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Eco-labelling schemes in the European Union and their impacts on brazilian exports

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SUMÁRIO

I. Introduction

Although eco-labelling programs are voluntary and accessible to both domestic and non-domestic producers, there is a series of reasons for assuming that the industry of the importing country is in a position to influence the conceptualization and implementation of these programs, requiring foreign suppliers – particularly from the developing countries – to put forth additional efforts in order to maintain the competitive edge of their exports. Insofar as the criteria and parameters of these eco-labelling schemes are related to the life-cycle of the products and therefore include the production process, they point to the need to achieve, for example, certain standards for pollutant emissions in the countries of origin of the products. The broad-ranging scope of this assessment suggests that eco-labelling systems, although not mandatory, may also affect the production of input materials and raw materials for the export industry, thus effectively acting as barriers to the entry of products exported from the developing countries – although the production of these goods does not generate any environmentally-hazardous transborder effects. Thus, although a small number of export products of interest from the developing countries is covered by schemes in force today, there is a clearcut upturn in these figures. In fact, of 25 categories of products for which criteria are being set under the aegis of the European Union, at least eight (various types of paper, packaging, textiles, ceramics, footwear and refrigerators) are on the list of Brazilian exports, in varying quantities.

On the other hand, insofar as the so-called ‘dirty’ industries are noted to represent an increasingly large proportion of exports from the developing countries – and in the case of Brazil this relationship has already been established in a previous study – it may be assumed that eco-labelling initiatives could trigger negative impacts on the export chains of natural resource-intensive industries, as well as heavy polluters, where costs of compliance with environmental criteria in relation to total production costs and investment costs could be particularly high.

Despite expressive growth in Brazil's industrial exports over the past few decades, it is today an acknowledged fact that this export drive has not always taken environmental factors into consideration. On the other hand, the development of industrial exports from the mid-1980s onwards suggests a reduction in competitiveness gains indicators, due to the country’s macroeconomic crisis and its implications on the dynamics of productive investments.

This means that the position of Brazil's export industry on the international market is vulnerable to environmental regulations and non-mandatory initiatives that could boost production costs and investments for its export products, or for the input materials thereof. With the exception of a few sectors, Brazil is a minor supplier on international markets of highly competitive products where the standard for competition is based on prices, leaving limited room for product differentiation strategies. Due to factors linked to the technical and economic characteristics of production processes and international markets, the costs of compliance with environmental rules tend to be higher than those for industry on average, and it is difficult to transfer them to environmentally-friendly competitive strategies.

This study analyses the actual or potential impacts of the eco-labelling systems under discussion and/or implementation in the European Union for Brazil's, textiles, footwear and export pulp and paper sectors. These three sectors featured reasonable export dynamics between 1980 and 1993 – higher than the average for Brazil's foreign sales – with their joint participation in Brazil's export list rising from 9.2% to 12.5% over the period (Tables 1 and 2). This analysis is given in Section II, referenced to some structural characteristics of the three sectors in Brazil and a brief assessment of the competitive position of each of these sectors on the international plane. In this same section, the results are given for the assessment of the sectorial impacts of eco-labelling systems, carried out by corporate representatives and technical staff for all three sectors.

Section III describes two initiatives under way in Brazil in the area of environmental certification of products: the Green Seal Program launched the Brazilian Technical Norms Association - ABNT, and the CERFLOR Project, resulting from the partnership between entrepreneurs in the logging sector and timber consumers, as well as Federal Government agencies. Although neither of these initiatives is operational, their proposed objectives, functional guidelines and institutional organization are all under discussion. The views of exporters regarding these two initiatives are also presented in this Section.

Finally, Section IV gives the Conclusions And Recommendations of this study, covering the impact of the eco-labelling schemes under discussion and/or implementation in the European Union on Brazilian exports in the three sectors analyzed, as well as the establishment of systems of this type in Brazil, and the conditions necessary to endow them with credibility and ensure international acceptance.

Table 1
BRAZILIAN EXPORTS - SELECTED SECTORS
(US$ millions)

Sectors	1980	1985	1990	1991	1992	1993
Pulp and paper	518.246	555.997	1.205.494	1.235.835	11.444.245	1.508.409
# Pulp	362.703	273.873	592.052	578.364	735.273	711.006
# Paper	155.543	282.124	613.442	657.471	708.972	797.403
Footwear	407.655	968.668	1.183.589	1.245.397	1.473.529	1.945.178
Textiles	915.666	1.000.607	1.248.069	1.358.970	1.463.256	1.382.438
# Natl.Threads & Fabrics	614.701	598.864	594.656	603.235	541.143	404.475
# Art.Threads & Fabrics	90.170	125.849	226.817	268.725	351.113	308.391
# Clothing	210.795	275.894	426.596	487.010	571.000	669.572
Total Sectors above	1041.567	2525.272	3.637.152	3.840.202	4.381.030	4.836.025
Other Sectors	18.290.834	23.113.739	27.776.604	27.780.257	31.480.495	33.946.654
Overall Total	20.132.401	25.639.011	31.413.756	31.260.459	35.861.525	38.782.679

Source: DTIC/SECEX/MICT. Prepared by: FUNCEX.

Table 2
BRAZILIAN EXPORTS - SELECTED SECTORS
(Participation in Export List)

Sectors	1980	1985	1990	1991	1992	1993
Pulp and paper	2.57	2.17	3.84	3.91	4.03	3.89
# Pulp	1.80	1.07	1.88	1.83	2.05	1.83
# Paper	0.77	1.10	1.95	2.08	1.98	2.06
Footwear	2.02	3.78	3.77	3.94	4.11	5.02
Textiles	4.55	3.90	3.97	4.30	4.08	5.02
# Natl. Threads and Fabrics	3.05	2.34	1.89	1.91	1.51	1.04
# Artif. Threads and Fabrics	0.45	0.49	0.72	0.85	0.98	0.80
# Clothing	1.05	1.08	1.36	1.54	1.59	1.73
Total Sectors above	9.15	9.85	11.50	12.14	12.22	12.47
Other Sectors	90.85	90.15	88.42	87.86	87.78	87.53
Overall Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: DTIC/SECEX/MICT.

II. Eco-labelling systems in the european union and their impact on brazilian exports of three industrial sectors

II.1. The Textile Sector

A) Structural Characteristics and Competitive Position

Brazil's textile industry is characterized by technological and managerial heterogeneity. Within one single market segment, modern companies operate with technological standards and strategies similar to those of the world's top-performance companies, partially modernized companies with updated equipment at strategic stages or even with old machinery but run under rigid quality controls with advanced design skills; as well as a large number of companies with outdated technological and managerial standards.

This industry underwent a concentration process during the second half of the 1980s: from some 6,000 companies in 1986 only 4,300 survived by 1991. In terms of employment, this concentration speeded up the process – noted during the past twenty years – of a reduction in the absorption of labor. The modernization of the production process in companies in this sector, based on techniques designed to economize on labor, explains this acceleration. The liberalization of the market launched in 1990 allowed increased imports of textile machinery (which totaled over US$ 450 million in 1992), furthering the modernization process of this sector, although in a somewhat heterogeneous manner.

The various spinning and weaving segments accounted for 57% of the sector's billings, and this structure is not particularly concentrated, although the concentration indicators (revenues of the four largest companies / total revenues for the segment) vary in accordance with the segment: 34% for spinning, 39% for weaving, and 23% for integrated spinning and weaving. The presence of small and medium sized companies is relevant here, but is far less expressive in the principal segments responsible for the burgeoning export performance of the sector: cotton knits, and bed, table and bath linens.

In these segments, the concentration – measured by the indicator mentioned above – reached 72% in cotton knits and 81% for bed, table and bath linens. Large companies largely underpin the export performance of the past few years: in 1992, the cotton knits and bed, table and bath linen segments accounted for 25% and 26% respectively of total exports by this sector.

According to Garcia (1993), exports are strongly concentrated in a relatively small number of companies. In 1989, 456 companies exported textile products, including goods to North America and the E.C. The ten largest (2.2% of total exporters) accounted for 46% of total exports; the next ten largest handled 14% of exports, making up 60% of the total. It should be noted that all are sizable companies with over 500 employees. Finally, the seventy principal companies were responsible for over three quarters of total exports. This concentration of exports in a small number of major companies results from the technological and organizational heterogeneity of the textile industry. These companies adopted the international market as an important variable in the formulation of their growth strategy. However, this high level of concentration limits exports to the specific plans and objectives of this group of companies.

This large Brazilian textile companies find no obstacles curbing their expansion on the domestic and foreign markets. They dominate management process technologies and are closely attuned to international trends, in addition to having their own funding and access to sources of financing for their modernization and expansion projects. Nevertheless, most companies lack the technological updating necessary to take over large portions of the domestic and foreign markets while also being threatened by imported synthetic fabrics, fibers, and threads.

Using the nomenclature of foreign trade statistics, it is possible to note major trends in exports for this sector over the past few years (Tables 3 and 4):

– First, moderate growth in Brazilian exports over the past 14 years. Between 1985 and 1990, growth rates were higher than during the previous five years, but from 1990 through 1993, the pace of expansion slowed yet again. Textile exports were distributed through different regional markets, with the North American and Western European (European Union plus EFTA) markets and Japan absorbing 64% of Brazilian exports in 1985, dropping to 61% in 1992. The principal factor responsible for this downturn is the appreciable growth in Brazilian textile exports (in the three segments listed in Tables 3 and 4) to the LAIA countries. Between 1985 and 1992, exports to the LAIA Zone rose by some 300%, to represent 27.4% of the total, up from 10% in 1985, and in contrast with a total sectorial export expansion of some 46%. Nevertheless, the OEDC nation markets remain the principal destination for Brazilian textile exports.

According to data given in Tables 3 and 4, in 1992, textile exports played a particularly important role in the list of Brazilian foreign sales to the USA, Canada and the EFTA, in addition to LAIA itself. This factor is linked to the weight of clothing exports in the list of textiles channeled to these countries and regions;

– Second, in 1985 the threads and fabric segments represented 72.5% of total textile exports, while in 1992 they accounted for only 52.5%, mirroring the rising weight of the clothing segment in Brazil's foreign sales. This development is in step with world textile trade trends, today concentrating increasingly in prepared fabrics, cotton knitwear and clothing. In the threads and fabrics segment, artificial (synthetic) products have become increasingly important on Brazil's export lists, trimming the participation of natural threads and fabrics – a trend also in step with developments noted in the world textile trade;

– Third, despite the observation in the item above, exports for this sector remain strongly linked to intermediate or finished products using natural fibers, particularly cotton. Some 47% of threads and 73% of textiles exported in 1991 by Brazil used this natural fiber. In the products that incorporate natural fibers (cotton, silk, jute) grown in Brazil, within the textile sector, its largest market shares on the international market were for certain types of cotton skeins, where Brazil's participation reached 6.5% of the global market, with cotton bedsheets reaching 4.7%.

The specialization and competitive edge of Brazil in cotton products is also clearly proven by the level of utilization of its export quotas under the Multifiber Agreement. In exports to the E.C, the product that is effectively limited through regularly filling its quotas with a high percentage of use is cotton threads. Cotton-knit shirts and T-shirts, brushed or smooth, also feature an upward trend in filling their quotas.

This characteristic makes the sector particularly sensitive to assessment initiatives for the life-cycle of a product using environmental criteria related to the production and use of cotton fibers. Managers of large export companies seem well aware of this fact and are concerned with incorporating this variable into their strategies.

With regard to water pollution indicators, sectorial indices are well below the average for the industry (7.3 gr/ US$, against 18.2 gr/ US$, respectively for BOD and 0.1% gr/ US$ against 0.4 gr/ US$, for heavy metals). For BOD, the pollution abatement rates reach 48%.

With regard to air pollution indicators, the same characteristic is noted, as the emission of particulates (24.25 gr/ US$) is appreciably lower than the industrial average of 41.34 gr/ US$. The same occurs with emissions of SO_2 (13,44 gr/ US$ and 31.95 gr/ US$ respectively) and to a lesser extent of NOX (11.21 gr/ US$ and 13.88 gr/ US$ respectively).

The general data for the textile sector covering both pollution indicators as well as its export performance and structure should be considered merely as a reference, when the focus of concern is a segment with characteristics as specific as T-shirts and bed linens. As has already been noted, these segments are far more concentrated than the sectorial average, and the large and medium sized companies are located in Santa Catarina State in Southern Brazil, characterized by heavy immigration of European industrial workers, particularly from Germany.

These large and medium sized companies export cotton bed clothes and T-shirts to the Western European nations as well as other parts of the world.

The two largest production groups in the cotton knitwear segment (both from Santa Catarina) are powerful exporters with some 50% of the net operational revenues for this segment in Brazil. In the case of bed, table and bath linens, the three largest companies – all exporters to Europe located in Santa Catarina – hold 75% of the revenues for this segment in Brazil (1992 data).

The São Paulo textile park exports cotton or synthetic products to the American continent and the Middle East, with sales to Europe being virtually negligible. The two largest T-shirt exporters in Santa Catarina earmark just over 50% of their total exports for Western Europe, principally Germany; in 1993 this represented US$ 56 million. Germany alone absorbed US$ 16 million in T-shirts this same year from these two companies.

These two major T-shirt exporters accounted for 80% of foreign sales of this product in 1993. The inclusion of the eight companies that follow them in export rankings boosts this percentage to 90%, meaning almost the entire sector, as close on 10% of Brazilian T-shirt exports are handled through operations carried out by small trading companies working with neighboring countries, particularly Paraguay.

In the case of the cotton bedclothes segment, export supplies are concentrated. Here also the same export pattern as that noted for T-shirts is seen: large companies in Santa Catarina exporting cotton products to the European market. Almost all the products in this segment exported to Europe come from large companies in Santa Catarina: three of them alone accounted for 65% of total Brazilian exports worldwide in 1993. Once again the sizable participation of sales to neighboring countries by border-area companies should be noted.

These characteristics of the T-shirt and bed linen segments are important for qualifying perceptions and reactions to initiatives such as eco-labelling. Major export companies are already adapting pollution abatement strategies, and one is even a member of the ECO-TEX consortium, wielding its pioneering spirit in the environmental area as a domestic and international marketing tool. These companies are also among the first to develop quality management systems in the textiles sector, and, to a certain extent, it maybe said that environmental issues are viewed by them as an extension of their quality campaigns.

Table 3
BRAZILIAN TEXTILE EXPORTS - 1985/1992
(US$ millions)

Sectors Economic Zones	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985								
Textiles	228,339	56,000	279,512	100,914	32,327	42,653	260,862	1.000,607
# Natl. Threads & Fabrics	89,293	18,236	202,180	34,026	32,290	28,620	194,219	598,864
# Art. Threads & Fabrics	18,061	18,837	22,409	20,604	0	2,886	43,052	125,849
# Clothing	120,985	18,927	54,923	46,284	37	11,147	23,591	275,894
Overall Total	6.955,930	427,510	6.227,434	2.230,670	1.397,792	797,002	7.602,673	25.639,011
1990								
Textiles	270,444	56,659	412,504	134,479	59,290	44,644	270,049	1248,069
# Natl. Threads & Fabrics	37,872	11,605	235,103	38,976	57,073	12,328	201,699	594,656
# Art. Threads & Fabrics.	67,080	11,983	53,306	41,767	894	6,188	45,599	226,817
# Clothing	165,492	33,071	124,095	53,736	1,323	26,128	22,751	426,596
Overall Total	7.718,426	521,574	9.870,062	3.193,685	2.348,517	621,825	7.139,667	31.413,756
1992								
Textiles	365,951	47,171	389,089	400,334	50,228	43,041	167,442	1463,256
# Natl. Threads & Fabrics	123,805	14,315	133,538	115,664	48,745	9,667	95,409	541,143
# Art. Threads & Fabrics	67,663	9,854	69,552	138,364	130	2,701	62,849	351,113
# Clothing	174,483	23,002	185,999	146,306	1,353	30,673	9,184	571,000
Overall Total	6.933,230	401,475	10.627,516	7.591,924	2.306,067	436,661	7.564,632	35.861,525

Table 4
BRAZILIAN TEXTILE EXPORTS - 1985/1992
(US$ millions) - Participation in export list

Sectors Economic Zones	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985								
Textiles	3.28	13.10	4.49	4.52	2.31	5.35	3.43	3.90
# Natl. Threads and Fabrics	0.26	4.27	3.25	1.53	2.31	3.59	2.55	2.34
# Art. Threads and Fabrics	0.26	4.41		0.92	0.00	0.36	0.57	0.49
# Clothing								
1990								
Textiles	3,50	10.86	4.18	4.21	2.52	7.18	3.78	3.97
# Natl.Threads and Fabrics	0,49	2.22	2.38	1.22	2.43	1.98	2.83	1.89
# Art. Threads and Fabrics	0.87	2.30	0.54	1.31	0.04	1.00	0.64	0.72
# Clothing	2.14	6.34	1.26	1.68	0.06	4.20	0.32	1.36
1992								
Textiles	5.28	11.75	3.66	5.27	2.18	9.86	2.21	4.08
# Natl.Threads and Fabrics	1.79	3.57	1.26	1.52	2.11	2.21	1.26	1.51
# Art.Threads and Fabrics	0.98	2.45	0.65	1.82	0.01	0.62	0.83	0.98
# Clothing	2.52	5.73	1.75	1.93	0.06	7.02	0.12	1.59

Source: DTIC/SECEX/MICT.

B) The eco-labelling scheme in the European Union and Brazilian textile exports

As shown in a recent UNCTAD study (Jha and Zarrilli, 1993), various private eco-labelling schemes are being proposed in the European Union nations and Austria. The German textile industry has proposed a product label - MST - and a process-related label - MUT. Under both schemes, criteria cover air, soil, and water pollution during the production process. German industry has already introduced processes targeting compliance with criteria for use of power, chemical products and pollution emissions, which places it in a favorable position compared to imported products. Additionally, very strict criteria on the use of dyestuffs may also impose the need to import this type of material from Germany on export companies aiming at the German market (Jha and Zarrilli, 1993), in addition to discriminating against natural dyes produced by the developing countries.

The ECO-TEX scheme, developed by an association of German and Austrian research institutes, defines criteria that basically focus on controlling the possible impacts of the use of textiles on human health. Production standards are similar to those of German labels, and the effects expected on competition in the domestic markets of countries that institute them will tend to be the same as these schemes.

Under the aegis of the eco-labelling schemes launched by the European Union in 1992, Denmark was appointed as the lead country to develop and propose eco-criteria for T-shirts and bed linen made of cotton or blends of cotton and polyester. The criteria developed refer to different stages in the life-cycle of the products and in particular to the raw materials production process, the fabric manufacturing process, and finished products to a lesser extent. These may thus constitute a benchmark not only for the specific products which are today under analysis (T-shirts and bed linen) but also for textile products in general.

In its current format, the proposal submitted by Denmark covers the criteria and parameters defined in Matrix I. Detailed information on some parameters may be obtained from the document presenting the criteria defined by the Danish experts, on the pages mentioned in Matrix I.

Matrix I
Eco-criteria for textiles: T-shirts (100% cotton or blends of cotton/polyester) and bed linen

Ref.	CRITERIA	PARAMETERS
1	Mechanical & Physical Properties	- ISO 5077 e 7768 (pg37) - wash & wear test
2	Color Fastness of Dyeings & Prints	- to water (din 54006),rubbing (54021), perspiration (54020), domestic & commercial laundering (54017)
3	Materials	100% cotton or blend of cotton/polyester
4	Energy Consumption - production polyester-fiber - mechanical process - wet treatment	≤50mi PE/kg fiber ≤150 MJ PE/KG TEXTILE see formula ≤165 MJ PE/KG TEXTILE (FOR BED LINEN) pg 38 e 44 ≤ 50 MJ PE/KG TEXTILE
5	Consumption of water during wet treatment	≤ 245 l /Kg (for 100% cotton) ≤ 140 l/Kg (for 100% polyester) pro-rata (for blends)
6	Waste water parameters (in manufact. process)	- EC directive on urban waste water (91/271/EEC) plus - COD≤ 50Kg/tonne of textile - AOX ≤ 0,025 Kg/tonne of textile (DIN 38409) - ≤ maximum accepted coloration (DIN 38494)
7	Volatile organic compounds	- production of polyester fibers -≤ 10g/Kg of fiber - wet treatment - no chemical containing VOC - halogen containing organic solvents considered as a source of VOC
8	Pesticides & chemical during cotton growing	- hazardous to environment - persistent and/or bioaccumulativity not to be used see pg 39 for criteria - hazardous to health - no to be used see pg. 40 for criteria - no pesticides containing heavy metals
9	- Catalysts during polyester production	- antimony catalyst - not to be used
10	- Lubricants	- only minerals oils of pharmaceutical quality (in spinning, knitting & weaving)
11	- Detergents & compelling agents	- no surface active agents where degradation results in formation of stable toxic metabolites - DTDMAC, DSDMAC, DHTDMAC, NTA, EDTA - not to be used
12	- Bleaching agents	- no to use: containing chlorine & chlorine compounds
13	- Dyes, pigments & carriers (in manufacturing process)	- benzidine-based dyes, azo-dyes based on other aromatic amines, dyes containing or consuming heavy metals - not to use - carcinogenic (or suspected) and dyes with acute toxic effects (LD 50< 200 mg/Kg bw) no to be used - carriers containing chlorine or other halogens - not to use
14	- Flame retardants	- based on heavy metals or halogened - not to use - FR systems releasing formaldehyde - not to use
15	- Crease resist finishes	- releasing formaldehyde - not to use
16	- Occupational conditions	- 89/391/EEC - Council Directive on the introduction of measures to encourage improvements in the safety and health of workers at work: written assessment of risks
17	- Cotton dust	- ≤ 0,2 mg/m3 (8h - TWA) - at all life cycle stages
18	- Noise	- ≤ 85 dB (at all life cycle stages)
19	- Final products	- substances & parameters - limits for chemicals residues in the final products see pgs. 35 e 36

The assessment of the implications for Brazilian companies of the eco-labelling scheme proposed in the European Union was based on interviews with companies in the clothing segment that manufacture and export the categories of products to which this scheme would be applicable.

The option to focus this assessment on major export companies in Santa Catarina spotlights the potential effects of the eco-labelling scheme on sales of the companies for which exports to the European Union have an appreciable weight.

As these companies are better equipped to carry out the adaptations and make the investments required by the foreign market, the assessment based on the experience of these companies does not reflect possible future negative impacts of the proposed scheme on companies with lower levels of qualification. Given the extreme heterogeneity of Brazil's textile and clothing industries, the implications of this scheme may vary substantially, depending on the export experience of the companies concerned, the age of their equipment, and their growth strategies. Large companies with limited exports to Europe were contacted by the survey team, but showed little concern over this issue, and appeared largely unwilling to discuss it. This led to efforts to supplement the assessments of export companies in Santa Catarina with perceptions alert to the potential diversity of these impacts, due to a series of corporate characteristics. The European Union scheme on textiles was then discussed in detail with the technical staff of the Chemical and Textile Industry Technological Center of the National Industrial Apprenticeship Service (CETIQT/SENAI) of the National Confederation of Industry in Rio de Janeiro.

With regard to the Santa Catarina clothing industry, the companies interviewed accounted for an appreciable proportion of Brazilian exports of T-shirts and bed linen to the European Union. All were keenly aware of the environmental requirements of European consumers, the irreversible nature of the trend expressed by these requirements, and the implications thereof on exports and the production and marketing strategies of these companies. They constitute the core of the leading companies in the textile sector in the introduction of quality management systems (ISO-9000 & 9001) inserting concern with the environment into the quest for total quality, which also involves the functioning of CCQs and other participative programs. In the words of one of the directors of a leading Brazilian cotton knit clothing company. “Consumers all over the world are becoming increasingly demanding, not only with regard to the final quality of the products they buy, but also with regard to the companies that manufacture them.” This company spotlights its trail-blazing activities in environmental management issues as an element in its marketing strategy, through market presentation of “differentiated products at competitive prices that are ecologically correct”. This same company belongs to the ECO-TEX business association which establishes environmentally-correct classification criteria for textile products and clothing, monitoring surveys on the use of new natural dyestuffs in the textile industry, particularly those carried out by the TDG -Textile Design Group, in Milan.

All five companies interviewed were coping with environmental demands made directly by their European importers, particularly the Germans. Although these requirements have not yet had an effect on their exports, they have - for at least one of these companies - generated additional costs through carrying out tests in order to certify products exported.

The requirements formulated by the importers covered various aspects of the production process:

- Use of production processes that give rise to a pollutive discharge during local production by the company (four companies) ;
- Use of raw materials considered as toxic (four companies) ;
- Use of production processes considered as virtually unacceptable in terms of the emission of noise or air pollution (three companies).

Four of the five companies interviewed had information on eco-labelling initiatives for textiles in the European Union. European clients were the principal source of information for export companies. Suppliers and technical literature played a subsidiary role in providing this information for companies.

They stated that they could comply with requirements stipulated by clients with regard to the environmental impacts of their production, which, for these export companies implied:

- Alterations in the production process (three companies);
- Increased demands for compliance with environmental standards in the procurement policy for input and raw materials by the companies (three companies);
- The installation of pollutant emission control equipment (two companies);
- Changes in the presentation and packaging of products (three companies). One of the companies reported that the first environmental requirement of its principal German importer referred to plastic packaging for T-shirts, which should be bio-degradable, a demand that was transferred to the suppliers of this packaging and was complied with.

A bed linen exporter (Brazil's third-largest producer, with net operational revenues of US$ 90 million in 1992, and exports of US$ 3,4 million in 1993), also reported that the demands of its clients had prompted the company to update its physical and chemical laboratory installations, as well as to import chemical input materials appropriate to compliance with requirements of the importers. The other bed linen exporter advised that environmental requirements forced the company to introduce changes in its marketing strategies.

With these adaptations implemented, the companies could maintain their export strategies to the European Union unchanged, although this had imposed the need to make major investments linked to environmental requirements. For the above-mentioned bed-linen exporter, the proportion of investments underway prompted by environmental requirements reaches 50% of the total, while for T-shirt exporters, the figures for Brazil's third-largest cotton knit producer - an average exporter - hovered around US$ 18 million against annual billings of US$ 75 million in 1992 and exports of US$ 2 million in 1993. In the case of the cotton knit market leader, the largest exporter in the segment, with operational revenues of US$ 240 million in 1992 and exports of US$ 38 million in 1993 from the Santa Catarina plants[1], these reached

12% of total investments underway. In the case of the other company interviewed - Brazil's largest bed-linen exporter, with exports equivalent to US$ 11.1 million in 1992 and operational revenues of US$ 96 million - investments of an environmental nature were equivalent to 0.8% of the total.

Faced with the criteria and parameters of Matrix I, taken from the document prepared for the European Union by Denmark, companies interviewed took up the following positions:

Description	Company 1	Company2	Company 3	Company4	Company 5
* The company already complies with criteria presented	1,2,3,4,5,6,7, 10,11,12,13,1 4,15,17,18	2, 4, 5, 12	1, 2, 3, 5, 7, 8, 11, 12, 13, 14, 15, 18	2, 3, 5, 11, 12, 15	1 to 16 (except 6 & 8)
* The company complies with criteria but is making the investments necessary to comply with them	8	11, 13 &15	6	1, 4, 6, 7, 13, 16, 19	19
* The company does not comply with criteria and is not in a position to make the invest-ments necessary to comply with them	-	-	-	8, 10, 17, 18	6 &18
* The criterion is not applicable to the Company's products	9	-	-	9 & 14	-
* The company lacks information to reply	16	-	-	-	8 & 17

An analysis of the results obtained suggest that this group of leading companies in the Brazilian clothing sector is well aware that its production list is already to a large extent adapting to requirements imposed by the criteria of the eco-labelling scheme proposed in the European Union. There is a large concentration of responses in the two first alternatives, indicating a high capacity to comply with these criteria and a trend among these companies of channeling investments towards resolving shortfalls under some criteria.

With regard to compliance with these criteria, the severest difficulties are found in Criteria Nos. 8 (use of pesticides in cotton-growing), 6 (waste water parameters during manufacturing process), and 18 (noise). These three criteria were mentioned in the various orders by three companies, and for the total references made, were ranked as follows: 8, 6 and 18, in decreasing levels of difficulty in complying with the criteria. Also mentioned as criteria difficult to comply with by one of the companies were Criteria Nos. 13 (dyes, pigments and carriers during manufacturing process), 17 (cotton dust) and 4 (energy consumption).

Among the parameters mentioned as difficult to achieve, one company mentioned compliance with Standard DIN 38409 of Criterion 6 (waste water parameters) together with the parameters for energy consumption and the physical and mechanical properties of the product (under Criterion No.1).

The principal difficulties encountered by the companies in complying with the criteria presented refer to:

* Relationships with the suppliers of input materials (cotton, pigments etc.) - five companies;
* Outdated equipment - four companies. One - the same company that advised it was investing US$ 18 million - commented that the equipment was being replaced;
* Higher product prices, in a market where competition is price-based - four companies;
* Lack of market stimulation, linked to the fact that the demand is not very exigent in environmental terms - two companies;
* Inadequate installations and location of companies - one company.

This assessment of the origin of the stumbling-blocks hampering compliance with criteria is compatible with the analysis of the levels of difficulty in complying with the various criteria. The issue of cotton supplies stands out (Criterion No.8) - as this raw material is imported to an increasing extent by Brazil - together with difficulties in modernizing equipment which, if implemented, would imply changes in working conditions (Criteria 17 and 18, and in the use of lubricants, pigments and other chemical input materials (Criteria 10 and 13 respectively), and problems related to the functioning of a market where product differentiation is very limited and the competition is essentially price-based. This latter aspect was brought out quite clearly during the interviews: the possibilities of establishing product differentiation on the basis of compliance with ecological criteria seemed neither adequate nor sufficient to allow companies to set prices higher than those of products that fail to comply with these criteria. According to one of the interviewees, the consumer's preference for "ecological" products (T-shirts, in this case) would only be exercised if equivalent to the traditional product in both price and appearance. In relationships with European customers, the following type of behavior was noted: "We developed a T-shirt using natural dyestuffs. When the customer discovered this would cost US$ 5, while other traditional T-shirts cost US$ 2, he did not buy it. We received no orders (...). The buyers said that the consumer would not pay this difference just for an ecological T-shirt."

With regard to cotton production, the interviews indicate that Criterion number 8 is of much concern to the companies. Until recently, cotton bought by the Brazilian clothing industry was produced almost completely in Brazil, with low pesticide use, harvested almost completely by hand.

With large-scale cotton imports by Brazilian industry on the rise, the companies interviewed admit that they are not in a position to state that the cotton is pesticide-free. To the contrary, "let us imagine that I import US cotton. This cotton has certainly been treated with pesticide. Why? At the price I am paying, at the quality and in the quantity that I am buying, I can only acquire it from a major grower, I can not buy from an ecological grower." At the same time, the companies suggest that although they find difficulties in controlling the use of pesticides in the production of imported cotton[2], the presence of pesticides in raw materials is completely eliminated in the final product, as the pesticides are water-soluble, and all cotton knit production requires treatment in hot water.

The large number of ecological criteria already complied with by these companies reflects:

* The relative modernity of the equipment used;
* The negotiating position of major export companies with multinationals producing in Brazil chemical input materials for the textile industry; and
* The realization that some of the investments required have a high technical and economic return, as they reduce wastage in the use of input and raw materials.

The use of lubricants, for example, complies with the specifications of the manufacturers of machinery and equipment. “These standards are European. Our machines arrive with the manufacturers recommendations for oil. In order to alter the oil, we have to contact the suppliers of the machinery.” Additionally, the use of manufacturer-recommended oils ensures the quality of the dyeing and the final product.

Chemical input materials (Criteria No.7 through 15, except 8) are supplied to the textile industry by a restricted group of multinational companies with production plants in Brazil. Their supply of products in Brazil depends on the characteristics of local demand, which is generally not very exigent with regard to quality and environmental criteria.

This data means that chemical companies continue to produce in Brazil input materials that are no longer used in Europe or the USA, or may even be banned in these countries. The demand in Brazil for products compatible with environmental regulations and European national legislation thus originates in major textile and clothing companies, with high export levels(to European Union countries) participating in their revenues. In addition to pressuring chemical industries to supply - either through local production or imports - the input materials required by legislation in the European nations, major export companies did not agree to pay more for these input materials, as this would affect the competitiveness of their prices on foreign markets. As noted below, this fact reflects the specific market power of the major exporters’ companies, and this pattern of relationships with the chemical industry does not correspond to the small and medium sized textile and clothing companies throughout the segment.

Compliance with criteria for water consumption and - to a lesser extent - energy, spotlights the perception that compliance with these requirements may introduce sizable economic and financial benefits for the company, by reducing expenditures on these input materials and imposing the rationalization of production processes, generating additional savings. The leading cotton knit clothing manufacturer and Brazil's largest exporter recycles 600 tons a month of cotton waste, sold to third parties for producing string, cotton batting, eiderdowns, towels etc. It is also implementing a conservation program for energy resources, both renewable and non-renewable, which will allow it to save 300 tons per month of oil, reducing the emission of air pollutants and replacing oil by natural gas. It has cut the amount of water used for each kilogram of cotton knit produced by 30%, down to 120 liters/ kg, targeting 100 liters/kg in the near future.

This awareness certainly explains why, of the companies interviewed, only two (the smallest among the five) consider that investments to comply with criteria and parameters under analysis in the European Union will increase their production costs, one estimating this hike at 15%. The same two companies feel

that these investments will not introduce an assortment of savings into the production process, and one of them admits that they in fact blunt the competitive edge of its products on the foreign market. It is not by chance that this is the company which stated it is not in a position to comply with criteria Nos. 17 and 18, which would require investments in new machinery and equipment.

The economic and financial restrictions which characterize the vast majority of Brazil's textile and clothing companies at the moment, and the effects of these constraints on the investment capacity of firms constitute – in the view of CETIQT/ SENAI technical staff – the benchmark for assessing the possibilities and difficulties of complying with the eco-criteria defined by Denmark for the European Union eco-labelling scheme. The CETIQT technicians calculate that compliance with most of the criteria presented essentially depends on renovation of machinery and equipment for most companies. The sharp drop in domestic consumption of products manufactured by this sector, together with rising imports, challenges companies with the need to adapt in order to survive. However, the vast majority of small and medium sized companies are not in a position to finance investments in modernization. The reduction in consumption is accompanied by shrinking demands for quality on the domestic market, so that companies not orientated towards exports find investments in modernization of equipment and concern with environmental criteria somewhat remote within this context. The low level of technical requirements and compliance with criteria related to human health drops still further when the crisis on the domestic market heats up price-based competition.

The opinion of CETIQT technical staff suggests that the key variable for defining the capacity - and the motivation - of companies to invest in modernizing the production process, whether or not this is done specifically to comply with environmental criteria, is the importance of exports in corporate strategy, particularly in view of the increasing gap over the past few years between quality requirement levels on the domestic and foreign markets, namely the European Union and the USA. Even among export companies, there are substantial differences among the production processes and products earmarked for the local market and foreign sales. These differences involve:

* Quality of threads used
* Use of chemical input materials
* Quality of the final product.

In non-exporter companies, the dominant trend on the domestic market prevails, where the demand for quality is concentrated to an increasing extent in upper income segments.

The assessment by CETIQT technical staff of these criteria is based on the limited investment capacity of the vast majority of companies, concluding that:

* The most difficult criteria to comply with are those involving the production of raw materials which lie beyond the control of companies (Nos. 7 and 8). Additionally, these difficulties also involve criteria and parameters where compliance depends on investments, renovation of machinery and equipment (Nos. 17 and 18 for example) particularly in the case of small and medium sized companies. Restrictions in this case are not based on access to technology but rather on investment costs.

* Compliance with the criteria related to the use of chemical input materials essentially depends on the level of requirements of the demand, as well as the market power and negotiation capabilities possessed by textile companies on their relationships with suppliers in the chemical sector. On the one hand, the limited requirements of domestic demand do not force textile companies to replace chemical input materials used. On the other hand, the sales policy of companies in the chemical sector raises an additional obstacle to this substitution, due to the impact on the costs of these materials. Only major companies will be in a position to negotiate reasonable price conditions with chemical firms for the acquisition of new materials.

However, criteria where compliance demands investments in renovating machinery and changes in relationships with the suppliers of raw materials and input materials are those where non-exporter companies and/or small and medium sized companies in Brazil may well find the greatest difficulties in adaptation.

Other criteria are already being complied with in a larger corporate universe. These are principally those associated with economies of cost, through rationalization of the use of energy input, whose relative price has increased substantially over the past few years, as well as water (Nos. 4 and 5). The difficulties encountered by Brazilian companies in complying with these criteria lie in achieving the parameters stipulated, particularly for small and medium sized companies.

The criteria covering the emission of waste waters (No. 6) is complied with by most of the leading export companies in this sector, and Brazilian legislation requires companies to build waste waters treatment systems. Both the criteria and the parameters seem reasonable to CETIQT technical staff, provided that company treatment systems are properly designed and operated. In Brazil, this depends to a very large extent on the supervisory capacities of the environmental control agency at the state level, which means that legislation is only implemented and routinely enforced in Southern Brazil.

The use of bleaching agents containing chlorine and chlorine compounds has already been abandoned or is being phased out by the vast majority of Brazilian companies. This means that Criterion No. 12 may be considered as not posing a problem for these companies. With regard to the use of flame retardants and crease-resistant finishes releasing formaldehyde (Nos. 14 and 15), this depends on the destination of the product, whether the domestic or a foreign market. Many companies that produce for the domestic market use these input materials.

The global assessment made by the CETIQT technical staff is that, for small and medium sized companies, no criteria are easy to comply with, due to the shortage of funding for investments and the lack of market or legal incentives which would encourage them towards compliance therewith. These difficulties increase in step with stiffer requirements (associated with the criteria) for new investments, and the capacity and power of negotiation with the suppliers of raw and input materials.

For major export companies, none of the criteria presented offer great difficulties in compliance, as investments in modernization of equipment are a pre-requisite for the participation of these companies on the international market. As they export to “demanding” markets, 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 parameters (Criteria 6 and 8) may prove difficult.

II.2. The pulp and paper sector

A) Structural Characteristics and Competitive Position

The pulp and paper industry generated 1992 revenues of some US$ 5.1 billion, ranking high among producers worldwide: eighth for pulp and tenth for paper.

Brazil's industrial park consists of 236 plants belonging to 170 companies which also maintain industrial forests in areas equivalent to 1.3 million hectares. Of this total number of companies, 58% produce only paper, 12% manufacture paper, and 3% - meaning six companies - produce only pulp, while 27% produce pulp and paper, being integrated.

One half of pulp production is earmarked for consumption by the companies themselves, with 36% exported and 14% channeled to the domestic market. Some 94% of exports are handled by four major companies.

During the 1990s, some of these major companies expanded their production capacity appreciably, which tends to increase the level of concentration in this sector, topping 42% (CR-4) at the start of the decade.

The paper production segment is characterized by concentrated production and structural heterogeneity. In this segment, the entry into operation of new production plants, together with the expansion of some existing plants and various mergers and take-overs, are increasing the level of sectorial concentration, which reached 38% in 1990 for CR-4. This trend buttresses the structural heterogeneity of the sector, where medium-sized and non-integrated companies compete with massive exporters that are verticalized from the forest base onwards, and - in the case of multinationals - are specialized only in the production segment.

In the export of both pulp and paper, Brazil competes internationally through prices. In the paper segment exports are concentrated in products considered as commodities, such as printing and writing papers, and kraft (kraftliner) packaging. The export performance of Brazil is thus somewhat sensitive to variations in price and changing competitive conditions on the world market. According to Mendonça (1993), “the recent crisis on the international pulp market showed Brazilian producers that although their production costs tend to be lower than those of their competitors, this is not sufficient to guarantee a comfortable position during a period of marked supply-side surpluses such as that encountered in 1992-1993”.

Since the early 1980s, exports for this sector top US$ 500 million, meaning 2.6% of the total exported by Brazil (See Tables 5 and 6). Shrinkage in domestic demand during the first half of this decade triggered an upsurge in paper exports, which soared 82% between 1980 and 1985. In 1990, sectorial exports rose 116% compared to 1985, an upswing noted for both pulp and paper. Pulp exports rose principally for the USA and the European Union, while paper exports expanded in the European Union nations, as well as the LAIA countries and Others.

Between 1990 and 1992, foreign sales for the sectors rose by 20%, with the pace of increase for pulp (24%) exceeding that of paper exports (15.6%). The European Union market for pulp grew increasingly important (38% in 1985, 41% in 1990, and 45% in 1992). Brazil chalked up appreciable gains in its market share during the 1980s, while for paper, the increase in its participation for the LAIA countries in total Brazilian sales between 1991 and 1992 ranked this market group as the principal destination of Brazilian exports (34% of the total), a figure practically equal to that of the Other countries (33.9%), slightly higher than that for the European Union (30.9%). In 1993, pulp exports sagged slightly (-3.3%) while paper sales rose by over 12%.

In 1990, Brazilian participation in the international pulp and paper markets corresponded to 5.1% for pulp, 4.6% for writing and printing paper, and some 3.0% for photographic and kraft paper.

The availability and speed of replacement of forest raw materials, the mastery of industrial forest management technologies, short-fiber eucalyptus pulp fabrication techniques and environmental administration techniques, allied to the supply of renewable energy sources (hydro-electric power) at competitive prices and scales of production constitute the principal comparative advantages of Brazil's pulp and paper sector. In the case of paper, “various medium and small producers lack the quality to cope with the new requirements for quality and standardization arising from the use of more modern printing and crimping machinery”. Efforts to achieve ISO-9000 quality management certification are concentrated in large companies (Mendonça, 1993).

Although chlorine gas is still used during the pulp-bleaching stage, a number of plants are prepared to produce elementary chlorine-free – ECF pulp, replacing chlorine gas by chlorine dioxide. Two industrial plants are ready to produce total chlorine-free – TCF pulp. Corporate concern with environmental control is already appreciable throughout the pulp and paper segment, and major companies have already channeled investments to reducing the discharge of liquid wastes and particulate emissions.

Although the pulp and paper sector appears on the list of Brazil's industrial sectors with the greatest intensity of residual pollution (pollution level after control / GNP for the sector), its pollution abatement rates are equivalent to 71% of total output. The abatement rate for particulate emission hovers around 79%, against an average of 57% for Brazilian industry as a whole. Particulate air pollution indicators for the sector (28.2 gr. / US$) are lower than the average for Brazilian industry at 41.3 gr. / US$.

The abatement rates for sulfur dioxide and nitrogen oxides are still negligible in Brazilian industry, as is the case with the pulp and paper sector, where abatement rates do not exceed 1% for the former and are 0% for the latter. Nevertheless, there is no doubt that, for a developing country such as Brazil, the pollution problems generated by the emission of these elements are not comparable in either size or real or potential consequences to those produced by industry in the OEDC nations.

For such a sector as the pulp and paper, where an appreciable proportion of process and production technology is incorporated into equipment manufactured by a limited number of giant global producers, compliance with environmental requirements and criteria may trigger two effects:

* First, the costs of adapting the production system to comply with these requirements may prove extremely heavy. The investments necessary to support strategy of compliance with environmental criteria may blunt the competitive edge of exporters already on the international market;

* Second, this may implicitly make compliance with environmental criteria conditional on the adoption of specific technological solutions embodied in equipment produced by these manufacturers, which may potentially skew trade flows and divert international investments.

Concerns of this type become particularly acute during a phase, when the global market is characterized by excess supplies due to the maturation of capacity expansion projects in various countries, as well as the entry of new competitors, in addition to depressed prices.

Table 5
BRAZILIAN PULP AND PAPER EXPORTS - 1985/1992
(US$ millions)

Sectors	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985								
Pulp and paper	101,575	297	143,298	66,281	49,123	244	195,179	555,997
Pulp	71,843	292	104,118	24,751	48,709	3	24,157	273,873
Paper	29,732	5	39,180	41,530	414	241	171,022	282,124
Overall Total	6.955,930	427,510	6.227,434	2.230,670	1.397,792	797,002	7.602,673	25.639,011
1990								
Pulp and paper	211,551	10,927	459,798	87,469	110,264	2,940	322,545	1.205,494
Pulp	203,039	1,619	243,231	9,821	107,442	0	26,900	592,052
Paper	8,512	9,308	216,567	77,648	2,822	2,940	295,645	613,442
Overall Total	7.718,426	521,574	9.870,062	3.193,685	2.348,517	621,825	7.139,667	31.413,756
1992								
Pulp and paper	218,122	1,300	551,695	258,997	100,081	1,264	312,786	1.444,245
Pulp	209,668	0	332,377	18,041	99,561	0	75,626	735,273
Paper	8,454	1,300	219,318	240,956	520	1,264	237,160	708,972
Overall Total	6.933,230	401,495	10.627,516	7.591,924	2.306,067	436,661	7.564,632	35.861,525

Table 6
BRAZILIAN PULP AND PAPER EXPORTS
Participation in Export List

Sectors	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985								
Pulp and paper	1.46	0.07	2.30	2.97	3.51	0.03	2.57	2.17
Pulp	1.03	0.07	1.67	1.11	3.48	0.00	0.32	1.07
Paper	0.43	0.00	0.63	1.86	0.03	0.03	2.25	1.10
1990								
Pulp and paper	2.74	2.10	4.66	2.74	4.70	0.47	4.52	3.84
Pulp	2.63	0.31	2.46	0.31	4.57	0.00	0.38	1.88
Paper	0.11	1.78	2.19	2.43	0.12	0.47	4.14	1.95
1992								

Pulp and paper	3.15	0.32	5.19	3.41	4.34	0.29	4.13	4.03
Pulp	3.02	0.00	3.13	0.24	4.32	0.00	1.00	2.05
Paper	0.12	0.32	2.06	3.17	0.02	0.29	3.14	1.98

Source: DTIC/SECEX/MICT. Prepared By: Funcex.

B) The European Union Eco-labelling Scheme And Brazilian Pulp And Paper Exports

Brazil's pulp and paper exports have had to cope with two trends in the environmental area. The first refers to legislation implemented in Germany less than three years ago, which obliges packaging manufacturers to use secondary fibers, meaning scrap, offcuts and recycled material. Along the same lines, a law was passed in Belgium stipulating a high proportion of secondary fibers (60%) in the production of imported papers. Given the difficulties in complying with these requirements, this legislation was later revoked.

The second trend leans less towards State regulation, being more closely linked to changing habits in paper products consumption, increasingly influenced by tropical rainforest protection movements underwritten by environmental preservation non-government organizations in the developing countries. According to Brazilian producers and exporters, the link between pulp and paper products and native tropical rainforest devastation and clearing practices – particularly for a nation such as Brazil, with the largest reserves of this type of forest in the world – is actively established by environmental non-government organizations, adversely affecting the exports of companies that invest in industrial forest management and ecologically-sustainable practices.

The effectiveness of these actions has prompted a preference and acceptance of recycling as a social norm among final consumers. The appearance of paper recycling as a positive social standard or conduct tends to produce commercial effects, including when initiatives for laying down environmental standards are not mandatory, but rather depend on the preference of the consumer, as is the case with eco-labelling schemes.

With regard to the impacts of the introduction of eco-labelling on Brazilian pulp and paper exports, it may be said that these fundamentally depend on the environmental goals implicit in this legislation. The criteria adopted seek to boost the use of received material, using clean technology with minimum waste during the production process. In order to qualify for an eco-label, a product may not score more than a stipulated number of load points or penalties, “which are awarded on the basis of several parameters” (Jha and Zarrilli, 1993).

According to the Brazilian Pulp Exporters' Association - ABECEL, eco-labelling and environmental quality certification are important and must be implemented, accepted, used and respected by suppliers and consumers. However, to guarantee reliability in terms of acceptance and recognition, eco-labelling award systems must be based on the following seven conceptual and strategic points: (i) the system must be open, clear and transparent; (ii) it must be based on sound technical and scientific information; (iii) the criteria must not be discriminatory against products, producers, countries and regions; (iv) the criteria must be selected on the life cycle basis and should be independent of each other; (v) the system should not establish limits curbing the creativity and competitiveness inherent to each country and case; (vi) the system must consider all types of impacts on the environment and not only a segment of them; (vii) the system shall avoid assigning preference to certain technologies over others.

These strategic points were made because Brazilian "producers / manufactures of paper and pulp felt that the working group" - consisting of six EU member countries chaired by Denmark - "had developed the criteria keeping in mind solely the patterns of European production, and rewarding only environmental efforts made in Europe. No attention was paid to the fact that in non-EU countries positive environmental results might be achieved in ways different from those tagged as top priority in Europe, and that solutions appropriate to Europe may not be valid for other regions". (Jha e Zarrilli, 1993). It is important to note that "Brazilian manufacturers / exporters have been unsuccessful in voicing their concern, since their application to participate, either directly or indirectly (through the International Chamber of Commerce) in the discussions for the settling of criteria has been rejected" (Jha e Zarrilli, 1993).

According to ABECEL, the way in which load points are established would largely benefit European paper producers because the working group that set the criteria and parameters does not follow the conceptual and strategic points described above, especially the criteria concerning: the point system, consumption of renewable and non-renewable resources, waste generation, and atmospheric emissions.

Concerning the point system, the Brazilian producers / exporters position is that the system should be better balanced between recycled papers and sustainably-produced virgin pulp. With regard to renewable resources, two issues arise relative to the criteria covering sustainability and consumption. For ABECEL, "the Helsinki definition of sustainable forestry is too vague to be workable, since it is not based on measured parameters. Since there is general agreement over the difficulty of defining sustainability in a wide range of applications (from natural forests to fast-growing plantations), a lead-time must be allowed to establish the relevant standards and criteria. In order to be accepted as such, sustainable forests must comply with criteria covering various types of forests and their locations. These measurable parameters should be established by a team of acknowledged international experts representing various regions of the world, so that different local conditions are considered. Compliance with these standards should be verified and certified by neutral auditors and/or authorities".

Regarding the wood consumption parameter, the ABECEL position is "that if forests are sustainably managed, the timber criteria must define zero load point. The present criterion as proposed by DG XI gives from 0.9 to l.2 load points when a tissue mill uses 100% virgin pulp, even when the wood comes from a sustainably-managed forest. This means that, no matter how hard and efficiently you work to guarantee sustainability and to provide a sound relation between industrial production and nature, you will be penalized ".

Brazilian manufactures/exporters expressed their displeasure at the fact that producers outside Europe would be charged with load points corresponding to the amounts of SO2, AOX and CO2 emitted during pulp-and paper production. As already noted by Jha and Zarrilli (1993), "a reduction in sulfur emissions (SO2) in Europe would alleviate the phenomenon of "acid rain" that affects some countries in Europe. A parallel reduction of these emissions in other geographical areas would be of no use to Europe, which would be too far away to benefit. Countries outside Europe - such as Brazil - which must reduce their sulfur emissions in order to comply with eco-labelling criteria, will probably never experience a similar phenomenon".

The reduction of AOX emissions is a questionable criterion because it works by imposing penalties on just one side of the environmental damage. According to ABECEL, "today a first-class bleached kraft pulp mill with minimum environmental impact has, after a secondary or tertiary level waste-water treatment, an AOX specific load of about 0,3 kg/t. According to the latest DG XI proposal, this corresponds to 1.2 load points when 100% virgin pulp is used in a tissue mill. On the other hand, no points are due under this criterion to the use of fibers coming from a deinking plant without any type of wastewater treatment".

Even if AOX abatement is implemented as a criterion, the concern factor should be reduced and the limits kept higher. According to ABECEL, Canadian and French scientists "have proven that AOX levels below 1.0 kg/t are acceptable and not harmful to the environment. There is thus no reason to set barriers at a lower figure".

Concerning the reduction of CO2 emissions, the ABECEL position "is to maintain criteria factors independent of each other. Should CO2 be adopted as a criterion, our opinion is that the overall balance should be evaluated. The removal and immobilization of CO2 by planted forests should win credit points for companies planting their own forests for pulping. To be consistent, the ABECEL position is valid only if credits are also granted for the use of waste paper due to the question of solid waste reduction".

The way in which waste generation and waste paper is calculated and load points are attributed would also benefit European companies to a larger extent. According to ABECEL "the DG.XI favoring criterion for waste paper (or re-used paper) may unbalance the future supply of fibers for the paper industry. The balance between virgin fiber and waste paper is by far the most reasonable alternative, if based on technical, economic and social issues. Our opinion is that no credit is due for solid waste reduction for recycling waste paper. Waste paper is a resource, a raw material for the industry just like timber. Used paper must be environmentally friendly, collected, cleaned, stored, handled, deinked and used again". As the use of recycled paper by European companies is greater than that of Brazil, the former are allowed to subtract it from the amount of waste generated.

The waste generated in manufacturing industries, such as pulp and tissue mills, CTMP and deinking plants, has different hazardousness and toxicity ratings. ABECEL understands "that wastes should be considered as the Total Equivalent Waste Concept, by weighting differences in toxicity and hazardousness".

Having interviewed Brazilian exporters, Jha and Zarrilli (1993) assert that criteria based on the consumption of renewable and non-renewable resources would allot few load points to European producers for the following reasons.

(A) Waste paper is not counted in the calculations of renewable resources.

(B) No distinction is made between timber from planted forests, which are generally sustainably managed, and other kinds of timber.

(C) The beneficial environmental and social effects of planted forests have not been considered.

(D) The consumption of fossil fuels is calculated using the implicit assumption that all countries have an energy grid similar to that of Europe.

(E) The definition of sustainable forest management has been laid down by Denmark, instead of an international forum.

The considerations put forward by Jha and Zarrilli (1993) to a large extent cover the arguments of Brazil's pulp and paper exporters. Brazilian industry in these sectors has channeled heavy investments to environmental controls, and its exports are crucial to the profitability of these investments. The definition of criteria and parameters that spotlight specific environmental management methods tends to give rise to discriminatory effects in terms of international trade, skewing trade flows and diverting off investments over the medium term.

In the case of pulp – an intermediate good that constitutes an input for paper production – it is important to note that the definition of criteria and parameters that prioritize the use of secondary fibers immediately boosts the value of a product competing with pulp, which thus becomes an incentive to replace pulp by this product. In this case, and taking into account the sensitivity of consumers and the activism of environmental non-governmental organizations in the forest products area, these effects make themselves felt immediately on the pulp market, through shrinking demand. This blunts the competitive edge of the export industry, and over the medium term undermines its modernization plans, including those in the environmental management field.

In view of the weight of the European market as a destination for Brazilian pulp exports, it logically follows that these impacts tend to be particularly striking in this case.

II.3. The Footwear Sector

A) Structural Characteristics and Competitive Position

Brazil ranks fourth in the world's footwear sector: its 1990 output consisted of 42% plastic and rubber and 41% leather footwear, with the remaining 17% concentrated in sports shoes. Some 28% of Brazilian footwear production was exported that year, but the export profile differs substantially from the production profile. In fact, 92% of exports consist of leather footwear, which makes this type of footwear industry an essentially export activity: almost two thirds of output is earmarked for foreign sales.

This fact warrants particular attention as Brazil's leather sector has an extremely high rate of residual pollution, particularly heavy metals.

In addition to channeling most of its leather footwear to exports, these activities take place in a very specific pattern of industrial organization characterized by concentration in two regional centers in southern Brazil: Novo Hamburgo, in Rio Grande do Sul state (women's footwear) and Franca in São Paulo (men's footwear). This regional polarization of production has attracted new producers, as well as

manufacturers of input materials and equipment, while spurring the implementation of a technological and information infrastructure in these production centers. In addition to underwriting the participation of small and medium sized companies on the international market, this structuring endowed Brazil's export footwear sector with great flexibility as well as a permanent capacity to adapt to constantly changing rules and conditions for competing on global markets. This explains how the sector chalked up expressive growth in exports over the past few years, despite the entry of new competitors from Southeast Asia on the international market.

Thus, while total footwear production is relatively concentrated in a few major companies, in the leather footwear export segment, production is distributed among large, medium and small companies. The concentration of production in this segment shows 28% of total revenues for the eight largest companies in 1992 (with a downward trend for this indicator) while the number of exporter companies rose from 294 in 1975 to 487 in 1992.

As a part of the international market, Brazil's footwear production sector has gone through three distinct periods over the past 15 years (see Tables 7 and 8):

* The first, between 1980 and 1985, was characterized by marked growth in exports (up 138% over the period), due principally to expansion fueled by demand in the USA. During this phase, Brazil expanded its market share in international competition, although this growth in footwear exports was concentrated in one single market (USA);

* The second, between 1985 and 1990, is marked by relative stagnation of the total amounts exported by this sector (up only 22% over the period) and by a shrinking international market share, down from 2.1% to 1.8% on the worldwide market from 5.0% to 2.8% in the North American market. The entry of competitors from Southeast Asia on this market and transformations in the North American retail market forced suppliers to adopt quick-response practices, explaining Brazil's loss of position in the USA and prompting Brazilian producers to adopt cost-cutting strategies, while upgrading products;

* The third, between 1990 and 1993, suggests that the adaptation to these new market conditions was highly successful: exports soared 64% in three years and maintained the trend towards market diversification, within the OECD nations. In 1992, exports to the USA represented 69% of the total, against 72% in 1990 and 85% in 1985. The European Union, which in 1985 absorbed 7% of Brazil's footwear exports, in 1992 accounted for 19% of this total. Consequently, the participation of footwear in Brazil's list of exports rose from 3.8% in 1990 to 5% in 1993. The challenge of competition from Southeast Asia was handled through the introduction of technological updating programs and managerial modernization. Additionally, a recent study of the competitive nature of Brazilian industry noted that in the footwear sector ‘some areas show technological lags, with a probable blunting of competitive advantages in relation to competitors from Southeast Asia. Small companies, hampered by tight finances, are finding the greatest difficulty in investing, which tends to accentuate the technological heterogeneity of this sector.

> Basic microelectronics equipment, although not unknown in these companies, is still in limited use. The dissemination of CAD is limited to a few companies, and the same applies to stitching machines, die-cutters and equipment fitted with microprocessors (Costa, 1993).

Although limited, these transformations - underwritten in some major companies by investments under now extinct Befiex Incentives Program - helped redeem the competitiveness of Brazil's footwear exports. Investments in fixed capital by companies supported a strategy of upgrading production as a means of facing up to competition from Southeast Asia and breaking through to an intermediate segment of the OECD markets (North America and the European Union), in terms of the unit price of product.

Technological and organizational changes through which the sector has recently passed did not alter in any significant manner its relationships with the leather supply sector which is responsible for the emissions of high volumes of pollution (BOD and heavy metals) as well as the highest rates of residual water pollution in Brazilian industry (878.9g/US$ in BOD and 30.3 in heavy metals) in which the abatement rates reached 54% for BOD and 62% for heavy metals (Seroa da Motta, 1993). As a recent (1993) UNIDO study noted " although tanneries have effluent wastes treatment installations, it is estimated that they are not used in an efficient manner (...). Low-pollution processes are being adopted very slowly; treatment plants represent investments and heavy operational costs, particularly for small and medium sized companies, and only in a few places is it possible to establish joint-use plants. The impossibility of arranging adequate disposal of liquid wastes and muds may force the shutdown of installations which are not in a position to make the necessary investments".

Two tendencies may reshape the quality of the relationships between the leather and footwear sectors over the next few years. On the one hand, Brazil's major footwear companies are becoming vertically integrated, acquiring tanneries and leather treatment plants in order to guarantee the quality of their products and delivery periods. On the other hand, the integration process of the MERCOSUR Southern Cone Common Market streamlines the access of Brazilian footwear manufacturers to leather produced in the other countries of this subregion.

This former development implies the internalization by major companies of pollutive stages in the production processes of footwear input materials. Environmental requirements and regulations targeting the production and preparation of leather will have a direct impact on these companies. In contrast, the latter development implies the import of input materials, thus transferring to the area of relationships between companies in the various MERCOSUR countries, the issue of adapting productive processes to possible future new environmental regulations and requirements.

Table 7
BRAZILIAN FOOTWEAR EXPORTS - 1985/1992
(US$ millions)

Economic Zones Sectors	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985								
Footwear	820,172	25,237	64,366	5,452	0	2,258	51,183	968,668
Overall Total	6.955,930	427,510	6.227,434	2.230,670	1.397,792	797,002	7.602,673	25.639,011
1990								
Footwear	853,192	43,460	198,579	24,150	6,653	27,125	30,430	1.183,589
Overall Total	7.718,426	521,574	9.870,062	3.193,685	2.348,517	621,825	7.139,667	31.413,756
1992								
Footwear	1.017,824	47,444	283,107	51,961	8,291	18,935	45,967	1.473,529
Overall Total	6.933,230	401,495	10.627,516	7.591,924	2.306,067	436,661	7.564,632	35.861,525

Table 8
BRAZILIAN FOOTWEAR EXPORTS - 1985/1992
(US$ millions)

Economic Zones	USA	Canada	EU	LAIA	Japan	EFTA	Others	Total
1985	11,79	5.90	1.03	0.24	0.00	0.28	0.67	3.78
1990	11.05	8.33	2.01	0.76	0.28	4.36	0.43	3.77
1992	14.68	11.82	2.66	0.68	0.36	4.34	0.61	4.11

Source: DTIC/SECEX/MICT. Prepared by: Funcex.

B) The European Union Eco-Labelling Scheme and Brazilian Footwear Exports.

The Netherlands were appointed by the European Union as the lead country for the definition of product categories, and the development of criteria and parameters for granting footwear the eco-label. The preliminary proposal put forward mentions footwear “made out of leather, rubber, EVA, nylon, polyester, and cotton (...) provided their combined share in the total weight of the shoe is at least 90%.” These criteria and parameters cover the five phases of the life-cycle of the product: acquisition of raw materials, production of materials, fabrication of the product, use of the product and waste-processing. The environmental aspects considered for each of the phases in the life-cycle of the product cover the use of raw materials (renewable and non-renewable), energy consumption (including non-renewable), discharges and emissions, various forms of nuisance (health and environmental hazards), wastes, reutilization of products and parts thereof (including through recycling) and the reparability and durability of the product.

Matrix 2 presents the principal environmental factors and aspects to be considered during the production phase of materials and raw materials (hides for tanning and chemical or plant-based tanning agents) for the production of leather footwear, relevant factors for the fabrication phase of footwear as well as those pertinent to the phases of product use and waste processing. This Matrix also indicates in which aspects the environmental impact of the various phases of the life-cycle of the product are considered substantial (++), reasonable (+), non substantial (-), unknown (?) and uncertain (-).

A preliminary assessment based on the information provided in this matrix suggests that major concerns are concentrated on energy consumption, the emission of toxic substances and the quantities of waste during the production phase of materials; energy and waste again during footwear fabrication phase, and finally, emissions of toxic substances, wastes, reparability and durability during the use and waste-processing phases.

The criteria and parameters defined on the basis of these concerns focus particularly on the production of leather footwear.

Raw materials: (1) energy content no greater than 95 mj/pair (60 for children's footwear); (2) constraints on the use of chemicals and dyestuffs in processing raw materials.

Leather production: (1) emissions of chrome < 120 mg/pair; (2) PCP content in the leather <100 ppm; (3)Treatment of leather with water-based materials and not VOs. For VOs no greater than 150 mg/m3; (4) During the leather tanning process, waste water should be disposed of in a biological water purification installation; (5) Contaminated chrome waste should be recycled unless the chrome waste is not discharged/recycled as chemical waste in the country where the waste originates

- Footwear production (1) criteria identical to item (3) above.

- Quality and performance requirements: there is a lengthy list of requirements for the various components in footwear, all with defined parameters and testing methods, with specified checking procedures. These requirements cover, among other matters, resistance to splitting, sweat, rubbing and abrasion, water, repeated bending, dry and wet, and are specific for upper leather, inner leather, insole leather, non-leather, insole materials, rubber and synthetic sole materials etc.

- Average energy content: for all materials that could be used in the production of footwear eligible for the eco-label, this establishes an energy content grid which includes the energy content of the raw material plus that of the processing.

Matrix II: Factors to be considered in an environmental assessment of footwear: leather component (phases 1 & 2); shoe manufacture (phase 3); leather part (phases 4 & 5)

Main aspects/ Environment measures	Partial aspects	Acquis. raw material (1)	Produc. of materials (2)	Manuf. of product (3)	Use of product (4)	Waste processing (5)
Raw materials	1. Depleting scarce renewable raw materials	(+)	-	-	-	-
	2. Depleting non-renewable raw materials	+	-	(-)	-	-
	3. Total quantity of raw materials use	-	+	+	-	-
Energy	4. Depleting non-renewable energy sources	+	+	+	-	-
	5. Total energy used	+	+	+	-	-
Emissions	6. Acid emissions	-	+	-	-	+
	7. Fertilizing emissions	-	-	(-)	-	-
	8. Greenhouse gas emissions	-	+	+	-	+
	9. Ozone-depleting emissions	-	(-)	+	-	(+)
	10. Emissions of substances toxic for flora and fauna	+	++	-	-	++
	11. Emissions of substances toxic for man (smog)	-	++	+	-	++
	12. Emissions of waste	-	-	-	-	-
	13. Radiation emissions	-	-	-	-	-
Nuisance	14. Release of substances causing odors	?	++	+	-	-
	15. Noise nuisance for user/environment	-	-	-	-	-
	16. Risk of catastrophes	-	?	-	-	-
	17. Effects on nature/landscape/quality of life	-	-	-	-	+
Waste	18. Quantity of waste produced in processing	-	++	++	-	++
	19. Quantity of waste after processing (final waste)	-	++	++	-	++
	20. Quantity of chemical waste	-	++	++	-	++
Re-usable	21. Total product re-usable	-	-	-	-	(+)
	22. Parts of total product re-usable	-	(+)	(+)	-	(+)
	23. Materials can be recycled	-	-	-	-	+
Repairable	24. The product can be repaired	-	-	-	++	-
Lifespan	25. Technical lifespan of product	-	-	-	++	-

Brazil's major business associations representing the export sector are keenly aware of European eco-labelling initiatives, but this issue is not treated as top priority. More concern is directed to maintaining the competitive edge of export product prices within a context marked by a fresh offensive launched by Asian competitors (principally China) on the international market.

The widespread feeling is that efforts to comply with eco-label criteria would increase production costs and jack up product prices, making them still more vulnerable to competitive prices of Asian products. Interviews were carried out with representatives of business associations, individual companies, and the Footwear, Leather and Similar Products Technological Center (CTCAA) in the Vale dos Sinos Production and Export complex in Rio Grande do Sul State in Southern Brazil. Additionally, four export companies were contacted directly in 1993, which together sold some US$ 134 million on foreign markets, particularly the USA, the European Union and the EFTA nations. A questionnaire was forwarded to the companies, covering the criteria for eco-labelling under discussion at the European Union. None of the questionnaires forwarded to these companies was replied to, and one of the companies, through a

representative, advised over the telephone that it was not possible to answer it, as this topic would be too complex and would depend on a prior survey of information that was not available.

Apparently, large companies are beginning to worry about obtaining information. Difficulties in this area refer principally to information on input materials, as the footwear producers in this case depend on information which their suppliers are not yet capable of providing.

The CTCCA replied in writing to the questionnaire forwarded by UNCTAD to Funcex. The following comments are based on the replies furnished by this Center.

With regard to the criteria covering chemicals and dyestuffs, the Center advised that 'Brazilian companies are already taking steps to ensure the safety of chemical products and dyestuffs used in production processes. Many of the products under restrictions mentioned in the European Union document are no longer in use. The substitution of these products resulted in higher final costs for footwear, which are, however, difficult to measure without an indepth study'.

The requirements for maximum chrome and PCP emissions, as well as limits on the use of volatile organic substances, received the following comments:

* Chrome emissions - "with present effluent waste treatment systems, tanneries currently discharge double the required limit. Nevertheless, new investments must be made to upgrade the efficiency of existing treatment stations";

* PCP - "the use of PCP as a leather preservative is already banned in Brazil. Imported leathers should comply with the guarantee certificates ensuring that pentachlorophenol is not used. With increasing leather imports from neighboring countries, this requirement will tend to have an increasingly marked effect on the relationships between Brazilian footwear companies and Uruguayan or Argentine tanneries";

* Volatile organic substances - the emission of volatile substances into the atmosphere "is a major problem during the leather finishing stage. There are already products - which are more expensive - for finishing leather that are water based, and the replacement of products based on organic solvents is already underway. At other production stages, the emission of volatile organic substances is virtually negligible";

* Biological water purification systems - in general, tanneries have such systems to treat water biologically;

* Use of chlorine-bleached cotton - "in Brazil, bleaching takes place with chlorine, while the footwear sector uses raw or unbleached cotton";

* Use of plastic foam - "footwear industries use much expanded plastic material. However, expansion agents are not chlorine based";

- The use of TDI/MDI in PUR, and limits for sulphur and nitrous-dichloromethome in relation to PUR - Brazilian companies already comply with the requirements. The use of nitrous dichloromethome is “insignificant”, according to the CTCCA, “and the figure of 2% for sulphur concentrations is considered somewhat low, to the extent of undermining the quality of some products”. It is suggested that the parameter should be raised to 3%;

- Quality and performance requirements - companies are in a position to comply with these requirements, “which involves using good to excellent quality components, thus affecting costs”;

- Energy grid - in a superficial analysis, the CTCCA noted no major problems for this set of parameters. This Center is preparing a project to study the use of energy by the leather and footwear sector, in order to obtain more accurate data on this. It should be noted that almost all power used in this sector is hydroelectric.

The CTCCA and business associations are seriously concerned with constraints on the use of PVC linings, coatings and soles, considered a basic material in the production process. Companies are aware of products that replace PVC, but these products boost the cost of materials by at least 20%. In the specific case of coatings, this increase may reach 100%.

Business associations advise that some companies in this sector are already finding difficulty in exporting to some parts of Europe, particularly Germany, due to rising restrictions on the use of PVC in footwear.

Similarly, requirements covering the use of glue and adhesives also prompt doubts: one company felt that the glue required was not proven adequately efficient. The CTCCA believes that yet again the industry can comply with these requirements, but that this would “boost costs and reduce the productivity”: of companies.

In general, the CTCCA feels that Brazil's companies are in a position to produce footwear up to eco-label standards, but that costs would be appreciably higher than for conventional products, although no data are available to measure these cost hikes.

The adaptation of the production process and the use of materials complying with these requirements only makes sense if plans are afoot to develop a line of products targeting a market niche that can pay for footwear with the characteristics required under this scheme. Even under this hypothesis, companies would need time to adapt to these criteria and parameters, the more so as this adaptation involves relationships between the producers and the suppliers of their input materials (leather, plastics, and chemicals). The Brazilian footwear sector feels that many of the difficulties in adapting to these criteria arise from the fact this basically demands changes in the production process of leather - a core material for Brazilian exports.

Historically, the relationship between the leather and footwear sectors in Brazil has been marked by conflict, and thus characterized by a low level of cooperation. Companies in the footwear sector have responded to this situation through verticalization (purchase of tanneries) and increased imports from neighboring countries (Argentina and Uruguay). In turn, this has prompted the leather sector to shift towards modernization which may over the medium term streamline compliance with eco-label requirements.

It is also thought that as these requirements are not mandatory, 'they should not cause any major problems for the sector', as this operates in segments of the market where compliance or non-compliance with environmental criteria seems of little importance in shaping consumers' choices.

III. Eco-labelling in Brazil

The first initiative for setting up the Brazilian Green Seal dates back to 1990, when the Brazilian Technical Standards Association - ABNT proposed to the Brazilian Environmental Protection Institute - IBAMA, that they should implement a joint action in the environmental area. This project made little progress, principally due to difficulties of an institutional order, namely lack of resources and insufficient coordination.

Two projects are currently under way: one is being forwarded again by the ABNT, and the other is an initiative undertaken by the Brazilian Forest Development Society - SBS, an organization bringing together private corporate associations to set up the Forest Raw Material Origin Certificate - CERFLOR.

III.1. The ABNT Project

In 1993, the ABNT Project was selected in an open competition by the Scientific and Technological Development Support Program - PADCT. Financed by the Brazilian Government and the IRDB, under the administration of FINEP (Studies and Projects Financing Agency / Ministry of Science and Technology), it began to work on setting up a Green Seal Project. Its purpose is to establish a voluntary environmental certification system in Brazil, defining the strategies to be adopted for the certification of environmental management systems and implementing the certification of products through a pilot experiment applied to a single product category.

The awarding of Green Seals is designed to certify that a specific product complies with environmental criteria. This is an informative mechanism aimed at consumers, helping them choose products that are more environmentally friendly. It therefore acts as a marketing tool for companies, used on a voluntary basis.

The system under study by the ABNT has two basic guidelines: to be well-tailored to Brazilian reality in order to play the role of an environmental education instrument on the nation's domestic market, and be compatible with international models, so as to develop into a tool helping Brazilian exporters overcome possible future technical barriers based on environmental criteria. This latter guideline assumes that the Brazilian system is established in a manner that allows mutual recognition with programs set up elsewhere in the world.

The first stage in this project consisted of a survey of the state-of-the-art of eco-labelling in various nations, including the visit of Brazilian technical staff to seven countries. This survey provided the basis for the conceptual framework of the studies under way. Next, the first Brazilian Green Seal Project workshop was held in Rio de Janeiro in June 1993. Its purpose was to discuss strategies related to the certification of environmental administration systems and product certification (Green Seal), as well as the guidelines for the Green Seal model. This meeting pinpointed ten families of top-priority products for the project, of which one was to be chosen for the pilot experiment. Representatives of 33 companies took part in this workshop, as well as other agencies and organizations, including: Petrobrás, Vale do Rio

Doce, Aracruz Celulose, Shell, Coca-Cola, Papel Klabin, and the Brazilian Nature Foundation, in addition to representatives of the Ministry of Foreign Affairs, the São Paulo State Federation of Industries (FIESP), and the Brazilian Consumer Protection Institute.

The ten families of products suggested during the workshop were the following: paper, footwear and leathers, household appliances, CFC- free aerosols, automobile batteries, biodegradable detergents, lightbulbs, wooden furniture, packaging, cosmetics and toiletries. The selection of products was based on a technical approach and a preliminary survey that was not carried out in any great depth. It was decided that the average technology used by companies in Brazil was already in a position to obtain environmental certification. Additionally, some companies were appraised as being particularly sensitive on this issue, either through the need to export or the need for marketing on the domestic scene.

With regard to the criteria, it was agreed that these should cover the entire life-cycle of the product, constantly concerned with considering the effects on the surrounding environment.

Finally, in December 1993 the ABNT took part in a meeting in Brasília at the invitation of the Ministry of Foreign Affairs to discuss setting up two work groups involving representatives of various Ministries and employer associations: one group would accompany the progress of efforts to set up the Green Seal Project, and the other would monitor the implementation of a structure to follow up and participate actively in the work of the TC-207 Technical Committee on Environmental Management Systems set up by the International Standardization Organization - ISO, which prepared the international standards that will in future guide the implementation of Environmental Certification Systems.

On this occasion, reference was made to the fact that sizable sectors of the Brazilian economy were beginning to find their exports adversely affected by the unilateral imposition of commercial constraints of an environmental nature. According to the study carried out, the sectors most heavily affected were pulp and paper, footwear, and textiles. At this meeting, it was emphasized that the implementation of Brazil's Green Seal Project would need to be based on work under way by the ISO, otherwise it would run the risk of not meeting the minimum conditions for international acknowledgment.

With regard to the time schedule established by FINEP, the ABNT Project is today somewhat behind. The ABNT is still in the phase of confirming the families of products proposed at the June 1993 workshop, in the hopes that the interest shown therein by companies will help underwrite this project. In this task of heightening the awareness of the companies involved, the ABNT sees the participation of the Ministry of the Environment and other government agencies as crucial.

The next step is to define the criteria. Starting out from the basis of the survey and the study of the criteria established in the various programs of other countries, the intention is to assess the possibility and feasibility of firming up the pilot experiment scheduled, with a specific category of Brazilian products.

Due to the high costs represented by defining the criteria, the ABNT intends to use technical staff from companies which, together with representatives from other agencies, will establish a consensus on these criteria. International criteria will be taken as the basic text.

Having defined the criteria, any company interested in achieving certification will approach the ABNT, where a Certification Commission is already part of its structure, with Technical Certification Committees for each segment preparing certification regulations.

According to the ABNT certification manager, with the interest shown by the pulp and paper sector, by mid-1994 it will already be possible to carry out the pilot experiment of certifying a paper-mill. The packaging sector has also shown reasonable interest in the Green Seal Project, largely prompted by exports. As little progress has been made in the definition of criteria, it does not seem very likely that the pilot experiment in certification will be carried out by mid-1994.

At the moment, the ABNT is coordinating the preparation of a broader-ranging seminar for discussion with business associations, government agencies and companies, with particular attention to developing a model for product certification, tailoring Brazilian participation in the TC-207 project during the first half of 1994.

The ABNT was recently threatened with having to interrupt its participation in the ISO, as it had not paid the annual fee of US$ 200,000 to this international organization. However, there are indications that this problem will be solved by the advance of this amount by Brazil's National Metrology Institute - INMETRO. Even so, these difficulties explain why the lack of funding is one of the major stumbling-blocks preventing the ABNT from carrying out its coordination and implementation function for the Green Seal project.

III.2. The Cerflor Forest Products Certification Project

The idea of setting up a Certification System for the origin of forest raw materials arose in late 1992. In May 1993, the Brazilian Forest Development Society signed a cooperation contract with the Brazilian Agricultural Research Company- EMBRAPA, through the National Forest Research Center - CNPF, covering the preparation of a technical handbook on forest production aspects liable for certification, (due to the demand by corporate clients), and on a certification regime. A document entitled “The Reference for Obtaining CERFLOR Industrial Forest Origin Certification” was then produced.

The Brazilian Forest Development Society brings together business associations such as the Brazilian Pulp Exporters Association - ABECEL, the Brazilian Chipboard and Plywood Industries Association - ABIMCI, The Association of Timber Export Industries - AIMEX, the Brazilian Charcoal Association - ABRACAVE, and public institutions such as the Brazilian Agricultural Research Company - EMBRAPA, and the Forest Research Institute - IPEF.

Three factors led to the action by the Forest Development Society - SFS:

1. Difficulties faced by the exporters of mahogany and tropical hardwoods, accused of unwarranted forest clearing;

2. The same difficulties were faced by exporters of pulp and paper, also accused of desertification. It should be noted that companies such as Aracruz Celulose have already been visited by inspectors

from importer companies (Proctor & Gamble, Kodak) in order to assess if the procedures adopted by the company are acceptable from the environmental viewpoint;

3. The existence of eco-labels in the European Union, whose analysis of the life-cycle of the product involves the origin of the raw materials used (type of forest), the industry itself, and the finished product.

Faced with this situation, the Forest Development Society decided to act pre-emptively, by proposing its own certification system "in order to avoid being subject to certificates imposed by other countries" as stated in a document issued by this organization. This would therefore act as a marketing tool for Brazilian companies.

The work strategy adopted by the National Forest Research Center was to contact the sales departments of member companies in order to identify pertinent aspects, in view of the difficulties already felt by companies with regard to the foreign market, so as to prepare basic documents for presentation and wide-ranging discussion within the sector. The final document was only approved after a third revision, at a meeting of the Forest Development Society in December 1993.

This is a generic document defining the principles of the CERFLOR Forest Products Certification system and the actions required of companies wishing to apply for certification:

1. Comply with the law;
2. Strive to preserve bio-diversity;
3. Conserve the sustainability of natural renewable resources over the short, medium and long term;
4. Respect water, soil and air;
5. Interface with the community, fostering its environmental, economic and social development.

This document also stipulates the procedures for certification, which takes place in two phases. The company first submits a letter of principles to the accredited certification agencies, declaring the manner in which it handles the five basic points of the CERFLOR Forest Products Origin Certification. During the second phase, routine checks are run through the entire process of obtaining raw materials and if necessary recommendations are forwarded to the company.

During the second phase, the definition of criteria as well as the appraisal and certification scheme cover a number of aspects, in accordance with the following priorities:

1. Industrial forests, whose scheme is already complete, where a pilot pulp and paper company project will be tested;
2. Tropical rainforests (Amazonia) both terra-firma and floodland;
3. *Cerrado (*savanna);
4. Southern Brazil.

The intention is to implement a specific work strategy as described above for each of these types of forest, preparing a basic document, presenting this to the companies involved, as well as to researchers, non-government organizations and Universities for discussion, revising it in accordance with recommendations and if necessary repeating this process until a consensus is reached among the participants.

The CERFLOR Industrial Forest Products Origin Project is designed to issue credentials for Inspectors and Certificators, which should be research companies whose technical staff are suitable for these functions, foundations etc.. These certificators will be paid for their work by companies which are awarded certification. They should follow a Routine for Accredited Certificators, which is a document used together with "The Reference for Obtaining CERFLOR Industrial Forest Products Origin Certification". It is also hoped to set up an audit system to check the work of certificatory agencies. In order to ensure that the certificate is endowed with adequate credibility and transparency outside Brazil, this audit should be carried out by well-known people, representatives of non-government organizations or business associations (timber importers, for example).

Companies wishing to act as certificatory agents should apply to the Forest Development Society for qualification as accredited agents for the CERFLOR Industrial Forest Products Origin Certification Project.

Any company wishing to be accredited by the CERFLOR Project will be charged a fee that will finance the functioning of this Project, including the audit system, dissemination, secretariats etc., which will be added to the payment by the company to the engineering companies and research firms etc. accredited for supervision and certification. The estimated cost for this entire process is US$ 80,000 for each 10,000 hectares of industrial forest. The structure of the CERFLOR Industrial Forest Products Origin Certification Project consists of a Secretariat and two Boards: an Administrative Board consisting of the business associations of CERFLOR corporate members, whose function is to establish guidelines and set up administrative operations. The other is a Technical Board consisting of research companies, universities specializing in forest affairs, and non-government organizations, whose function is to review and update the criteria and ensure that the CERFLOR Technical Model continues compatible with sustainable development, deciding what adaptations should be introduced etc.

The annual maintenance cost of the CERFLOR structure was estimated at around US$ 50,000, basically including meetings, technical work and travel. Its source of funding is the Forest Development Society itself, with financing coming from the private organizations associated therewith.

The process of preparing the guidelines and principles of the CERFLOR Project is similar to that of the Forest Stewardship Council - FSC, an initiative undertaken at worldwide level. However, the principals and criteria that rule the FSC are stricter than those of the CERFLOR Project in various aspects, such as for example not permitting the replacement of native forest by reforestation, while the CERFLOR criteria allow such replacement, provided that corrective measures are implemented for maintaining forest functions.

Interviews held with representatives of the pulp and paper sector – which is the most heavily affected by global eco-labelling initiatives and comes under heavy fire on the domestic front – lead to the conclusion that the principal issue is that of the worldwide credibility of Brazil's Green Seal. For companies whose output is channeled principally to the foreign market, the implementation of the Brazilian Certification System is somewhat irrelevant, as it would be preferable to adapt to the eco-labelling requirements of their export markets, or seek to influence decisions on the conceptualization and implementation of foreign eco-labelling systems. Integrated pulp and paper companies whose pulp output is channeled to the manufacture of paper by the company itself, show greater interest in setting up a Brazilian Green Seal Project, provided that this achieves international acknowledgment. In order for this to occur, these companies feel that the participation of Brazilian interests in setting up an eco-label for a specific project is fundamental, particularly in discussions taking place in international fora, as well as establishing cooperation schemes (joint ventures, in the expression of one businessman interviewed) among Brazilian agencies developing eco-labelling projects and similar organizations and non-government organizations in other countries.

At the moment, both initiatives described here suffer under this questioning of their credibility, thus adversely affecting their utility in terms of access to markets and marketing at the international level, by potential end-users. On the other hand, the lower level of requirements on the domestic market, particularly for non-durable consumer goods, leads to insufficient generation of incentives for companies targeting these markets to seek quality-based products and to reward environmentally-friendly marketing strategies.

In addition to reducing political support for these projects, this perception by businessmen in sectors that are potential beneficiaries of the initiatives under way may also affect their feasibility in economic terms. The CERFLOR initiative depends on funding supplied by companies, while the ABNT project needs the participation of technical staff from companies in target sectors in order to underwrite the setting up of the scheme without excessive costs for this organization.

As already noted, the ABNT has been faced with financial difficulties due to shrinking government funding to its budget, which could seriously undermine efforts implemented to date, while blocking the possibilities of introducing a Brazilian eco-labelling scheme.

IV. Conclusions and recommendations

The environmental regulations in the OECD nations – particularly the European Union – are generally perceived by Brazilian exporters as a threat to the maintenance of positions won by Brazilian products in the markets of these countries over the past two decades.

Under this concept, eco-labelling schemes featured two characteristics that point in opposite directions. On the one hand, as they are not mandatory, the threat represented by these schemes is, at least in principle, lightened. On the other hand, as this involves 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 forms of utilization of inputs, as well as processing and production methods. This assessment, due to the criteria and parameters that guide it, necessarily implies the

upgrading of a specific standard that is not only environmental but also technological and economic, covering the production and interface among various stages of production chains. Criteria and parameters that take into consideration the various sustainable alternatives for the utilization of input materials and production methods may reduce these discriminatory concepts.

These considerations spotlight what may be one of the principal conclusions of this study: the firming-up of potential threats presented by eco-labelling schemes to Brazilian exports depends, among other factors, on the specific characteristics of the formulation and implementation of these schemes. In particular, the experience of Brazil's pulp and paper sector suggests that:

* The definition of criteria and parameters is a major source of potential discrimination, by devaluing environmentally-compatible production methods which are at the same time suited to the availability of natural resources and energy sources that constitute the origin of the comparative advantages of Brazil in the international pulp trade. In this case, Eurocentrism is evident in the formulation of an energy and input materials grid based on European standards which neutralizes Brazil's comparative advantage.

* The decision process covering the formulation and implementation of this scheme may also constitute a source of discrimination by blocking possibilities for discussing the parameters and criteria that could undermine imports compared to domestic output. The conclusion of the Uruguay Round and the new agreement on Technical Trade Barriers makes the notification procedures already covered for certification systems formulated by government agencies mandatory, even for programs sponsored by private agencies. This fact may lighten the discriminatory effects of the decision process applied to the implementation of eco-labelling schemes.

In addition to this factor, the experience of the two industrial sectors (pulp and paper and footwear) and a segment (T-shirts and bed linen) with a strong tradition of exports in Brazil, indicates that three other aspects related to the consumer market, to the pattern of competition, and to the production structure also influence the capacity of eco-labelling schemes to act as a barrier to trade:

- First, the pre-existence of a consumer preference for specific environmentally-friendly products and production methods endows the eco-labelling system with a high capacity to guide consumer choices, creating a voluntary (rather than regulatory) discrimination that is still more relevant as it blocks products with a high level of substitutability (as is the case with recycled pulp and paper).

The preexistence of a high consumer sensitivity to deforestation and the social appreciation of products and production methods based on recycled paper, which easily replaces pulp, explains what may apparently seem a paradox. This is the threat presented by the eco-labelling scheme to a sector producing intermediate and homogenous (meaning that product differentiation does not play a relevant role in competitiveness) goods with which the consumer does not enter into direct contact. There is no doubt that this threat is also explicit in the factors already mentioned, including the discrimination implicit in decision processes and criteria, but it is interesting to note that whenever a marked consumer sensitivity is noted to the compatibility

between production methods and products on the one hand and the environment on the other, the pressures of demand seem sufficient to introduce product differentiation, demanding investments by companies in order to comply with new specifications (as is the case with TCF pulp etc.).

- Second, the relevance of competition through prices and product differentiation in the patterns of competition of segments or sectors analyzed appears in two ways. On the one hand, if the pattern of competition in market segments where companies operate are essentially centered on a price basis, compliance with criteria may undermine the market position of these companies, but, at the same time, concern over the discriminatory effects of the eco-labelling scheme decreases, as the market will not sanction such discrimination and will maintain its preference for low prices. Apparently, this is the case with the Brazilian footwear sector: the perception that the costs for adapting the production process to these criteria are high is accompanied by a relative lack of concern with regard to the effects of the introduction of this scheme on the market shares of the Brazilian footwear industry in European Union. On the other hand, if the demand for ecologically-differentiated products should create segmentation in the consumer market, this would act as a significant incentive for upgrading the production process to comply with eco-labelling criteria, principally in the case of companies where exports to the European Union have a high weight in total foreign sales and growth strategies;

- Third, the analysis of the life-cycle of the product shows, in the case of Brazilian footwear, textile and clothing sectors, the weight of the items related to the production of raw materials and input materials in eco-labelling schemes proposed by the European Union. In both these sectors, Brazilian companies repeatedly mention difficulties in complying with criteria covering these items, which involve imports to an increasing extent. Additionally, these difficulties may also reflect the tradition of troubled relations between the input materials production sectors, and the finished goods production sectors, in a closed economy where levels of protection were administered by the government, frequently in function of pressures from sectorial interests. This means that any effort to channel back to earlier stages in the production chain the information and demands required by these eco-criteria - principally when compliance involves investments in equipment and machinery in the input materials production sector - seems a particularly difficult task for the finished goods production sector, in contrast to what is occurring in the pulp production sector, which is verticalized back to forest planting.

It should also be noted that the transformation of eco-labels into a trade barrier also depends on the economic and financial capacity of companies in the sector studied to implement the adaptations required in their production processes and products. In the case of Brazil it has been noted that this capacity varies in each sector, in function of the size of the company and the weight of its exports – as well as the European Union export market in the company's growth strategy. This is even more so for the large majority of small and medium sized companies in Brazil, where these requirements involving renovation of equipment and redefinition of the patterns for relationships with suppliers and customers seem totally unobtainable within the current economic and financial context of the country.

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 industry, it has also been indicated that testing and certification costs are far heavier than might been assumed *a priori.*

Any reduction in the vulnerability of Brazilian exports to eco-labelling schemes would basically involve:

* With regard to schemes being implemented in the European Union, the adoption of non-discriminatory criteria and parameters, as well as a decision process tailored to GATT regulations;

* The development of international initiatives leading to the consensual preparation of guidelines for the formulation and implementation of national and supra-national eco-labelling schemes, serving as a basis for mutual acknowledgment of domestic schemes;

* On the Brazilian side, the development of initiatives targeting:

A) Expansion of knowledge within export sectors of initiatives underway in other nations and their own production processes, which presupposes, among other factors, the systematic preparation and generation of technical data on the use of input and raw materials and the manufacturing processes of companies of these sectors.

B) Broader fora for discussion and negotiation among sectors producing input materials and exportable finished goods, seeking the establishment of mechanisms for cooperation that also leads to the modernization of these sectors with a consequent reduction in vulnerability attributable to specific characteristics of Brazil's production structure;

C) Indepth discussions of Brazil’s Green Seal Project, expanding corporate and government mobilization regarding this initiative and avoiding institutional lack of coordination and a waste of resources. Along the same lines, technical cooperation with countries that have already implemented eco-labelling schemes, together with a quest for compatibility between the Brazilian schemes and these systems would boost the domestic and foreign credibility of the Brazilian scheme, while opening the way for future mutual recognition of national schemes:

D) Joint assessment by the government and the private sector of initiatives underway in the European Union nations, while requiring through diplomatic channels that these schemes should comply with the rules of the new GATT Technical Trade Barriers Code.

FOOTNOTES

Some of these points were briefly described by Jha & Zarrilli (1993) but the following presentation offers the perception of producers / exporters in greater detail, with regard to the criteria and parameters for eco-labelling pulp and paper.

The Group as a whole exported some US$ 55 million in 1993 from its plants in Santa Catarina and Northeastern Brazil.

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