ECONOMIC COMMISSION FOR LATIN AMERICA
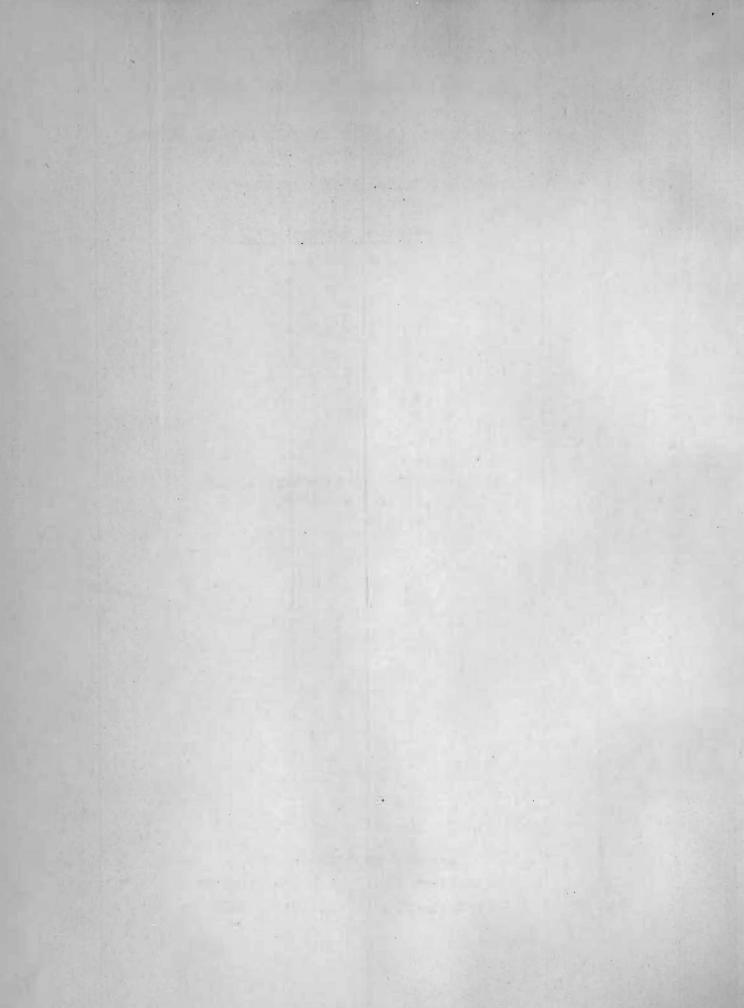
TECHNICAL SYMPOSIUM ON LATIN AMERICA AND THE CURRENT
ENERGY PROBLEMS

Santiago, Chile, 23-27 September 1974

Information document № 7

LATIN AMERICA AND COMMODITY PRICES
IN 1973 AND 1974

International Trade Unit
Department of External Co-operation
ORGANIZATION OF AMERICAN STATES

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LATIN AMERICA 1/ AND COMMODITY PRICES IN 1973 AND 1974

INTRODUCTION

The main feature of world trade in 1973 and the first semester of 1974 has been the phenomenal increase in the prices of commodities exported by developing countries. However, it is improbable that this upward trend will continue in the second semester, for already in June and July of 1974 the market prices of several important products began to decrease from their previous record levels. It may be expected that, in the future, market prices will continue to drop, although, in all probability, they will remain at levels higher than those of 1971 and 1972.

To a large extent, as a result of this exceptionally favorable situation in the international markets, Latin America was able in 1973 to increase by 33 percent the value in dollars of its exports. Such increase broke the previous 17 percent record dating back to 1952. A 51 percent increase is forecast for 1974. It is important, as of this moment, to point out that the 1973 increases were due to the general rise in export prices for commodities, whereas in 1974 the determining factor was the price of petroleum (see Table No. 1).

Although the behavior of oil exports is certain to have a marked influence on total value exported by the region, such exports, from the standpoint of income, basically affect only four countries which are net

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1. This report covers the Latin American countries that are members of the OAS.

Table 1

LATIN AMERICA: VALUE OF EXPORTS IN 1970-74 AND COMMODITY PRICE INDEX

(In billions of U.S. dollars 1968=100)

	1970	1971	1972	1973	ESTIMATED 1974	PERCENTAGE CHANGES			
						1971	1972	1973	1974
I. Net Oil-exporting Countries a/									
A. Value of exports	3.3	3.8	4.0	5.1	13.8	15	5	28	271
B. Oil price index	100	100	115	157	406	0	15	37	259
II. Other Latin American Countries									
A. Value of exports	11.3	11.0	13.1	17.6	20.4	-3	19	34	16
B. Price index (oil exports) b/	121	111	123	174	223	-8	11	44	26
III. LATIN AMERICAN TOTAL									
A. Value of exports	14.6	14.8	17.1	22.7	34.2	1	15	33	51

a. Includes Bolivia, Ecuador, Venezuela and Trinidad and Tobago.
b. Includes cotton, sugar, bananas, cocoa, coffee, meat, wheat, wool, copper, tin, lead, zinc and iron ore.

Source: CIAP Country Reviews. Organization of American States (OAS), Boletín de Precios de Productos Básicos, No. 6, June 1974. Estimates, Unit on International Trade.

LATIN AMERICA - VALUE OF EXPORTS OF PRINCIPAL COMMODITIES, 1968, 1970, 1971, 1972 AND 1973 a/

	In millions of dollars					In percentages				
	1968	1970	1971	1972	1973 a/	1968	1970	1971	1972	1973
Agriculture										
Cotton	453	435	368	472	597	6.3	5.0	4.3	4.9	4.3
Sugar	499	545	625	834	1 208	6.9	6.2	7.2	8.6	8.8
Bananas	334	362	370	414	450	4.6	4.1	4.3	4.2	3.2
Cocoa	119	137	114	118	158	1.7	1.6	1.3	1.2	1.1
Coffee	1 609	2 053	1 786	2 091	2 844	22.2	23.5	20.7	21.5	20.7
Meat	297	500	537	856	1 045	4.1	5.7	6.2	8.8	7.6
Wheat	139	136	76	116	300	1.9	1.6	.9	1.2	2.2
Wool	175	144	119	124	289	2.4	1.6	1.3	1.3	2.1
SUBTOTAL	3 625	4 312	3 995	5 025	6 891	50.1	49.3	46.2	51.7	50.0
Mining										
Copper	971	1 132	870	836	1 354	13.4	13.0	10.1	8.6	9.8
Tin	93	102	84	97	132	1.3	1.2	1.0	1.0	1.0
Lead	57	63	48	69	79	.8	.7	.6	.7	.6
Zinc	82	104	95	124	134	1.1	1.2	1.1	1.3	1.0
Iron ore	278	493	509	473	638	3.8	5.6	5.8	4.9	4.6
SUBTOTAL	1 481	1 894	1 606	1 599	2 337	20.5	21.7	18.6	16.5	17.0
Oil	2 126	2 539	3 037	3 091	4 521	29.4	29.0	35.2	31.8	33.0
TOTAL	7 232	8 745	8 638	9 715	13 749	100.0	100.0	100.0	100.0	100.0
Total (excluding oil)	5 106	6 206	5 601	6 624	9 228					

a. Partial estimate subject to revision.

exporters: Bolivia, Ecuador, Trinidad and Tobago, and Venezuela. This report will focus primarily on analysis of the current situation and outlook for the remaining commodities exported by Latin America and the impact thereof on the value of exports.

I. LOOKING BACK ON 1973 AND INTO THE IMMEDIATE FUTURE (1974)

Looking back, 1973 may be considered an exceptional year for world trade in commodities--possibly not to be equaled in many years to come, due to the fact that the relative increases registered in international prices during that year have no precedent. The upward trends in the price of these commodities began at the end of 1971 and has continued without interruption until the middle of 1974. In 1973, on the average, the general level of market prices (in dollars) for the principal commodities exported by Latin America, 1/ excluding oil, was 43.3 percent higher than the previous year.2/ This substantial rise took place even after an 11.1 percent recovery registered in 1972 (see Table No. 2). It is estimated that in 1974 prices will rise even more, though at a slower pace than in 1973. Such increase is calculated to be 26.5 percent.

Between the last quarter of 1972 and the second quarter of 1974 an 89.9 percent increase was registered in the prices of the main commodities,

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1. Based on the market price indices of the main commodities exported by Latin America: cotton, sugar, bananas, cocoa, coffee, meat, wheat, wool, cooper, tin, lead, zinc, iron ore and oil. In 1968, the index base year, these products produced 62 percent of the total value in dollars of Latin American exports.
2. In the following analysis, and unless otherwise specified, the word "commodities" shall be understood to exclude oil.

Table No. 2

PRICE INDEX OF COMMODITIES EXPORTED BY LATIN AMERICA */
(1968 = 100)

	1970	1971	1972	1973	Estimated 1974
At current prices	121	111	123	177	223
At constant prices 1/	111	96	99	122	139

*/ Excluding oil.

1. Deflated on the basis of the United Nations index for unit value of manufactures exports.

Source: OAS, Boletín de Precios de Productos Básicos, No. 6, June, 1974.

and the highest quarterly increase took place in January-March 1974, when prices rose by 16.2 percent. However, in the second quarter of this year, the rate of increase dropped to 6.9 percent, and it is estimated that by the third and fourth quarters prices will drop by 14.9 and 8.9 percent, respectively.

The extremely favorable conditions of the international markets for commodities in the past 18 months is unique. This is due to the fact that the essential elements that serve to explain the magnitude and duration of the rise in general price levels are of an economic nature

Table No. 2A

OAS MARKET PRICE INDICES OF THE PRINCIPAL EXPORT COMMODITIES OF LATIN AMERICA
(1968=100)

	GENERAL INDEX	AGRIC. INDEX	MINING INDEX	OIL INDEX	GENERAL INDEX (EXCL. OIL)
	ANNUAL AVERAGES				
1963	92.37	101.53	58.98	100.00	89.20
1964	101.58	111.50	79.55	100.00	102.24
1965	100.46	102.82	95.36	100.00	100.66
1966	100.77	100.03	103.68	100.00	101.09
1967	95.01	96.26	84.76	100.00	92.93
1968	100.00	100.00	100.00	100.00	100.00
1969	105.99	105.97	114.64	100.00	108.49
1970	115.08	123.04	117.22	100.00	121.36
1971	107.73	117.07	95.98	100.00	110.96
1972	120.72	134.71	95.18	114.64	123.25
1973	170.94	185.15	155.93	157.14	176.68
1974	(277.06)	(230. 84)	(205.51)	(405.71)	(223.49)
	QUARTERLY AVERAGES				
I-1972	116.02	125.90	93.78	114.64	116.59
II	116.91	127.86	93.34	114.64	117.86
III-	124.04	141.42	94.97	114.64	127.96
IV	127.11	146.10	98.50	114.64	132.31
I-1973	142.11	164.56	115.46	122.38	150.33
II	156.63	177.88	136.16	134.64	165.79
III	175.70	195.96	169.30	145.60	188.24
IV	209.18	202.04	202.76	225.82	202.25
I-1974	283.65	238.29	226.61	400.71	234.90
II	295.03	248.99	255.99	400.71	251.02
III	(271.49)	(226.10)	(182.49)	(410.71)	(213.45)
IV	(258.10)	(210.00)	(157.00)	(410.71)	(194.6)

( ) Estimated.

Source: OAS, Boletín de Precios Internacionales de Productos Básicos.

rather than political factors normally associated with war situations.1/
Table No. 4 shows the magnitude of the increase in its historical context.

During 1973 and early 1974, a combination of numerous factors occurred
which taken as a whole explain the phenomenal raise in prices. Many of
these factors properly pertain to the commodity industries, but other
factors related to the evolution of the world economy and in particular
to that of the member countries of the Organization for Economic Coopera-
tion and Development (OECD) also had a marked influence.

The remaining material in Section I of this document will deal with
the following: a. Factors responsible for changes in commodity prices
(factors pertinent to the market for each product, general factors such
as the evolution of the world economy); b. The impact on Latin America's
capacity to import; and c. Price outlook.

Table No. 3

CHANGES IN THE PRICE LEVELS OF COMMODITIES
EXPORTED BY LATIN AMERICA

	1972				1973				1974			
Percentage change in relation to the previous quarter	I	II	III	IV	I	II	III	IV	I	II	III*/	IV*/
	2.3	1.1	8.6	3.4	13.6	10.3	13.6	7.5	16.2	6.9	-14.9	-8.8

*/ Estimated.

Source: Table No. 2A.

1. It is interesting to correlate the more noticeable annual in-
creases of over 20 percent registered in the general price levels of
commodities, on the one hand, and the armed conflicts of the world, on
the other. The price index of raw materials since 1845, prepared by
the magazine "The Economist" (see Tables No. 4 and No. 5), shows that
the greatest index increases took place in 1950 (48 percent), 1940
(30 percent), 1916 (28 percent), 1917 (26 percent), 1915 (24 percent),
and 1951 (23 percent).

Table No. 4

COMMODITY PRICE INDEX

(1845 - 1850 = 100)

1860	124	1898	87	1936	135
1861	128	1899	92	1937	148
1862	141	1900	99	1938	131
1863	160	1901	92	1939	135
1864	170	1902	90	1940	175
1865	152	1903	94	1941	193
1866	141	1904	98	1942	201
1867	128	1905	100	1943	207
1868	124	1906	109	1944	212
1869	122	1907	114	1945	216
1870	122	1908	101	1946	230
1871	122	1909	103	1947	265
1872	135	1910	109	1948	293
1873	133	1911	115	1949	307
1874	128	1912	123	1950	453
1875	124	1913	122	1951	558
1876	119	1914	123	1952	450
1877	120	1915	153	1953	413
1878	110	1916	196	1954	444
1879	107	1917	247	1955	435
1880	113	1918	269	1956	428
1881	106	1919	302	1957	421
1882	110	1920	332	1958	389
1883	102	1921	222	1959	379
1894	98	1922	198	1960	380
1885	93	1923	198	1961	369
1886	93	1924	213	1962	361
1887	97	1925	204	1963	409
1888	99	1926	185	1964	442
1889	99	1927	181	1965	447
1890	102	1928	177	1966	469
1891	99	1929	167	1967	444
1892	96	1930	140	1968	437
1893	96	1931	116	1969	475
1894	90	1932	112	1970	500
1895	89	1933	116	1971	486
1896	89	1934	120	1972	562
1897	87	1935	124	1973	929

Source: "The Economist," March 2, 1974.

Note: This index covers the prices of 34 commodities, excluding oil.

Table No. 5

ANNUAL PERCENTAGE VARIATION IN THE
COMMODITY PRICE INDEX

Year	%	Year	%	Year	%	Year	%
1860	0	1889	0	1918	9	1947	15
1861	3	1890	3	1919	12	1948	11
1862	10	1891	-3	1920	10	1949	5
1863	13	1892	-3	1921	-33	1950	48
1864	6	1893	0	1922	-11	1951	23
1865	-11	1894	-6	1923	0	1952	-19
1866	-7	1895	-1	1924	8	1953	-8
1867	-9	1896	0	1925	-4	1954	8
1868	-3	1897	-2	1926	-9	1955	-2
1869	-2	1898	0	1927	-2	1956	-2
1870	0	1899	6	1928	-2	1957	-2
1871	0	1900	8	1929	-6	1958	-8
1872	11	1901	7	1930	-16	1959	-3
1873	-1	1902	-2	1931	-17	1960	0.3
1874	-4	1903	4	1932	-3	1961	-3
1875	-3	1904	4	1933	4	1962	-2
1876	-4	1905	2	1934	3	1963	13
1877	1	1906	9	1935	3	1964	8
1878	-8	1907	5	1936	9	1965	1
1879	-3	1908	-11	1937	10	1966	5
1880	6	1909	2	1938	11	1967	-5
1881	-6	1910	6	1939	3	1968	-8
1882	4	1911	6	1940	30	1969	9
1883	-3	1912	7	1941	10	1970	5
1884	-4	1913	-1	1942	4	1971	-3
1885	-5	1914	1	1943	3	1972	16
1886	0	1915	24	1944	2	1973	65
1887	4	1916	28	1945	2		
1888	2	1917	26	1946	6		

Source: Table No. 4.

A. RELEVANT CHANGES IN THE PRICES OF COMMODITIES

1. Factors Affecting the Specific Markets
for each Commodity

Although commodities account for more than 80 percent of the annual exports of Latin America, they are traditionally composed of some 14 principal items which make up nearly two thirds of the region's exports.

During 1973, the more remarkable increases in market prices occurred in minerals and metals. The price index for this group rose that year from 95.18 to 155.93, i.e. an increase of 63.8 percent, while agricultural products and oil increased by 37.5 and 37.1 percent, respectively (see Table No. 2A).

a. Mineral exports

The share of mining products in total exports has been decreasing in recent years. In 1973, such products represented 17 percent of the value in dollars exported by the region (see Table No. 1A).

The price of copper began to drop in 1969, and this trend was reversed only in the early months of 1973. At that time, the copper market was influenced by uncertainty as to supplies from Chile, the United States, and Zambia, and even more so by a strong expansion in demand, especially in Japan. Indeed, it is estimated that the world demand [1] for refined copper reached 6.8 million tons in 1973, which represented an increase of 10 percent over the previous year and, in the case of Japan, it is estimated at

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1. Member countries of the Mutual Assistance Council are not included.

26 percent.1/ Nevertheless, world production grew by only 3 percent for a total of 6.5 million tons. The deficit was covered by a proportional reduction in stocks.

As a result of the foregoing, in 1973 the price of copper at the London Metal Exchange (LME) was ₤724 per ton. This represented a record annual average and an increase of 69.9 percent over the previous year. As of January 1973 and April 1974, prices underwent a sustained rise, going from ₤475 to ₤1,268 per ton.

During that same period, the price of tin rose to unprecedented levels, breaking the record registered during the Korean War. The 1973 average price at the LME was 30.6 percent higher than the previous year, i.e., it rose from ₤1,506 to ₤1,967 per ton. While world production of this mineral fell by 5 percent in relation to 1972, the demand for primary metal rose by 9 percent. Even though in the second semester of 1973 the United States resumed operations on its strategic tin reserves by selling more than 19,000 tons, prices continued to climb. The substantial increase in prices was due to a combination of several factors, among which were a rise in consumption, speculative purchases, and also the fact that some exporting countries experienced production difficulties.

As with copper and tin, other minerals of interest to Latin America showed significant price increases: zinc (229 percent), lead (45.1 percent), and iron ore (40.2 percent). In the case of bauxite there was a slight increment of only 4.2 percent (for more details see Table No. 6).

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1. Between 1967 and 1972 world demand grew at an annual rate of 5.7 percent and that of Japan at 9.1 percent.

b.   Agricultural exports

Latin America's main export heading is composed of agricultural products. In 1973, the sale of only eight products 1/ yielded the equivalent of US$6.9 billion, which represented one half of the region's exports (see Table No. 1A). If to these products are added the oil seeds products and fats (US$1.3 billion) and corn (US$410 million), the percentage becomes 62.6 percent.

As previously noted, the market prices in current dollars for agricultural exports rose by 37.5 percent. Table No. 2A shows the agricultural index, and it may be noted that it climbed from 134.7 in 1972 to 185.2 in 1973.

During 1973 it was observed, in many cases, that import requirements exceeded export availability, not as a result of the marked decrease in production, but as a consequence of the fact that consumption--both in exporting and importing countries--has been growing at a higher rate than production. Cocoa, wheat and bananas were noteworthy exceptions to this rule. The latter product is undergoing a chronic situation of overproduction.

The general grain situation in 1973 was extremely critical in view of the decline in total production, including rice. It is estimated that, due to adverse weather conditions, the world grain harvest in 1972/73 declined by approximately 40 million tons,2/ i.e., a drop of 3 percent, for

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1.   Cotton, sugar, bananas, cocoa, coffee, meat, wool and wheat.
2.   This includes the USSR wheat crop, which dropped by some 13 million tons.

Table No. 6

MARKET PRICES OF THE FOURTEEN PRINCIPAL COMMODITIES EXPORTED BY LATIN AMERICA:
ANNUAL AVERAGE 1970-1973, MONTHLY AVERAGE FOR DECEMBER 1973 AND MAY 1974

Commodity			Currency and unit	ANNUAL AVERAGE				Monthly average		Percentage change
				1970	1971	1972	1973	Dec. 1973	May 1974	
Agriculture										
Bananas	Ecuador c.i.f.	Hamburg	$/MT	144	140	136	145	129	180	39.5
Beef	Argentina, Hind-quarters	London	NP/kg.	74.18	88.91	96.60	128.96	135.32	170.0	25.6
Cocoa	Bahía, c.i.f.	New York	Cents/lb.	32.0	25.9	31.1	61.1	63.0	108.8	72.7
Coffee	Colombian, mild		Cents/lb.	56.65	48.99	56.62	75.52	71.03	82.33	15.9
	Other milds		Cents/lb.	52.00	44.99	50.25	62.31	64.59	71.02	10.0
	Unwashed Arabica		Cents/lb.	55.80	44.71	52.42	69.19	73.50	80.00	8.8
Cotton	Mexico, S.M. 1-k/16		NP/kg.	28.15	32.37	32.64	55.69	72.82	60.24	-17.3
Sugar	"Free" market		Cents/lb.	3.74	4.52	7.43	9.59	11.83	23.65	99.9
	United States	New York	Cents/lb.	8.08	8.52	9.09	10.29	11.34	23.05	103.3
Wheat	Argentina, candeal Taganrog f.o.b.		$/lb.	1.64	1.63	1.77	3.77	4.90	5.44	11.0
Wool	"U.K. Dominion" Washed wool, 50's		NP/kg.	50	50	84	150	165	129	21.8
Mining										
Copper	LME, cash wire rods, immediate delivery		L/MT	589	444	428	727	960	1 191	24.1
Tin	LME, immediate delivery, cash		L/MT	1 531	1 438	1 506	1 967	2 788	3 855	38.3
Lead	LME, cash		L/MT	126.8	104.1	120.8	175.3	256.0	277.0	8.2
Zinc	LME, cash		L/MT	123.3	126.9	151.1	347.5	700.2	73.4	5.4
Iron ore	Liberia, Nimba 27% purity c.i.f.	North Sea	$ barrel	12.5	11.6	11.1	15.6	17.1	18.2	6.4
Fuels										
Oil	Venezuela, 35-35.9° f.o.b. Puerto de la Cruz Official reference price		$ barrel	2.80	2.80	3.21	4.40	7.11	11.2	57.5

Abbreviations:

$/MT: U.S. dollars per metric ton.
L/MT: Sterling pounds per metric ton.
Cents/lb.: U.S. cents per pound.
NP/kg: New pennies per kilogram.

Source: Unit on International Trade, Boletín de Precios Internacionales de Productos Básicos.

a total of 1,300 million tons. This decrease may be compared with the annual average increase of 34 million tons registered during the past 10 years. Wheat prices reacted violently in the face of the massive purchases made by the USSR in the United States and, consequently, 1972 prices doubled in 1973.

Between the latter part of 1972 and the latter part of 1973, cocoa prices for Bahia type cocoa in the terminal market of New York nearly tripled. The increase was due to a decline in the 1972/1973 harvest of approximately 13 percent, in addition to low stock levels. World consumption, measured in terms of grinding, increased by 5 percent, a percentage similar to that of the two preceding years.

After wheat and cocoa, beef registered the greatest price increase. In 1973, international beef prices rose, on the average, to 32.5 percent above the 1972 level. In 1973, the production of beef in the main importing countries decreased slightly in order to increase livestock. This situation was coupled with a softening of restrictions on imports in several principal markets. As of 1972, the United States did not apply the "voluntary" import quotas, and the EEC did not apply its variable import levies during several months in 1973.[1]/

Two of the agricultural products of the greatest importance to Latin America, not only because of the high returns from exports but also because of the large number of countries that export them, are sugar and coffee. In 1973, the price of sugar in the "free" market rose by 29.1 percent, while

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1. By June of 1974, the beef market became saturated and the EEC Commission adopted several steps designed to raise internal prices. Among other measures taken, beef imports from third countries were prohibited.

the price in the United States increased by 13.2 percent. Although the world sugar crop for 1972/73 reached a record level of 77.2 million tons, it was not sufficient to meet consumption, which was 78.1 million tons. Covering the balance resulted in a stock decrease. It is important to note that in the case of sugar, production between 1961/70 and 1972/73 grew at an annual rate of 2.2 percent, while consumption rose by an annual 3 percent. This resulted in a substantial rundown in stockpiles, and what seemed a year or two ago to be a short-term world shortage situation has turned into a structural problem.

Again, one of the factors having a strong bearing on the market was the purchases made by the USSR as of late 1971. A decline in the Russian production, coupled with a poor crop in Cuba, resulted in 1973 in an unprecedented "free" market price of 9.59 cents. However, this record will be more than doubled in 1974. During 1973, the tendency to rise displayed by controlled prices in the U.S. sugar market followed the behavior of the "free" market quotations, albeit at a more moderate pace.

In 1973, the conditions of the world coffee market were very stable, even taking into consideration that for the first time in 10 years the market operated freely without being regulated by the International Coffee Organization (ICO). In 1973 the reference price of the ICO for all types of coffee was 62.16 U.S. cents per pound as compared to 50.34 cents in 1972, which represents an increase of 23.5 percent. The firmness of prices was due to the relative scarcity of Arabica coffees, as a consequence of the poor Brazilian crop in 1970/71 in addition to the fact that Brazilian

stocks, which at one time had a depressing effect on the market, were substantially reduced.1/

During a large part of 1973, short supply and strong demand were the factors responsible, as in the case of other products previously dealt with, for the influences exerted on the price of agricultural fibers, both wool and cotton. The prices of these two commodities rose by 77.4 and 70.6 percent, respectively (see Table No. 6).

c. Petroleum

Although it is not a primary purpose of this study to analyze the crude oil situation, it is nevertheless important to make some observations in order to have a better perspective of the general situation of export commodities in Latin America.

In the post-war period, oil has been the main export item of the region. One third of the value of Latin American exports in 1973 consisted of petroleum. This year was crucial for the world oil industry, since the governments of those developing countries that export crude oil secured effective control of production and price policies. Before that year, transnational companies had the power to set both production levels and prices.

In fact, the member governments of the Organization of Petroleum Exporting Countries (OPEC) exercised their oligopolistic power on the world oil market and thus succeeded in raising prices. The average price

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1. At the end of the 1965/66 coffee year, Brazilian stocks were 73.9 million bags, which is equivalent to a one-year world consumption. By 1972/73 stocks had dropped to 205 million bags.

of Venezuelan oil in 1973 was 37.1 percent higher than in 1972, and it is expected to climb by 255 percent in 1974.

In addition to the great increase in the cost of petroleum imports,1/ it is important to note that the phenomenal rise in prices has resulted in a strong increase in the prices of many of the materials of critical importance to modern industry, both manufacturing and agricultural. The prices of nitrogenous fertilizers doubled between late 1973 and early 1974, which made it possible for phosphates to rise proportionally. In turn, fuel prices, depending on the product, increased between 37 and 83 percent.

2. World Economic Situation in 1973

The previous paragraphs have dealt with the principal events bearing on the various commodities and the impact thereof on market prices. The world economic situation and its incidence on price behavior will not be analyzed.

Essentially, commodity prices depend on growth of demand and elasticity of supplies, in both the exporting and importing countries. In addition, prices are influenced by other factors, such as inflationary pressures, monetary exchange adjustments, and competition from substitute products. Also, tariff and non-tariff barriers are very directly related to trade flows and to the level of prices to be paid by importers. Of all these

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1. It is estimated that in 1973 the 17 Latin American countries that are net importers of oil spent US$1.4 billion to import oil and its by-products, and that a conservative estimate for 1974 is US$3.8 billion.

factors, the one that had the greatest impact in 1973 and will continue
to be the decisive element, was growth in demand, which is closely linked
to the economic activity of each country. Exports of developing countries
and, consequently, prices to be paid in such transactions will depend to
a large extent on the economic development of the OCDE countries. For
Latin America, the OCDE markets are of vital importance, since they absorb
roughly two thirds of Latin American exports other than oil.

The following paragraphs set forth in summary form the recent evolu-
tion of the main economic indicators of the OECD countries.

a. Growth and inflation

In 1972 and 1973 the OECD prices reflected a strong expansion in eco-
nomic activity, as a result of which there was a marked acceleration in
industrial output and a substantial increase in inflation rates.

Taken as a whole, the GNP of the OECD countries grew by 6.3 percent
in 1973, while industrial output registered the greatest growth since the
Korean War (see table No. 7). Inflation in these countries, quantified on
the basis of the behavior of consumer prices, showed an annual rate of
7.5 percent, as compared to 4.6 percent in the previous year and 3.4 percent
for the period 1959-60 to 1970-71.

As to industrial production, it is important to point out that the
greatest increase (13 percent) took place in the production of metals,
and this resulted in a strengthening of the demand for mineral ores and
concentrates exported by developing countries.

Table No. 7

OECD: PRINCIPAL ECONOMIC INDICATORS

(In percentages)

		Average 1959-60 to 1970-71	Variation in relation to the previous year			Variation in relation to the previous semester				
			1972	1973	1974	1973		1974		1975
						I	II	I	II	I
I Growth of GNP	OECD Total	5.3	5.7	6.3	1	-	-	-	-	-
	EEC	4.9	4.0	5.5	2.5	-	-	-	.-	.-
	U.S.A.	3.9	6.1	5.9	-0.5	6.9	2.7	-2.75	1.5	3.0
	Japan	11.1	9.4	10.3	-1.5	12.9	3.1	-6.5	4.5	7.25
II Prices paid by Consumers	OECD Total	3.4	4.6	7.5	13.0	-	-	-	-	-
	EEC	3.6	6.1	8.1	12.75	-	-	-	-	-
	U.S.A.	2.4	2.6	5.3	10.0	5.4	2.9	11.5	9.25	7.5
	Japan	5.6	4.9	11.8	24.75	10.3	19.2	29.75	20.25	15.0
III Industrial Output	OECD Total	-	5.9	10.1		-	-	-	-	-
	EEC	-	3.9	8.4		-	-	-	-	-
	U.S.A.	-	7.9	9.0	-1.75	10.0	4.7	-4.25	-2.5	2.5
	Japan	-	7.3	17.6	2.5	23.3	11.1	-2.5	4.0	8.5

Source: OECD, Economic Outlook No. 15, July 1974.
Industrial Production, No. 1, 1974.

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The pressures of demand were partly reflected by the trade carried
on by OECD member countries, there being an unprecedented increase in 1973.
The value of total imports grew, from one year to the next, by no less than
39.1 percent, and a large portion thereof consisted of foodstuffs and raw
materials.

Latin America benefited from this situation and OECD purchases from
Latin America increased by 47 percent in 1973, as may be seen from Table
No. 8. The greatest increases were in the EEC and Japan.

Table No. 8

OECD: C.I.F. IMPORTS FROM LATIN AMERICA

	Annual Average 1969-1971	1972	1973*	1973 increase in relation to 1972
OECD TOTAL	11.7	13.8	20.3	47%
EEC	4.2	4.8	8.2	71%
USA	4.8	5.8	7.2	24%
Japan	1.2	1.2	1.8	50%

* Preliminary.

Source: OECD Overall Trade by Countries.

A rise in the value of imports of such magnitude as the one in 1973
may be basically explained in terms of two factors. The first factor
concerns the pressure of demand resulting from an accelerated expansion
of the economy, and the second deals with an accumulation of wealth. The
latter factor plays a very important role during strong inflationary periods

and/or monetary crises, since many businessmen and investors prefer to accumulate physical stocks rather than monetary assets.

b.   Realignment of currencies

Since mid-August, 1971, when the United States suspended the convertibility of the dollar to gold and demanded a substantial readjustment of exchange rates, various realignment of currencies has taken place. As regards to international commodity trade, the prolonged monetary crisis coupled with strong fluctuations in the parity values of currencies introduced an element of great instability in the markets. As a result of the ensuing uncertainty, many producers and investors began to operate in the futures market, where they believed there was greater security to protect their investments against fluctuations in parity values and against the adverse impact of inflation. These speculative operations undoubtedly exerted upward pressure on prices.

3.   Real Impact of the Rise in Commodity Prices on the Importing Capability of Latin America

It has been verified that in 1973 there was a particularly favorable situation in the market prices of commodities. This exceptional situation was due as much to internal factors of the products industries as to external factors related to the world economic situation. It is therefore important to analyze the real effect of this favorable situation and its impact on the capacity of Latin America to import 1/ and on the economic development of the region.

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1.   In theory, the capacity of a country to import is determined by the value of its exports, plus or minus the net flow of capital and payments for production factors, divided by an index of import prices.

The impact of this favorable price situation on the capacity of each Latin American country to import cannot yet be quantitatively ascertained. For a number of reasons, the statistical data available to date on the trade of Latin America is not sufficiently broken down to make a country-by-country analysis. Nevertheless, certain general conclusions may be arrived at on a regional level, subject to the caveat that such conclusions may vary as to the magnitude of the figures from country to country, depending on the composition of both its exports and its imports.

In the absence of up-to-date statistics, the best way to analyze the impact of market prices on the capacity to import is to calculate relative prices, in other words, to deflate the market price index of export commodities by the import price index.1/ The following table shows this price relation for those Latin American countries that are not net exporters of oil.

Before analyzing the results of this exercise it is important to indicate the basis for the 1974 estimates and the 1975 forecast. As regards to commodities, excluding oil, it is believed that, although the first quarter of 1974 showed the greatest increase of the whole 1972-1974 period, this tendency decelerated notably in the second quarter, and it is believed that prices generally will drop by the third and fourth quarters. Although it is difficult to forecast the future evolution of prices, prospects

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1. The import price index of the Latin American countries that are not net exporters of oil were calculated by weighting the following headings in the indicated manner: oil imports (12 percent), food and raw material imports (15 percent), manufactures imports (73 percent).

for 1975 are that the downward trend will continue and that, on the average, prices will drop by 10 percent. Sugar and grains should be excluded from this general tendency.

As regards to the import index, it is estimated that oil prices in 1975 will remain at their 1974 level and that the prices of imports of manufactures will increase by 13 percent each year. Prices of food and commodity imports in 1974 will rise by 26 percent in relation to 1973, but they will decline by 10 percent by 1975.

Having explained the working hypothesis, certain very important conclusions can be drawn from Table No. 9. First of all, the 1973 increase in relative prices was only 16.5 percent, while market prices rose by 43.3 percent. In 1974, the Latin American countries that are not net exporters of oil began to face an unfavorable relative price situation. In other words, although it is estimated that market prices will increase by 26.5 percent, real prices will drop by 6.1 percent, but in any event, the latter will remain above the level of base year 1968. According to our forecasts, 1975 relative prices will continue to decline, there being projected a drop of 13.9 percent in relation to 1974. This means, in fact, that relative prices will drop to 5 percent below the base year level and will be the lowest prices registered in 1963-74 period, with the exception of 1967.

The results of the estimates on the evolution of real prices between 1970 and 1973 are closely related to the figures prepared by the OAS on Latin America's capacity to import, which in 1970 was equivalent to US$16.4 billion; and it was concluded that there was "in 1971 a decrease of 4.05

Table No. 9

RELATIVE PRICES OF LATIN AMERICAN TRADE
FOR COUNTRIES THAT ARE NOT NET EXPORTERS OF OIL

(1968=100)

Price Index:	1963	1964	1965	1966	1967	1969	1970	1971	1972	1973	1974	Estimates 1975
Commodities	89.2	102.2	100.7	101.1	92.9	108.5	121.4	111.0	123.3	176.7	223.5	201
Imports	93.3	95.9	97.2	99.5	98.9	103.5	110.2	113.3	123.6	152.0	202.6	211
Relative Price	95.6	106.6	103.6	101.6	93.9	104.8	110.2	98.0	99.8	116.3	110.4	95

and 3.02 percent in 1972 by reason of the monetary realignment and the changes that occurred in world prices and that, as a result of the 1973 increase in commodity prices, the capacity to import had increased by 1.84 percent."[1]/

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1. Organization of American States, CIES/2013, February 1973. It is important to point out that the model used to calculate Latin America's real capacity to import included oil, but it had no major impact on Latin American trade in 1973, since it followed the general trend of 1970-73; the price increase was proportional to the increase in the prices of other products, for which reason the result is not distorted.

B. THE IMMEDIATE FUTURE

Although world economic activity in 1972 and 1973 registered strong growth, toward the fourth quarter of the year indications already were beginning to arise that in 1974 there would a a slowdown. This not only became obvious, but it worsened with the energy or petroleum crisis. With the quadrupling of crude oil prices in one year, the importing countries faced in 1974 a tremendous petroleum import bill. The most recent estimates of the OCDE anticipate that the cost of petroleum imports for 1974 will increase by about US$55 billion and that there will be a deficit on current account of US$30 to US$35 billion. The value of petroleum imports to Latin America will increase by US$4 billion.

Prospects for economic growth of the OCDE countries in 1974 are discouraging. It is estimated that countries such as the United States and Japan will record negative rates of -0.5 and -1.5 percent, respectively. The economic slowdown will mean a drop in industrial production and, according to calculations of the OCDE Secretariat, the following rates for the principal countries are foreseen:

Table No. 10

INDUSTRIAL PRODUCTION AND CONSUMER PRICES IN
SELECTED OCDE COUNTRIES

(Percentage change from the previous year)

	Industrial Production		Consumer Prices	
	1973	1974	1973	1974
Japan	17.6	2.5	11.8	24.75
Italy	9.2	6.0	10.8	19.0
United States	9.0	-1.75	5.3	10.0
Canada	8.3	5.0	5.6	10.0
Fed. Republic of Germany	7.5	2.0	7.2	8.5
France	7.5	5.25	7.3	14.0
United Kingdom	7.1	-3.0	8.6	15.0

Source: OCDE, Economic Outlook, No. 15, July 1974.

The situation is further complicated by the big jump in the rate of inflation foreseen for 1974. In 1973, consumer prices for the OCDE countries rose by 7.5 percent, and they are expected to reach an annual rate of 13 percent. Table No. 10, above, shows the figures for the main OCDE countries.

In 1974 the economies of the main industrialized countries face a new economic situation which could be called "stagflation," that is, the economy is entering a cyclical phase of stagnation together with strong inflationary pressures. This situation means not only great uncertainty for these countries, but even more so for developing countries which depend to a large extent on trade with those countries.

Normally, prices of commodities, especially metals, are closely tied to the economic activities of the industrialized countries. When the economy changes direction, from an expansionist phase to a period of contraction, there is a delay before commodity prices react to the new situation. It is difficult to determine precisely the time lag, but it can be from a few months to a year. The phenomenal increase in prices recorded in the first quarter of 1974 and the more moderate increase in the second quarter constituted the final part of the price rise. In the second half of the year, prices began to feel the effect mentioned above, and there will be a gradual decline.

Price changes over the next few months will depend on the particular situation of each product. For example, prices of sugar, which recorded record crops in 1972/73 and in 1973/74, and which expects another in 1974/75, have shown astounding firmness. This is because a long-run shortage is

foreseen and there is much uncertainty for the short run concerning traditional market arrangements. Moreover, after 40 years, the U.S. Congress has failed to approve sugar legislation which controls sugar imports, as well as other aspects of the U.S. sugar industry. Furthermore, the EEC countries are not reaching agreement on future sugar policy and its regulation. Aside from this picture of uncertainty in the main protected markets, the International Sugar Agreement has not been regulating the "free" market since 1972. Other products might register increases in the immediate future if there is a drop in production as in the case of grains or if for some reason the supply is regulated and drops off.

II. CONCLUDING REFLECTIONS ON COMMODITY PRICES

A. ATTEMPTS TO MAINTAIN PRICES IN 1974

The bonanza in international commodity markets that prevailed throughout 1973 and in early 1974 meant a real contribution to the economic development process of the Latin American countries, since it meant a real increase in their export earnings. There was a recovery from the depressed levels of 1971 and 1972, but the effect may be temporary, lasting barely two years.

During this period, the exporters of commodities enjoyed for the first time since the Korean War a strong negotiating position vis-à-vis the industrialized countries in the matter of commodity trade policies. The oil crisis showed the industrialized nations' dependence on external sources of supply. Events in the area of petroleum, however, have been unique and may not have any counterpart in the particular situation of other commodities. Consequently, thus far it has not been possible to establish other cartels following the model of OPEC.

Representatives of the governments of the bauxite-producing countries --Australia, Jamaica, Guinea, Guyana, the Dominican Republic and Surinam-- met in Conakry in March 1974 to study the possibility of forming a cartel and subsequently established the International Bauxite Association. That same month, representatives of the six main Latin American banana-exporters met in Panama and decided to establish the Union of Banana-Exporting Countries (UIEB) and also to increase export prices. With regard to copper,

the member countries of CIPEC 1/ met in Paris to discuss ways to sustain prices by fixing minimum prices. Other examples of negotiations of this kind were the establishment of "Café Mundial, Inc." by Angola, Brazil, Colombia and the Ivory Coast, and "Cafés Suaves, S.A.," by Costa Rica, El Salvador, Guatemala and Mexico. Thus far the results of all these negotiations have been somewhat discouraging as the prices continue to soften.

It is very important to remember that, to establish an oligopolistic position in commodity markets, certain economic as well as political conditions must be met, in addition to the requirement that there be a relatively short supply situation in relation to demand. The main economic consideration is that the product in question must have a relatively low price elasticity so that high prices will not cause a substantial reduction in real demand for the final product through, for example, substitution by a similar or alternate product. Among the policy factors, it should be indicated that it is necessary that the group include a dominating member or, lacking this, that the product be exported by a very limited number of countries. If this does not take place, administration of the cartel becomes very complicated. It is also important that the countries have some similarity of interests.

Unilateral measures, such as the measure recently taken by Jamaica and also contemplated by the Dominican Republic, to increase export taxes on bauxite, tend to be effective over the short, and perhaps, medium run when they are based, as in this instance, on the dependence certain

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1.   Chile, Peru, Zambia and Zaire.

factories have on a specific grade of ore. However, when there is a chronic overproduction, as in the case of bananas, with alternative sellers outside the cartel, increases in export duties or the establishment of minimum export prices does not have the same effect.

Although it is concluded that the rising trend of commodity prices has reversed itself beginning mid-1974 and that the drop in quotations for some products which occurred in June and July were not merely technical market adjustments, it would seem advisable for the exporters of commodities to take corrective measures. The important thing for the countries that export commodities is to achieve short-range stabilization of their export earnings and longer-range real growth in those revenues.

At the present time, the negotiating strength of the developing countries for stabilization of their export earnings depends largely on two related factors. The first is related to the control they exercise on a substantial part of the supplies of certain key commodities considered vital to the industrialized countries. The second factor is the fact that these countries are attempting to implement anti-inflationary policies. The latter is important, since substitute or alternative products can be developed only at very high costs which would add to the inflationary pressure.

B. OPTIONS FOR STABILIZATION POLICIES

There are many options for commodity price stabilization policies. They could, on the one hand, follow the historical trend of dealing with the problem product by product, or this matter could instead be dealt

with as a whole taking advantage of the economic interdependence among nations. Some of the possible alternatives are presented, for the purpose of eliciting an exchange of ideas on this vitally important subject.

In any strategy the developing countries adopt in defense of commodity prices, one factor that could be decisive is the negotiating strength the net petroleum exporting countries have today in dealing with the industrialized countries as a direct result of the petroleum crisis. The petroleum exporting countries could be the catalytic factor for persuading the industrialized countries of the desirability of negotiation.

The product-by-product approach could assume the form of international agreements between producers and consumers. One alternative would be to establish cartels. Nevertheless, a new approach would be negotiation of long-term sales contracts between producers and consumers which would establish future prices, possibly with automatic adjustment clauses for inflation and/or changes in monetary parities, and at the same time tonnages would be determined. This option, aside from reducing price fluctuations, has the advantage of allowing a rationalization of production with better use of available resources.

A strategy dealing with the problem of commodities as a whole could be carried out by establishing an international institution or council whose purpose would be to stabilize revenues from commodity exports. This institution would represent the governments of the producer countries as well as those of the consumer countries. It should be authorized to formulate, evaluate, implement and, if necessary, modify a general coordinated strategy on commodities. This overall strategy would include the establishment

of specific policies for each product, taking into account the special problems and requirements of each country.

The essence of this plan is to achieve short-term price stabilization with a long-term price policy aimed at balancing supply with demand, allowing a gradual growth of the most efficient or lowest-cost producers. In other words, since prices change, it is necessary to fix them over the short run within reasonable limits that will enable the producers that find current prices attractive to expand production at the expense of those that do not have the same view of those prices.

Another possible option could be for the industrialized countries to guarantee the developing countries that export commodities a minimum level of export earnings in exchange for guaranteed access to commodity supplies. That is to say, if a country's earnings drop due to the drop in value of exports of a specific product below a previously negotiated level, the country affected could obtain concessional compensatory financing.

At present, the International Monetary Fund offers this service, but the loans are not concessional. To a greater extent the industrial countries, the net exporters of petroleum, and to a lesser degree the exporters of commodities could contribute to a concessional guarantee fund.

LATIN AMERICA AND THE OIL DEFECIT: THE LONG-TERM
BALANCE OF PAYMENTS ADJUSTMENT PROCESS

by

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with the collaboration of Leonardo A. da Silva*

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Paper to be presented at the Latin American Symposium on Energy
Sponsored by ECLA

(Santiago, Chile, September, 1974)

Washington, D.C.
August, 1974

LATIN AMERICA AND THE OIL DEFICIT:

THE LONG-TERM BALANCE OF PAYMENTS ADJUSTMENT PROCESS

I. SUMMARY AND CONCLUSIONS

1. The problem of financing the oil deficit is a matter of deep concern
    for most countries of the world. However, the recent increase in
    oil prices is only one of the change elements that characterizes the
    world economy in the present decade. Widespread inflation and the
    instability of the international monetary system are also important
    elements at the present time.

2. The long-term adjustment process to correct this situation has to be
    viewed from the standpoint of the external sector as a whole. The
    approach that emphasizes the transfer of short-term funds among
    countries is useful, but it is unilateral and incomplete. For the
    world as a whole, the adjustment process related to the oil deficit
    requires an orderly transitional period in which while the import
    capacity of goods and services of the surplus countries (i.e. the oil
    exporting countries) increases, this group of countries will be
    in a position to transfer resources and have available to them
    attractive and safe investment opportunities in the deficit countries.
    From the viewpoint of the deficit countries, the adjustment process
    needs to take place in the same orderly fashion, but in reverse.
    First, they would have to resort to the international capital markets
    in order to finance the higher external payments; this would be fol-
    lowed later by a gradual expansion of their exports of goods and
    services to the surplus countries.

    Eventually, a new basic equilibrium satisfactory to both groups of
    countries would be achieved.

3. In actual practice, this process is not as easy as it appears in
    theory. It is now clear that as the financial world begins to bear
    the full impact of this massive adjustment process in the course of
    1974, a serious imbalance has developed in the financial markets,
    which manifests itself in an excess supply of short-term funds, and
    a relative scarcity of medium and long-term funds. This situation
    is further complicated by the prevailing high inflation rates, but
    even after this problem is partially or totally eliminated, there
    would be still other potential sources of disequilibrium which might
    threaten the world economy.

4. As far as the oil deficit is concerned, the situation of Latin America
    is more favorable than that of other developing regions; however,
    several countries will confront serious difficulties in the adjust-
    ment process. In this connection, the announcement made by Venezuela
    of her willingness to cooperate with other Latin American countries
    is a compensatory factor of great importance.

Perhaps as important as the aforementioned situation would be the impact on regional trade and financial flows resulting from the extraordinary increase of foreign exchange going to Venezuela and, to a lesser extent, to Ecuador, Bolivia and Trinidad and Tobago. Nowhere is this clearer than in the case of the Andean Group, not only because of the expanded market represented by these countries, but also because of the new investment opportunities in the area.

5. The possibilities that Latin America may obtain in the near future additional financing from traditional sources are not great. As far as the access to surplus funds from non-Latin American oil exporting countries is concerned, the possibilities will depend on three main factors: first, the investment policies of such countries regarding their surplus funds; second, the policies of the Latin American countries designed to attract these funds; third, the efficacy of the financial mechanisms and instruments through which this resource transfer can be achieved.

6. The measures of a financial nature will not be a cure-all in the adjustment process. In the long-run it is indispensable that Latin America be in a position to generate additional export earnings to cover the higher cost of oil imports. This is so because there are not many opportunities to expand import substitution within the region. Also, if and when the Latin American countries can obtain adequate financing during the initial phase of the adjustment process, the external payments related to these new borrowings may become a heavy burden on the balance of payments unless exports are stepped up.

7. The long-term adjustment process of the Latin American balance of payments will depend to a certain extent on the energy policies to be adopted in each of the countries, as well as on the cooperation and coordination among themselves for the development of existing energy resources.

I. INTRODUCTION

Following the increase in oil prices effective January 1, 1974, the problem of financing the deficits of the countries which are net oil importers became, not without reason, a matter of world concern. As was natural, financial measures to ease the balance of payments position of the deficit countries received most attention, because when faced with a quadrupling of the cost of oil imports compared to 1973, the first reaction of the countries was understandably to seek external funds to finance the higher payments required.

The mobilization of additional external resources is a fundamental aspect of the adjustment process, because without additional external aid this process would be too drastic in many cases. This is why the attitude of countries such as Venezuela which have offered various forms of financial cooperation to other countries of the region, through both bilateral and and multilateral channels, has been most significant in the Latin American context.

In the longer term, however, the structural adjustments to compensate for the effect of the oil crisis will call for an absorption of the higher prices by the various sectors of the economy while, at the same time, maintaining an adequate equilibrium in the external sector as a whole. This is the approach that countries must adopt in formulating and implementing measures and policies to facilitate the adjustment of their economies to the new situation.

The purpose of this document is to examine, in the light of recent events, certain aspects of this process and the prospects regarding the equilibrium of the external sector of the Latin American countries.

There is one point which should be particularly noted in this connection. Although this document revolves around what is known as the "oil crisis", this is not the only problem of external origin which the economic policy of the Latin American countries and, therefore, the countries of the world, presently have to face. The oil crisis has to be considered in the context of the entire world economy in this decade, which began with symptoms of a serious disequilibrium --evidenced by, among others, highly significant manifestations, the desintegration of the Bretton Woods monetary system-- which are having far reaching effects on the further economic development of the countries, but whose final results are still in an evolutionary process. The "oil crisis" is just one further element in this process of change.

As a consequence, the adjustment of the external sector of the Latin American economies in the years ahead must take as a frame of reference, the entire range of these changes and not just the individual element of the new oil price.

III.   NATURE OF THE EXTERNAL SECTOR ADJUSTMENT PROCESS

The bulk of the recent studies on the measures to be taken by the countries to cope with the oil crisis has placed special emphasis on mechanisms by which the additional foreign exchange earnings of the oil exporting countries can be recycled through the capital markets and other mechanisms to provide financing for the deficit countries.

This approach is useful, but it is also unilateral and incomplete. From both the point of view of the countries with balance of payments surpluses --the oil exporters-- and from that of the deficit countries --the net oil importers-- the problems raised by the balance of payments adjustment process are much more complex. As the volume of resources involved is unprecedented, it would be out of the question to expect that over the medium term the oil exporting countries will be able to absorb into their economies, in terms of real resources, the additional foreign exchange earnings flowing into them. The most optimistic estimates consider that no more than 20 per cent of these earnings, which would be the equivalent of US$10-15 billion, could be absorbed by imports of goods and services in 1974.

This would leave in 1974 alone, a balance of US$54 billion which would have to be recycled in one way or another in order to avoid a serious dislocation of international trade and finance. Considering the amounts that will accumulate year after year, the totals assume alarming proportions which could jeopardize the stability of the financial system and, therefore, the world economy.

It must be stressed that this would not be a state of affairs that would benefit the oil exporting countries. It is in the interest of these countries that the world's balance of payments adjustment be an orderly process in which, as their capacity for importing goods and services increases, they may transfer resources and have available to them attractive and secure opportunities for investing their surplus funds on terms and conditions that are in line with the requirements and absorptive capacity of the deficit countries. All this within a process that makes it possible to maintain a relative equilibrium between trade and financial flows.

From the viewpoint of the deficit countries the adjustment process needs to take place in the same orderly fashion, but in reverse. To begin with, these countries will not be able to immediately finance their balance of payments deficits with additional exports, or by a sharp cutback in their imports; they will instead have to turn to the capital markets in search of short, medium and long-term funds tailored to the requirements of their particular adjustment processes. This could be followed by a gradual expansion of their exports of goods and services to the surplus countries. Ultimately, a new basic equilibrium satisfactory to both groups of countries will be achieved.

A "dynamic" balance of payments equilibrium at world level calls for an orderly behavior on the part of the different countries throughout the adjustment process. However, this is not a sufficient requirement. Financial mechanisms and instruments to facilitate this process are also needed.

In actual practice, this process is not as easy as it appears in theory. It is now clear that as, in the course of 1974, the financial world begins to bear the full impact of this massive adjustment process while the world is facing at the same time other major problems (especially world inflation), the effects of a serious financial disequilibrium are already making themselves felt. This disequilibrium is apparent, particularly, in the excess supply of short-term funds, and the relative scarcity of medium and long-term funds.

Some experts believe that this inbalance cannot be corrected until world inflation is not significantly reduced. This is only partially true, since even if satisfactory progress is made in the fight against inflation, there will still be two potential sources of disequilibrium. The first is that under normal monetary conditions, excess funds from surplus countries would tend to flow mainly to countries with a strong balance of payments rather than to those with weak currencies and real financial problems.

The other potential source of disequilibrium is that some of the countries most seriously affected by the oil crisis might feel tempted, or even forced, in extreme cases, to apply import restrains, while at the same time trying to expand exports. It is obvious that this type of policy if applied by several countries would not contribute to restore equilibrium, but rather, to worsen disequilibrium conditions.

This is, in brief, the nature of the problem which most countries of the world, and therefore, the Latin American countries, have to come to grips with. In other words, the long-term adjustment process of the external sector of the Latin American countries must be approached from the angle of their balance of payments as a whole, i.e. by taking into consideration both the current account and the capital account.

Since the external sector has traditionally been one of the bottlenecks in Latin America's development programs, and external financing has played a role of strategic importance for many countries in the past, this is an aspect of highly critical interest for the region. The much higher cost of oil has added a new dimension to this old problem.

IV. THE MAGNITUDE OF THE OIL DEFICIT

The starting point for formulating adjustment policies must, of course, be to determine the magnitude of the oil deficit in relation to an appropriate index. The three chief indexes could be the following:

   i. The degree of self-sufficiency in oil and oil products.

  ii. The ratio of the oil and oil derivatives deficit to total imports.

 iii. The ratio of that deficit in relation to a country's international monetary reserves.

With regard to the first item, the relatively dynamic picture presented by oil production as against consumption must be borne in mind. This is clearly illustrated by comparing the figures of 1970 and 1973 shown in Table 1. In the short period that has elapsed since that year, the following important changes have already taken place:

a. Mexico and Argentina have switched from a slight surplus situation to one of deficit;

b. Venezuela, Colombia and Trinidad and Tobago decreased their position as net exporters;

c. Ecuador has passed from a deficit situation into one of considerable surplus;

d. Brazil, Peru and Chile have increased their external dependency for the supply of their oil requirements; and

e. The share of the domestic production in relation to total consumption has diminished considerably in the regional countries as a whole,

The foregoing can undoubtedly be projected into the future and is of obvious significance in the analysis of the adjustment process. For instance, it is known that Mexico currently has a program underway for expanding oil production; Peru is shortly to start work on an oil pipeline to exploite recently identified oil reserves which can transform the country into a net exporter in a short period of time 1/, and Argentina possesses reserves which would enable it, too, to substantially boost its production. These are all factors which must be taken into account in projecting the adjustment process, since the oil deficit is by no means a static situation, either from the viewpoint of oil production itself or from that of development of other energy sources such as coal and hydroelectric resources.

Table 2 shows the ratio of oil imports to the countries' total imports in 1972 and 1973, before the substantial increase in oil prices registered in the early months of 1974. Roughly speaking, the oil figure is now four times larger in relation to the total, which means that for the deficit countries of Latin America as a whole the cost of oil imports may amount to some 20 per cent of total imports. However, this percentage is not a good enough measure of the problem in a dynamic sense. For instance, the proportion for Uruguay could run as high as 30 per cent, and for Brazil it could be 35 per cent; but considering economic prospects in the two countries the problem acquires quite a different dimension: while for Brazil it might not pose major difficulties at the medium term, for Uruguay, it might involve a much more acute problem in the long-run.

Table 3 shows the estimated additional cost of Latin American oil imports in 1974, compared with gross international reserves as of the end of 1973. Using this index alone, the situation seems tolerable in the short term for some countries such as Brazil, Argentina, Mexico, Nicaragua, Panama and Peru, for all of which the additional cost of oil represents less than 25 per cent of their gross reserves as of the end of 1973. However, the picture is fundamentally different for countries such as Chile, Honduras, Jamaica, El Salvador and Costa Rica, particularly if their external debts are taken into consideration. For all these countries the deficit represents a very high percentage of their international monetary reserves as of the end of 1973. This is most important since the monetary reserves constitute the first line of defense in the adjustment process. Once the first line is exhausted, an immediate need to obtain additional resources from abroad arises.

This trend has to be evaluated considering the degree of participation of petroleum and its derivatives in the total energy consumption in each of the countries. As can be observed in Table 4, in all of the countries of Latin America, with very few exceptions, the utilization of petroleum and its derivatives represents a high percentage of the total energy consumption, especially in Argentina, Chile, Jamaica, Panama, Peru and Uruguay. The comparison of these percentages with the aforementioned indicators, evidences the serious consequences of the large increase in the world prices of petroleum.

1/ As of the end of June 1974, production at the rate of 70,000 barrels/day had been attained in Peru's eastern oilfield which were only waiting for the laying of the pipeline.

The foregoing analysis has sought to focus attention on the chief
elements by which the magnitude of the oil deficit can be established,
this being the basis for programming the adjustment process of the external
sector. The data presented highlights the diversity of situations that
characterize the problem in each individual country, which has obvious
implications for the adjustment process.

V. RECENT TRENDS IN LATIN AMERICA'S BALANCE OF PAYMENTS

In order to analyze the balance of payments prospects of Latin America
in the face of the oil crisis, it is necessary to examine first the
behavior of this sector of the regional economy in the recent past,
as a basis for extrapolating and projecting some of the structural trends.

With some exceptions, the trends observed over the past decade in the
region's consolidated balance of payments have been relatively favorable.
According to the figures given in Table 5, the current account deficit
was maintained at a relatively low and stable level up to 1967, amounting
to US$1.7 billion in that year, as against US$1.3 billion in 1961. From
1968 onward, however, as Latin America increased its rate of growth, the
current account deficit jumped to US$2.9 billion in 1970 and to US$4.4
billion in 1972. In brief, these figures are the result of the following
trends.

First, the deficit on the services account has grown continuously, rising
from US$2.2 billion in 1960 to US$3.9 billion in 1970 and US$5 billion in
1972. Second, the trade balance has displayed a variable trend that warrants
more detailed comments. Following for the most part traditional lines of
behavior, this balance increased from a surplus of US$9 million in 1960 to
a peak of US$2.4 billion in 1965; since then, however, it declined gradual-
ly, reaching a US$180 million deficit in 1971. In 1972 and 1973 the trade
balance returned to a surplus, but this was primarily due to essentially
cyclical and speculative factors connected with the international com-
modity markets.

It proved possible for the current account deficit of the region's balance
of payments to be absorbed without major problems, mainly by the inflow
of capital during the greater part of the period under review, which
together with the inflow of short-term capital, permitted an increase
in the region's international monetary reserves from US$2.8 billion in
1960 to US$ 4 billion in 1968 and US$5 billion in 1972.

In summary, there has been a deterioration in the region's balance of
payments current account, as a result of the deficits registered in both
goods and services movements. Long-term capital inflows have been the
compensatory factor in the balance of payments.

VI. BALANCE OF PAYMENTS PROSPECTS

In the light of the foregoing analysis, what are the prospects for maintaining the equilibrium of the region's balance of payments during the adjustment period? Before embarking on an analysis of this problem, certain important observations must be made.

The first is that preparing a balance of payments projection on a country-by-country basis in order to try to arrive at a more or less satisfactory regional result would be beyond the scope of this paper. Also, the changing circumstances in today's world make it impossible to draw up projections that would be reasonably reliable. These circumstances include, for instance:

a. the dynamic, though still confused, state of the commodity markets;

b. worldwide inflation and the uncertainty regarding the prospects of the world economy;

c. the instability of the international monetary system and the evolutionary approach adopted for international monetary reforms; and

d. the unadequate amount that has been learned up to the present as to the policies of the oil exporting countries regarding the disposition of their foreign exchange surpluses.

The following analysis seeks only to present certain assessments of a general nature regarding the possible course of events.

The second observation called for is that, for obvious reasons, this part of the analysis relates solely to the countries of the region that are net oil importers; in other words, it does not include Venezuela, Ecuador, Bolivia, Colombia and Trinidad and Tobago.

Third, it is assumed that the countries' general objective during the adjustment process is mainly to maintain a "dynamic equilibrium" in their economies. This must be interpreted to mean keeping a relative equilibrium in the basic balance of the balance of payments by seeking to maintain, at the same time, the rate of economic growth of recent years. Of course, one might include as a reasonable hypothesis that one of the ways of maintaining the equilibrium of the external sector could be the reduction of the rate of economic growth; and in certain cases this could in fact happen, if appropriate compensatory measures are not adopted. We have deliberately discarded this as an initial hypothesis since, in some cases, the correction of the deficit through contractionary measures might tend to worsen the problem.

1. Prospects in the financing field

If the countries of Latin America were able to obtain, in adequate volume and at reasonable terms, additional external funds to pay the higher cost of oil imports over the coming years, the problem would perhaps be much more manageable and the adjustment process would be

enormously facilitated. This might be possible in some cases, but to examine these possibilities more thoroughly at the country level, a clear distinction would have to be made between private and public capital. It would also be necessary to differentiate between the region's traditional sources of capital and possible new sources.

Perhaps the prospects are not very favorable with regard to Latin America's traditional sources of financing. While these have up to the present been able to provide financial resources, both public and private, in sufficient volume to maintain the regional balance of payments equilibrium, it is doubtful whether they will be able to do so in the future, since these sources have also been affected by the oil crisis, and this situation is further complicated by inflation and the prevailing current instability of the monetary system. Under these conditions, the traditional sources would unlikely be able to provide more resources and it would also be doubtful if, in global terms, the previous levels of external financing could be maintained. As regards official capital this situation would require a rationing system in which, quite logically, preference would be given to the less developed countries. Consequently, the larger and more developed countries would have to turn increasingly to private and commercial sources, including direct investment.

There is considerable, but not easily quantifiable, potential for financing from non-traditional sources: specifically, the oil exporting countries. Although some concrete offers have been made, it is not presently possible to assess their magnitude regarding the impact in the region. The most specific offers have come from Venezuela, which has offered various forms of cooperation to the other Latin American countries, both through bilateral and multilateral channels. This is a compensatory factor of fundamental importance for Latin America.

However, perhaps as important as this official offer could be the impact which the considerably improved economies of the oil exporting countries of the region might have on other Latin American countries with which they maintain close commercial and financial relations. Here, two aspects must be taken into account: first, the income or market effect, in that the oil exporting countries (Venezuela in particular) have greatly increased their external purchasing power. Nowhere is this clearer than in the case of the Andean Group, in which the enormous resources of Venezuela, plus the much increased ones of Ecuador and Bolivia 1/, could have a very considerable influence on the economic development of the Group, both as regards market expansion and from the angle of the possibilities for capitalization of the area as a whole. Taking into account the volume of the additional resources available to the Latin American oil exporting countries (US$7.6 billion/year) compared with the deficit of the oil importing countries (somewhat less than US$2.7 billion/year), this source could certainly be a compensatory factor of significant importance.

1/ And Peru as well, in a few years.

Neither should one ignore the resources of the Arab countries.
It is possible that official funds from these sources may be less
readily available to Latin America than to other developing regions
of the world which are in even less favorable position --Asia and
Africa-- but as far as private investments are concerned, including
direct investments in projects, bond issues, etc., the possibilities
of financing for Latin America could be more promising, especially
for the larger and more developed countries which offer more op-
portunities of this nature.

To sum up, while it may be that traditional sources of external
financing for Latin America might offer in the near future fewer
possibilities than before, the new sources, especially those located
in the region, may constitute a quite considerable compensatory factor.
This possibility, at the same time, depends on two strategic elements:
first, on the policy of the oil exporting countries regarding employ-
ment of their surplus resources, both in geographic and sectoral terms
and as regards terms and conditions, and second, on the policy adopted
by the Latin American countries themselves to attract these resources.
Finally, and this is most important, the ease with which these trans-
fers of both public and private resources can be effected will depend
on the efficacy of the financial mechanisms available for the purpose.

One final point should also be noted. The measures of a financial
nature to facilitate the adjustment process are not a cure-all.
In the middle and long-run, all countries will have to place more or
less emphasis on increasing their exports of goods and services. This
is necessary not only because eventually it will be essential to
generate new export earnings to pay the higher cost of oil, but
because even if the countries are able to obtain adequate external
financing during the adjustment period, the service of these capital
inflows would constitute an additional problem if exports are not
stepped up.

2. Prospects in the goods and services trade field

Within the possibilities for adjtment through the current account
items the following three alternatives must be considered:

a. increasing of exports;

b. reduction of imports; and

c. a combination of a and b.

A distinction must also be made between merchandise and services.
As regards the merchandise item, it can be stated that, in general,
the possibilities of reducing imports are not great in Latin
America. The trade and industrialization policies which the
Latin American countries have been pursuing over several decades
have been oriented mainly to import substitution. This process has now
reached a stage where a further reduction of imports --which currently
run at around 12 - 13 per cent of gross domestic product-- would

be difficult to achieve without seriously affecting essential imports
such as raw materials for industry (including fuels), food and capital
goods. This is particularly certain at this stage in which Latin
America as a whole --with few exceptions-- is growing rapidly.
Despite the oil crisis, this impetus will probably be maintained in
the future, which could require a further increase in imports rather
than a scaling down.

Consequently, efforts to eliminate the oil deficit will have to be
oriented, in most cases, more toward increasing exports than
substituting imports. The sooner such efforts are gotten under way
the better it will be for the region's economy, since delay would
only mean postponing the structural solution.

The above statement is demonstrated by the figures already presented
in section IV of this document, where it is pointed out that pre-
cisely because of the higher rates of economic growth of the past
six years, Latin America's imports have been expanding faster than
its exports, to the extent that the region's trading account
surplus had been practically eliminated in 1971, and had even
become a deficit by 1972.(See Table 5)' This picture would not be
improved by excluding from the regional figures the net oil ex-
porting countries (Venezuela, Ecuador, Bolivia and Trinidad and Tobago).
What is more, the region's imports have been rising faster than the
region's gross domestic product. In 1970-72, for example, the
increase of the region's imports in real terms averaged 8.9 per cent
per year, as compared to 5.8 per cent for exports and 6.6 per cent
for the regional gross domestic product. (See Table 6)

The foregoing does not mean that the possibilities for import sub-
stitution have been exhausted. On the contrary, in a process of
dynamic growth new opportunities are always generated. What it does
mean is that in view of the region's already low import coefficient,
the margin for further import substitution is smaller.

This being the position, consideration should be given to the pos-
sibilities for expanding the region's exports in the medium term.
The trends in the past decade to this respect were not all that
favorable. For instance, in the period between 1967 and 1970,
the value of exports expressed in current dollars increased at an
average of 8.6 per cent per annum, but more than half of this
increase was due to higher prices of exports, while the increase in
volume terms was barely 4 per cent per annum. In the years preceding
1967, the increase in exports in volume terms was even slower.

The opportunities for the future in this area lie in the type of
export-promotion programs which have already been set in motion in
some countries of the region. The Brazilian, Colombian and Mexican
programs can be mentioned by way of example, but other countries have
also initiated similar programs. One can conclude that thanks to its
industrial base and its endowment of natural resources, Latin America

should be able to have a much more dynamic export sector, but for this aim to be achieved, a greater effort will be needed than in the past.

As regards the services items in the balance of payments, what is also expressed in Section V of this document is worth repeating, namely that, while exports of services have shown more dynamic behavior than those of merchandise, imports of services have always outstripped them. The result has been a deficit which has consistently increased in absolute terms, reaching around US$5 billion in 1972. In view of these past trends, a reduction of this deficit is hard to envisage.

Summing up, the correction of the oil deficit through the current account must rely more on export expansion than on import substitution. On the other hand, perhaps prospects for expansion and diversification of exports might be brighten in the merchandise account than in the services sector.

Going over the long-term prospects of the balance of payments in Latin America in the light of the so called "energy crisis" it would be worthwhile mentioning the importance that each of the countries adopt investment energy policies, production and prices oriented towards an efficient assignment of the resources among the various energy alternatives, compatible with the orderly and accelerated growth of the various sectors of their economies. Furthermore, the adjustment process of the balance of payments in Latin America will not only depend on the energy policies of each of the countries, but on the degree of cooperation and coordination among themselves in the development of conventional and non-conventional energy resources available in the region.

Table 1

LATIN AMERICA: PRODUCTION, CONSUMPTION OF PETROLEUM AND NATURAL GAS

(thousand metric tons of petroleum equivalent)

		Production (A)		Consumption (B)		Production/ Consumption (A/B)-%	
		1970	1973	1970	1973	1970	1973
Oil Producing Countries							
Argentina		20,519	21,232	20,136	24,506	101	87
Bolivia		1,150	2,390	500	635	230	376
Brazil		8,199	9,021	23,413	37,989	35	24
Colombia		11,073	10,043	4,997	7,334	222	137
Chile		1,620	1,575	4,424	4,793	37	33
Ecuador		198	10,305	1,100	1,367	18	754
Mexico		25,414	22,793	21,703	30,760	117	74
Peru		3,844	3,564	4,584	5,041	84	71
Trinidad and Tobago		7,304	8,275	1,700	2,362	430	350
Venezuela		193,659	169,719	6,407	12,680	302	134
	Subtotal	272,980	258,917	88,964	127,467	307	203
Non-producing Countries							
Barbados		-	-	131	111	-	-
Costa Rica		-	-	419	760	-	-
Dominican Republic		-	-	480	1,547	-	-
El Salvador		-	-	528	525	-	-
Guatemala		-	-	156	115	-	-
Haiti		-	-	120	138	-	-
Honduras		-	-	376	552	-	-
Jamaica		-	-	1,410	1,948	-	-
Nicaragua		-	-	473	524	-	-
Panamá		-	-	544	1 105	-	-
Paraguay		-	-	192	193	-	-
Uruguay		-	-	1,410	1,670	-	-
	Subtotal			6,239	9,188	-	-
	TOTAL	272,980	258,917	95,203	136,655	260	189

Table 2

LATIN AMERICA: NET EXPORTS AND IMPORTS OF PETROLEUM AND NATURAL GAS

(in millions of US$ and as a percentage of total exports and imports)

| Countries | Net Exports | | | | Net Imports | | | |
| | US$ | | % | | US$ | | % | |
	1972	1973	1972	1973	1972	1973	1972	1973
Petroleum producing countries								
Argentina	-	-	-	-	59	167	3.1	9.0
Bolivia	40	64	19.1	28.3	-	-	-	-
Brazil	-	-	-	-	513	930	10.7	13.5
Colombia	59	62	7.9	6.1	-	-	-	-
Chile	-	-	-	-	68	70	7.2	7.4 1/
Ecuador	40	271	11.9	57.0	-	-	-	-
Mexico	-	-	-	-	127	288	4.3	6.9
Peru	-	-	-	-	43	46	5.4	4.4
Trinidad and Tobago	63	154	11.3	26.8	-	-	-	-
Venezuela	2,924	4,215	78.7	92.9	-	-	-	-
Subtotal	3,126	4,766	56.2	68.9	810	1,501	7.1	10.1
Non-producing countries								
Barbados	-	-	-	-	3	4	2.1	6.7
Costa Rica	-	-	-	-	13	25	3.5	6 7
Dominican Republic	-	-	-	-	38	57	10.3	11.7
El Salvador	-	-	-	-	12	17	4.3	4.5
Guatemala	-	-	-	-	14	38	4.3	11.4
Haiti	-	-	-	-	3	5	4.6	7.0
Honduras	-	-	-	-	15	18	7.8	6.9
Jamaica	-	-	-	-	43	64	6.9	9.5
Nicaragua	-	-	-	-	14	17	6.4	5.2
Panama	-	-	-	-	36	73	8.2	14.9
Paraguay	-	-	-	-	6	7	7.2	8.5
Uruguay	-	-	-	-	35	46	16.5	16.1
Subtotal	-	-	-	-	232	369	7.0	9.3
TOTAL	3,126	4,766	56.2	68.9	1,042	1,872	5.4	7.8

1/ Total imports of 1972

Source: 1972 - ECLA, Economic Survey of Latin America, 1973, Chapter I, Table 7
1973, IDB based on official data.

Table 3

LATIN AMERICA a/ :IMPACT OF PETROLEUM AND DERIVATIVES IN THE BALANCE OF PAYMENTS, 1974
(In million of US$)

I. Net petroleum importing countries

| Countries | Net import of petroleum | | | | | Gross Intern. Reserves | 1974 Cost Increases/gr intern. reser |
| | 1972 | 1973 | 1974 (Estimate) | Annual Increase | | 1973 b/ | 1973 |
				1973	1974		(%)
Argentina	59	167	370	108	203	1,318	15
Barbados	3	4	10	1	6	18 c/	33
Bra il	513	930	2,675	417	1,745	6,417	27
Chile	68	70	362	2	292	306 c/	95
Costa Rica	13	25	68	12	43	42	102
Dominican Rep.	38	57	39	19	-18	88	d/
El Salvador	12	17	46	5	29	62	47
Guatemala	14	38	102	24	64	212	30
Haiti	3	5	12	2	7	17	41
Honduras	15	18	50	3	32	42	76
Jamaica	43	64	174	21	110	127	87
Mexico	127	288	120	161	-168	1,356	d/
Nicaragua	14	17	46	3	29	117	25
Panama	36	73	94	37	21	942	22
Paraguay	6	7	20	1	13	31	42
Peru	43	46	140	3	94	551	17
Uruguay	35	46	138	11	92	232	40
Subtotal	1,042	1,872	4,466	830	2,696	11,878	23

II. Net petroleum exporting countries

| Countries | Net export of petroleum | | | | | Gross Intern. Reserves | 1974 Income increases/gr intern. reser |
| | 1972 | 1973 | 1974 (estimate) | Annual Increase | | 1973 | 1973 |
				1973	1974		
Bolivia	40	64	204	24	140	72	194
Colombia	59	62	99	3	37	534	69
Ecuador	40	271	787	231	516	241	214
Trinidad & Tobago	63	154	482	91	328	48	683
Venezuela	2,924	4,215	10,760	1,291	6,545	2,420	270
Subtotal	3,126	4,766	12,332	1,640	7,566	3,315	228

III. Regional Resumé

| | Net export of petroleum | | | | | Gross Intern. Reserves | 1974 Net In Increases/g intern. rese |
| | 1972 | 1973 | 1974 (estimate) | Annual Increase | | 1973 | 1973 |
				1973	1974		%
Total	2,084	2,894	7,866	810	4,870	15,190	32

a/ IDB member countries
b/ Source: International Monetary Fund, International Financial Statistics, August 1974
c/ Estimate figures based on official data
d/ Negative amount

Table 4

LATIN AMERICA: CONSUMPTION OF COMMERCIAL ENERGY
(million metric tons of petroleum equivalent)

Petroleum Producing Countries		Total Energy Consumption	Petroleum and Derivatives participation in total energy consumption (in %)
Argentina		21,295	76.5
Bolivia		631	85.7
Brazil		27,382	77.5
Colombia		5,242	56.8
Chile		5,089	49.7
Ecuador		1,272	97.1
Mexico		26,476	56.9
Peru		5,056	83.5
Trinidad and Tobago		1,499	50.8
Venezuela		9,067	49.7
	Subtotal	103,009	67.2

Non Producing Countries

Barbados		178	98.9
Costa Rica		499	84.3
Dominican Republic		751	99.1
El Salvador		466	92.8
Guatemala		917	97.0
Haiti		94	100.0
Honduras		391	94.0
Jamaica		2,016	99.4
Nicaragua		517	94.7
Panamá		870	100.0
Paraguay		1,886	92.2
Uruguay		1,657	91.9
	Subtotal	10,242	95.2
	TOTAL	113,251	100.0

Source: United Nations Energy Supplies series J (Preliminary data)

Table 5

LATIN AMERICA: BALANCE OF PAYMENTS SUMMARY
(Millions of US$)

		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1972 a/	1973 a/
A.	Current Account	-1,290.0	-1,308.0	-440.0	-777.0	-516.0	-1,201.0	-1,701.0	-2,273.7	-2,317.6	-2,907.2	-4,280.0	-4,449.0	-3,700.7	-2,682.0
	1. Balance of Trade	901.0	1,194.0	2,074.0	2,164.0	2,415.0	1,890.0	1,480.0	1,004.7	1,383.3	786.7	- 195.2	271.4	937.2	3,168.1
	Exports (F.O.B.)	8,461.0	9,020.0	9,607.0	10,318.0	10,844.0	11,443.0	11,380.0	12,038.2	13,419.3	14,637.2	15,277.0	17,988.6	16,950.8	24,269.7
	Imports (F.O.B.)	7,560.0	7,326.0	7,533.0	8,154.0	8,429.0	9,553.0	9,900.0	11,033.5	12,036.0	13,827.0	15,453.1	17,760.0	16,055.4	21,100.8
	Non-monetary gold	b/	b/	b/	b/	b/	b/	b/	b/	b/	-22.6	-19.1	42.9	41.9	- 0.8
	2. Balance of services	-2,097.0	-2,430.0	-2,471.0	-2,923.0	-2,927.0	-3,118.0	-3,241.0	-3,297.0	-3,730.8	-3,937.1	4,285.9	-4,960.7	-4,866.2	-6,207.7
	3. Transfers	- 94.0	-72.0	- 43.0	- 18.0	- 4.0	27.0	60.0	18.6	29.9	243.2	201.1	240.3	228.1	357.3
B.	Capital Account	1,151.0	1,427.0	384.0	1,651.0	666.0	1,756.0	1,560.0	1,917.5	3,297.3	2,551.9	3,972.2	3,537.5	2,750.5	2,037.1
	1. Long Term Capital	1,036.0	921.0	870.0	1,595.0	1,018.0	1,687.0	1,694.0	2,355.2	3,620.1	2,623.2	3,450.8	5,379.1	4,965.8	6,691.3
	2. Short term Capital	115.0	506.0	-486.0	56.0	-352.0	69.0	- -134.0	- 437.7	-322.8	-71.3	521.4	-1,841.6	- 2,215.3	- 4,654.2
C.	Errors and Omissions	139.0	-119.0	56.0	-874.0	-150.0	-555.0	141.0	356.2	979.7	355.3	307.8	911.6	950.3	644.8

a/ Exclude Barbados, Chile and Panama
b/ Included in exports and imports
Source: IMF., Balance of Payments Yearbook

Additional Information

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1972 a/	1973 a/
Basic Balance (A + B.1)	-254.0	-387.0	430.0	818.0	502.0	486.0	-7.0	81.5	1,302.5	- 284.0	-829.2	930.1	1,265.1	3,955.6
Net change of international reserves c/	-120.0	-459.0	468.0	126.0	421.0	-67.0	272.0	471.4	- 555.9	-1,167.8	935.9	3,815.5	3,349.6	5,492.8

c/ Source: IMF., International Financial Statistics

Table 6

LATIN AMERICA: SUMMARY COMMODITY TRADE STATISTICS, 1970-1972

(millions of dollars, indexes, and percentages)

		Actual Values			Percentage change from preceding years			Average annual variation
	Unit of Account	1970	1971	1972	1970	1971	1972	1970-72
EXPORTS								
Value	Million US$	14,637	15,277	17,989	9.3	4.4	17.8	10.5
Quantum index	1963 - 100	139	139	158	3.7	0.0	13.7	5.8
Unit value index	1963 - 100	115	120	124	5.5	4.3	3.3	4.4
IMPORTS								
Value	Million US$	13,828	15,453	17,761	15.1	11.8	14.9	13.9
Quantum index	1963 - 100	154	164	182	9.2	6.5	11.0	8.9
Unit value index	1963 - 100	115	121	125	5.5	5.2	3.3	4.7

Source: IDB, Economic and Social Report in Latin America, 1973

ECONOMIC COMMISSION FOR LATIN AMERICA

TECHNICAL SYMPOSIUM ON LATIN AMERICA AND THE CURRENT
ENERGY PROBLEMS

Santiago, Chile, 23-27 September 1974

<u>Information document NQ 9</u>

ENERGY RESOURCES DEVELOPMENT OPPORTUNITIES IN DEVELOPING
COUNTRIES, WITH SPECIAL REFERENCE TO LATIN AMERICA*

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I. ENERGY RESOURCES DEVELOPMENT OPPORTUNITIES

With the sharp rise in imported energy prices and the resulting impact, particularly on the balance of payments of the energy-deficit developing countries, attention is now focused on the importance of achieving self-reliance in energy to the extent it is feasible in technical and economic terms, and on the development and utilization of indigenous energy resources. Attempts will be made to widen the available energy options and to provide speedy and effective solutions to the growing energy problems in at least three directions: (1) expanding the conventional energy resource base; (2) developing alternative sources of energy; and (3) making more efficient and economical use of available energy.

Some of the greatest developmental challenges and opportunities lie in the expansion of the resource base of both conventional as well as non-conventional energy sources, particularly in the developing countries. The developing countries have yet to undertake vigorous programmes of exploration for underground energy (oil, coal, oil shale, tar sands, uranium, geothermal energy, etc.) and of utilization of their vast potentials of renewable sources of energy (e.g. hydropower, solar, wind and tidal power). Even the use of only presently available technologies will result in an extraordinary expansion of their energy resource base. It is estimated that at least 50-60 developing countries have either offshore or on-land petroleum potential, 25-30 countries have geothermal potential, an equal number of countries may have oil shale and tar sands potential and perhaps a larger number is estimated to possess coal and lignite potential. There are vast hydropower potentials in developing countries, only a small fraction of which is presently utilized whilst half a dozen countries have tidal power potential. Sea thermal power exploits the temperature differential between surface and deep waters off the coasts of tropical countries. Solar and wind energy are very widely spread. The wide spectrum of rich energy resource potentials awaiting development in developing countries including those of Latin America calls for the development of a variety of technological and investment resources at the national and international levels.

II. ROLE OF ENERGY PLANNING IN DEVELOPMENT

Heretofore, the development of the primary energy resources of developing countries has been largely haphazard and unplanned, in the sense that most Governments in these countries have not consciously tried to evaluate their energy resources, and develop them in a rational manner, consistent with the needs of the economy. In many cases primary energy resources have been developed by foreign capital for export and any benefits to the host country have been somewhat incidental to the primary objectives of the developers.

The recent rise in prices of crude oil on the international market has reinforced the need for energy planning as an integral part of national development plans.

The main requirements for energy resources development planning are as follows:

1) A knowledge of the extent, nature and quality of indigenous energy resources.

2) A detailed knowledge of existing demand for primary and secondary energy, by type, end-use and sector of the economy.

3) A forecast of the increase in demand for energy, obtained by analysing the development plan, growth of population and other relevant material.

4) Assessment of comparative costs of alternative sources of energy, domestic as well as imported.

5) Evaluation of investment and foreign exchange requirements of meeting future energy needs.

Once the basic parameters for an energy plan have been evaluated, a balance must be struck between indigenous supplies and imports or exports in the case of countries exporting primary fuels.

It is essential that energy planning be organized on a continuing basis. Forecasts should be prepared on a short-term, medium-term, and long-term basis of the order of say two, five, and 15 years respectively. The longer the span of the forecast, the more likely it is to be erroneous and these forecasts must, therefore, be revised on an annual or biennial basis, which in turn implies a nucleus of trained personnel permanently engaged in this work.

Energy is a fundamental factor in development and yet is the one most ignored by conventional planning exercises. It is therefore important that

energy planning is given its proper place in policy-making.

III. AN IMMEDIATE ENERGY RESOURCE: BETTER ECONOMY AND EFFICIENCY IN THE PRODUCTION, TRANSPORT AND UTILIZATION OF ENERGY*

Apart from strenuous efforts to increase available primary energy resources, it is imperative that primary energy consumption should be made more efficient, in order to develop a rational energy economy, and maintain a well balanced energy supply system at continuously increasing levels.

Methods of energy conservation and efficient energy usage are of critical importance in the short as well as long-run time periods. The present methods of electricity generation have an inherently low efficiency due to technically almost inevitable conversion losses and dissipation of waste heat. Conventional processes of oil extraction yield only a fraction, with nearly two-thirds of it left underground. With the rise in oil prices, secondary and tertiary methods of recovery will substantially increase the efficiency of oil extraction. In transportation, the overall efficiency in fuel utilization in the present internal combustion engine is not more than 15 per cent. It appears that the development of chemical systems such as batteries and fuel cells might raise the efficiency rate by a factor of three. In the industrial sector, technological progress has substantially reduced the input requirements of energy particularly in such energy intensive industries as aluminium, steel, chemicals, cement, etc. The utilization of energy emitted as a by-product in industrial processes could result in very significant savings of energy. Considerable technological advances have been made in reducing losses in electricity transmission and in oil, natural gas and coal transportation.

The overall efficiency of energy utilization integrates the effects of all efficiencies in the energy processes of the conversion and transporting chains between the demand for net usable energy and the primary energy spent for that purpose; i.e. it represents the ratio between the net energy output and the primary energy input. The overall efficiency of energy utilization varies between 20-50 per cent for different countries and probably averages some 30-35 per cent for the world.

It is almost impossible in the present changing energy situation to make acceptable predictions of possible future energy savings. These will be conditioned not only by progress in technology management and the spirit of co-operation, but

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*United Nations Secretariat, "Consideration of Possible Improvements in the Conversion and Use of Energy", 9th World Energy Conference, 1974.

also by the level at which energy prices finally stabilize and the extent to which energy demand responds to price. However, a rough assessment, taking into consideration the geographical distribution, the prospective evolution and different conservation potentials in various developed and developing countries, would indicate a margin of 10-15 per cent on a short-term basis, 20-25 per cent in the medium-term (1985) and possibly 35-40 per cent for the year 2000.

As far as practical approaches, especially for developing countries, are concerned, a three phase programme for gradually improving the efficiency and economy in energy utilization should be envisaged:

- in the short term where energy savings would result as immediate additional energy made available or correspondingly would reduce costly petroleum imports, attention should be concentrated on determining and meeting the real needs of end-energy forms. Practically little new equipment is involved in this phase in which the accent is mainly on managerial and organizational measures, aimed to limit energy consumption to real needs and avoid all wastage and profligate consumption. Accordingly, domestic, commercial and industrial fuel and electricity demand should be scrutinized and needs for transportation thoroughly reviewed.

- the medium term approach while continuing the previous objectives, would aim at installing only new energy equipment with improved performances, exchange obsolete equipment of low efficiency with better more modern equipment (burners, boilers, furnaces, motors and engines) and prepare for the more comprehensive long-term conservation actions.

- the long term basic approach should encompass an early planned campaign for improving the overall efficiency and economy of energy utilization by:

a) an early attempt to formulate alternative concepts for the overall energy development of developing countries. These concepts should certainly include a careful evaluation of the real needs for energy in the different main consuming sectors, on the basis of the desirable energy-intensiveness of the various processes involved and the available manpower. The special conditions relating to optimal agricultural development together with the possibilities of utilizing local unconventional energy resources are important supplementary factors affecting the conditions under which energy may be saved.

b) securing a more efficient utilization of energy in industry by a high
   degree of waste heat recovery in technologies where large quantitites
   of heat result as secondary energy resources, as for example in the
   iron and steel, chemical and petrochemical, pulp and paper, or some
   food and textile industries.

c) by meeting electricity and concentrated local heat demand, with jointly
   produced electricity and steam (or hot water) from combined heat and
   power stations using a centralized distribution system. Practically
   all the above-mentioned industries can fit into such a complex system,
   if above a minimum size or when conveniently located. A good example
   of such usage is afforded by the fish-meal factories in the south
   Chimbote area (Peru).

IV. EXPLORATION AND EVALUATION OF INDIGENOUS FOSSIL FUELS

1. Oil and Natural Gas

Many developing countries have yet to undertake vigorous programmes of
exploration for oil and natural gas. Even with the use of only presently available
technologies, it is estimated that about fifty to sixty developing countries have
impressive offshore or on-land petroleum potential (ultimate recoverable resources
of petroleum). For example, there are at least seven countries with a range of
potential petroleum resources falling between 100 billion barrels to a trillion
barrels. These may be called the potential giant oil producers. Nineteen
developing countries have very large petroleum potentials ranging from 10 billion
to 100 billion barrels. It is estimated that 31 developing countries may have
substantial potential resources in the range of one billion to ten billion barrels.
In addition, there are 15 countries with comparatively modest petroleum resources
ranging from 100 million to one billion barrels. There are a number of other
developing countries which have small to smaller size petroleum resources
potential.* Till now only a small fraction of these have been developed and
herein lies the future opportunities which these countries would wish to exploit,
particularly in view of the sharp rise in the price of imported oil.

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* Summary of Petroleum and Mineral Statistics for 120 countries (U.S. Geological
  Paper 817).

Large tract areas in many developing countries consist of sedimentary basins which await land and aerial surveys for oil and gas exploration. For example, oil discoveries in the Amazonas basin areas of Colombia, Ecuador and Peru indicate similar potentials on the Brazilian side as well. In some instances, in spite of requisite surveys, exploration has not led to any significant discoveries of hydrocarbons. This does not, however, exclude the possibility of discovering petroleum and gas deposits if drilling were to be undertaken at depths beyond the 10,000 to 14,000 foot range; in fact, experience has shown that the incremental increases in costs of deeper drilling have been offset by sizeable discoveries of petroleum in areas where success had not been encountered at shallower depths. Because of the high costs involved, it may be worthwhile to examine the prospects for joint surveying and exploration of certain sedimentary areas common to a region, in search of oil and gas. Such prospects exist with respect to both on-land and offshore areas in Latin America as well as Central and South Eastern parts of Asia.

There are a number of developing countries, apart from the well-known producers and exporters of oil (e.g. Venezuela) which have either limited oil production, insufficient for their own needs, or indications of the possible existence of oil. They may be expected to intensify the search for oil in their territories. Among these may be cited Argentina, Chile, Costa Rica, Peru and Uruguay in addition to Bolivia, Colombia, Ecuador and Mexico.

An oil exploration programme has been carried out off the coast of Central Chile in the area of the Aranco Peninsula by the Chilean state oil company Empresa Nacional de Petroleos, with assistance from the United Nations. First, an airborne magnetometer survey was made in 1970 over the continental shelf, using a modern high sensitivity magnetometer with digital recording. This established the existence of a sedimentary basin and was followed in 1971 by a reflection seismic survey which indicated the presence of a number of favourable geological structures. Drilling was carried out in 1972 and resulted in the discovery of accumulation of natural gas. Despite the fact that no exploitable accumulation was discovered in the first drilling programme, the results were sufficiently encouraging to justify further exploration.

To give some idea of the scale of costs involved in the type of exploration programme described above, the approximate overall costs of the various stages were as follows:

Airborne magnetometer survey (10,000 line kilometers)	US $170,000
Marine seismic survey (4,600 line kilometers)	US $800,000
Drilling (6 wells varying in depth from 750 meters to 3,000 meters in water-depths 60-100 metres)	US $ 10,000,000
Production facilities (estimated)	US $ 70,000,000

The above figures relate to past work, and subsequent inflation would substantially increase the sums required to carry out the same work at the present time.

Exploration and capital expenditures for discovering and developing capacity for the the production of a barrel of oil vary from one country to another and from one location to another in the same country. During the proceedings of the United Nations Ad Hoc Panel of Experts on Projections of Demand and Supply of Crude Petroleum and Products (New York, 9-18 March 1971), one specialist from an internationally integrated oil company submitted data which indicated that exploration and development expenditures for a barrel of oil per day capacity varied between $156 and $830.* Similarly a recent discovery of oil offshore in a developing country has cost $25 million in exploration and will cost another $25 million for development for a production of 25,000 barrels per day by 1975. This would indicate exploration and development expenditure of $2,000 per barrel per day capacity. Investment costs of over $3,000 have been reported in the North Sea, where offshore conditions are among the most difficult in the world.

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*United Nations, Petroleum in the 1970s, New York, 1974, p. 32
Sales No. E.74.II.A.1

The following table gives the order of magnitude of investment and
production costs (including exploration and lifting) for some of the oil-bearing
regions of the world.

TABLE 1*

APPROXIMATE COSTS OF PRODUCING CRUDE OIL OR ITS ENERGY EQUIVALENT

1972-1973

Energy Source	Capital Cost ($/(bbl/day))	Production Cost ($/bbl)
Persian Gulf	100-300	0.10-0.20
Nigeria	600-800	0.40-0.60
Venezuela,# Far East, Australia	700-1,000	0.40-0.60
North Sea, most other Europe	2,500-4,000	0.90-2.00
Large deep-sea reservoirs	over 3,000?	2.00- ?
New U.S. reservoirs (not too remote)	3,000-4,000	1.70-2.50

Natural gas has been extensively utilized in Argentina and Venezuela, and
to some extent in Colombia. The pipeline network of Gas del Estado in Argentina
is the largest in Latin America, bringing gas to Buenos Aires from as far away as
Patagonia and Bolivia. At present, a considerable amount of associated gas is
still wasted by flaring although less than in the past and in view of the value of
this resource it is recommended that Governments should take active steps to
encourage conservation or utilization of the gas. In this respect Argentina,
Chile and Venezuela have all taken positive steps to avoid such waste, either
by compressing the gas and transporting it by pipeline to the nearest market,
or by reinjecting it into underground reservoirs.

Excluding heavy oils.

* Amory B. Lovins: "World Energy Strategies", Bulletin of Atomic
    Scientists, May 1974.

2. Coal

The majority of coal bearing areas in the world are probably already known, but one cannot discount the possibility that further exploration in developing countries may discover hidden coalfields. It is also true that exploration of many known coal-bearing areas is far from complete, and therefore additional reserves may be discovered as a result of intensified exploration.

Quoted figures of reserves of coal in any given area tend to fall into two main categories, namely; geological estimates of total coal in place and estimates of the mineable reserves which can be recovered at a given price level. Both may vary with time; the former as a result of further geological work, which may have the effect of increasing or decreasing earlier figures as a result of more detailed knowledge; the second will vary in accordance with fluctuations in the price of possible alternative fuels, and also possibly to some extent as a result of changing technology. Since coal mining is labour intensive, changes in the rates of pay for labour will also affect the estimate of recoverable reserves. As an example of the foregoing, the recent sudden increase in the price of fuel oil, which is the principal fuel competing with coal, has rendered viable many coal-mining operations which were formerly regarded as uneconomic. This will have a marked effect on estimates of recoverable coal reserves in many areas.

Cost levels are highly variable and only orders of magnitude can be given. For example, the geological investigation and establishment of reserves for a medium-sized mine producing 1,000 to 2,000 tons/day may cost around $1,000,000, the feasibility study $100,000, and opening and equipping the mine some $5 to $10 million . It must again be emphasized that these figures represent only orders of magnitude, and take no account of inflationary increases of cost with the passage of time. Some allowance for environmental factors must also be made in view of the present worldwide concern. Strip or open-cast mining of coal, in particular, requires quite expensive remedial action if the land-surface is to be restored to anything resembling its previous form and productivity.

Developing countries which are known to have substantial reserves of coal include the following: Botswana, Brazil, Colombia, India, Indonesia, Madagascar, Nigeria, Peru, Swaziland and Zambia. Many others are known to possess minor

reserves which may nevertheless make a significant contribution to their economies if developed and utilized.

The exploitation of existing coal deposits even if some of them are not of very high calorific value, together with the introduction of modern mining methods, should be considered as among the main targets during the period 1975-1984 for ensuring the independence of those of the Latin American countries which depend heavily on imports for meeting their electricity needs. An increase in the utilization of local coal is possible not only in Colombia, but also in Argentina, Chile and Peru, as well as in Brazil and Mexico.

Generally speaking, little is known about the coalfields of Latin America and what is known about coal reserves can hardly be summarized. According to data pertaining to coal reserves in some major countries in Latin America, more than 40,000 millions tons of coal exist in probable and proven reserves, equivalent to at least an order of magnitude of 100,000 Twh of electric energy.

3. Oil Shale

Oil shale, despite its name, does not contain free oil. It is an argillaceous, sometimes calcareous, sedimentary rock containing varying proportions of organic matter in the form of kerogen, which breaks down on heating to give a substance resembling crude oil. The kerogen organic content of oil shales can vary from near zero up to around 20 per cent by weight for a rich shale. In addition to being a potential source of oil, oil shale may also be regarded as a low-grade mineral fuel which can be burned directly for steam raising in a suitably constructed furnace. The total known reserve of oil in oil shales is very large, but until recently it has not been economic to extract it in the face of low prices for conventional crude oil but recent increases in oil prices have changed this situation. In fact, the only large-scale exploitation at present, as far as is known, is in the Estonian Republic of the USSR. Formerly, oil shales were exploited in France, Germany, Nova Scotia, Scotland and Sweden, among other places. Pilot plants are reported from Brazil and the western United States. The technology of the extraction of oil from oil shale is therefore well known, but until recently the economics were unattractive.

The problems connected with the exploitation of oil shale are concerned with mining the shale, retorting it to extract the oil, disposing of the spent shale, and transporting the oil to market. Because of its low organic content, oil shales must be processed and the oil extracted at the mine if excessive

transport costs are to be avoided. In many cases the oil produced is waxy and
must be partly refined before transport. There are also problems involved in
crushing and retorting the shale. All these factors add to the cost of producing
oil from shale and are among the reasons why exploitation at the present time is
not on a large scale.

It is difficult to say exactly how much oil shale development might cost.
The geological exploration and sampling phase is slow, but not particularly costly.
However, by the time a mine has been put in operation, retorts constructed, pro-
cessing plant erected, and a pipeline laid, costs are likely to be of the order
of $50 million for a medium sized operation producing, say 1,000 tons of oil per
day. Even an operation on this scale would imply mining some 8,000 to 10,000
tons per day of shale and the disposal of a corresponding quantity of shale waste.

Developing countries known to have large oil shale reserves are Brazil,
Thailand and Zaire. Many other developing countries are known to have smaller
reserves which have never been fully evaluated.

4. Tar Sands

These are sands impregnated with a heavy viscous oil which may constitute
up to 18 per cent by weight of the sands. Such sands are known to be widely
distributed in the world, occurring in Albania, Canada, Colombia, Ecuador, Ghana,
Ivory Coast, Malagasy, Nigeria, Peru, Trinidad, USA, and Zaire. At present
only one large plant is extracting oil from such sands, at Athabasca in western
Canada. The sand is mined in an open pit and the oil extracted by washing with
hot water. At normal temperatures the oil is too viscous to flow and so the
extraction plant incorporates a refinery with cracking and hydrogenating
facilities. Elsewhere in western Canada, experiments are going on to find a
method of extracting oil from the sands where these are too deeply buried to
permit mining the sand. Most of the techniques involve heating the oil by
injecting steam into the sand, or by setting fire to it, through wells drilled
into it. The oil is subsequently produced from the injection wells.

Costs of the plant in Canada have been adversely affected by the remote
location and the very severe climatic conditions, but it is estimated that
production costs were around $5-$6 per barrel of synthetic crude oil produced.
The product is of high quality, very low in sulphur. Comparable costs could be
achieved, even in developing countries, because with the higher ambient temperature
costs would be lower. It is also possible that exploitation could commence with
a relatively simple and unsophisticated plant, provided that some means of trans-
porting the product to market were available.

V. HYDRO-POWER AND NON-CONVENTIONAL SOURCES

1. Hydro-power

Some of the greatest opportunities for developing countries lie in the exploitation of their vast hydro power potential. It is estimated that less than five per cent of the existing hydro power potential has been actually exploited in these countries. Some of the largest unexploited hydro power sites in the world are located in the Mekong-Salween, Brahmaputra and other Himalayan Rivers in Asia, the Congo and other rivers in Africa and in the Amazonas and La Plata basins in Latin America. The comparatively large size of many of these sites and the heavy investments required by way of dams and generating facilities, in relation to the size of local markets have impeded development of such resources. In the future, however, with the growth in electricity demand which is doubling every seven years and with increased regional co-operation in the development of energy resources, it is quite likely that the pace of hydro electric exploitation will accelerate. Even with a substantial increase in local electricity demand, the countries having such potential will only be able to absorb a very limited fraction of these resources for their domestic use. There is here substantial scope for increased inter-country, regional and interregional co-operation requiring the linkage of investment fund, technical assistance and connexions with power markets.

It is clear from the outset that the volume of the Latin American hydro electric potential is tremendous in view of the hydro-meteorological and, particularly, the topographical features of the whole region. The gross surface potential from precipitation, although of a wholly theoretical value, amounts to a regional total of 40,700 Twh per annum, corresponding to a mean of 2 Gwh per square kilometre and an allocation of 138 Mwh per person. The economic potential would be considerably less than this theoretical figure and under certain assumptions this potential has been estimated at 2,800 Twh. By dividing this figure by 8,760 hrs., it is apparent that the mean power potential would be 319 GW.

Out of the total mean power potential of 319 GW, the comparable installed capacity at the end of 1972 (calculated with a utilization factor of 0.5) was only 10.7 GW, corresponding to a utilization of only 3.35 per cent of the potential.

According to published plans, the generating capacity of the new hydro-electric plans which have been approved or were in an advanced stage of consideration in Latin America, totalled roughly 30 GW in 1973. (In a few cases these projects will not be completed before 1984). The recent increase in the price of fuel oil will lead to a reassessment of many potential hydro-electric projects which have hitherto been regarded as uneconomic. In these circumstances it is anticipated that there will be a considerable upsurge in the construction of new hydro-electric schemes.

2. Nuclear Energy

One of the most important non-conventional sources of energy which has started to play an increasing role in the production of electricity is nuclear fission. If it could be consumed in its entirety, a single kilogramme of fissionable material could produce as much energy as the equivalent of 2,000 tons of petroleum (8 Gwh).

Even with current techniques, utilizing but one-hundredth of the potential energy, the fuel transport costs become relatively insignificant, despite the elaborate precautions involved in handling nuclear material. Hence unlike hydro electric plants which can only be built in certain places, nuclear plants can be located closer to the centres of consumption, subject to factors affecting public safety.

Experience has shown that certain conditions must be fulfilled before nuclear electric power can be produced at competitive prices. Above all, the power station must be of a large size. The cost of installing nuclear power capacity decreases faster in relation to the size of the nuclear plants than for conventional thermoelectric plants. The investment cost per kw installed in nuclear power plants equipped with reactors using enriched uranium drops by more than half as capacity is increased from 50 to 300 MWe and by two-thirds when it approached 1,000 MWe. In the case of reactors using natural uranium, the economy of scale is even greater.

Hitherto, it has been necessary to design nuclear power plant in large sizes in order to reap the benefits of the resulting economies of scale which would make them economically competitive. However, the recent quadrupling of the price of oil has meant that nuclear power stations can be economically competitive with oil-fired alternatives at smaller sizes where such units are commercially available. However, it should be borne in mind that from an operational point of view the largest size of generating unit which can be accommodated on an interconnected electricity system is a function of the system size. Since the unit size must not form too large a proportion of the total interconnected system capacity, nuclear power units which can still not be produced economically in very small sizes are not applicable to the small electricity networks found in most developing countries.

Although considerable experience exists in developed countries on the operation of nuclear power stations, there have been problems associated with delays in construction and there is still in some countries no general agreement on the question of plant operational safety.

In addition, as nuclear power plants need greater unit investment than conventional thermoelectric plants, they must operate at a high load factor in order to compete with other sources of electricity generation.

Finally, the possibility of installing nuclear power plants becomes attractive when local energy resources are small or non-existent and, in such cases, only when the demand for electric energy is sufficiently large and cannot be economically supplied from other sources.

3. Geothermal Energy*

Geothermal energy is the natural heat of the earth, usually extracted in the form of hot water or steam. Geothermal activity is widely distributed in the volcanic areas of the world, notably the Andean mountain chain, the African Rift system, and the island chains in the Pacific. The hyperthermal manifestation of the volcanic zones are increasingly being investigated as a source of electrical

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* "Geothermal Energy and Its Uses", a paper by UN Secretariat to the Ninth World Energy Conference, Detroit, 1974

power and process heat. The pioneer countries in the application of
geothermal heat were Italy, Iceland, New Zealand, and the USA. Subsequently,
investigations have been undertaken in Chile, El Salvador, Kenya, Mexico,
Nicaragua, Philippines and Turkey, most of these with the active assistance
of the United Nations. The physical manifestations which may indicate the
presence of industrially exploitable geothermal resources are steam fumaroles,
boiling springs or mud pools and steaming ground.

The preliminary exploration consists of geological and geochemical
reconnaissance, followed by geophysical investigations, usually in the form of
electrical resistivity surveys. Electrical resistivity anomalies may have
to be checked by drilling shallow wells to measure the temperature gradient
before choosing the sites for exploratory wells. These latter are drilled
with modified oilfield rotary equipment to depths of three to four thousand
feet, although economic production is frequently found at shallower depths.
Reservoir temperatures in excess of 200° Celsius are normal, and the wells
may flow naturally at very high rates. The wells usually produce a mixture
of saturated steam and boiling water, although in exceptional cases such as
at Larderello in Italy and the Geysers in USA they may produce dry steam. The
productivity of a well is often as much as 300 to 400 tons of fluid per hour
of which 10 per cent to 15 per cent may be steam, at a wellhead pressure of
around 100 psig.

Geothermal energy may be used for electricity generation or as process
heat in any industry requiring large quantities of low-grade heat. Examples
are pulp and paper making and food processing. The principal advantage of
geothermal heat over more conventional sources is its extreme cheapness once
the exploratory costs have been amortized. This advantage will be accentuated
by the recent steep rise in the price of conventional fuels. Among the
negative aspects of geothermal energy are the corrosive properties of geothermal
brines and problems of waste brine disposal.

Almost all the countries in Latin America have prospects for geothermal
resources and there are several known sites which are especially suitable for
the establishment of power plants using geothermal energy.

Besides power stations existing in Mexico, other sites in North and Central Latin America (Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama) have a geothermal potential for electricity production as well as countries of the Western Seaboard and the Andean Cordillera (Argentina, Bolivia, Chile, Colombia, Ecuador, Peru, Venezuela) and some Caribbean islands.

Following a successful United Nations-assisted geothermal exploration project in El Salvador, the government is building a geothermal power station of 30 MW capacity. It is hoped to install a further 60 MW of geothermal power plant by 1977 and thereby obviate the need for the one million barrels of oil which are at present imported annually for electricity generation.

4. <u>Solar, Tidal and Wind Energy</u>

Solar energy is at present being utilized in many small installations mostly in the sunnier parts of the world for domestic water heating, domestic space heating and production of fresh water from brackish and saline water. In favourable climates, both domestic hot water systems and solar stills for fresh water have proven successful, technically and in some instances economically. New and innovative approaches for generating electrical energy from solar heat and storage of such electricity are in the process of development.

Tidal energy, where electricity is generated by making use of tidal differences in water levels, could eventually find some applications in Latin America. Suitable sites exist in Argentina and Brazil.

The use of wind energy is widespread in different countries of the world for small-scale electricity generation and for direct pumping from wells. Wind energy may be harnessed, on a small scale, in several places in Latin American countries where wind conditions are favourable, especially in rural areas for its localized use. Before any development of this type is undertaken, areas with suitable wind conditions must be located and detailed meteorological data compiled (wind speeds, duration, etc.)

VI. NON-COMMERCIAL FUELS AND RURAL ENERGY ECONOMY

In many developing countries a significant amount of energy is provided by the utilization of non-commercial fuels which do not normally enter the local energy markets. Of these fuels the two most important are wood and dried animal dung, whilst waste vegetable matter is also used and is illustrated by the utilization of bagasse which can be found in areas growing sugar cane. The efficiency of utilization of these fuels is often extremely low as when wood and dung are burnt in open fireplaces. In addition, their use is frequently accompanied by undesirable side effects such as loss of valuable manure where dung is burnt and deforestation accompanied by soil erosion where wood is used. Fumes and smoke which result from the poor combustion conditions may also give rise to health and fire problems.

Considerable thought is being given to the possibility of supplying the energy needs of rural communities from indigenous renewable energy sources. This concept involves the application of known and well-tried technologies to conditions in the rural environment. Such an integrated rural energy economy would utilize solar energy for providing hot water, wind power for pumping water and possibly producing electricity. Animal dung, previously burnt as fuel, would be digested in anaerobic fermentation plants to produce methane gas for cooking, heating and lighting. The resulting sludge from the digester plant would form a valuable organic fertilizer for agricultural purposes and thus reduce the need to import chemical fertilizers.

The philosophy of supplying rural energy needs from local energy sources is relevant to all developing countries in the present conditions of high energy costs and any effort and money spent on developing suitable systems could be easily justified.

VII. COMPARATIVE COSTS OF ALTERNATIVE ENERGY SOURCES AND TECHNOLOGIES

The foregoing brief assessment indicates that in the present conditions of high oil prices, planning in the energy field is of paramount importance to developing countries. Particular attention needs to be paid to the

possibilities for the development of indigenous energy resources and the degree
to which these may be substituted for expensive imported oil. Any consideration
of the development of domestic energy resources would involve the magnitude
of reserves, exploitation costs (both capital and operational), plant lead
times and the availability of substitute sources of energy at various price
levels.

In regard to the magnitudes of mineral fuel resources, it must be emphasized
that the concept of reserves, as commonly used, is geared to a given price
level and therefore with the sharp rise in oil prices, estimates of these
reserves are likely to be revised substantially upward, since what were
considered as marginal or sub-marginal deposits now become quite economic
to exploit under the new price regime obtaining since early 1974.

It is also important to recognize the time scale involved in the develop-
ment of energy resources; for example, the time required to explore and
develop oil production may be as long as ten years from the commencement of
an exploration programme, particularly if offshore operations are involved,
and in any event is unlikely to be less than five years. The exploration and
development of a geothermal field also takes around five years. To open a new
coal mine may take two to four years depending on the availability of geological
information, the accessibility of the deposit and the existence or otherwise of
a trained work-force. In regard to nuclear power stations, it may take as long
as 8 to 10 years to have it planned, constructed and functioning satisfactorily.

Although the figures given in Table 2 do not refer to conditions in Latin
America they provide an indication of comparative costs which were applicable
to the United States at the end of 1972. It will be seen from these figures
that the average cost of generating electricity from geothermal energy was
approximately U.S. 9 mills/Kwh compared with an oil-fired alternative of
U.S. 13.2 mills/Kwh.

Table 3 lists the various new energy technologies which are under active
development as sources of oil production. The estimated timing of demonstration
plants for the various processes together with the projected U.S. production in
1985 give an indication of the significance which each of these may attain in
meeting oil needs. The cost of oil derived from these alternatives is estimated

to range from U.S. $5 to $10 per barrel and thus appears competitive with
the present cost of imported oil.

Generally speaking, increased oil import costs are likely to accelerate
the pace of exploration for indigenous energy resources in the developing
importing countries. Where oil prospects may seem unpromising, efforts will
be made to develop alternate sources such as nuclear, geothermal or coal.
New investments are likely to be made in alternate sources of energy.
These new investments will, of course, compete with other investments and
decision-makers will have difficult choices to make. Furthermore, the
development of alternate energy sources is a long-term process (usually
taking from 5 to 10 years). It is within this context (time-scale);
alternate investment costs) that the energy problems of the developing
countries, including Latin American countries, must be seen.

COMPARATIVE COST OF ALTERNATIVE ELECTRIC POWER GENERATION METHODS

Alternative Electric Power Generating Fuels in the United States

Item	Coal[1]	Geothermal Steam Purchased[2]	Geothermal Steam Owned[3]	Natural Gas[4]	Nuclear[5]	Oil[4]
Without Cooling Towers						
Plant Investment ($/Kw)	$213	$180	$260	$145	$345	$145
Plant Factor (%) [6]	60%	75%	75%	60%	68%	60%
Capacity Cost (mills/Kwh)	6.7	4.9	7.0	4.5	9.6	4.6
Fuel Cost (mills/Kwh)	2.8	2.4	-	3.8	2.6	7.9
Operation and Maintenance (mills/Kwh) [6]	0.9	1.0	1.5	0.7	1.7	0.7
Variable Cost (mills/Kwh)	3.7	3.4	1.5	4.5	4.3	8.6
Total Cost (mills/Kwh)	10.4	8.3	8.5	9.0	13.9	13.2
Water Disposal (mills/Kwh)	-	0.5	0.5	-	-	-
Total Cost (mills/Kwh)	10.4	8.8	9.0	9.0	13.9	13.2
With Cooling Towers						
Wet Cooling						
Plant Investment ($/Kw)	$222			$154	$354	$154
Capacity Cost (mills/Kwh)	7.0			4.8	9.9	4.9
Total Cost (mills/Kwh)	10.7			9.3	14.2	8.6
Dry Cooling						
Plant Investment	$241			$173	$375	$173
Capacity Cost (mills/Kw)	7.6			5.3	10.5	5.5
Total Cost (mills/Kwh)	11.3			9.8	14.3	14.1

[1] Plant investment without water cooling derived as an average of base load plant costs for Colorado Public Service Co. escalated at 5% annually from 1966-72. Fuel cost based on price paid by CPS in 1972 for coal containing 1% S or less; heat rate of 10,417 Btu/Kwh computed as a weighted average for CPS base load plants.

[2] Based on PG&E experience at the Geysers adjusted to 1972 as required.

[3] Based on data from the U.N. Informal Seminar on Geothermal Energy, January 1973.

[4] Plant investment without water cooling derived as an average of base load plant costs for Pacific Gas and Electric escalated at 5% annually from 1966-72. Fuel cost based on price paid by PG&E in 1972 for natural gas and for No. 6 residual oil containing 0.5% S or less; heat rate of 9,952 Btu/Kwh computed as a weighted average for PG&E base load plants.

[5] Plant investment without water cooling derived as an average of nuclear plant costs for Sputhern California Edison and PG&E escalated at 5% from 1968-72. Fuel cost based on average cost for those plants, does not include that part of fuel cost paid by AEC as a research expense.

[6] Weighted average for base load plants except geothermal.

Source: Alvin Kaufman of Public Service Commission of New York State, Personal Communication (December 1973).

ALTERNATIVE METHODS OF OIL PRODUCTION

	Year of Proven operation 1/	Lead time (years)	Investment $/bbl/day capacity	Estimated Cost at source ($bbl) equivalent 2/	Projected US-production by 1985 (mill.bbl) 3/	Present status of technology
TECHNOLOGIES						
Agro-Waste Utilization 4/	1976	3		5/	86	Pilot plant
Improved Drilling 6/	1978	5		5.0	517	Early development
Enhanced Recovery of Oil 6/	1979	6		5.0	430	Various stages
Oil Shale - Surface Processing	1979	6	5000	5.0	258	Pilot plant
Improved Auto to Reduce Fuel Consumption	1979	6			(1034) 11/	Various stages
Heavy Oil and Tar Recovery	1980	7	4000 7/	5.0	344	Early development
Methyl Fuel from Coal-Surface 8/	1981	8		10.3	258	Concept
Methyl Fuel from Coal-in situ	1982	9	6000-8000 9/	8.1	258	Concept
Coal Liquefaction	1982	9		8.6 10/	154	Small pilot plant
Oil Shale - in situ/Mining	1983	10		5.0	258	Pilot scale
Oil Shale - in situ/Nuclear	1983	10		5.3	258	Concept

Sources: Oil and Gas Journal, 17 September 1973.
Geothermal Energy, January 1974.
US Energy Outlook (National Petroleum Council).

1/ Proven operation is assumed to be approximately one year after completion of plant construction.

2/ Upper range of price as estimated in the sources.

3/ Refers to additional supplies of energy above those from current methods, in terms of equivalent thermal input, and to savings (in parentheses) of energy due to increased conversion efficiencies.

4/ No credit is included for waste disposal.

5/ Cost is set by competing technology.

6/ These entries refer to additional fuel quantities which would result from Research and Development funded by the Government.

7/ Investment costs to produce synthetic crude from Athabasca tar sands through in situ or mining methods, exclusive of infrastructure facilities. Operating costs will vary widely (National Petroleum Council, US Energy Outlook, Vol. II, Interior report, p. 142).

8/ Price of methyl fuel is assumed to be $10¢/10^6$ BTU less than hi BTU gas.

9/ Source as in 7/

10/ US Eastern coal at $8.10-11/ton = $32-44¢/10^6$ BTU.

11/ Energy savings.

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