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TRADE, ENVIRONMENT AND DEVELOPMENT
LESSONS FROM EMPIRICAL STUDIES:

The case of Brazil

Synthesis report by the UNCTAD secretariat
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CONTENTS

I. INTRODUCTION

1.   In the framework of the UNCTAD/UNDP project on "Reconciliation of Trade and Environment Policies", a study on trade and environment linkages in Brazil was carried out by the Foundation Centre for Studies on International Trade (Fundaçao Centro de Estudos do Comercio Exterior, FUNCEX). FUNCEX also prepared a study on the potential effects of eco-labelling in the European Union on Brazilian exports. This report provides a synthesis, prepared by the UNCTAD secretariat, of the following studies:

> (a)   Pedro de Motta Veiga (coordinator), Marta Reis Castilho and Galeno Ferraz Filho, <u>Relationships between trade and the environment: the Brazilian case</u>.[1]

> (b)   Pedro da Motta Veiga, Mário C. de Carvalho Jr., Maria Lúcia Vilmar and Heraldiva Façanha, <u>Eco-labelling schemes in the European Union and their impact on Brazilian exports</u>. Paper prepared for the UNCTAD workshop on Eco-labelling and International Trade, 28-29 June 1994.

2.   The first study contains a comprehensive analysis of the vulnerability of Brazil's exports to environmental requirements, based <u>inter alia</u> on their product composition and destination as well as on environment-related factors, such as natural resource and pollution intensity of production. It also includes detailed surveys of the iron and steel, pig iron, and pulp and paper sectors, including on business strategies in response to domestic and external environmental policies, standards and regulations. In the second study, the possible effects on Brazilian exports of eco-labelling programmes in the European Union are analysed on the basis of case studies covering pulp and paper, textiles and footwear. Both studies contain recommendations.

3.   The sector-specific analyses in both studies include an examination of a series of factors that determine the potential competitiveness impacts of environmental requirements at the firm level, such as firm size, share of exports in total production, destination of exports, patterns of competition in export markets, and corporate structure, particularly in terms of vertical integration. The studies stress that since sectors tend to be quite heterogenous in terms of firm size and level of technology, the competitiveness effects of environmental regulations tend to be differentiated even within sectors. Small and medium sized enterprises (SMEs) tend to have larger difficulties in complying with environmental requirements than large firms. However, even large firms may have difficulties in complying with certain stringent environmental requirements emerging from external markets.

4.   Both studies point out that Brazil's exports may be vulnerable to environmental factors, in particular for two reasons. First, in the case of Brazil, international competitiveness is derived to a large extent from the intensive use of natural resources and energy. Secondly, a significant share of exports consist of homogeneous, low-value-added products, which compete in international markets on the basis of price.[2] Therefore, possibilities for product differentiation are limited and producers generally find it difficult to recover increased costs arising from the need to comply with environmental requirements through price premiums. The point is made, however, that while pollution-intensive sectors account for a relatively large share of total exports of manufactured products, the more dynamic export sectors have also achieved relatively high levels of pollution abatement, which seems to suggest that participation in international markets would encourage improved environmental management.

5.   The studies further argue that, in the case of Brazil, external environmental requirements related to inputs and to Processes and Production Methods (PPMs), for example in the context of eco-labelling, may pose a greater potential threat to market access and export competitiveness than product regulations, even though compliance with the former is not mandatory.

6.   External environmental requirements, however, are not always the most important factors contributing to improved environmental management. Growing concerns over the environment can be observed at the levels of the business sector, in particular larger firms, and the Government. Furthermore, public sector financial institutions are implementing programmes to support investment in pollution abatement, and their financial support for investment projects in general is conditional on a company's compliance with all relevant environmental legislation.

II. RELATIONSHIPS BETWEEN TRADE AND ENVIRONMENT: MACRO ISSUES

A. The economic development model

7.   In the 1970s, the Brazilian economy was growing at an annual rate of approximately 10 per cent. Following the oil shock, Brazil resorted to foreign debt and an intensification of import substitution policies to reduce the impact of external factors on the economy. Trade and investment policies were based, inter alia, on import restrictions, export promotion and openness to foreign direct investment.

8.   Large investments were made in agricultural and industrial activities as well as in infrastructure, increasing the average scale of production units. In the agricultural sector, for example, large-scale production of soybeans and oranges (for exports) and sugar (for the production of alcohol to reduce Brazil's dependence on oil imports) were promoted. Similarly, export-oriented projects were implemented in the Amazon region for the development of livestock, forestry and mining. Large-scale investments were also made in the energy sector (including through the construction of several huge hydroelectric plants) and in infrastructure.

9.   Furthermore, investment programmes were implemented to expand the production of intermediate goods, such as cement, pulp and paper, fertilizers, chemicals, steel and aluminium. As will be pointed out in various parts of this report, the ability of manufacturers of final products to comply with specific environmental requirements may depend to a large extent on the environmental policies of suppliers of raw materials and intermediate goods.

10.   This growth strategy put a heavy pressure on the exploitation of the country's natural and energy resources. Until recently, the attention of local and foreign environmental groups as well as international agencies focused on deforestation caused by projects in the Amazon region. Currently, attention is focusing not only on the environmental impact of primary exports, but also on the environmental impact of industrial production[3] and on the linkages between the natural resource- and pollution intensity of industrial production and international competitiveness. This synthesis report focuses on the latter set of issues.

B. Domestic environmental policy-making

11.   Environmental policy in Brazil in essence started in 1981 with the enactment of Law 6938, which established the "National Environment Policy" and created the National Environmental System[4], to implement this policy.[5]

12.   In Brazil, State Governments may legislate on environmental issues, provided that this does not conflict with federal legislation. State Governments thus have a relatively high level of autonomy in environmental management.

13.   The study by FUNCEX holds that Brazil's National Environment Policy has achieved some success in recent years. IBAMA, Brazil's Environmental Protection Agency, has become more effective in controlling forest clearing and logging, while the Ministry of the Environment, Water Resources and the Amazon Region has managed to strengthen the consideration of environmental factors in government agencies, in addition to promoting initiatives designed to attract foreign

investments in environment-related projects. Some CONAMA (an advisory and executive council on the environment) regulations have been instrumental in promoting the use of environmental impact studies (which are mandatory in the case of large-scale projects).

14.   Furthermore, Law 6938 made the financial support that public-sector financial institutions may provide to companies for investment projects conditional on the company's compliance with all relevant environmental legislation. The incorporation of environmental considerations in the management of public-sector support for investment projects was reinforced in subsequent legislation.[6]. This has strengthened the consideration of environmental issues both within financing agencies as well as by their beneficiaries. An example could be found in the context of the BNDES (National Bank for Social and Economic Development) system, the Government's principal long-term credit agency with a budget of over US$ 3.0 billion per year. In addition to requiring compliance with environmental legislation, the BNDES has encouraged companies which benefit from BNDES support for programmes aimed at increasing productivity and improving the quality of products and production processes, to include the control of environmental impacts in these programmes (including through a more efficient use of inputs).

15.   BNDES offers loans for pollution abatement programmes developed by government agencies[7] and in the context of industrial projects. In the period 1990 to 1993, environmental disbursement (representing US$ 276 million in 1993) typically accounted for 6 to 7 per cent of BNDES' total disbursements.[8] The BNDES Planning Superintendency believes that over the next ten years this share would increase to up to 20 per cent.[9] Table 1 indicates that three sectors (iron and steel, pulp and paper, and chemicals and petrochemicals) absorbed 71 per cent of total environmental investments made under the BNDES System in 1993.

16.   Other institutions such as FINEP (an agency which provides financial support for projects and studies) also have programmes to support environmental protection. In Brazil, FINEP is the implementing agency of the Multilateral Fund of the Montreal Protocol. At the time of drafting, various projects were being analyzed for funding, principally in the refrigeration sector, which would need financing of some US$ 15 million. FINEP has also earmarked funds for scientific and technological research in the environmental area. Approximately US$ 20 million has been budgeted for this purpose, drawing from the National Scientific and Technological Fund, which depends on transfers from Brazil's National Treasury.[10]

Table 1

Brazil, National Bank for Economic and Social Development (BNDES):
Support to environmental investments in 1993.

(US$ millions)

Sector	Total investment (1)	Environm. Investment. (2)	Share (3)= (1)/(2)	BNDES contribution to environmental investment		
				Value (4)	Share (5)= (4)/(2)	Distr. by sector (6) (%)
Total	-	432.2	-	276.2	-	100.0
Cattle raising and agro industries	35.2	0.7	1.9	0.4	53.7	.1
Alcohol and sugar mills and plants	3.0	3.0	100.0	2.2	75.0	0.8
Automobile parts	23.4	9.1	39.0	2.3	25.2	0.8
Food	3.2	0.2	4.7	0.1	50.0	..
Beverages	14.2	0.2	1.0	0.1	50.0	..
Energy	198.2	0.8	0.4	0.6	67.8	0.2
Pulp and paper	370.0	130.0	35.0	42.6	32.8	15.4
Oil products	24.1	24.1	100.0	8.1	33.4	2.9
Chemicals and petro-chemicals	62.6	44.8	71.0	30.7	68.7	11.1
Iron and steel	727.7	184.2	25.0	123.3	67.0	44.6
Textiles	18.6	0.8	4.3	0.6	80.0	0.2
Transportation	671.5	15.8	2.3	1.7	10.9	0.6
Others	28.6	18.7	-	63.5	-	23.0

Notes:

(1)   Sum of own and third party resources invested in the project by the entrepreneurs.
(2)   Portion of the total investment assigned to environmental preservation and control.
(3)   Environmental investment financed by the BNDES System (BNDES/FINAME).
(4)   Participation of the sector in total environmental investments financed by the BNDES System.
(5)   Includes support for pollution abatement programs developed by government agencies.

Source : BNDES

17.   FUNCEX points out that, apart from the Government, the business sector is also becoming more concerned about environmental management. A survey conducted in 1993 among 23 major industrial groups with considerable export activities (half of them derived more than 50 per cent of their revenues from exports), operating in 34 sectors, indicates that environmental issues are important factors in their management strategies.[11] Almost all groups had already been engaged in environmental auditing or were planning to do so in the near future, even though auditing was not mandatory under Brazilian legislation. In some cases auditing had been prompted by importers in overseas markets. Among the principal benefits expected from audits the following were mentioned: improved corporate image; better relationship with environmental supervising agencies; differentiation from competitors; and increased exports.

C. The structure of international trade

18.   The value of Brazil's exports increased rapidly during the 1970s and early 1980s, exceeding the rate of growth of world trade as well as of many other dynamic developing countries. Exports showed an erratic development between 1985 and the early 1990s, strongly influenced by changes in the domestic macro-economic situation. The value of exports amounted to US$ 38.7 billion in 1993 (See Table 2). The growth in the volume of exports exceeded that in value terms, thus more than compensating a decline in export prices, in particular for semi-

manufactured and manufactured products.[12] It is to be noted that in the case of these products, Brazil's exports are concentrated in products with a relatively low level of technology and for which international markets are relatively less dynamic in terms of growth. Indeed, a 1993 study by Brazil's National Bank for Economic and Social Development Bank (BNDES) shows that Brazil's exports, in general, tend to be concentrated in sectors with declining participation in world trade. This suggests that international competitiveness may be fragile and vulnerable to any requirement leading to an increase in production and marketing costs. These characteristics, in combination with the geographical distribution of exports, to a large extent determine the vulnerability of Brazilian exports to external environmental requirements.

Table 2

Brazil: Total exports and imports by main commodity groups, 1975-1993
(millions of US dollars)

Commodity groups	1975	1980	1985	1990	1991	1992	1993
Imports:							
(In value)							
Total	13578.3	24948.8	14329.2	22457.7	22976.3	22338.0	27288.3
Food and agr. prod.	1039.7	2728.9	1529.9	2689.4	3181.7	2743.0	3835.5
Fuels	3550.9	10749.1	6766.7	6009.4	5398.6	5155.6	4558.9
Ores and metals	567.2	1281.1	586.1	1032.9	995.2	895.7	881.7
Manufactured goods	8417.5	10180.1	5430.9	12734.0	13395.2	13541.9	18010.3
(Share, in percentages)							
Total							
Food and agr.prod. Fuels	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Ores and metals	7.7	10.9	10.7	12.0	10.2	12.8	10.1
Manufactured goods	26.2	43.1	47.2	26.8	6.1	5.5	3.8
	4.2	5.1	4.1	4.6	3.9	3.7	2.7
Exports:	62.0	40.8	37.9	56.7	76.6	74.3	76.1
(In value)							
Total							
Food and agr. prod.							
Fuels	8669.5	20132.1	25638.7	31397.3	31610.4	35995.5	38679.4
Ores and metals	5026.2	10110.2	10097.6	9777.8	8954.1	10320.0	10960.8
Manufactured goods	200.7	357.5	1629.7	678.1	430.7	568.5	639.2
	1071.8	1894.4	2408.3	4257.0	4535.6	4275.5	4094.4
of which:	2192.4	7491.9	11215.5	16300.1	17342.7	20489.7	22768.1
Chemicals							
Paper							
Steel	185.6	722.4	1674.0	1979.5	1968.8	2176.4	2381.0
Textiles	27.6	154.2	262.7	693.1	733.7	804.3	894.5
Footwear	171.6	881.5	2174.3	3587.2	4132.1	4150.4	4195.8
Machinery	373.0	792.2	835.6	1015.1	1128.8	1358.0	1338.2
Others	165.1	387.9	907.6	1106.7	1176.7	1409.1	1859.6
	896.2	3392.3	3900.0	5807.5	5830.8	7443.1	8063.6
(Share, in percentages)	373.3	1161.4	1461.3	14189.0	14970.8	17341.3	18732.7
Total							
Food and agr. prod. Fuels							
Ores and metals						100.0	
Manufactured goods	100.0	100.0	100.0	100.0	28.3	100.0	100.0
	58.0	50.2	39.4	31.1	1.4	28.7	28.3
	2.3	1.8	6.4	2.2	14.3	1.6	1.7
	12.4	9.4	9.4	13.6	54.9	11.9	10.6
	25.3	37.2	43.7	51.9		57.0	58.9

Source: UNCTAD, based on COMTRADE.

Note: Food and agricultural products consist of SITC 0+1+2+4 less (27+28); Fuels consist of SITC 3; Ores and metals consist of SITC 27+28+68; Manufactured products consist of SITC 5+6+7+8 less 68.

D. Export shares of products from pollution-intensive industries

19.   An examination of world trade patterns corresponding to industries with high pollution abatement and control expenditures shows that these industries account for a relatively high share of Brazil's exports.[13] In the case of Brazil, pollution-intensive industries account for a particularly high share of total exports of manufactured products (47 per cent in 1990), compared to other countries (see Table 3).[14]   Furthermore, while in OECD countries and Asian developing countries, this share has decreased significantly, in the case of Brazil it increased from 21.6 per cent in 1975 to 44.4 per cent in 1990. These figures indicate that a high share of Brazilian exports may _a priori_ be vulnerable to environment-related pressures.

Table 3
Share of pollution-intensive industries in total exports
of manufactured products, 1965-1990, by region.

(percentages)

Period	World	Developing countries				OECD			
					of which:				
		Total	Asia	America	Brazil	Total	USA-Canada	EU	Japan
1965	29.5	38.2	21.3	76.2	49.9	29.1	27.0	24.1	29.2
1970	27.6	35.4	19.8	67.9	44.4	27.1	28.5	22.0	26.5
1975	26.6	26.0	17.0	48.0	21.6	26.6	24.3	23.8	29.6
1980	26.0	25.4	18.4	48.2	29.9	25.9	25.2	22.7	21.4
1985	22.5	22.5	15.7	45.3	38.5	22.3	20.0	21.9	14.1
1986	20.7	19.4	13.9	39.8	38.4	20.7	19.4	19.4	12.1
1987	20.5	18.4	13.2	40.7	34.9	20.6	20.5	19.0	11.7
1988	21.2	20.4	14.0	47.1	44.3	21.1	20.6	19.4	12.2
1989	21.3	20.0	13.7	47.6	44.3	21.3	21.5	19.2	11.9
1990	20.1	19.1	12.9	47.0	44.4	20.1	19.3	17.8	11.0

Source: Mollerus, Roland "Environmental Standards: impact on SELA's competitiveness and market access", in Trade and Environment, the international debate, SELA/UNCTAD, 1994.

Notes: Data for the EU (European Union) and USA and Canada excludes intra EU and intra USA-Canada trade. For analytical purposes and/or incomplete time series, the following countries are not included in the group of OECD countries: Austria, Iceland, Mexico, Norway and Turkey.

E. Natural-resource and energy intensity

20.   In Brazil, international competitiveness of sectors which use natural resources intensively, tends to be high compared to sectors which make a less intensive use of such resources. For example, in 1988, the Revealed Comparative Advantage Index of industrials sector with a high Direct Natural Resource Coefficient (DNRC) was much higher than that of sectors with a low DNRC (see Box 1).[15]

21.   Data by the World Energy Council show that in Brazil industrial energy consumption per unit of GNP is high compared to most other countries. While the international trend is towards a reduction of energy consumption per unit of production, in Brazil this coefficient has remained relatively stable in the 1970s and 1980s. In these two decades, in Brazil the use of electricity consumption per unit of GNP increased considerably, reflecting a transformation in Brazil's energy grid. Electricity accounted for almost 50 per cent of industrial energy consumption in 1992, increased from 32 per cent in 1975. It is to be noted that in Brazil around 87 per cent of electric power is generated by hydric resources. Thus, "dirty" sources of energy, such as fuel-oil, fuel-wood and charcoal, are being replaced by cleaner sources of energy, such as hydro-electric power and natural gas.

22.   It follows that while Brazilian industry is generally energy-intensive,

the energy grid has been changing in favour of clean and renewable sources of energy. Indeed, the availability of hydro-electricity is an important factor contributing to the comparative advantage of many industries. The report shows that this may be an important issue in the analysis of Brazil's vulnerability to external environmental requirements. For example, according to Brazilian industry, criteria regarding energy use in the context of certain European Union eco-labels, by failing to take account of the characteristics of Brazil's own energy grid, have resulted in discrimination against Brazil.

F. Vulnerability to external environmental requirements

23. The previous sections have pointed out that, because of certain characteristics, a relatively large share of Brazilian exports may a priori be expected to be vulnerable to external environmental requirements. This section complements that analysis by examining the importance and geographical distribution of Brazil's exports in sectors where environmental requirements are already emerging.[16] Such requirements have been identified by the UNCTAD secretariat. A preliminary estimate indicates that around 25 to 30 per cent of Brazil's exports to OECD countries belong to sectors where environmental requirements are already emerging (see Table 4).

Box 1

Natural resource intensity and export competitiveness

In the case of Brazil, there is a strong correlation between the intensity in the use of natural resources and export competitiveness. Ranking products in accordance with their Direct Natural Resource Coefficients (DNRCs), shows that the most natural-resource intensive products have in general achieved higher levels of international competitiveness. Indeed, the Revealed Comparative Advantage Index (RCAI) of the 10 to 20 products which make the most intensive use of natural resources is considerably higher than that of the 10 to 20 sectors which make the least intensive use of natural resources.

Revealed Comparative Advantage of products, ranked in accordance with their Direct Natural Resource Coefficient (DNRC)

Products, by DNRC	RCAI-1988	RCAI average 1980/88
10 highest 10 lowest	0.2555 0.0306	0.2685 0.0189
20 highest 20 lowest	0.2165 0.1173	0.2499 0.0803

Source: P. de Motta Veiga, et al.

Table 4

**Brazil, 1993: Exports of selected products
which may be vulnerable to environmental requirements.**
(millions of US dollars)

	World	OECD countries				Develo-ping coun-tries
		Total	United States and Canada	European Union	Japan	
Total exports	38679.4	21372.4	8479.5	9957.5	2313.0	15928.7
	191.6			18.3		
Fish	37.2	166.9	100.0	6.0	48.3	24.7
Tuna	62.2	27.6	11.3	3.4	10.4	9.6
Shrimp	286.6	61.9	28.2	109.8	30.3	0.3
Fruit		239.8	111.3		0.5	0.7
	837.8			325.9		
Wood and wood products	513.0	619.6	255.6	228.1	16.0	211.6
Tropical timber	45.9	399.1	157.6		7.1	108.1
	161.9			..		
Fertilizers	43.1	14.1	14.0	27.9	0.1	31.9
Insecticides	33.7	76.0	42.5	0.2	0.5	84.8
Detergents	229.1	4.8	4.1	0.1	..	37.0
Paints	45.9	0.2	0.1	23.0	..	33.6
Certain other chemicals	71.8	129.0	75.5	1.5	24.9	96.3
Batteries		5.4	3.9	5.2	..	40.4
Asbestos	675.9	18.2	5.8		4.9	52.3
	424.4			85.7		
Plastics		177.5	81.5	27.9	0.5	491.3
Tires	804.4	176.5	137.3		1.0	244.4
	1338.2			146.0		
Paper and paper prod. Textiles	498.6	243.7	70.3	304.2	0.6	551.9
and clothing	1859.6	766.5	408.5	248.0	23.8	547.8
Leather/leather prod.		356.9	85.4	278.9	12.1	134.5
Footwear	2807.2	1731.4	1421.0		3.7	99.9
	1378.6			278.8		
Cars		632.1	319.3		0.8	2156.0
	164.0			101.1		828.4
Products which may contain	55.2	532.3	414.5		0.5	
CFCs	10.9			1.9		151.1
Refrigerators, etc. Air	29.9		4.6	1.5	..	24.2
conditioners	11780.8		28.0		..	
		6095.2		2285.0		5569.6
All selected products			3324.9		141.0	

Source: UNCTAD, based on COMTRADE.

Note: For analytical purposes and/or incomplete time series, the following countries are not included in the group of OECD countries: Austria, Iceland, Mexico, Norway and Turkey.

24.   The geographical distribution of exports is thus an important factor determining the vulnerability of Brazilian exports to external environmental regulations.   For example, exports of sectors such as food products, in particular fruit and fish[17], timber and timber products[18], paper, textiles, and footwear are destined principally to the OECD countries. Tables 4 and 5 indicate, however, that the geographical distribution of Brazil's exports in other manufacturing sectors where environmental requirements are emerging in the OECD countries varies across sectors. In some cases (e.g. fertilizers, detergents, paints, batteries and products made from asbestos) exports go primarily to developing country markets, which may reduce the vulnerability of these sectors to external environmental requirements. There has been a particularly strong growth of exports to Latin American countries, as a result of trade liberalization and the ongoing process of economic integration in the context of MERCOSUL.

Table 5

**Brazil, 1993: Exports by commodity groups and markets
(shares, in percentages)**

	World	OECD countries				Develo-ping coun-tries
		Total	United States and Canada	European Union	Japan	
Total	100.0	55.3	21.9	25.7	6.0	41.2
		68.3				
Food and agr. products	100.0	67.7	15.3	45.4	5.6	24.4
Food	100.0	72.6	14.5	46.1	5.1	24.2
Agr. raw materials	100.0		22.3	39.4	9.9	25.8
		52.2				
Fuels	100.0		49.6	2.3	0.0	47.3
		71.1		38.3		
Ores and metals	100.0		8.5		23.9	25.9
		46.4		14.7		
Manufactured goods	100.0	44.0	26.9	18.2	3.1	52.1
Chemicals	100.0	33.6	17.6	18.4	6.6	52.7
Paper	100.0	29.7	12.0	5.8	0.1	64.9
Steel	100.0	57.3	16.0	22.7	7.0	69.6
Textiles and clothing	100.0	71.6	30.5	49.7	1.8	40.9
Leather	100.0	93.1	17.1	15.0	2.4	27.0
Footwear	100.0	41.2	76.4	12.0	0.2	5.4
Machinery and equipm.	100.0		26.1		2.2	57.6

Source: UNCTAD, based on COMTRADE.

Note: For analytical purposes and/or incomplete time series, the following countries are not included in the group of OECD countries: Austria, Iceland, Mexico, Norway and Turkey.

25.   The value of exports to the OECD countries of products which are potentially affected by CFC policies[19], representing US$ 726 million in 1989, declined by 45 per cent between 1989 and 1992 (see Table 4 above and Table 6 below).[20] It should be noted, however, that taking manufactured products as a whole the value of exports to the OECD countries also declined over the same period (by 7 per cent). Exports of products which may contain CFCs to developing countries increased quickly in the early-1990s, but export growth was commensurate with that of the group of manufactured products as a whole. Overall, the share of the value of exports of products which may contain CFC going to the OECD markets declined from 59 per cent in 1989 to 39 per cent in 1993.

Table 6

**Brazil, 1993: Exports of products which may be subject to CFC policies[1]
(millions of US dollars)**

Period	Exports of products which may contain ODS			Exports of all manufactured products		
	World	OECD	Developing countries	World	OECD	Developing countries
1989	1282.2	726.2	544.6	18449.9	10703.3	7540.6
1990	1059.5	642.5	400.9	16259.5	9931.5	6128.8
1991	909.2	413.0	476.2	17323.6	9503.4	7625.1
1992	1047.3	398.2	637.6	20459.6	9914.5	10367.1
1993	1378.6	532.3	828.4	22735.1	10636.4	11843.4

Source: UNCTAD, based on COMTRADE, and UNEP "A note regarding the harmonized system customs code numbers for the products listed in Annex D of the Amended Montreal Protocol", UNEP/OzL.Pro.4/3, 28 May 1992.

Note: For analytical purposes and/or incomplete time series, the following countries are not included in the group of OECD countries: Austria, Iceland, Mexico, Norway and Turkey.

[1] These are exports of products listed in Annex D of the Montreal Protocol which possible contain ozone depleting substances.

III. SECTORAL STUDIES

26.   FUNCEX carried out several case studies on specific sectors to analyse their vulnerability to domestic and external environmental requirements as well as to examine business strategies in response to environmental concerns. Such studies were largely based on surveys, using questionnaires and interviews with representatives of firms and industry associations. The sectors selected, i.e. iron and steel, pig iron and pulp and paper, have several common characteristics, such as (a) strong export growth during the 1980s and early-1990s; (b) intensive use of natural resources and energy; and (c) high pollution potential.

27.   The case studies identify factors that determine the potential competitiveness impacts of environmental requirements at the firm level. These include:

   (a)   Firm size and the share of exports in total output (smaller firms, particularly those which export a relatively small share of their output, tend to be less active in incorporating environmental factors in their business strategies). As most sectors are quite heterogeneous, e.g. in terms of firm size and level of technology used, the competitiveness effects of environmental requirements tend to be differentiated even within a particular sector. Furthermore, firms may differentiate products depending on whether they are exported or sold in the domestic market;

   (b)   The geographical destination of exports;

   (c)   Patterns of competition in external markets. Competition on the basis of price tend to reduce the firm's ability to absorb cost increases resulting from environmental requirements;

   (d)   Corporate structures; the more a company is vertically integrated, the greater its ability to control environmental factors throughout the product's life cycle tends to be.

28.   All three sectors are vulnerable to environmental requirements, but the source and characteristics of such requirements vary from case to case. While external environmental requirements are relevant in the case of pulp and paper, in the other sectors environmental investments respond essentially to domestic environmental requirements. The sectoral studies further illustrate the characteristics of Brazil's exports, discussed in Chapter II.

A. Pulp and paper

29.   The pulp industry and those subsectors of the paper industry which have achieved a high degree of international competitiveness (i.e. paper for printing, writing and packaging) are vulnerable to external environmental requirements for the following reasons: (a) a significant part of production is exported (around 40 per cent in the case of pulp and around 20 per cent in the case of paper); (b) a considerable share of exports goes to markets where environmental requirements are the most stringent; and (c) exports are concentrated in low-value-added products which compete in international markets on the basis of price. Other subsectors of the paper industry may be less vulnerable, as exports go principally to markets where environmental requirements are less stringent (for example, special papers are exported principally to Latin American markets).

30.   Within Brazil's pulp and paper industry, three types of firms can be distinguished: (a) large-scale producers of "market" pulp; (b) integrated paper producers (owning plantations), which are also firms with large production capacities; and (c) a heterogeneous subsector of non-integrated paper producers, consisting largely of SMEs, many of which use recycled fibres. With regard to (b), the four largest integrated firms accounted for 39 per cent of total production of paper and 57 per cent of total production of pulp in 1992. The high and growing level of industrial concentration is associated with characteristics of the production process and investments made under Brazil's second National Development Plan, which aimed at an expansion of the production capacity of this

industry and at modernization, supported by BNDES financing.

31.   Large companies surveyed by FUNCEX, stated that a considerable share of their exports already had to comply with environmental requirements. However, they were able to comply with such requirements without significant adverse effects on their competitiveness. Several large firms stated that they had the capacity to produce, at customers request, ECF (Elemental Chlorine Free) or TCF (Totally Chlorine Free) pulp and paper.

32.   Large producers had made significant environmental investments, to a large extent in response to domestic legislation, which was becoming more stringent. Smaller producers, however, would have greater difficulties in complying with stringent environmental requirements. In any case, both large and small firms remain vulnerable to increasingly stringent environmental requirements for two reasons. First, in the paper sector, consumer preferences for environment-friendly products are very relevant.[21]   Secondly, a considerable portion of product and process technology is embodied in the equipment manufactured by a limited number of producers, which implies that adaptation to environmental standards may require large investments.

33.   Concerns were expressed over recycling requirements and eco-labelling. Recycling requirements could significantly affect the competitiveness of pulp producers and integrated paper producers. It is to be noted that the competitiveness of integrated firms is to a large extent based on quickly growing eucalyptus. Indeed, eucalyptus takes approximately seven years to reach maturity, while species used by Brazil's major competitors may take 20 to 30 years. This makes Brazilian fibre some 45 per cent cheaper than North American and Canadian fibres. On the contrary, recycling has not been well developed in Brazil. Among the explanatory factors are the quality of the forest base, the relatively low level of domestic paper consumption and lack of infrastructure, e.g. in terms of collection systems.

34.   It follows that, in the case of Brazil, it may be more efficient from both an economic and environmental point of view, to use virgin pulp rather than recycled materials in pulp and paper production. Environmental requirements emerging from external markets, for example in the context of eco-labelling, may thus be inappropriate in the context of domestic environmental conditions and priorities (see also box 2).

B. Iron and steel

35.   Certain factors make the iron and steel industry vulnerable to environmental requirements, although vulnerability is lower than in the case of the pulp and paper industry. The industry uses natural resources intensively and production is potentially highly pollutive. Moreover, some segments of Brazil's iron and steel industry use charcoal; consequently the deforestation issue is of certain relevance for specific parts of the sector. It should also be mentioned, however, that given Brazil's energy grid, CO_2 emissions are, in general, lower than in most other countries. A survey conducted by FUNCEX reveals that the sector has not as yet faced external environmental requirements, among other reasons because there are no product-related environmental standards and regulations. Environmental requirements are of domestic origin. According to the survey, improved environmental management would imply higher energy efficiency, tighter pollution control and increased recycling; the Brazilian iron and steel industry considers that it is able to adjust to high standards.

36.   An analysis of this sector illustrates many of the characteristics of Brazil's exports described in Chapter II. Brazil's iron and steel industry has achieved high technological standards during the reduction phase, but such standards are relatively low during the final stages of processing. Consequently, Brazil's production and exports are concentrated in basic and semi-finished products, i.e. low-value-added products. International competitiveness is based on price.

37.   According to FUNCEX, between 1980 and 1992, around US$ 1.3 billion were

spent on environmental investments.[22] The Brazilian Steel Institute holds that environmental investments accounted for 20 per cent of total investments by the iron and steel sector in the period 1986 to 1992. Efforts to control pollution and to resolve environmental problems were being made essentially in response to domestic environmental policies and increased environmental awareness, resulting in the fuller incorporation of environment-related factors in corporate strategies. According to FUNCEX, the privatization of state-owned steel plants also contributed to this process.[23]

38.   Environmental policies have focused on the reduction of air and water pollution and on avoiding deforestation. Legislation introduced in the State of Minas Gerais in the early-1990s prescribes that by 1998 all charcoal consumed must originate from non-natural forests. This legislation forces charcoal-consuming steelmills either to invest in reforestation or to reduce the use of charcoal by converting their blast furnaces to coal (see the section on pig iron below).

39.   Another issue of concern to the iron and steel industry involves the implementation of domestic legislation regarding imports of scrap (IBAMA) as well as internationally-agreed measures concerning trade in scrap metals (The Basel Convention). Only around 10 per cent of Brazil's total output of raw steel comes from companies which operate using scrap metal. In addition, as shown in Table 7 below, imports account for only a small portion of the total supply of scrap metals.

Table 7

Brazil, 1983-1992: Supply of Iron and Steel Scrap (10^3 ton)

Year	Consumption	Plant generated scrap	Purchases on the market	Imports
1983	5,567	2,667	2,894	-
1984	6,324	2,965	3,651	31
1985	6,998	3,629	3,423	104
1986	7,198	3,718	3,491	491
1987	7,319	4,013	3,213	138
1988	7,676	4,242	3,409	87
1989	8,032	4,654	3,417	342
1990	6,574	3,248	2,878	113
1991	5,714	3,155	2,545	89
1992	6,086	3,482	2,660	99

Source: Brazilian Steel Institute, IBS.

40.   Industry is nevertheless concerned over the possible effects of measures restricting trade in scrap metals. Indeed, industry resorts to imports of scrap to make up for fluctuations in domestic supply. In the short run, an increase in exports coupled with a reduction in domestic steel consumption may result in shortage of domestically generated scrap. Second, in the medium term and the long run, a possible upsurge in Brazilian steel production could induce a considerable increase in the demand for steel scrap. In both cases, trade restrictions could adversely affect the sector's competitiveness.

C. Pig iron

41.   Brazil is an important producer and exporter of pig iron. Charcoal is used as the principal source of energy for approximately one third of pig iron production. Independent producers (producing pig iron only) account for 20 per cent of total production, an important share of which is exported.

42.   The independent pig-iron industry consists of 78 small and medium-sized firms, with total revenues of US$ 490 million in 1992. The State of Minas Gerais accounts for almost 90 per cent of production. The sector emerged in the early-1970s, taking advantage of the abundant supply of iron ore and charcoal, as well as low labour costs. The cheap supply of charcoal was largely due to the expansion of agricultural frontiers, which resulted in intensive forest clearing. The installation of new firms was also spurred by the fact that due to the

relatively simple technologies and modest investment requirements, there were no significant barriers to entry in this sector.

43.   As a result of domestic pressures and increased awareness of environmental effects of deforestation, in the early-1990s the State of Minas Gerais introduced legislation prescribing that by 1998 all charcoal consumed must originate from non-natural or sustainable managed forests. As charcoal consumption accounts for as much as approximately 70 per cent of the production cost of pig iron, such legislation has very significant effects on competitiveness. According to sources from the pig iron sector, the costs of charcoal from reforestation projects account to approximately US$ 25 per m^3, compared to only US$ 19 to US$ 20 per m^3 for charcoal from native forests. In addition, annual investments in reforestation projects required to comply with the law would exceed the annual sales revenues of the sector. Some steelmills were already closing down.

44.   The legislation has nevertheless been supported by industry, which has agreed to move towards more stringent environmental standards following the gradual approach set out in the law. In addition, fiscal incentives and programmes aimed at supporting the financing of forest plantations (e.g. PROFLORESTA as well as lines of financing provided by the World Bank) help to alleviate competitiveness effects. The case study on pig iron shows that stringent environmental standards have been introduced in response to domestic environmental concerns, despite their significant adverse effects on competitiveness. Positive measures, such as those mentioned above may have contributed to this outcome.

IV. EFFECTS OF ECO-LABELLING ON BRAZILIAN EXPORTS

A. Vulnerability to eco-labelling

45.   Eco-labelling in the developed countries has caused concern to Brazilian industry. Attention has been generated, for example, by eco-labels for tissue products, developed under the programme of the European Union, in particular because the criteria may have resulted in discrimination against the Brazilian pulp industry. Brazil is also potentially affected by eco-labels in other product groups. Several of the product categories for which criteria are being set under the eco-labelling programme of the European Union are of export interest to Brazil. Examples are given in Table 8 below.

Table 8

**Brazil, 1993: exports of products
earmarked for eco-labelling in the European Union**.

Product category	Brazilian exports		
	World (US$ millions) (1)	European Union (EU) (US$ millions) (2)	Share EU/World (percentage) (2)/(1)
Tissue paper	28.9	3.5	12.1
Copying and writing paper	40.1	7.4	18.5
T-shirts	108.0	44.3	41.0
Bed linen	51.9	12.0	23.1
Footwear	278.9	1859.6	15.0
Ceramics 1/	149.9	19.2	12.8
Lamps	42.7	7.5	17.6
Furniture 1/	191.1	120.3	63.0
Materials used			
(themselves not directly subject to eco-labelling)			
Wood pulp			
Leather	717.6	259.7	36.2
	401.9	188.1	46.8

Source: UNCTAD, based on COMTRADE, and "A statistical overview of selected eco-labelling schemes", TD/B/WG.6/MISC.5, 2 June 1995
Note: 1/ Included in national eco-labelling programmes.

46.   FUNCEX analysed the potential effects on Brazilian exports of European Union eco-labels in three sectors: tissue products, certain textile products (T-shirts and bed linen) and footwear (based on the national criteria for a footwear eco-label in the Netherlands). FUNCEX focused its analysis on an examination of the structure and export strategies of firms in the corresponding sectors in Brazil, and, taking into account these characteristics, a consideration of the degree of difficulties that Brazilian firms could encounter if they were to apply for an eco-label, based on interviews with representatives of firms and industry associations.

47.   The characteristics of the export sector is different for each of the three product groups analysed. Brazil's pulp and integrated paper industry consists of large firms which have achieved a high level of vertical integration and have their own plantation forests. While the textile industry is very heterogeneous in terms of scale and technologies used, exports of T-shirts and bed linen to the European Union are concentrated in a small number of large firms. In the case of footwear, on the contrary, while large firms account for most of production, exporters consist of both large as well as small and medium-sized firms.

48.   Brazil's exports of tissue products are relatively small and exports account for only a minor part of total production. Eco-labelling in tissue products, however, may have significant effects on exports of pulp. Production and exports of pulp are heavily concentrated in large firms. Indeed, the major exporter of eucalyptus pulp accounted for 55 per cent of total Brazilian exports in 1992. Exports accounted for almost 90 per cent of this firm's sales in 1993 and around one third of its exports went to the European Union.

49.   Brazil's textile exports are strongly concentrated in a relatively small number of companies. Indeed, five large firms located in the State of Santa Caterina account for the major part of exports of T-shirts and bed linen to the European Union. The two largest T-shirt exporters earmark just over 50 per cent of their total exports for Western Europe, principally Germany; in 1993 this represented $56 million. These two exporters accounted for 80 per cent of total Brazilian exports world-wide in 1993. In the case of bed linen, the three largest companies accounted for 65 per cent of total Brazilian exports in 1993.

50.   With regard to footwear, exporters consist of large, small and medium-sized firms. The footwear sector is characterized by its concentration in two regional centres in southern Brazil: Novo Hamburgo in the state of Rio Grande do Sul (women's footwear) and Franca in the state of São Paulo (men's footwear). This regional polarization of production has attracted manufacturers of input materials and equipment, while spurring the development of a technological and information infrastructure in these production centres. In addition to underwriting the participation of small- and medium-sized companies on the international market, this structuring has endowed Brazil's footwear exporters with flexibility in adapting to constantly changing rules and conditions for competing in global markets. The number of exporters increased from 294 in 1975 to 487 in 1992.

B. Eco-labelling criteria

51.   For all three product categories, the eco-labelling criteria being developed in the European Union relate principally to processes and production methods (PPMs). In addition, an important part of the criteria refer to the materials used: pulp (in the case of tissue products), cotton (textile products) and leather (footwear).

Box 2

Eco-labels for pulp and paper

Eco-labelling criteria for tissue products, proposed under the European Union eco-labelling programme, have been criticized by Brazilian industry.

Brazilian exporters have alleged that the emphasis on recycling in determining criteria regarding the consumption of renewable resources discriminate against Brazilian producers which use wood from plantation forestry. Indeed, fast growing eucalyptus and mastery of forest management technologies provide Brazilian industry with an important comparative advantage, which is further strengthened by economies of scale and the supply of renewable energy resources.

Brazilian industry has also alleged that the criteria related to SO_2 emissions in the production process are of little or no relevance since acid rain is not a major environmental problem in the location of production. They have further pointed out that calculations made to determine whether the criteria regarding the consumption of non-renewable energy resources are met result in discrimination against Brazilian producers, who depend largely on hydro-electricity.

Source: P. de Motta Veiga, et al., Eco-labelling schemes in the European Union and their impact on Brazilian exports.

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52.   According to FUNCEX, among the principal difficulties that companies are likely to encounter in complying with the criteria are the following: (a) the need to certify the environmental attributes of inputs and the relationship with suppliers of input materials, (b) outdated equipment, (c) higher product prices in a market where competition was price-based, and (d) lack of market stimulation, linked to the fact that, in Brazil, the domestic market for "environment-friendly" products is very small.

53.   With regard to (a), textile producers, for example, consider that it would be difficult to comply with criteria limiting the use of pesticides and chemicals during cotton growing. In Brazil itself the use of pesticides in cotton growing is low and cotton is almost completely harvested by hand. However, large-scale imports of cotton into Brazil are increasing rapidly and it is difficult for

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│                                                                       │
│                               Box 3                                   │
│                                                                       │
│                 Eco-labels for T-shirts and bed linen                 │
│                                                                       │
│         Brazil's exports of textiles are concentrated in intermediate │
│    or finished products using natural fibres, particularly cotton.    │
│    The specialization and competitive edge of Brazil in cotton        │
│    products is also proven by the level of utilization of its export  │
│    quotas under the Multifibre Agreement. Indeed, exports of cotton   │
│    threads to the European Union have been affected as Brazil         │
│    regularly filled its quotas. Quotas for cotton-knit shirts and     │
│    T-shirts, brushed or smooth, have also been increasingly used.     │
│    This characteristic makes the sector particularly sensitive to     │
│    life-cycle analyses of products using environmental criteria       │
│    related to the production and use of cotton fibres.                │
│                                                                       │
│         Criteria for eco-labels for T-shirts and bed linen developed  │
│    under the eco-labelling programme of the European Union refer to   │
│    environmental effects at different stages of the product's         │
│    life-cycle, in particular those related to cotton growing and the  │
│    manufacturing of fabrics. Consequently, most criteria are          │
│    PPM-related, referring, for example, to efficiency in the use of   │
│    energy and water and the treatment of waste water. There are       │
│    specific criteria concerning the use of pesticides and chemicals   │
│    in cotton growing and the use of dyes or chemicals in the          │
│    manufacturing process, in most cases to address local              │
│    environmental effects at the location of production. Only a few    │
│    criteria are clearly product-related. A group of criteria has been │
│    developed regarding chemical residues in final products.           │
│                                                                       │
│         Five large firms located in the State of Santa Caterina       │
│    account for the major part of exports of T-shirts and bed linen to │
│    the European Union. These large producers are already making       │
│    adjustments to comply with environmental requirements of European  │
│    importers. For example, one firm, exporting bed linen, stated that │
│    50 percent of the value of recent investments had been prompted by │
│    environmental requirements.                                        │
│                                                                       │
│         Four of the five companies interviewed had information on the │
│    European Union eco-labels from their European clients. These large │
│    firms stated that they already complied with a number of the draft │
│    criteria for the EU labels for T-shirts and bed linen. However,    │
│    some of them would have certain difficulties in complying with     │
│    specific criteria. Among these criteria the following were         │
│    mentioned by one or several firms: criteria related to pesticides  │
│    and chemicals during cotton growing; the use of dyes, pigments and │
│    carriers during the manufacturing process; waste water            │
│    parameters; noise; cotton dust; and residue values in final        │
│    products.                                                          │
│                                                                       │
│         While large firms with commercial links with markets where    │
│    environmental requirements are stringent may be in a position to   │
│    comply with a number of the eco-labelling criteria, SMEs are       │
│    likely to have much greater difficulties.                          │
│                                                                       │
│    Source:      P. de Motta Veiga, et al., Eco-labelling schemes in   │
│                 the European Union and their impact on Brazilian      │
│                 exports.                                              │
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textile producers to certify that imported cotton is pesticide-free. Similarly, footwear producers are aware that most of the difficulties in meeting eco-labelling criteria arose from the fact this would require changes in the production process of leather.[24]

54.   The relationship between producers of finished goods and sectors producing input materials, such as chemicals and leather, is also an important factor. In the case of textiles, compliance with the criteria related to the use of chemical input materials depend to a large extent on the market power and negotiating

capabilities of textile companies. Large firms often exert pressure on chemical industries[25] to supply - either through local production or imports - the input materials required in the European countries; they are unwilling to pay higher prices for these input materials, as this would affect the competitiveness of their prices on foreign markets. SMEs do not have this power. In this context, the pulp and paper industry, which has achieved a high level of vertical integration, is in a better position to control the environmental attributes of input materials.

55.   With regard to (b), for major export companies investments in modernization of equipment are a pre-requisite for participation in the international market. As they export to markets that are more environmentally demanding, their growth strategies, together with incentives to make additional investments in modernization and environmental management, increase and may become economically profitable. Nevertheless, it should be noted that even for these companies, compliance with certain requirements, e.g. with respect to waste-water treatment, may prove difficult. Criteria where compliance demands investments in new machinery are those where small and medium-sized producers may well find the greatest difficulties in adaptation.

56.   With regard to (c), footwear producers, for example, perceive that incurring the additional costs in adjustments required to comply with eco-labelling criteria would reduce the competitiveness of their products vis-a-vis other exporters who focus their competitiveness on price, principally suppliers from other developing countries, in particular China. They also think that market conditions will not allow them to recover the additional costs associated with the required adjustments.

57.   Concerning (d), the FUNCEX studies point out that as there is no significant domestic demand for environment-friendly products, the domestic market does not help firms to recover incremental costs of production. This factor is the most relevant in the case of textiles, as exports are relatively small compared to the domestic market. Pulp and leather footwear, however, are produced principally for exports.

C. Conclusions

58.   Eco-labelling in the developed countries is emerging in several sectors of export interest to Brazil. The degree of vulnerability varies from sector to sector, depending on factors such as product coverage, the formulation and implementation of such schemes, aspects related to the consumer market as well as production structures in Brazil.

59.   It is often mentioned that as eco-labels are voluntary, their trade impacts may be relatively small as compared to the effects of mandatory requirements. Indeed, in this context Brazilian exporters of footwear appear relatively unconcerned over eco-labels; as they compete on the basis of price they perceive that their market shares will not be affected. Pulp exporters, however, are more concerned over eco-labels; issues such as recycling and deforestation are important factors in the context of consumer preferences and buying policies of importers in the developed countries.

60.   Case studies carried out by FUNCEX indicate that eco-labels, in particular those which are based on a life cycle approach, may result in discrimination against Brazilian exports and undermine comparative advantage.[26] The capacity of firms to adapt to eco-labelling requirements varies from sector to sector, in function of the size of the company and the weight of exports -in particular to the European Union and other export markets were eco-labelling is applied- in the company's growth strategy. Given the high compliance costs, for the large majority of small- and medium-sized companies in Brazil it would be very difficult to qualify for eco-labels while maintaining export competitiveness. Even for major export companies, the cost of compliance have been considered high, principally when this involves new investments in fixed assets. In the case of the textile and footwear industries testing and certification costs may also

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Box 4

Eco-labelling for footwear

Brazil, the world's fourth largest footwear producer, exports almost two thirds of the leather shoes it produces. Most exports of footwear, representing US$ 1.9 billion in 1993, go the OECD markets (93 per cent of the value of total footwear exports in 1993). The European Union, where environmental requirements appear to be emerging, represented a market of almost US$ 300 million in 1993. Mandatory environmental requirements in Europe consist basically of restrictions on the use of Pentachlorophenol (PCP) and other chemicals. The use of PCP as a leather preservative has already been banned in Brazil. A survey conducted by FUNCEX reveals that some companies may find certain difficulties in exporting to the European Union, in particular to Germany, because of restrictions on the use of PVC in footwear. Companies are aware of substitutes for PVC, but according to some sources, such substitutes may increase the cost of materials by at least 20 per cent.

In the Netherlands, the Stichting Milieukeur (SMK - Dutch Foundation for Eco-labelling) has developed a national eco-label for footwear, which became effective on 1 March 1994. The SMK has also been appointed as the "lead competent body" for establishing draft criteria for an European Union eco-label (the European Flower) for shoes.

Only some of the criteria developed by the SMK are product-related. These include a long list of quality and performance ("functional") requirements, which are principally aimed at increasing the reparability and durability of shoes. One criterion refers to the "energy content" of shoes, aimed at reducing the consumption of energy and raw materials. Other criteria, referring to materials, are clearly PPM-related. In the case of leather such criteria refer, for example, to chromium emissions into water, emission of organic solvents, and the treatment of waste water.

Interviews with the Technological Centre for Footwear, Leather and Similar Products (CTCAA) reveal that Brazilian footwear producers would, technically speaking, be in a position to comply with most eco-labelling criteria. However, the production cost of shoes which comply with the eco-labelling criteria would be substantially higher than that of conventional products.

However, the question of whether or not shoes comply with the eco-labelling criteria depends basically on the environmental quality of materials used, in particular leather, and many of the corresponding criteria are PPM-related. With a view of securing supply of raw materials, a number of footwear producers have become vertically integrated by purchasing leather tanneries (a process unrelated to environmental requirements). Such firms may be in a better position to ascertain the environmental attributes of their raw materials.

Source: P. de Motta Veiga, op. cit.

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be particularly high. In addition, the eco-labelling process tends to lack transparency. FUNCEX also recommended initiatives at the international and national levels to mitigate potential negative effects of eco-labels on Brazilian exports, which are presented in paragraph 68 below.

V. CONCLUSIONS AND RECOMMENDATIONS

Box 5

Eco-labelling in Brazil

Currently there are two different proposals for setting up eco-labelling programmes in Brazil. The Brazilian Technical Standards Association (ABNT) has proposed to set up a Brazilian Green Seal programme; in addition, the Brazilian Forest Development Society has proposed the Forest Raw Material Origin Certificate (CERFLOR).

The Green Seal programme

The Green Seal programme is being developed under the administration of FINEP, a Government agency which funds studies and projects. It has received funding from the Government and the World Bank. The basic objectives of the programme are (a) to create awareness and educate consumers in the domestic market; and (b) to help exporters to meet environmental requirements emerging from external markets. While the first objective requires the programme to be well attuned to national conditions, the second objective calls for stringent criteria with a view to facilitating mutual recognition with eco-labelling programmes in the OECD countries.

At a workshop, held in Rio de Janeiro in June 1993, 10 groups of products were suggested for eco-labelling: paper, leather and footwear, household appliances, CFC-free aerosols, car batteries, biodegradable detergents, lightbulbs, wooden furniture, packaging, cosmetics and toiletries. It was suggested that criteria should be based on a life cycle approach.

The implementation of the programme has been delayed, in particular because lack of funding has prevented ABNT to carry out its functions in the field of coordination and implementation.

The CERFLOR forest products certification programme

Plans to develop the CERFLOR programme have been inspired by three factors:

(a) difficulties faced by exporters of mahogany and tropical hardwoods;

(b) external requirements faced by exporters of pulp and paper (e.g. companies such as Aracruz Celulosa have received visits of representatives from foreign companies, such as Proctor and Gamble and Kodak) in order to review environmental management;

(c) European Union eco-labels based on life-cycle analysis.

At the time of drafting both programmes were facing difficulties. One problem relates to the differences in environmental requirements in the domestic and the principal external markets. One the one hand, the domestic market currently may not respond to eco-labels and may not generate sufficient incentives for companies to improve the environmental quality of products. On the other hand, large exporters which may be in a position to comply with the criteria of eco-labelling programmes in their major markets, may prefer to try to obtain the eco-labels of foreign programmes directly, rather than aiming at mutual recognition.

Source: P. de Motta Veiga, et al.

A. Summary and conclusions

61.   An analysis of the characteristics of Brazilian exports suggest that increasingly stringent environmental requirements emerging from external markets may have a potentially adverse impact on Brazil's export performance. The FUNCEX studies attribute the vulnerability of Brazilian exports to external environmental requirements to three factors: (a) the high natural resource and energy intensity of exports; (b) other characteristics of exports, in particular the fact that a large share of exports, and in particular the most dynamic export sectors, consist of homogeneous products, with little possibilities for product differentiation, which are competing in international markets on the basis of price factors; and (c) the high share of exports going to markets where environmental requirements are more stringent.

62.   With regard to (b) -other characteristics of exports-, FUNCEX points out that environmental requirements might adversely affect export competitiveness, in particular for the following reasons:

(a)   certain external environmental requirements, which are inappropriate given domestic resource endowments, may reduce comparative advantage (An example can be found in certain European Union eco-labelling criteria for tissue products);

(b)   large-scale production tends to increase investment requirements;

(c)   the relationship between manufacturers of final products and suppliers of raw materials and intermediate goods may complicate the former's compliance with environmental requirements. In the case of Brazil, within the context of a rather closed economy, the Government had played a major role in such relationship. Producers of final products may find it difficult to impose specific environmental requirements on suppliers of raw materials and intermediate products, in particular when compliance requires significant new investments. A notable exception is the pulp industry, which is vertically integrated and includes the ownership of plantation forests;

(d)   competition on the basis of price makes Brazilian exporters, who normally are price-takers, vulnerable to any environmental requirement resulting in cost increases;

(e)   as in the case of homogenous products the capacity for product differentiation is limited, Brazilian producers generally find it difficult to recover increased costs of environmental improvements through price premiums. In addition, since in Brazil itself the demand for "environment-friendly" products is insignificant, the domestic market does not allow firms to recover incremental costs of production.

63.   The vulnerability to environmental requirements is further illustrated on the basis of case studies of specific sectors, i.e. pulp and paper; iron and steel and pig iron. Environmental requirements are especially relevant in the case of the pulp and paper industry. The sector is concerned in particular over recycling requirements and the use of voluntary instruments, such as eco-labelling. The iron and steel industry may be relatively less affected by external environmental requirements. There are no significant product-related requirements in this sector and, in any case, the European Union (where, in general, environmental requirements tend to be the most stringent) is a relatively small export market for Brazil. Domestic environmental requirements tend to be more important. One issue of concern to the steel industry, however, is the effects of the Basel Convention on international trade in scrap. While in general only a small share of scrap used for recycling is supplied by imports, a reduction in domestic consumption of iron and steel products and, consequently, in the output of semi-integrated mills may create problems to the recycling

industry if imports of scrap were to be restricted.

64.   Brazilian industry may be more vulnerable to voluntary requirements, related to inputs and PPMs, than to mandatory product regulations. As the application of PPM-related mandatory standards to imported products is not allowed under WTO rules, eco-labelling and other voluntary instruments are growing in importance. In this context, two characteristics of eco-labelling were highlighted in the FUNCEX studies. On the one hand, as eco-labels are voluntary, they may be less of a threat than mandatory requirements. On the other hand, as eco-labels involve an analysis of the entire life cycle of the product, they embody a massive potential for discrimination between imported and domestic products based on the assessment of the various uses of inputs, as well as PPMs.

65.   It should nevertheless be noted that improved environmental management responds largely to domestic requirements, as has been illustrated in the case of the forestry policy in the State of Minas Gerais. Sectoral studies indicate that a large portion of new investments consists of environmental investments, a trend that has been supported by policies of financial institutions such as the BNDES.

B. Recommendations and proposals for further work

66.   The FUNCEX studies indicate that improved environmental management is taking place in response to both external and domestic environmental requirements. Firms which are exposed to international markets may find it easier to adapt to increasingly stringent environmental requirements. Larger exporters, who have direct contacts with foreign clients and possess the financial and technological means to invest in environmental improvements are often using best environmental practices. It should be noted, however, that industrial sectors in developing countries tend to be quite heterogenous. Small and medium sized firms tend to have more difficulties in obtaining information and in adjusting to environmental requirements in external markets. Capacity-building efforts may help promoting a process whereby the know-how and experience acquired by larger firms is transmitted to smaller firms.

67.   The studies contain a number of recommendations, most of which refer to eco-labelling. Reducing the vulnerability of Brazilian exports to eco-labelling schemes would basically involve the following initiatives at the international level:

(a)   the adoption of non-discriminatory criteria and parameters as well as a decision-making process compatible with the provisions of the World Trade Organization (WTO); and

(b)   the development of multilateral initiatives leading to consensus on the preparation of guidelines for formulating and implementing national and regional eco-labelling schemes, which would serve as a basis for mutual recognition among different national schemes.

68.   At the national level, the following elements are crucial:

(a)   increased awareness, within export sectors, of eco-labelling initiatives in the major export markets, as well as of their own production processes, including through the systematic preparation and dissemination of technical data on the use of raw materials, other inputs and manufacturing processes;

(b)   broader fora for discussion and negotiation between exporters of finished goods and sectors producing input materials, seeking the establishment of mechanisms for cooperation that also lead to the modernization of the latter with a consequent reduction in vulnerability attributable to specific characteristics of Brazil's production structure;

(c)   development of a national eco-labelling scheme (see box on Brazil's

Green Seal Project), technical cooperation with countries that have already implemented eco-labelling schemes, and the exploration of mutual recognition with other schemes; and

(d)   joint efforts by the Government and the private sector to assess the initiatives under way in the European Union, and seeking in multilateral fora the compliance of eco-labelling schemes with the WTO Agreement on Technical Barriers to Trade.

69.   FUNCEX also proposes further studies aimed at improving the understanding of trade and environment linkages, by analysing in particular:

(a)   The effects of specific environmental policies, standards and regulations on Brazil's exports (such as the study carried out on eco-labelling). It would in particular be worthwhile to analyse the trade and competitiveness effects of Multilateral Environmental Agreements;

(b)   Possible changes induced by the trade liberalization process on the environmental strategies and performance of Brazilian industry; and

(c)   The effects of environmental requirements -both domestic and foreign- on the relationship between manufacturers of finished products and suppliers of raw materials and intermediate goods;

70.   In addition, it would be worthwhile to analyse factors which motivate the emergence of specific environmental requirements in the OECD countries in sectors which compete with imports originating in Brazil. The case studies indicate that different requirements may emerge in different sectors. For example, the importance attached to recycling by respectively the steel and paper industry varies considerably. Therefore, it may be necessary to analyse the conditions of sectors in the countries where environmental requirements emerge, in particular as those conditions may explain the type of policy or instrument that will likely be chosen.

Notes

1.   A summary of this study was published in Brazil. See: Pedro de Motta Veiga (coordinator), "Evidencias sobre as relacoes entre comercio e ambiente no Brasil", Revista Brasileira de Comercio Exterior, Number 41, October-December 1994. (Only in Portuguese.)

2.   Brazil's exports are highly concentrated in natural-resource intensive products and in sectors with large-scale or labour-intensive production processes. Although there has been an expansion of production and exports of high-value-added products, international competitiveness has been largely based on the relative abundance of natural resources (forests, water resources, mineral deposits) and agriculture.

3.   Manufacturing industries are responsible for around 60 per cent of emissions of organic matter and 100 per cent of the emissions of heavy metals in Brazil. See: R. Serao da Motta, Politica de controle ambiental e competitividade, paper prepared for the Study of the Competitiveness of Brazilian Industry, Campinas, 1993.

4.   The National Environmental System consists of the Government Council (with representatives of all ministries); an advisory and executive council (CONAMA, made up of representatives of the States, the Central Government, non-government organizations and environmental experts); a Central Agency forming a bureau under the presidency (SEMAN) and an Executive Agency (IBAMA). SEMAN has been substituted by the Ministry for the Environment, Water Resources and the Amazon Region. The National Environment System also includes other government agencies involved with environmental preservation as well as the environmental bureaus of the states and municipalities. In order to provide financial support to the National Environment Policy, the National Environment Fund was set up, administered by the National Environment System.

5.   The Law established the basis for public-sector policies, which are largely based on command and control measures such as (a) environmental standards and regulations; (b) land use control (zoning and the establishment of protected areas); (c) environmental impact studies; and (d) penalties. According to the FUNCEX study, the use of economic instruments is poorly developed.

6.   For example Decree 9927 of 6 July 1990

7.   For example, the II Industrial Pollution Control Project developed by the State of São Paulo and Brazil's National Pollution Abatement Programme.

8.   The FUNCEX study mentions that at the time of drafting BNDES loans for environmental protection were offered at annual interest rates of 6.5 per cent, lower than the average BNDES rate of 9.4 per cent and well below prevailing market rates.

9.   Gazeta Mercantil, 6 June 1994.

10.   Ibid.

11.   Boucinhos and Campos

12.   Indeed, the average export price index (basis 1980 = 100) for all exports fell to 89.5 in 1993. Export prices declined for all major groups of products (basic, semi-manufactured and manufactured goods), in particular for semi-manufactured (the index stood at 65.4 in 1993) and manufactured products (the index fell to 85.6).

13.   Pollution-intensive industries are identified on the basis of data on pollution abatement expenditures reported by United States manufacturers, published in United States Bureau of the Census in <u>Manufacturers' Pollution Abatement Capital Expenditures and Operating Costs (1988)</u>, Department of Commerce, Bureau of the Census, Industry Division, Washington D.C., 20233. See also P. Low and A. Yeats, in International Trade and the Environment, World Bank Discussion Papers, No. 159, 1992. A major shortcoming of these data is that they refer to the United States and are not necessarily valid for Brazil. Seroa de Motta has identified "dirty industries", based on data on the level of "remaining" water and air pollution for Brazilian industries.

14.   Contrary to trends in world trade, the participation of pollution-intensive industries in exports from American developing countries has remained high. Indeed, while the share of these industries in world trade fell from 19.0 per cent in 1965 to 15.7 per cent in 1990, over the same period their share in exports from Latin America and the Caribbean increased from 10.7 per cent to 19.1 per cent. See R. Mollerus, "Environmental Standards: impact on SELA's competitiveness and market access", in <u>Trade and Environment, the international debate</u>, SELA/UNCTAD, 1994

15.   M.J.B. Nonnenberg, Ventagens Comparativas Reveladas, Custo Relativo de Fatores e Intensidade de Recursos Naturais: Resultados para o Brasil - 1980/88. IPEA, Texto para Discussao No 214, IPEA, Rio de Janeiro, 1991.

16.   This section thus provides a preliminary indication of the incidence of environment-related measures, with different degrees of stringency, in Brazilian exports; it does not analyse their real impact on trade or export competitiveness.

17.   In addition to phytosanitary measures, exports of shrimp are potentially affected by the threat of trade restrictions, under United States laws.

18.   Exports to the OECD markets of timber and timber products are generally vulnerable to environment-related measures and consumer concerns related to deforestation, even though several studies have indicated that exports do not contribute significantly to deforestation in Brazil. Total value of exports of wood and wood products amounted to US$ 838 million in 1993. Of this, US$ 500 million could be classified as tropical timber, approximately 80 per cent of which goes to the OECD markets, in particular the European Union and the United States. Concerns over deforestation sometimes affect other sectors, such as pulp and paper, even though these sectors obtain their timber from planted rather than from natural tropical forests.

19.   Multilaterally agreed targets to control the use of chlorofluorocarbons (CFCs) and other ozone-depleting substances (ODS) have been negotiated in the framework of the Montreal Protocol on Substances that Deplete the Ozone Layer. The Multilateral Fund of the Montreal Protocol provides financial assistance to developing countries to assist them in phasing out CFCs. A number of countries, in particular in the OECD area, have designed product policies using a range of policy instruments such as product standards, taxes and charges, eco-labelling, voluntary industry agreements and government procurement guidelines, to reduce the <u>use</u> of controlled substances and to complement policies aimed directly at the control of these substances. Thus, product policies and a shift in consumer preferences away from CFC-containing to CFC-free products imply that countries exporting to the OECD markets have to accelerate a shift to CFC-free technologies (independent from their own commitments under the Montreal Protocol) for products such as air conditioners and refrigerators. This may, in principle, have some effects on trade, depending on the cost of technology switching. See: UNCTAD, <u>Newly emerging environmental, policies with a possible trade effect: a preliminary discussion</u>. (TD/B/WG.6/9, 28 august 1995). In the case of Brazil, the value of exports of air conditioners and refrigerators is relatively small. In addition, these products are exported mainly to other developing countries.

20.   In 1993, exports recovered, in line with an overall recovery of exports of manufactured products to the OECD markets.

21.   According to Brazilian producers, consumers and environmental NGO's in the developed countries sometimes link Brazil's pulp and paper production with the deforestation issue, even though the sector obtains its raw materials from plantation forests.

22.   The sector would need to invest another US$ 500 million to achieve the highest possible pollution abatement rates, taking into account the technological and commercial constraints of firms.

23.   The National Steel Company (Compania Nacional de Siderurgia, CSN), located in the city of Volta Redonda, was privatized in 1993. CSN has scheduled to spend some US $ 100 million in environmental clean-up and health care projects. Some US$ 58 million will be used to compensate the city of Volta Redonda for environmental damage caused by operation of the CSN plant in this location. This sum will be used for environmental control programmes, clean-up of slums and healthcare programmes. Source: P. De Motta Veiga, <u>et. al</u>.

24.   Historically, the relationship between the footwear and leather sectors in Brazil has been characterized by a low level of cooperation. Companies in the footwear sector had responded to this situation through verticalization (purchase of tanneries) and increased imports from neighbouring countries, in particular Argentina and Uruguay. In turn, this had prompted the leather sector to modernize which could over the medium term streamline compliance with eco-labelling requirements.

25.   Chemicals were supplied to the textile industry by a small group of transnational companies (TNCs) with plants in Brazil. Their production in Brazil depended on the characteristics of local demand, which was generally not very exigent with regard to quality and environmental criteria. This meant that chemical companies continued to produce in Brazil chemicals that were no longer used in Europe or the United States, or even banned in these countries.

26.   FUNCEX also makes the point that establishing eco-labelling criteria for emissions contributing to environmental effects addressed by Multilateral Environmental Agreements (MEAs) may raise certain questions. In the first place, criteria which are established unilaterally by the eco-labelling programme of the importing country may not take account of internationally-agreed targets set for different groups of countries. Such targets are negotiated by Governments and tend to be set at the country level, taking into account the common but differentiated responsibilities of all countries. In the second place, whereas MEAs tend to set rights and obligations at the country level, eco-labels are granted to products. Commitments at the country level may not translate in uniform standards for all companies or production units in the country concerned. Indeed, though systems such as tradeable permits and offsets, Governments and industry are trying to reduce emissions where such reduction is the most cost-effective. It would thus appear inappropriate to associate environmental disadvantages to unlabelled products originating in a country or region which as a whole complies with internationally agreed targets.