damage and the potential loss off export earnings (when consuming countries are likely to substitute a higher-priced commodity), depending among other things on the availability of alternatives for export diversification. Probably the best negotiating strategy will be to focus on a agreed-upon unacceptable level of ecological damage associated with the production of the commodity. This being agreed, it is possible to assess to which extent this applies to all producing countries.
- * **A compromise has to be reached on the magnitude of the price markup necessary to cover the extra costs of alternative techniques and measures in the production process.** Among producing nations it will easily be agreed to establish a minimum level, i.e. that associated with the extra costs that even the country with the most favorable production conditions will have to cope with. It may be agreed to defend a higher markup, which implies that countries with the most favorable production conditions can realise extra gains. However, even with a 'minimum-level' strategy tough bargaining with the consuming nations can be expected.
- * **Finally, governments must achieve an agreement on a number of questions relating to the institutional form in which the price markup will be introduced (import surcharge, export tax or other forms).** Associated with this conclusion are decisions on a number of questions regarding the setup of a monitoring system, check procedures and sanctions to guarantee that the price premium will be paid and that the resulting extra earnings will be allocated to expenses for environmental reconstruction and conservation as agreed upon in the agreement. As part of a monitoring system a subcommittee of the ICA may be charged with

a permanent review of ecological, technological, and economic conditions in the commodity branch. The subcommittee may periodically present proposals on necessary adjustments of the price markup.

The actual extension of current ICAs with provisions to effectuate the incorporation of environmental externalities will be the third stage.

Import levy or export tax

In principle the environmental price markup can have the form of a commodity-specific import duty charged by the importing countries or the form of an commodity-specific export tax levied by the exporting countries. Both forms have their own advantages and disadvantages.

One of the implications of the export tax variant is that commodity-importing developing countries will face higher import bills. When the international community agrees on the principle that most of the financial burden of the environmental reconstruction and conservation will have to be borne by the OECD countries, additional measures have to be taken. The most direct way to elaborate this principle would be the foundation of a compensatory fund financed by OECD countries and managed by the Common Fund for Commodities (a 'Third Account' ?) or the World Bank. The proportions (13) of the fund and the distribution of 'drawing rights' are to be settled separately.

A second problem associated with the export tax variant is the necessity to limit or rule out the possibility of 'free riding', i.e. benefiting from the arrangement without sharing the burden of it. Therefore, it seems unavoidable to introduce some controls that may limit the national sovereignty of producing countries. The markup operation can only be a success when the export tax is actually levied in all exporting countries and when funds stemming from this surcharge are verifiably used for environmental reconstruction or preservation. Any evidence that these conditions are not or only partly fulfilled by one or more producing country would undermine the total agreement. Other producing countries would fear unfair competition if exporters take the levy for their own account as a form of price discount. On the other hand, consuming countries in the longer term would no longer be prepared to pay a price markup that flows into the pockets of private exporters or in general government finance. To prevent these things to happen producing countries will have to accept some forms of international audit that check the observance of the rules of the agreement by the producing countries. Governments might consider it to interfere with their national sovereignty. The auditing body should have the right to inspect:

- (a) exporting companies in order to check whether the price markup is actually charged by the exporter and whether the funds stemming from the markup actually were transferred to the national government. Also the origin of the expor-

ted commodities has to be verified, in order to prevent misuse by re-export or blending of commodities from countries where no export tax is levied.

- (b) the financial transactions of the national government related to a special account to be created for the transfer of funds from the price markup. The international auditing committee should be entitled to review both the receipts and the expenditures from this account.
- (c) the environmental preservation and reconstruction projects financed from these expenditures and shaped by private producers, or by local authorities in the commodity-producing areas.

In case irregularities are found, the auditing committee reports to the standing committee or governing board of the ICA, that may urge the country involved to undertake corrective steps. When the governing board of the ICA and the national government disagree reach agreement a problem arises. Juridical action (e.g. for the International Court of Justice in The Hague) seems not the most appropriate way to regulate an escalated conflict, as the actual economic functioning of the ICA in many cases will be undermined before a settlement is reached.

It has been shown that the environmental price markup in principle can be charged in the form of an export tax, though implementation in this way is marred by the necessity of extra measures and international bureaucracy. Besides, these measures can easily create conflicts with national sovereignty feelings of producing countries. Therefore, it is more than worthwhile to consider an alternative implementation of the price markup, viz. in the form

of an import duty. Many of the problems mentioned before may be avoided when the price markup is charged as an import surcharge. This commodity-specific import surcharge will have to be paid by importers in the commodity-importing developed countries. They pay a fixed amount per quantity imported to the fiscal authorities of their national government. The government of the importing country periodically transfers this sum to a special environment fund administered by the ICA. Governments of producing countries can make drawings from this fund for projects elaborated for environmental preservation and reconstruction to neutralize negative ecological side effects associated with the production of a commodity. The exporting countries and a statistical body of the ICA knows the commodity quantities exported, so the total annual increase of the fund can relatively easy be established. Also, it will be relatively easy to establish the amount due from every importing country. In other words, the import surcharge variant has the advantage that its effectuation is relatively easy to check. The 'drawing rights' from the funds can be allocated to the producing countries according to their exports of the commodity. Additional stimuli and technical assistance may be necessary to avoid that some producing countries do not present enough elaborated and feasible projects to be financed from their quota in the fund.

A relative disadvantage of the import surcharge variant is that the connection between commodity production and implementation of environment-preserving techniques becomes less directly.

Conditions for success

It has been shown that integration of environmental externalities in ICAs is possible, though not easily accomplished. In the model described thus far, only current costs for environmental protection and reconstruction have been taken into account, while additional markups for the depletion of non-renewable resources (e.g. in the case of mineral commodities) have been left out of consideration. The latter subject has been widely discussed in literature, especially in reaction to the publications of the Club of Rome. This problem was here left out of consideration for purely practical reasons. The matter implicates a number of highly disputable valuation questions like those regarding time preference, historic-geographical distribution of the consumption of depletable natural resources and the current value implications of future technical innovations in recycling, material-saving and the development of non-scarce natural substitutes. In order to avoid a paralyzing international dispute on these matters, it seems preferable to make a start with the internalisation of current environmental externalities associated with commodity

production.

Introduction of a price markup is not necessarily associated with price stabilisation. However, the combination of these two issues within one international commodity agreement will enlarge the chances for success. Without provisions and mechanisms to secure price stabilisation the commitment of consuming countries to pay the markup would severely be tested in periods of price booms. Alternately, the commitment of producing countries to insist on payment of the premium would undergo a hard test in periods of low prices when competition is harsh. In order to enlarge their sales exporters might decide to take the markup for their own account as a form of price discount. So, strong price volatility would negatively influence the feasibility of an environmental price mark-up. Therefore, ICAs with economic mechanisms (buffer-stock, quotas) for price stabilisation - the so-called formal ICAs - seem more success-prone. Formal ICAs exist or existed for sugar, tin, coffee, cocoa and rubber. From the point of view of consumers the price markup, be it in the form of an export tax or import duty, functions as a form of turnover tax on the international price of the commodity.

All formal ICAs depend for their success predominantly on the political will of participating governments of producing and consuming nations. Apart from that, 'external' factors and actors

will have their influence. International commodity agreements be successful only if certain conditions apply. The commodity must have a certain degree of homogeneity regarding quality and variety, and it must be possible to stock it in bufferstocks at reasonable costs. Price formation takes place on a market or exchange where the price can be influenced by a bufferstock manager. The main producing and consuming nations must participate in the ICA, so that free market transactions outside the sphere of the ICA can be limited in magnitude and number. Stable supply conditions must prevail, avoiding discrepancies between (a) the interests of traditional producers and newcomers, and (b) diverging production costs in the different producing countries. Supply and demand side of the commodity market should not be dominated by one or a small number of transnational corporations regulating the market according to their own interests (e.g. vertical integration), or benefiting from the continuation of highly volatile prices (e.g. traders and speculators).

Informal ICAs, like those on jute, wheat, tropical timber and olive oil, lack economic mechanisms for price stabilisation. This does, however, not necessarily mean that an environmental price markup is unfeasible. Participating governments could reach an additional agreement on the establishment of a price markup sys-

tem. This might even be an initiative of importing countries. An example of the latter system is currently under discussion for the international tropical timber trade. European timber trade organizations, feeling a growing public pressure to limit the imports of tropical hardwoods that lead to the disappearance of tropical rain forests, are lobbying their governments for a surcharge on the import prices of tropical hardwood. This surcharge (extra import levy) will be used to fund - through the International Tropical Timber Organization - the development of sustainable tropical timber resources. If such a system comes into existence exporting countries can make drawings from this fund for reforestation projects.

Conclusion

Damage to the ecosystem in developing countries is often indisputably related to international trade and especially the international trade in commodities. Partly because of their debt problem and struggle against poverty, these countries lack the necessary financial means for investment in environmental conservation and reconstruction. Therefore, there are very good reasons to argue in favor of a transfer of funds for ecological conservation and reconstruction from OECD countries to Third World countries. Present forms of fund transfers for ecological reconstruction

(via World Bank, FAO or UNEP projects) occur only on an ad hoc basis. Internalisation into a price system is absent.

International commodity agreements (ICAs), however, are appropriate institutional vehicles for the internalisation of such a funds transfer by means of a markup in the commodity price.

Several necessary steps for the realisation of this extra objective for existing and future ICAs are identified. Whether the 'environmentalisation' of ICAs will be successful depends primarily on the political will of the participating producer and consumer nations. Other factors, associated with the particularities of a specific commodity market, may also influence the degree of success.

It has been shown that, in principle, an environmental price markup can be charged in the form of an export tax, though additional measures are necessary for the reimbursement of the price markup paid by Third World commodity importers, and for the creation of an international auditing body. The activities of the latter body might interfere with national sovereignty feelings in producing countries. Because of the disadvantages of the export tax variant, a system in which the price markup is levied as an import tax surcharge in commodity-consuming developed countries seems preferable.

At present, and particularly since the 'tin crisis' of 1985, several ICAs find themselves in an impasse caused by low commodity prices and a change of attitude towards ICAs in major OECD countries. Many developing countries show disappointment about the failure of ICAs as instrument for the stabilisation of export earnings. The addition of an extra function as described above can give a new impulse to current and future ICAs, particularly now the operation of the Common Fund for Commodities comes in sight.

NOTES

- (1) World Bank (1986).
- (2) UNCTAD (1988).
- (3) WCED (1987), p. 83.
- (4) Walter & Loudon (1986). This calculation of the magnitude of the hypothetical subsidy might be an underestimation of the real costs of ecological damage in exporting countries. (WCED 1987, p.84). Besides economic damage costs associated with resource depletion are not counted.
- (5) The interpretation of ICAs as a means for export earnings stabilization always was criticized by various authors. Many governments of various developed countries also opposed this interpretation on various occasions.
- (6) The relatively high price of tin caused a decline of the consumption of tin for tin-plate and canning, the most important applications of tin metal. Tin-plate became more and more substituted by aluminium and coated steel. (ITC, 1986; Economist Intelligence Unit, 1987).
- (7) IMF Commodities Division (1988), p.8
- (8) The coffee agreement (1983-1989) represents a special case among the formal commodity agreements. For the regulation of the coffee market mainly export quotas are used. There is no bufferstock mechanism. At the beginning of each 'coffee year' negotiations take place between the participating countries to establish the reference prices.
- (9) The cumulative loss of export earnings from non-fuel commodities during the period 1981-1986 has been estimated to amount \$ 70 billion for developing countries (UNCTAD, 1987).
- (10) UNCTAD (1987), p. 113.
- (11) George (1988), p.61.
- (12) UNCTAD (1983), p. 2.
- (13) The proportions of the fund might be set at a level according to the volume of this specific commodity that developing countries imported in year t-1. Developed countries and maybe also the more industrialised NICs contribute to the fund according to their import volume in that same year.

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