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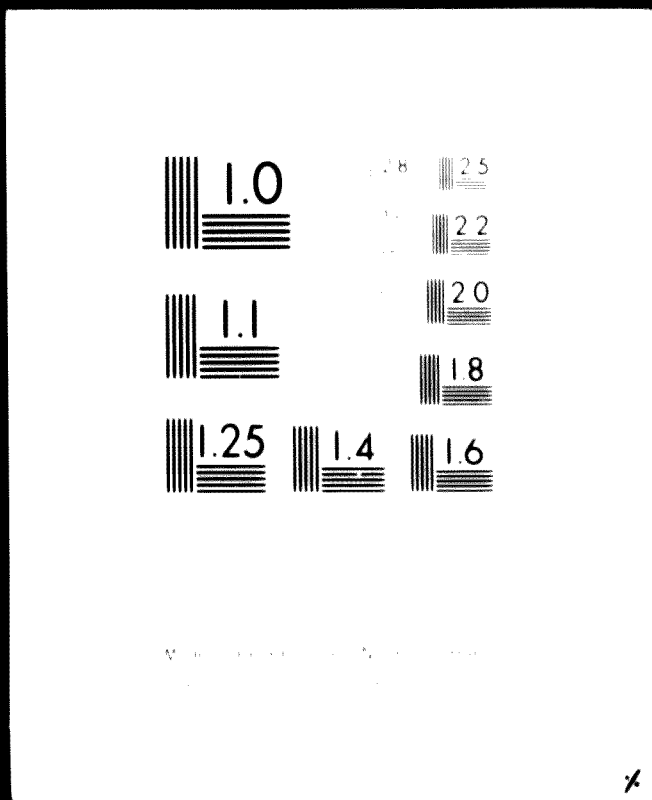
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PAPER-BASED PACKAGING IN LATIN AMERICA

C A R I F T A
Countries

FAO/ECLA/UNIDO

Forest Industries Advisory Group for Latin America

Santiago de Chile



Country Statements
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PAPER-BASED PACKAGING IN THE CARIFTA COUNTRIES

1.- GENERAL ECONOMIC AND INDUSTRIAL INFORMATION

- a. Gross Domestic Product (at current factor-cost)
- b. The contribution of the agricultural sector (crops, livestock, forestry, hunting and fishing) to the G.D.P.
- c. The contribution of the industrial sector (mining and quarrying, manufacturing, processing and construction) to the G.D.P.

	a			b			c		
	1960	1967	1969	1960	1967	1969	1960	1967	1969
	Millions of W.I. dollars								
Jamaica	1 036.4	1 645.4	1 987.7	124.8	187.0	179.5	363.8	578.9	777.6
Trinidad/ Tobago	865.9	1 377.9	1.582.0	102.8	111.6	132.0	417.8	622.2	675.0*
Barbados	119.8	189.2	216.7	33.6	47.8	41.7	21.8	35.0	41.0
Guyana	263.5	378.5	447.0	68.9	83.8	94.9	81.3	138.5	175.1
Antigua	21.0	34.0	38.9	4.5*	0.9	1.1	4.7*	10.0	10.9
St. Vincent	24.3	28.4	33.9	7.9*	8.4	9.4	2.5*	2.8	3.8
St. Lucia	30.4	39.7	49.1	10.6*	11.0	13.7	4.4*	6.5	8.8
Dominica	21.1	27.0	26.4	7.4*	8.7	9.4	3.3*	4.7	5.6
Grenada	28.7	38.0	40.2	11.1*	13.1	13.5	3.4*	4.4	4.7
Montserrat	3.5	6.6	8.2	1.4*	1.3	1.5	0.4*	1.4	2.2
Belize	36.7	76.2	91.1	13.7*	31.9	40.7	5.9*	11.4	13.5
St. Kitts/ Nevis/An- quilla	19.8	24.0	26.5	9.0*	8.8	9.1	2.1*	2.4	2.9
Total	2 471.1	3 864.9	4 547.7	395.7	514.3	546.5	911.4	1 418.2	1 720.9

Source: TID 22/71: "Industrial Location and Regional Integration"

* Throughout the text the use of the asterisk means an estimated figure.

d. Population (in thousands) 1969

e. Exchange rates (local currency unit per U.S. dollar)
1969

	d	e
Jamaica	1954	J.\$ 0.83
Trinidad/Tobago	1040	TT\$ 2.01
Barbados	254	WI\$ 2.01
Guyana	742	Guy\$ 2.01
Antigua	63	WI\$ 2.01
St. Vincent	95	WI\$ 2.01
St. Lucia	110	WI\$ 2.01
Dominica	74	WI\$ 2.01
Grenada	105	WI\$ 2.01
Montserrat	15	WI\$ 2.01
Belize	120	BR.H\$ 1.69
St. Kitts-Nevis-Anguilla	56	WI\$ 2.01
Total	4628	

Although in the CARIFTA countries agriculture is of major importance as a source of employment-about half the economically active population works in the agricultural sector -the agricultural contribution to the total 1969- G.D.P. was only 12%. Sugar, banana and citrus are the main commodities, and of these much is exported: Guyana and Jamaica have considerable exports of sugar, Jamaica, Dominica and St. Lucia of banana and Jamaica and Belize of citrus and citrus juices.

The industrial sector contributes about 38% to the G.D.P. Bauxite and alumina, mined and processed in Jamaica and Guyana, are the major industrial export products, together with petroleum and petroleum products exported by Trinidad and Tobago. However, in the majority of the less industrialized countries (Antigua, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia and St. Vincent) the economic activities are still mainly generated by the agricultural sector, and industrial development is only incipient. At the same time, increasing amounts of capital are being invested in the tourist industry, especially in the construction of hotels and guesthouses.

2. - CONSUMPTION OF AND MARKETS FOR PAPER PACKAGING MATERIALS2.1.- Consumption of Paper Packaging Materials

	1960	1961	1962	1963	1964	1965	1966	1967
(metric tons per year)								
<u>Converted products:</u>								
Corrugated boxes	5 647	6 631	14 777	16 037	17 401	19 616	21 011	19 918
Corrugated board ^{1/}	141	171	454	497	542	644	689	648
Multiwall sacks	5 160	5 115	5 070	5 026	4 982	4 940	4 908	5 346
Retail bags	1 966	1 875	1 826	1 785	1 744	1 704	1 664	2 490
Welding boxes	1 671	1 372	1 394	2 084	2 326	1 917	2 452	2 917
<u>Non-converted products:</u>								
Kraft paper ^{1/}	16 401	4 712	1 238	1 475	1 256	1 856	6 881	5 036
Semikraft paper	2 133	1 571	412	491	418	619	2 294	1 679
Low-strength wrapping	-	-	-	-	-	-	-	-
White board	2 486	2 732	290	1 424	744	5	1 574	3 662
Chip board	1 066	1 171	125	611	319	2	674	1 569
Food board	1 438	1 673	187	957	523	3	1 210	3 622

Packaging paper or board production in the CARIFTA started only in 1971 and consequently the converted paper packaging products had to be manufactured from imported raw material. These imports increased from 22 thousand tons in 1960 to 38.5 thousand tons in 1967. In addition, finished converted paper packaging products were imported as well and up to 1967 they made up a large share of the total consumption:

^{1/} Consumed as wrapping material.

	1 9 6 0			1 9 6 7		
	Imports	Con- sumption (metric tons)	%	Imports	Con- sumption	%
Corrugated boxes	2 607	5 647	46	5 849	19 918	34
Corrugated board 1)	47	3 402	1	200	14 762	1
Multiwall sacks	1 933*	5 160	37	1 277*	5 346	24
Retail bags	1 933*	1 966	98	1 276*	2 490	51
Folding boxes	290	1 671	17	761	2 917	26

1) Part of this is consumed as wrapping material (see page 3) and the rest for production of corrugated boxes.

Since paper and board for conversion enter the CARIFTA countries duty free, the quality and the price of the paper packaging materials have always been of an international level.

2.2.- End-use Analysis of Converted Paper Packaging Products

The end use of corrugated boxes, multiwall sacks, retail bags and folding boxes has been derived from the sales patterns of the various manufacturers. Lacking accurate information on the end-uses of the imported packaging products the break-down, can however, only give a general picture of the end-uses.

Of the total corrugated box consumption, 71% could be traced and almost 40% of this represented banana boxes. Multiwall sacks (82% of the total consumption could be traced) were principally used to pack cement (50.5%), animal feed (25.5%) and sugar (12.3%). The end-use pattern of retail bags is very unclear, but the principal consumers were supermarkets (19.5%) and bakeries (14.7%). Of the total folding box consumption 75% could be traced and it appeared that the main use was for garments and textiles and for shoes (each of these groups consumed about 21%).

The following table gives a more complete picture of the end-use of the various converted paper packaging products:

End-uses							
1967							
(percentages on weight basis)							
Corrugated boxes		Multiwall sacks		Retail bags		Folding boxes	
Banana	39.8	Cement	50.5	Supermarkets	19.5	Shoes	21.5
Rum	6.7	Animal feed	25.5	Bakeries	14.7	Garments	21.4
Foodstuff	6.1	Sugar	12.3	Sugar	13.4	Pharmaceuticals	16.1
Citrus	4.7	Wheat flour	4.1	Flour	11.8	Detergents	11.4
Soap; detergents	3.5	Fertilizers	1.6	Miscellaneous	40.6	Foodstuff	5.3
Glasswork	3.1	Limestone	0.9			Ice cream	4.0
Garments	2.0	Chemicals	0.5			Biscuits	2.0
Oil; margarine	1.9	Miscellaneous	4.6			Shrimps	1.1
Lobster; shrimps	1.9					Miscellaneous	17.2
Beer	1.4						
Canned food	0.8						
Miscellaneous	28.1						
Total	100.0%		100.0%		100.0%		100.0%

The total consumption of the above converted paper packing products including corrugating board used as wrapping material increased from 14 585 tons in 1960 to 31 319 tons in 1967, which means a total increase of almost 115% or an average yearly increase of 11.5%. Practically the whole increase in the consumption of converted paper packaging products was in corrugating boxes.

Competing materials

Since cotton sacks are not used at all by the CARIFTA countries and wooden crates and polyethylene sacks have only limited markets, the only real competitive non-paper packaging material is jute sacks, which are used e.g. for internal sugar transport in Belize and Jamaica, for rice exports and internal rice distribution in Guyana, for cocoa and coffee exports in Trinidad/Tobago and in various countries for animal and poultry feed distribution.

Another competitive way of distributing local production is bulk transport. Sugar exports are almost entirely done in bulk (Trinidad/Tobago, Jamaica, Guyana); only exports to other CARIFTA countries are normally done in paper sacks. Transport of coffee from the field to the factory is done in bulk, and part of the cement production moves in bulk as well.

Wooden boxes are used principally for exports of fresh fruits (other than banana and citrus) and vegetables and for local distribution of beverages. Bruce boxes, imported from Miami are preferred to corrugated boxes by the citrus exporters of Jamaica. Dominica exports grapefruit in Bruce boxes.

Polyethylene retail bags are used to some extent in the supermarkets of Jamaica, Guyana and Trinidad/Tobago especially rice is sold in such retail bags. Polyethylene industrial sacks were recently introduced to the market but until now they are used only in Guyana for rice packing. In Jamaica woven polypropylene sacks are used to sack fertilizers, which are imported and arrive in bulk. Some animal feed is as well packed in such sacks. Beer is distributed in imported (from USA) plastic-coated cardboard boxes, but trials are being made with plastic crates, which have an estimated life time of 6-7 years, whereas cardboard boxes last only 6-7 roundtrips.

The situation as regarding factory prices (June 1971) was as follows:

	<u>US dollar</u>
Multiwall sacks:	
For 50 lbs. of animal feed, 3 plies, empty weight 182 grs. (Jamaica)	0.07
For 94 lbs. of cement, 4 plies, (Jamaica)	0.10
For 94 lbs. of cement, 4 plies, empty weight 227 grs. (Trinidad/Tobago)	0.15
For 112 lbs. of sugar, 5 plies, without valve (Jamaica)	0.19
with valve (Jamaica)	0.20

	<u>U.S. Dollar</u>
Jute sack:	
For 100 lbs. of animal feed (Trinidad/Tobago)	0.39
For 60 kgs. (132 lbs.) of coffee (Trinidad/Tobago)	0.42
For 224 lbs. of low grade sugar (Jamaica)	0.50
For 220 lbs. of cocoa (exports) (Trinidad/Tobago)	0.99
Polyethylene sack:	
For 180 lbs. of rice, double wall, printed (Guyana)	0.37
Polypropylene sack:	
For 112 lbs. of fertilizer, woven and laminated with polyethylene, breakage factor less than 1% (Jamaica)	0.20-0.30
(For comparison: a multiwall sack, of the same capacity, 5 plies and laminated with polyethylene, breakage factor around 5% (Jamaica)	0.15-0.20
Corrugated box:	
For citrus exports (T/T), 13 1/2 x 10 1/8 x 9 1/16 inches, empty weight 590 grs.	0.17
For banana exports (Jamaica), 20 1/4 x 13 1/4 x 7 1/4 inches (body), weight top + body 910 grs.	0.32
For square bottles of 26 oz. of rum. 12 3/4 x 9 5/8 x 10 7/8 inches (T/T)	0.37
For 12 round bottles of 26 oz. of rum, 14 x 10 1/2 x 12 inches	0.42
For 24 280 cm ³ (9.5 oz.) beer bottles (Guyana)	0.70
Wooden box:	
For 24 beverage bottles (Guyana)	1.40
For 40 kgs. (88 lbs.) of citrus, banana, or vegetables (Jamaica)	1.80
Bruce box:	
For 41 kgs. (90 lbs.) of citrus (exports) (Dominica, Jamaica)	0.95
Cardboard box:	
For 24 10 oz. beer bottles, plastic coated (T/T)	0.75

U.S. Dollar

Plastic crate:

For 24 beer bottles (not in regular use yet) (T/T) 3.75

Paper retail bags:

For 1 kg. or 2 lbs. of sugar etc. (T/T) per thousand 1.72

For 1 kg. or 2 lbs. of sugar (Barbados) 1.99

For 1 kg. or 2 lbs. of sugar (Jamaica) weight per thousand 4.8 kgs. 3.44.

Polyethylene retail bags

2- lbs. bags, size 6 x 10 inches, thickness 0.002 inch 7.20
per thousand2.3.- Major Fields of Packaging

For some selected commodities, which already at present consume considerable quantities of converted paper packaging products or are likely to do so in the future, demand projections have been made for the years 1975 and 1985.

B a n a n a										
Exports 1/										
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
(1000 metric tons)										
Jamaica	156.9	159.6	148.5	162.5	177.2	203.0	203.6	193.3	155.7	153.4
St. Lucia	27.6	39.2	48.9	53.2	61.2	81.7	76.6	63.2	65.5	72.9
Dominica	30.5	28.4	28.1	32.0	42.0	49.2	39.8	42.8	55.8	58.6
St. Vincent	23.0	21.1	22.1	25.6	25.5	28.9	25.4	24.5	27.9	30.4
Grenada	12.0	12.0	12.5	14.6	11.6	21.0	21.3	26.0	26.1	21.6
Belize	-	0.3	0.3	1.3	0.4	2.0	3.1	3.5	5.5	1.8
Trinidad/ Tobago	4.2	2.7	1.6	0.3	0.3	-	-	0.1	0.1	0.1
Total	254.2	263.3	262.0	289.5	319.1	385.8	369.8	353.4	336.6	338.8

1/ FAO Trade Yearbook

Although the exports of bananas from Jamaica during the last decade have always been made in corrugated boxes, the Windward Islands used to export complete banana stems, wrapped in paper and/or polyethylene. However in 1969 the switch to corrugated boxes was made and since 1972 the new corrugated box plant in St. Lucia will provide the Windward Islands with banana boxes, until then imported from England and Trinidad.

As demonstrated by the export figures presented, the banana exports increased by about 8.7% annually between 1960 and 1965. After 1965, the exports decreased considerably principally due to adverse weather conditions (droughts and hurricanes) and the average yearly export growth during 1960 - 1969 was only 3.2%.

From various sources the conclusion has been drawn that in 1972 Jamaica and the Windward Islands each expect to export about 200 000 tons of bananas. Most of the Caribbean banana production has been sold on the protected United Kingdom market up to 1972. However, it is still uncertain how the entrance of the U.K. into the Common market will affect this situation.

The uncertainty in the banana market is of great importance in the present context since most of the increase in consumption of paper based packaging material has been due to increase in banana exports.

The total world market for bananas is expected to grow between 2.5 and 3.4% annually up to 1975 and at a rate of between 2.0 and 2.5% during the period 1975 - 1985 (Source: FAO's Indicative World Plan), total CARIFTA banana exports may reach between 431 and 442 thousand tons by 1975 and between 525 and 566 thousand tons by 1985. At present, banana boxes are used which contain 28 lbs. (net) of bananas. The weight of an empty box is slightly over two lbs. (950 grs.). Under the assumption that this type of box would continue to be used, the consumption of corrugated boxes for banana exports, would be around 23 000 tons in 1975 and 41 000 tons in 1985.

R u m

In 1967, about 6.7% (1 335 tons) of the total corrugated box consumption was used for the packing of bottled rum. The exports of bottled rum (a growing part of the rum production is exported in bulk) decreased sharply between 1960 and 1967: from 6.3 to 3.6 million liters and it is very uncertain whether the corrugated box will be able to keep its share of this part of the rum market. Therefore, it is to be expected that the consumption of corrugated boxes for rum exports will only slightly increase: to 1 500 tons by 1975 and to 2 000 tons by 1985.

C i t r u s										
Exports 1/										
1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	
(metric tons)										
19 796	18 593	22 520	27 591	17 963	15 704	14 850	16 002	15 551	12 398	

1/ Source: FAO Trade Yearbook.

The citrus fruits exporting countries (Jamaica, Trinidad, Dominica, Belize and Guyana) in 1967 consumed about 936 tons of corrugated boxes for the packing of fresh citrus fruit. However, these countries cannot be expected to remain large consumers of corrugated boxes for this purpose. The main reason is that more and more fresh fruit is processed into pulp, slices and juices, and the exports of fresh fruits is consequently decreasing. Another obstacle to the use of corrugated boxes for this purpose is the strong preference for Bruce boxes (imported from the U.S.A.) evident among the principal citrus exporters. Corrugated boxes were said not to have sufficient resistance. For these reasons it is believed that the future consumption of corrugated boxes for the exports of fresh citrus fruit at best will remain at the 1967 - level: between 900 and 1 000 tons.

F i s h a n d S h e l l f i s h

The export statistics reveal that the exports of fresh and frozen fish and shellfish between 1960 and 1967 increased by over 500%. Cardboard boxes are being used for retail packing (especially of shrimps) and corrugated master boxes are used as secondary packing. In 1967 about 378 tons of those corrugated boxes were consumed by the fish and shellfish exporters. It is not to be expected that this high yearly rate of increase (26.2%) will be maintained. However, the 1975 exports are expected to be twice the 1967 exports whereas by 1985 exports may be about three times those of 1967. Corrugated box consumption for fish and shellfish may consequently reach 756 and 1 134 tons by 1975 and 1985 respectively.

F o o d s t u f f

For the packing of foodstuff not separately mentioned, 10.2% of the total 1967 corrugated box consumption was used. Since this branch of industry does not seem to offer much promise for expanded exports, it may be expected that the demand for boxes for foodstuff will grow at an average yearly rate of slightly over 2.3%, i.e. slightly over the expected future growth rate of the region's population. (During the period 1960-1967 the population of the CARIFTA countries grew yearly with 2.3%. Source: U.N. Monthly Bulletin of Statistics, September 1969).

Consequently, the consumption of boxes for the packing of foodstuff may increase from 2 032 tons in 1967 to 2 575 tons by 1975 and to 3 461 tons by 1985.

O t h e r p r o d u c t s

For the packing of other products, including soap, detergents, clothes and glass-work, 7 310 tons of corrugated boxes were consumed in 1967.

In the Caribbean area corrugated boxes are chiefly a packaging material for export commodities, while in the local markets less sophisticated packaging materials are used or no packaging at all. Although this will gradually change, projections of the future demand for boxes for this rest group of products have been made here based on the over-all annual growth rate of the aggregate exports of Jamaica, Trinidad/Tobago, Guyana and Barbados. This growth averaged 8% annually during 1950-1969 1/, while the average export value of the West Indian countries during the period 1957-1963 2/ increased by 9.6% annually. The average annual growth of the Region's Gross Domestic Product between 1960 and 1969 was 7%. The export growth of the major countries Jamaica, Trinidad/Tobago and Guyana was more rapid in the period 1950 to 1960 than from 1960 to 1967. It is expected that exports of the group "other products" will regain its earlier vigour and show average yearly increases of 8% up to 1975, with the consequent demand for corrugated boxes reaching 13 530 tons by that year, for the period 1975-1985. Assuming a somewhat lower growth rate, 7%, for the period 1975 to 1985 box consumption would reach 26 610 tons by 1985.

N e w a p p l i c a t i o n s

In view of the existence of two important corrugated box manufacturers in the Region and the establishment of another box plant in Santa Lucia (under construction in 1971), there is no doubt that an increasing number of commodities will be packed, handled and eventually shipped in corrugated boxes, since these plants are certain to promote uses for many purposes besides banana packaging. It is estimated that the use of corrugated boxes for "new" commodities will represent roughly 10% of the total 1975 corrugated box consumption. In 1985 this share may have reached 15%.

1/ Source: The foreign trade and trade policy of the english-speaking caribbean countries; ECLA, 15 March 1971.

2/ Source: The dynamics of West Indian Economoc integration; Brewster and Thomas.

Expected Total Consumption of Corrugated Boxes (tons)			
	Consumption 1967	Projection 1975	Projection 1985
To pack:			
Bananas	7 927 <u>1/</u>	33 000 <u>1/</u>	41 000
Rum	1 335	1 500	2 000
Citrus	936	950	950
Fish and shellfish	378	756	1 134
Foodstuff	2 032	2 575	3 461
Other products	7 310	13 530	26 610
New applications		10%: 5 809	15%: 13 265
Total	19 918	58 120	88 420

As for multiwall sacks, the following demand projections have been prepared:

C e m e n t										
	1960	1961	1962	Production ^{2/} 1963 1964		1965	1966	1967	1968	1969
	(1000 metric tons)									
Jamaica	212.4	212.3	196.5	200.7	281.3	315.5	355.4	335.0	408.4	415.9
Trinidad	177.2	98.0	165.3	162.3	176.1	189.2	211.8	190.2	209.9	243.2
Total	389.6	310.3	361.8	363.0	457.4	505.7	567.2	525.2	618.3	659.2

1/ This increase includes the switch to full use of box packaging as well as the increase in exports, as explained in the text.

2/ Source: ECLA Statistical Bulletin for Latin America.

The total cement production of Jamaica and Trinidad/Tobago (the only cement producing countries of the CARIFTA) increased at an annual average of 6% during 1960-1969. The Jamaican authorities expect a future yearly growth of local production of 8%, principally based on a steadily growing local demand (between 1966 and 1970 about 7.7% yearly), and stagnating exports. Although the cement production in Trinidad showed an average yearly increase of 6.7% during 1964-1969, it is felt that more export markets will be found, and a joint yearly production growth of 8% is considered to be reasonable. The total cement production would consequently be 1 046 thousand tons by 1975 and 2 259 tons by 1985. However, not all the production is sold in sacks. Jamaica sells about 17% and Trinidad/Tobago 30% of the production in bulk. If these percentages were to remain unaltered, the future production to be sacked would reach 822 970 and 1 776 800 tons in 1975 and 1985 respectively. At present 4 ply multiwall sacks are used, which each contain 94 lbs. of cement (42.7 kgs). The empty sack has an average weight of 227 grs. The expected sack consumption for cement packing would therefore be 4 380 tons in 1975 and 9 443 tons in 1985.

A n i m a l f e e d

Animal feed is normally imported in bulk and sacked locally. Although woven polypropylene sacks have conquered part of the market, jute and paper sacks are estimated to be used for 80% of the animal feed consumption. In 1967, the consumption of multiwall sacks for stock and poultry feed reached 1 363 tons. Since very little is known about trends in animal production, it was assumed that production will follow South American trends: the total number of cattle (all species) increased between 1961 and 1966 by about 11% (2.1% yearly), and is expected to keep increasing at this rate.

Assuming that the animal feed consumption is closely related to the number of animals, multiwall sack consumption would be about 1 600 tons by 1975 and 1 950 by 1985. However, it is foreseen that paper sacks will replace the more expensive jute sacks and the demand projections for 1975 and 1985 have therefore been raised, arbitrarily, to 2000 and 3 000 tons respectively.

S u g a r

Sugar for exports is shipped in bulk, whereas sugar for local consumption (including exports to the CARIFTA countries) is normally packed in paper sacks. In Jamaica the D and C grades are packed in jute sacks, but it is expected that multiwall sacks will conquer the whole local market. The consumption of sugar is expected to follow the growth of the population. Since the population increased by 18.8% during 1960-1968 and this rate is expected to remain unaltered in the forthcoming 10 to 20 years, the consumption of multiwall sacks for sugar packing which was 658 tons in 1967, might therefore be

about 780 tons by 1975 and 970 tons by 1985. Taking into consideration the expected shift away from jute sacks, the consumption of paper sacks, may be about 1 000 and 1 500 tons by 1975 and 1985 respectively.

O t h e r p r o d u c t s

The remaining 11.7% of the total multiwall sack consumption in 1967 was used to pack various other products, such as wheat flour, fertilizers, chemicals and limestone. Since it is impracticable to project separately the future demand for these commodities of minor importance in this context, the future consumption is estimated for the whole group, assuming that their consumption will follow rather closely the economic development of the whole area. The average yearly growth of the joint Gross Domestic Product of the CARIFTA countries was 7% during the period 1960-1969. Assuming that this growth rate will be maintained in the forthcoming 15 years the -probably somewhat conservative- projections for the 1975 and 1985 consumption of multiwall sacks for this group of products are 1 070 and 2 110 tons respectively.

N e w a p p l i c a t i o n s

It is not expected that multiwall sacks will find important new markets. Rice, beans, coffee and cocoa will most probably continue to be shipped in jute sacks, as these products need some air circulation during storage and since the taking of samples, through the packing material is difficult in the case of paper sacks. However, it can be expected that new applications will represent some 5% of the total 1975 multiwall sack consumption, whereas this may be 10% in 1985.

Expected Total Consumption of Multiwall Sacks						
To sack:	Normal number of plies and average weight per sack	1967 Con- sumption in tons	Projection 1975		Projection 1985	
			Mill. of sacks	Weight in tons	Mill. of sacks	Weight in tons
Cement	4 ; 227 grs.	2 700	19.3	4 380	41.6	9 443
Animal feed	4 ; 227 grs.	1 563	8.8	2 000	13.2	3 000
Sugar	5 ; 450 grs.	658	2.2	1 000	3.3	1 500
Other pro- ducts		625		1 070		2 110
New applications			5%:	450	10%:	1 777
Total		5 346		8 900		17 830

3.- THE SUPPLY OF PAPER PACKAGING MATERIALS

3.1.- Converted Paper Products

3.1.1.- Production and Trade

	P r o d u c t i o n (tons per year)									
	1960	1961	1962	1963	1964	1965	1966	1967	1970	
Corrugated boxes	3 040	3 418	10 958	11 612	12 370	13 979	14 768	13 060	19 494	
Corrugated board <u>1/</u>	94	104	363	384	407	487	510	448	651	
Multiwall sacks	3 227	3 276	3 325	3 375	3 425	3 477	3 529	4 069	5 922	
Retail bags	33	36	81	134	187	241	295	1 214	3 860	
Folding boxes	1 381	1 015	970	1 593	1 768	1 292	1 760	2 156	4 244	

1/ Consumed as wrapping material.

Since packaging paper production in the CARIFTA countries started only in April 1971, the above mentioned converted paper products were entirely made of imported papers and boards.

The following table gives the production of the three kinds of corrugated board before conversion into corrugated boxes. Of the three types, the single face corrugated board is usually used for wrapping purposes (electrical equipment and such), but the double face and double wall corrugated board are intermediate products destined to be converted into boxes.

P r o d u c t i o n (tons per year)									
	1960	1961	1962	1963	1964	1965	1966	1967	1970
Corrugated board									
single face	94	104	363	384	407	487	510	448	631
double face	3 214	3 535	11 941	12 653	13 415	15 227	16 057	14 081	21 092
double wall	94	104	114	125	138	207	219	233	340
Corrugated boxes	3 040	3 418	10 958	11 612	12 370	13 979	14 768	13 069	19 494

The difference between the corrugated box production and the total corrugated board production is caused by conversion losses and by the single face board used as wrapping material. There is some intra-subregional trade in converted paper packaging products, but no exports of those products to non-CARIFTA countries. However, the imports of converted paper packaging products from abroad have always been considerable.

3.1.2.- The Paper Converting Industry

3.1.2.1.- description

The survey was carried out in June 1971. Although all the existing converting plants were visited and the inventory could be considered as being complete, for reasons of secrecy it was not always possible to obtain detailed information about past and present production, especially of corrugated boxes and multiwall sacks. There are three important corrugated box plants in the CARIFTA area (one in Trinidad/Tobago, two in Jamaica) and two multiwall sack factories (one in Trinidad/Tobago and one in Jamaica). Furthermore, a printing

shop in Guyana converts sheets of corrugated board (imported from Trinidad/Tobago) into corrugated boxes, mainly for shrimp exports.

Retail paper bags are manufactured in six plants (one in Guyana, two in Jamaica, two in Trinidad/Tobago and one in Barbados). Seven folding box manufacturers (printing shops and converting industries), one in Guyana, one in Trinidad/Tobago, and five in Jamaica were visited there is at least one more (in Barbados) which could not be visited.

The twenty converting industries mentioned together employ around 1 000 people.

None of these twenty industries is integrated with paper and/or pulp production, and all the raw material is being imported.

3.1.2.2.- capacity

To arrive at an estimate of the available production capacity the so-called Present Net Capacity has been used. This PNC is based on the production achieved during 1967. The production has then been recalculated on the basis of 360 days/year and 24 hours/day. If the machine speed during 1967 was reduced for other than mechanical reasons (e.g. low demand) a correction factor has been applied. The formula to compute the Present Net Capacity is:

$$\text{PNC} * = \text{Net 1967 production} \cdot \frac{360}{X} \cdot \frac{24}{y} \cdot \frac{100}{z}$$

where X = the number of days actually worked during 1967

y = the number of hours normally worked per day

z = the average percentage to which the machine speed was reduced during 1967.

The exercise was also made for 1970 in order to estimate how capacity utilization developed during the last few years.

* It must be pointed out that this formula is theoretical and not well suited for industries working only one shift. It also requires detailed statistics and knowledge of reasons for down time and machine speed reduction. This information is considered confidential by many mills.

	Present Net Capacity (PNC)			Achieved Production (AP)			Idle Capacity (IC) = (PNC)-(AP)			Idle Capacity as percent of PNC		
	1967 tons	1970 tons	change %	1967 tons	1970 tons	change %	1967 tons	1970 tons	change %	1967 %	1970 %	change rel. %
Corrugated boxes	56 669	81 824	+ 44.4	13 069	19 494	+ 49.2	43 600	62 330	+ 43.0	76.9	76.2	- 0.9
Corrugated board	71 372	103 993	+ 45.7	14 762	22 113	+ 49.8	56 610	81 880	+ 44.6	79.3	78.7	- 0.8
Multiwall sacks	16 139	20 952	+ 29.8	4 069	5 922	+ 45.5	12 070	15 030	+ 24.5	74.8	71.7	- 4.1
Retail bags	5 674	17 133	+202.0	1 214	3 863	+218.2	4 460	13 270	+171.9	78.6	77.5	- 1.4
Folding boxes	14 426	26 854	+ 86.2	2 156	4 244	+ 96.8	12 270	22 610	+ 84.3	85.1	84.2	- 1.1

The new St. Lucia box factory described under 3.1.2.6 was not included here.

As the capacity estimates are very theoretical no detailed conclusions will be drawn from them here. They are only taken as indication of the fact that much idle capacity exists in all the converting industries mentioned.

However, most of this idle capacity is due to all these industries working one shift (this immediately gives an idle capacity 67% even if the factory is working 360 days/year at maximum output speed).

It appears that between 1967 and 1970 the actual achieved production has been increased merely by adding new capacity, keeping the idle capacity portion constant.

3.1.2.3. - announced capacity increase

Two (Jamaican) companies were considering the purchase of more machinery. One of these may install a second multiwall sack production line and the other company, a printing shop, plans to buy a second folding box machine.

3.1.2.4.- data on current conversion losses, gramweights and properties

	Conversion losses %	Gramweight of raw material grs./m ²	Measures of the product
Corrugated boxes	10	Banana boxes (standard type):	Top: 229/161/337 20 5/8x13 5/8x7 1/4 in. Body: 337/161/337 20 1/4x13 1/4x7 1/4 in.
Corrugated board	3	Liner: 127;161;185;205;337;439 Fluting: 112;127;161	
Multiwall sacks	3-6	161-244	
Retail bags	10	40:50	
Folding boxes	1-8	267-534	

3.1.2.5.- selling prices

Information on selling prices is included in the chapter on end-use analysis. Prices per ton are normally not used.

3.1.2.6.- local conditions

As became clear in chapter 3.1.2.2., the available capacity for the various converted packaging paper products is only partly utilized. The capacity utilization rates were for 1970 24%, 21%, 28%, 23% and 16% for corrugated boxes, corrugated board, multiwall sacks, retail bags and folding boxes, respectively. Comparing these figures with the corresponding percentages for the whole Latin American region (55%, 51%, 40%, 34% and 36%) it is clear that the figures for the CARIFTA region must be considered low with consequent high production costs.

Another important aspect is that there is no local production of packaging paper and/or board, although it would be difficult for locally produced papers to compete with imported raw material (no appropriate fibre resources, no local market which would permit large scale production) unless high import taxes would protect the local industry. In mid 1971, some papers and boards were imported at the following CIF prices (per metric ton):

Multiwall sack paper, kraft, 161-176 grs/m ² , from Scandinavia:	US\$ 201.-
Retail bag paper, brown kraft, 40-50 grs/m ² , from Scandinavia and U.S.A.:	225.-
Folding box board, 500 grs/m ² , from Finland and USA:	240.-

In April 1971 a Jamaican paper mill started production, producing waste paper based liner and fluting, one type only, 127 grs/m², which it hoped to sell at U.S. \$ 152/metric ton. This price, however, was said to be higher than the CIF price for imported paper of the same grade,

By the end of 1971, the new corrugated box factory in St. Lucia became operational. This plant was initially intended to manufacture banana boxes for the Windward Island (St. Lucia, Dominica, Grenada and St. Vicent), but plans are to expand the market by producing other than banana boxes as well. The factory is designed to produce 14 to 15 million boxes, working in one shift, 6 days/week. The banana boxes are made of double face corrugated board, Mullenest: 14 kgs/cm² (200 lbs/inch²) and originally contain 30 lbs. of bananas (upon arrival at the port of destination the weight is only about 28 lbs. due to loss of weight).

The Windward Islands' banana production increased from 92 thousand long tons (stems included corresponding to 7.5% of the total weight) in 1960 to a peak production of 199 thousand long tons in 1969, all exported to the United Kingdom. Due to droughts and hurricanes the output fell to 142 thousand tons in 1970 but hopes were that in 1972 the 1969 level would be reached again.

St. Lucia's box plant has plans for adding a production line for retail paper bags, and the manufacture of polyethylene bags and sacks on one of the other Windward Islands, is under consideration.

3.2.- Packaging Paper and Board

3.2.1. Production and Trade

During the period covered by this report (1960-1970) there was no packaging paper or board production in the CARIFTA countries and local consumption of kraft paper, semikraft paper,

low strength wrapping, liner, fluting, white-chip- food-, and folding box board was entirely supplied by imports mainly originating from the Scandinavian countries, Canada, U.K. and the U.S.A. Besides newsprint, printing and writing paper, the import statistics only distinguish between:

- Common packing and wrapping paper (641-03)
- Paper board (cardboard) inclusive corrugated board (641-04)
- Waxed and impregnated papers (641-07) (sometimes) and other papers and boards.

It was therefore not possible to obtain accurate trade information by country, year and kind of paper and board. However, based on more detailed information on the year 1967, collected from the industry, the following table presents a series of estimates of packaging paper and board imports. The assumptions listed below are partly copied from the report on CARIFTA's pulp and paper industry ^{1/} made by the Advisory Group in 1969, and partly based on collected information on the consumption of packaging paper and board by the converting industry:

- the group "common packaging and wrapping paper" includes fluting, sack paper, bag paper, kraft - and semikraft paper for wrapping
- the group "paper board" includes liner, white-chip-, food-and folding box board
- half of the group "other papers and board" is considered material for packaging or wrapping (e.g. waxed and impregnated paper) and added to the group "paper board".
- the paper and board consumption figures provided by the converters were used as a starting point and by adding the average raw material losses made during the conversion, an estimate can be made of the volume of imported paper or board
- since the quantities of paper or board within one group should add up to the totals presented in the mentioned report ^{1/}, the imports of the less important items were computed by subtraction.

^{1/} The Pulp and Paper Industry: Development Possibilities in the CARIFTA region. FAO/ECLA/UNIDO Forest Industries Advisory Group for Latin America, October 1969.

Imports of Packaging Papers and Boards								
	1960	1961	1962	1963	1964	1965	1966	1967
	(metric tons)							
Kraft paper for sacks	3 379	3 430	3 482	3 534	3 586	3 641	3 695	4 261
for wrapping	6 401	4 712	1 238	1 475	1 256	1 856	6 881	5 036
Semikraft paper for retail bags	37	40	90	149	208	268	328	1 349
for wrapping	2 133	1 571	413	491	418	619	2 294	1 679
Low-strength wrapping	-	-	-	-	-	-	-	-
Kraft liner	2 427	2 727	8 627	9 142	9 741	11 054	11 676	10 355
Fluting	1 249	1 402	4 418	4 684	4 990	5 673	5 902	5 317
Folding box board	1 446	1 063	1 016	1 668	1 851	1 353	1 843	2 258
White board	2 486	2 732	290	1 424	744	5	1 574	3 662
Chip board	1 066	1 171	125	611	319	2	674	1 560
Food board	1 438	1 673	187	957	523	3	1 210	3 022
Total	22 062	20 521	19 886	24 135	23 636	24 474	36 167	38 508

3.2.2.- The Packaging Paper and Board Industry

3.2.2.1.- description

The only packaging paper/board mill in the CARIFTA region is the one in Jamaica, which started production in April 1971, and on which no detailed information was as yet available. There are about 65 people employed in the mill.

3.2.2.2.- capacity

The daily production about mid-1971 was 30 tons but it is expected that the demand will increase gradually until the capacity, 50 tons/day, can be fully utilized.

3.2.2.3.- announced capacity increase

There were no plans for expansion in the near future.

3.2.2.4.- data on current fibre losses, gramweights and composition

The mill produces a kind of board, 127 grs/m², which is being sold as fluting and inner liner to the corrugated box manufacturers. The quality of the board, almost entirely made of waste paper with a small portion of imported long fibre pulp, does not meet the requirements of outer liner and the latter continues to be supplied through imports. About fibre losses no data were available yet.

3.2.2.5.- selling prices

At the outset the market price of the board, US\$ 152/ton, was higher than that of imported fluting, but it was hoped that with better capacity utilization, the price could be considerably reduced. This together with efficient service was thought to put the local product on full competitive terms with imported fluting.

3.2.2.6.- local conditions

Raw material for the mill consists mainly of collected waste paper (price at mill: US\$ 16.50/ton if bailed, US\$ 8.50 if not bailed), which seems to be available in sufficient quantities. However, it is expected that waste paper will have to be imported from other CARIFTA countries or from countries outside the region. The mill's minimum requirements at full capacity are around 17 000 tons, while Jamaica's total paper consumption in 1967 was 28 500 tons (excluding the corrugated boxes used for export products packing). This is not likely to be a sufficient basis to supply 17 000 tons of waste paper since the recovery rate is not considered to be high in Jamaica. The average recovery rate for Latin America was 22% in 1963 and 24% in 1970.

Similar considerations apply to other branches of the converting industry to an even greater degree and further subregional planning leading to better integration and work distribution should be undertaken in order to improve conditions in the packaging converting industry.

Unfortunately, the local consumption of paper packaging products cannot be expected to increase very rapidly and there is little hope that important export markets for the converted packaging products will be found, since the neighbouring countries have their own converting industry.

In view of the fact that possibilities for development are rather limited, much attention should be given to cost reducing measures, and lower prices would, no doubt, lead to increased consumption.

4.2.- Prospects for the Development of the Packaging Paper and Paperboard Industry

Since the converting industry as a "pioneer industry" is exempted from paying import duties on paper and board (raw materials) imported for subsequent conversion, the CARIFTA paper packaging products are currently of international quality, whereas the share of the cost of the raw material in the total cost price is relatively small (the price of the imported papers reflects the favourable economies of scale of the large scandinavian, and North American paper mills).

Furthermore, the low-strength raw material resources (indispensable for high-strength packaging paper production) are too limited to permit the construction of a local pulp mill within the period under review. The available markets are also too small to obtain acceptable scale economies for a local packaging paper or board mill integrated with kraft pulp production. The largest market is for kraftliner for banana boxes which must be made available at a low price in order to keep banana exports competitive.

If, nevertheless, local integrated packaging paper or board production were to be considered, these should probably best be directed towards the utilization of available fiber resources (mixed tropical hardwoods, bagasse, possibly bamboo). From these raw materials only the production of packaging papers and boards which do not require the highest strength properties could be produced, e.g. fluting, chip board, and low strength wrapping paper.

At the present time, the Central American producers of corrugated banana boxes import all the liner and a large part of the fluting from the U.S.A. Although transport distances would be short, exports to Central America of fluting produced in the CARIFTA would not be easy, since a mill within the CARIFTA would be of relatively small scale. It would be difficult to remain competitive, regarding both price and quality, with fluting imported from highly industrialized countries.

Therefore, the Jamaican mill, based on the utilization of waste paper and producing grades of liner and fluting, which apparently have a local market, is considered a modest but sound contribution towards foreign-exchange savings.

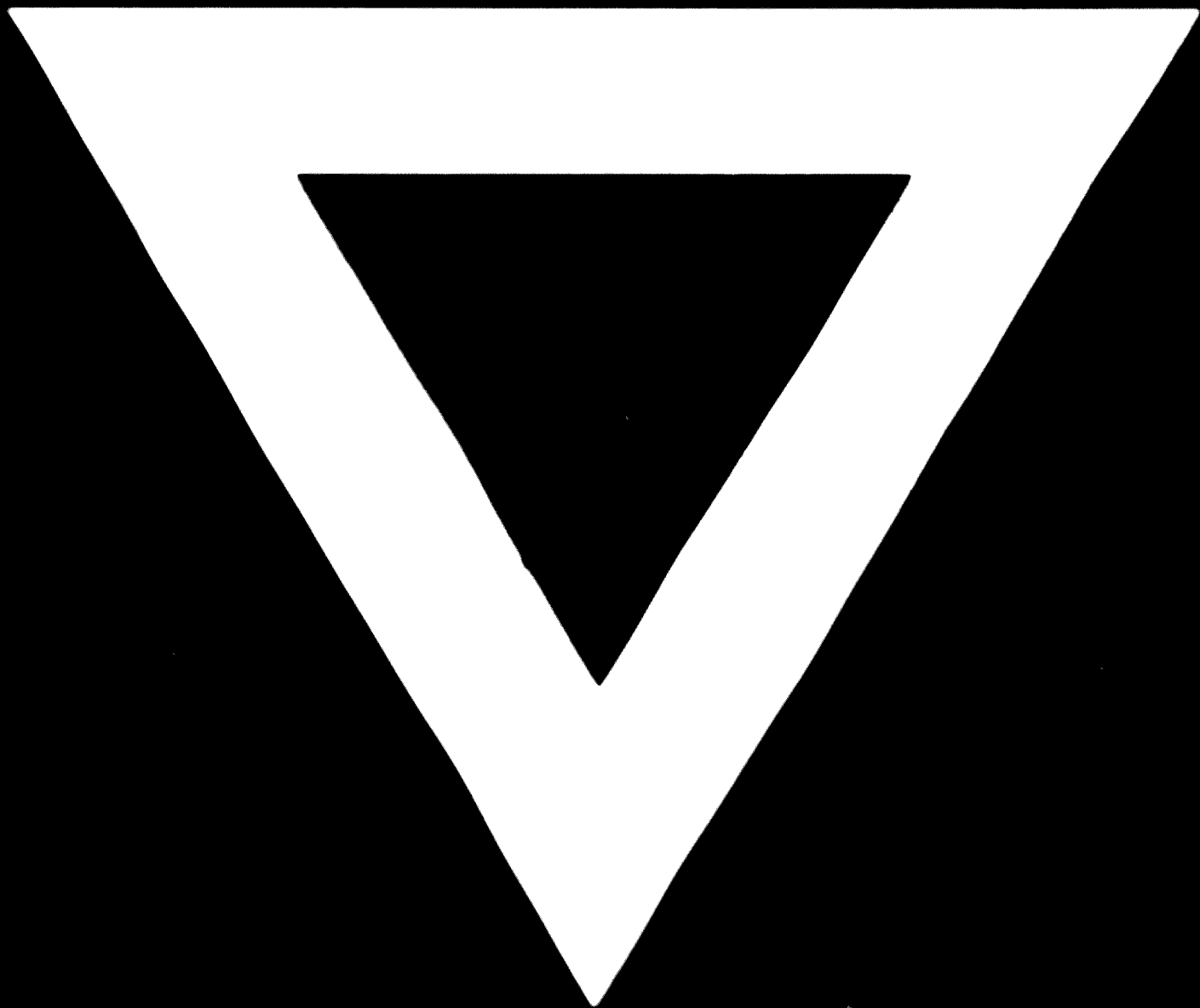
4.3.- The Outlook for Regional and External Trade

As mentioned before, the countries surrounding the CARIFTA area do not offer markets for converted paper packaging products manufactured in one of the CARIFTA countries and the possibilities for exporting locally produced paper or board seem rather remote. Better prospects for further development seems to be offered by the limitation of paper and board imports to those types which cannot be produced locally and by the discontinuation of the imports of converted paper packaging products.

In short, it appears that the paper packaging industry in the CARIFTA will have the best future, if it consolidates until a reasonable capacity utilization has been reached, if it develops a trade strategy which aims primarily at complete self-supply, i.e. the discontinuation of the imports of converted paper packaging products, and if the production of paper and board is limited to those kinds for which a high percentage of waste paper and short fibre (of which resources are abundantly available) can be used.



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