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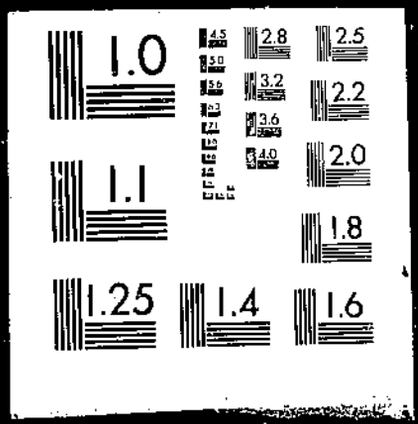

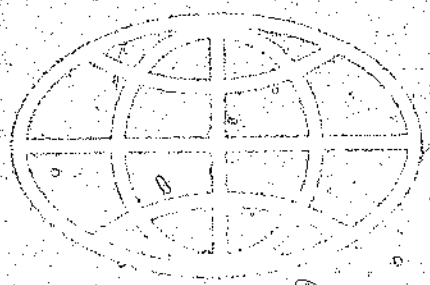

WORLD DEMAND PROSPECTS FOR COTTON IN 1980

WITH EMPHASIS ON TRADE BY LESS-DEVELOPED COUNTRIES

1980

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ABSTRACT

World demand prospects and future supply sources of cotton lint and textiles are examined to determine their implications for the export earnings of the less developed countries (LDC's). World cotton consumption in 1980 is projected to be 14.8 million metric tons, compared with 11.3 million tons in 1967. Cotton's share of total fiber consumption will drop to 48 percent. By 1980, the LDC's will account for about half of the world's cotton production and two-thirds of cotton lint exports. Trade in cotton textiles will increase and by 1980 about half the world's exports will originate in the LDC's. LDC net earnings from trade in cotton lint and textiles combined could reach $1.5 billion by 1980--over $600 million above estimated average 1966-67 earnings.

Key words: cotton, developing countries, textiles, foreign trade, commodity projections

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Results of the project of which this report is a part have been published as follows by the Economic Research Service:

World Trade in Selected Agricultural Commodities, 1959-65

Vol. I.--Beverage Crops: Coffee, Cocoa, and Tea. Foreign Agr. Econ. Rpt. 42, June 1969.

Vol. II.--Food and Feed Grains: Wheat, Rice, Maize, Barley, and Other Cereals. Foreign Agr. Econ. Rpt. 45, June 1968.

Vol. III.--Textile Fibers: Cotton, Jute, and Other Vegetable Fibers. Foreign Agr. Econ. Rpt. 43, June 1968.

Vol. IV.--Sugar, Fruits, and Vegetables. Foreign Agr. Econ. Rpt. 44, June 1968.

Vol. V.--Oilseeds, Oil Nuts, and Animal and Vegetable Oils. Foreign Agr. Econ. Rpt. 47, Mar. 1969.

Japan's Food Demand and 1985 Grain Import Prospects. Foreign Agr. Econ. Rpt. 53, June 1969.

World Demand Prospects for Agricultural Exports of Less Developed Countries. Foreign Agr. Econ. Rpt. 60, June 1970.

World Demand Prospects for Wheat in 1980 with Emphasis on Trade by Less Developed Countries. Foreign Agr. Econ. Rpt. 62, July 1970.

Copies of these reports may be obtained upon request to the Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D.C. 20250.

Additional reports are being developed on the following as part of the overall research project: World demand prospects in 1980 for rice; total grain; oilseed and meal; citrus fruits; coffee, tea, and cocoa; and bananas; the Japanese grain-livestock economy; and world agricultural import barriers. Publication of these reports will be announced.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402

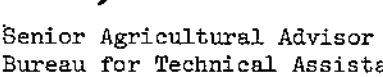
FOREWORD

Recently cotton has come under severe competition from manmade fibers and has been receiving a declining share of the market. This decline has been of concern not only to policy makers in the developed countries but in the developing ones as well. Further, cotton exports have been important sources of foreign exchange in many of the latter countries. Hence, the present investigation was designed to analyze the world demand prospects for this commodity at the onset of the next decade.

World cotton consumption is expected to be approximately 30 percent higher in 1980 than in 1967, assuming medium rates of income growth and a 26-cent price for SM 1-1/16 inch cotton, Liverpool. This increase is expected despite the fact that cotton's share of total fiber consumption is likely to decline from 57 percent in 1968 to 48 percent or less in 1980.

The pattern of world cotton trade is expected to change substantially during the next 10 years. At the end of that period, almost half of the world's cotton textile exports will originate from less developed countries. Also at that time the world cotton lint trade is expected to increase 900,000 tons over the 1965-67 average, with 25 percent of the total being imported by less developed countries. At the same time this group is expected to export 67 percent of the total lint, compared with 61 percent in 1965-67. Clearly, there are implications in these projections for economic growth for cotton-producing countries, especially the developing ones. In light of their requirements for foreign exchange, this study suggests that expanding international markets for cotton can provide less developed countries some additional impetus for economic developments.

This study is part of a research project on "Demand Prospects for Agricultural Products of Less Developed Countries" conducted by the Economic Research Service under a participating agency service agreement for the Agency for International Development.



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Washington, D.C. 20250

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EXPLANATORY NOTES

M.T. = Metric tons.

\- = Insignificant amount.

+++ = Extremely large percentage increase.

W.S. = Wrong sign on coefficient.

Neg. = Negative quantity.

n.a. = Not available.

(10) = Parenthesis around numbers in tables indicate estimate by authors.

(10) = Numbers in parenthesis and underlined refer to items in Literature Cited.

"Textiles"--Includes yarn, fabrics, clothing, and other manufactures (the last two to the extent statistics are available).

"All or total fiber"--Includes cotton, wool, cellulosic (rayon, acetate, etc.), and synthetic or noncellulosic (nylon, polyester, etc.) fibers. Flax, silk, and fiber glass are usually excluded.

"Cotton" or "Cotton lint"--Refers to ginned cotton (cotton with seed removed).

"LDC's" or "LDR's"--Less developed countries or regions.

"DC's" or "DR's"--Developed countries or regions.

"CPC's" or "CPR's"--Central plan countries or regions.

SUMMARY

World cotton consumption is projected to rise from 11.3 million metric tons in 1967 to 14.8 million tons by 1980, assuming medium rates of income growth and a 26-cent per pound price for SM 1-1/16 inch cotton, Liverpool. The less developed countries (LDC's) are projected to supply half of this demand and to earn $1.5 billion net in foreign exchange from the export of cotton lint and textiles combined.

Projections of 1980 consumption at other cotton prices range from 14.6 million tons at 30-cents per pound up to 15.0 million tons at 24-cents. Higher assumed rates of income growth in the LDC's raise projected world consumption by 1.3 million tons, while lower rates reduce projected consumption by 0.6 million.

Cotton's share of world fiber use in 1980 is projected at 47-48 percent, compared with 57 percent in 1968. Although per capita consumption of total fibers will increase greatly in developed countries (DC's), that of cotton will decline because of competition from manmade fibers. Per capita cotton consumption will increase moderately in the central plan sector (East Europe, the USSR, Mainland China) and will climb slightly from the present low level in the less developed countries.

Foreign world (non-United States) cotton production in 1980 is projected to range from 12.5 million metric tons at a 30-cent per pound price down to 11.9 million tons at a 24-cent price. To balance world production and consumption, U.S. production would need to range from 2.1 to 3.1 million tons (9.4 to 14.3 million bales).

World cotton textile trade by 1980 will be some 40 percent above 1965-67 levels and almost half the world's exports will originate from the less developed countries, compared with 34 percent in 1965-67. The proportion of cotton textile consumption needs of most DC's met by imports is projected to increase by 1980. On the other hand, many LDC's are expected to lower or eliminate their need for cotton textile imports. Comparative costs, product pricing policies, import restrictions, and national trade and development policies, are the factors behind the projected changes in trade patterns.

World cotton lint trade in 1980 under the medium income growth assumptions is projected to approach 4.7 million metric tons--an increase of about 0.9 million tons over the 1965-67 average. Though all sectors would increase imports, the increase would be greatest in the less developed sector whose share of world cotton lint imports would reach about 25 percent. At a 26-cent per pound cotton price, exports from the less developed sector are projected to reach 3.2 million metric tons by 1980, or 67 percent of the world's exports, compared with 2.3 million tons or 61 percent in 1965-67.

Under the medium income growth and 26-cent price assumptions, net earnings of the LDC's from trade in cotton lint and textiles combined could reach $1.5 billion by 1980--more than $600 million above estimated 1965-67 earnings. All of the projected increase would accrue from increased net textile exports. Under the high LDC income growth assumption, the projected net export earnings of the LDC's from lint and textiles are $307 million less than under the medium growth assumption. The smaller figure results because the projected increase in LDC consumption surpasses that of production. Under the low LDC economic growth assumption, the net export earnings of the less developed countries from cotton lint and textiles in 1980 are projected as $4 million higher than under the medium projection.

WORLD DEMAND PROSPECTS FOR COTTON IN 1980
With Emphasis on Trade by Less Developed Countries

by

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INTRODUCTION

Importance of Cotton to Less Developed Countries

Cotton is a major source of foreign exchange earnings for many less developed countries. It is an important earner or a potential earner in many others. In 1966, dependence of earnings upon exports of cotton lint exceeded 75 percent for Chad, and over 40 percent for the UAR, Syria, the Sudan, and Nicaragua (table 1). Three more countries depended on cotton lint for 20 to 30 percent of their export earnings, seven for 10 to 20 percent, and three for 5 to 10 percent.

Exports of cotton textiles also are an important source of earnings for several less developed cotton-producing countries. Cotton textile exports make up almost 20 percent of total exports from the UAR (table 2). When raw cotton exports are added to the textile exports, cotton's total contribution to the UAR's export earnings come to around 75 percent. Two other cotton-producing countries with high earnings from cotton textiles are Pakistan (over 15 percent), and India (over 7 percent). Also, several less developed countries (Hong Kong, South Korea, Taiwan) import cotton lint, manufacture it into textiles, and export the textiles as a major part of their trade.

Cotton's Future Earning Ability

Considerable potential exists in many less developed countries for increased cotton production through area expansion and yield improvement. However, cotton is usually only one of various crops that could be produced in larger quantities. Adequate planning requires insight into two important questions: (1) What are the prospects for cotton as a future earner of foreign exchange? And (2) should resources in the various regions be directed toward expansion of cotton production or into production of other crops?

A third question which also arises in economic planning is the extent to which homegrown cotton should be manufactured into cotton textiles for domestic use and export rather than exported as a raw product. Many cotton-growing-exporting countries traditionally have been net cotton textile importers. However, many have recently been expanding domestic mill capacity and reducing textile imports. Should this capacity continue to be expanded at a rate faster than domestic needs increase? What are the export prospects for cotton textiles?

The desire to expand cotton textile production and exports stems from the increased value of such exports over that of cotton lint, and the increased domestic economic activity thus supported. The value added usually ranges from over 1.5 times for yarn to 3 to 6 times for clothing exports and averages worldwide to around 4 times.

*Others who made major contributions to the study were Betty Thomas, John Foster, and Rena Perley, who assisted in the research and statistical compilations.

Table 1.--Cotton lint exports as a percentage of total merchandise exports, selected countries, 1966

Country	Percent
Chad	77.2
United Arab Republic	55.0
Syria	51.6
Sudan	49.9
Nicaragua	41.5
Turkey	25.8
Uganda	22.9
Tanzania	20.9
Guatemala	19.2
Afghanistan	17.0
Mozambique	15.4
Central African Republic	14.6
Mexico	13.5
El Salvador	12.6
Peru	11.1
Cameroon	7.3
Pakistan	6.9
Greece	6.7
Brazil	6.4
USSR	4.2
Honduras	4.0
Paraguay	3.8
Togo	3.1
Iran	2.9
Angola	1.7
Kenya	1.4
United States	1.4
Costa Rica	1.4
Nigeria	1.2

Source: Calculated from value data, FAO Trade Yearbook, 1967.

Table 2.--Cotton textile exports as a percentage of total merchandise exports, selected countries, 1968

Country	Percent
Hong Kong	20.5
United Arab Republic	19.3
Portugal	15.4
Pakistan	15.3
Taiwan	8.1
India	7.2
South Korea	4.6
Israel	3.3
Japan	3.1
Greece	2.6
Poland	1.5
EC (total)	1.2
Turkey	1.0
United Kingdom	0.8
Mexico	0.7
United States	0.7

Sources: Calculated from value data in IMF, International Financial Statistics, and GATT (34, table 1).

Purpose and Scope of This Study

Answers to the above questions on prospects for export earnings and on resource allocation to cotton production are heavily dependent upon the future demand for cotton. The purpose of this study has been to examine demand prospects and, to a lesser extent, supply sources. Four particular areas of concern guided the research:

(1) Anticipated expansion in future world cotton consumption (as positively affected by increasing population and income, and negatively affected by competition from manmade fibers).

(2) The import needs of major cotton deficit regions.

(3) The form in which these import needs will be met, and the role of cotton textiles. The future cotton lint-cotton textile trade mix.

(4) The source from which these import needs will be satisfied and the changes in trade flows to be expected.

Framework and Methodology

The approach taken in this study involved the following: (1) projecting regional cotton use and production at alternative prices; (2) determining regional production-use balances and potential trade flows; (3) determining the cotton lint-cotton textile mix of trade flow; and (4) transforming trade flows, trade mix, and prices into earnings estimates.

The first step was to divide the countries of the world into three economic sectors: developed, central plan, and less developed. Within these three sectors certain major cotton exporting and importing countries were analyzed separately while the others were roughly grouped together, depending upon geographic location and whether they are net cotton exporting or importing countries. The resulting regions are listed in table 3.

For each of these regions, cotton production, consumption, and trade were projected to 1980 by analyzing historical trends and other relevant factors, using both mathematical and subjective techniques. In brief, the major determinations for 1980 were made as follows:

(1) Fiber consumption was projected by multiplying expected changes in population by projected changes in per capita consumption levels as affected mostly by increasing per capita incomes.

(2) Cotton consumption was projected by multiplying projected fiber consumption by cotton's expected share which, in turn, was determined by prices of cotton and competing fibers and long-term trends. Adjustments were made to these projections when not compatible to direct projections of mill cotton use and net cotton textile trade.

(3) Cotton production was projected from long-term trends in area and yields, estimated responses to price changes, and from adjustments reflecting judgments about future availability of land, comparative advantages, improvements in yields, and domestic policy.

(4) The cotton balance or potential net total cotton (lint and textile) trade in 1980 was taken as the residual of projected cotton production over cotton consumption in each region.

Table 3.--Regions and included countries

Developed	
United States	
Canada	
Western Europe	
EC	Belgium-Luxembourg, France, Italy, Netherlands, West Germany
United Kingdom	
Other Western Europe	Austria, Denmark, Finland, Greece, Iceland, Ireland, Malta, Norway, Portugal, Spain, Sweden, Switzerland
Japan	
Australia & New Zealand	
South Africa	Republic of South Africa
Central Plan	
Eastern Europe	Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania, Yugoslavia
USSR	
Communist Asia	Mainland China, Mongolia, North Korea, North Vietnam
Less Developed	
Latin America	
Mexico	
Central America & Caribbean	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, and Caribbean including Cuba
Brazil	
Colombia	
Peru	
Other South America	Argentina, Bolivia, Chile, Ecuador, French Guiana 1/, Guyana 1/, Paraguay, Surinam 1/, Uruguay, Venezuela
North Africa	
United Arab Republic (UAR)	
Sudan	
Other North Africa	Algeria, Libya, Morocco, Tunisia
Less Developed (continued)	
East & West Africa	
East Africa	Botswana 2/, Burundi, Ethiopia, Kenya, Lesotho 2/, Malagasy Rep., Malawi, Mauritius, Mozambique, Rhodesia, Rwanda, Somalia, Swaziland 2/, Tanzania, Uganda, Zambia, French possessions (Afars-Issas, Comoro Islands, and Reunion)
West Africa	Angola, Cameroon, Central African Republic, Chad, Congo (Kinshasa), Congo (Brazz.), Dahomey, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Liberia, Mali, Mauritania, Namibia 2/, Niger, Nigeria, Port. Guinea, Sengal, Sierra Leone, Togo, Upper Volta, Equatorial Guinea, Cape Verde Is., Sao Tome e Principe.
West Asia	
Iran	
Syria	
Turkey	
Other West Asia	Israel, Iraq, Jordan, Kuwait, Lebanon, Muscat & Oman, Saudi Arabia, Yemen, S. Yemen (Aden), Trucial States, Qatar, Cyprus, Bahrein
South Asia	
India	
Pakistan	
Other South Asia	Afghanistan, Bhutan, Ceylon, Nepal
South East Asia	Burma, Cambodia, Laos, South Vietnam, Thailand
East Asia & Pacific	
Hong Kong	
South Korea	
Taiwan	
Other East Asia & Pacific	Brunei, Indonesia, Macao, Malaysia, Pacific Is., Papua, Philippines, Singapore

1/ These regions often included with Caribbean because of statistical reporting methods.
2/ These regions often included with the Republic of South Africa because of statistical reporting methods.

(5) Cotton lint trade and cotton textile trade were projected by expanding net total cotton (lint and textile) trade to a gross basis and then partitioning the results into cotton lint and cotton textiles in accordance with recent trends and expected changes.

(6) Export earnings or costs were estimated as the product of trade flows and the respective prices.

Major exception to the above procedure was the United States, where cotton production and cotton lint exports were assumed to be those which would balance world production and trade at each of the alternative price levels considered. This was a simplying assumption and does not imply a passive role for the United States, since the size of "residual" in the long run could be influenced by U.S. pricing and export policy.

WORLD COTTON PERSPECTIVE

Cotton Use

World cotton use reached an estimated all-time high in 1968--11.4 million metric tons or about 52 1/2 million bales (table 4). The trend during the last decade has been upward, but only at about the same average yearly rate as world population (about 2 percent per year).

Cotton use is suffering from intense competition of manmade fibers. 1/ Compared with a slight decrease in world per capita cotton use, consumption of manmade fibers more than doubled between 1958 and 1968. Cotton's share of world fiber use, which stood at 71 percent in 1958, dropped to 57 percent in 1968. During the same period, the share held by manmade fibers climbed from 20 to 36 percent. Wool's share dropped from 9 to 7 percent.

Cotton Production

World cotton production in crop year 1968/69 totaled 11.6 million metric tons (53.1 million bales), just below the all-time record crop of 11.7 million metric tons (53.9 million bales) in 1965/66 (table 5). Production in 1969/70 is below the level of the previous year. The long-term trend has been upward, with occasional drops in world production resulting mainly from decreases in U.S. output.

The long-term expansion in world production resulted primarily from increased yields. The estimated world average yield in 1968/69 was 323 pounds per acre, up nearly 100 pounds over the average yields of the early 1950's. In contrast, area in cotton in recent years has been below levels of the early 1950's.

Cotton Trade

Cotton moves in world trade as lint and as textiles. Both the total volume and value of this trade has been increasing. On a simple weight basis, recent total cotton trade has been around 5.4 million metric tons, compared with 3.4 million in the early 1950's (table 6). Valuewise, total cotton trade is currently running around $6.1 million, up from $5.7 million in 1960 (earlier data not available).

Cotton textiles are accounting for an increasing proportion of total cotton trade. In 1967, cotton textiles made up 29 percent of total cotton trade volume, but nearly two-thirds of cotton trade value. These proportions were up from 24 and 55 percent in 1960.

Cotton Lint Trade

World cotton lint exports climbed from about 2.6 million metric tons in the early 1950's to 3.9 million in 1960 (table 6). Since then, cotton exports have fluctuated from 3.5 to 3.9 million metric tons, with the peak level occurring again in 1966. Exports in 1967 were around 3.8 million tons.

Cotton lint exports accounted for roughly one-third of world cotton production, with no evident up or down trends.

1/ Rayon, acetate, polyester, nylon, and others.

Table 4. World textile fiber use, 1952-68

Calendar year	Population	Total use				Per capita use				Share of fiber use			
		Cotton	Wool	Manmade	All	Cotton	Wool	Manmade	All	Cotton	Wool	Manmade	All
	Millions	1,000 metric tons				Kilograms				Percent			
1952	2,586.9	7,670	1,088	1,755	10,513	2.96	0.42	0.68	4.06	73.0	10.3	16.7	100.0
1953	2,639.1	8,221	1,220	2,061	11,502	3.12	.46	.78	4.36	71.5	10.6	17.9	100.0
1954	2,687.0	8,534	1,182	2,262	11,978	3.18	.44	.84	4.46	71.2	9.9	18.9	100.0
1955	2,744.0	8,728	1,226	2,586	12,540	3.18	.45	.94	4.57	69.6	9.8	20.6	100.0
1956	2,798.3	9,100	1,322	2,690	13,112	3.25	.47	.96	4.68	69.4	10.1	20.5	100.0
1957	2,856.1	9,310	1,360	2,880	13,550	3.26	.48	1.01	4.75	68.7	10.0	21.3	100.0
1958	2,913.3	9,550	1,276	2,693	13,519	3.28	.44	.92	4.64	70.7	9.4	19.9	100.0
1959	2,973.5	10,150	1,446	3,088	14,684	3.41	.49	1.04	4.94	69.1	9.9	21.0	100.0
1960	3,034.9	10,360	1,495	3,302	15,157	3.41	.49	1.09	4.99	68.3	9.9	21.8	100.0
1961	3,097.3	10,090	1,505	3,512	15,107	3.26	.49	1.13	4.88	66.8	10.0	23.2	100.0
1962	3,161.1	9,880	1,501	3,936	15,317	3.13	.47	1.25	4.85	64.5	9.8	25.7	100.0
1963	3,226.3	10,000	1,475	4,381	15,856	3.10	.46	1.36	4.92	63.1	9.3	27.6	100.0
1964	3,292.3	10,615	1,460	4,966	17,041	3.20	.44	1.51	5.15	62.3	8.6	29.1	100.0
1965	3,359.3	10,919	1,473	5,370	17,762	3.25	.44	1.60	5.29	61.5	8.3	30.2	100.0
1966	3,427.1	11,219	1,539	5,817	18,575	3.25	.45	1.70	5.40	60.4	8.3	31.3	100.0
1967	3,495.6	11,333	(1,463)	6,170	18,966	3.25	.42	1.76	5.43	59.8	7.7	32.5	100.0
1968	3,565.5	11,438	(1,379)	7,288	20,105	3.21	.39	2.04	5.64	56.9	6.9	36.2	100.0
Change		Percent change				Percent change				Percentage points change			
1958-68	22	20	8	170	49	-2	-11	122	22	-13.8	-2.5	+16.3	--

Sources: ICAC data on mill consumption and population estimates compiled by Moe (59).

Table 5.--World cotton area, yield, and production, 1952-69

Crop year 1/	Area		Yield 2/		Production	
	Acres	Hectares	lb./acre	kg./ha.	Bales	Metric tons
	- - Million - -				- - - Million - - -	
1952	87.6	35.4	223	251	40.8	8.9
1953	82.6	33.4	245	275	42.1	9.2
1954	82.5	33.4	239	266	41.0	8.9
1955	84.7	34.7	247	274	43.6	9.5
1956	82.6	33.4	243	272	41.9	9.1
1957	79.3	32.1	254	287	42.0	9.2
1958	78.3	31.7	273	306	44.5	9.7
1959	79.8	32.3	282	316	46.9	10.2
1960	80.0	32.4	279	312	46.5	10.1
1961	80.6	32.6	269	301	45.2	9.8
1962	79.7	32.3	288	322	47.8	10.4
1963	80.8	32.7	298	333	50.2	10.9
1964	82.3	33.3	306	342	52.5	11.4
1965	81.9	33.1	316	353	53.9	11.7
1966	76.7	31.0	304	339	48.9	10.5
1967	76.2	30.8	299	334	47.5	10.3
1968 3/	78.9	31.9	323	364	53.1	11.6
1969 4/	80.1	32.4	307	346	51.3	11.2

1/ Crop year beginning August 1. 2/ Calculated before rounding area and production data. 3/ Preliminary. 4/ As estimated, February 1970.

Source: USDA/FAS.

Table 6.--World cotton trade and textile-lint mix, 1952-67

Calendar year	Exports			Share of total		
	Textiles	Lint 1/	Total	Textiles	Lint	Total
	- - Thousand metric tons - -			- - - - - - Percent - - - - - -		
Volume						
1952	798	2,617	3,415	23	77	100
1953	795	2,681	3,476	23	77	100
1954	883	2,949	3,832	23	77	100
1955	843	2,838	3,681	23	77	100
1956	893	3,084	3,977	22	78	100
1957	960	3,395	4,355	22	78	100
1958	871	2,930	3,801	23	77	100
1959	1,045	3,325	4,370	24	76	100
1960	1,219	3,943	5,162	24	76	100
1961	1,133	3,729	4,862	23	77	100
1962	1,133	3,508	4,641	24	76	100
1963	1,168	3,705	4,873	24	76	100
1964	2/1,480	3,890	5,370	24	76	100
1965	2/1,462	3,778	5,240	28	72	100
1966	2/1,579	3,917	5,496	29	71	100
1967	2/1,556	3,813	5,369	29	71	100
	- - - Million dollars - - -			- - - - - Percent - - - - -		
Value						
1952-58	- - Not available - -			- - Not available - -		
1959	n.a.	1,891	n.a.	n.a.	n.a.	n.a.
1960	3,100	2,569	5,669	55	45	100
1961	3,020	2,362	5,382	56	44	100
1962	3,030	2,054	5,084	60	40	100
1963	3,190	2,257	5,447	59	41	100
1964	3,470	2,372	5,842	59	41	100
1965	3,600	2,295	5,895	61	39	100
1966	3,790	2,307	6,097	62	38	100
1967	3,815	2,238	6,053	63	37	100

1/ Volume data 1952-65 are USDA/FAS. Other figures and all lint value data are FAO. 2/ These data are more inclusive of clothing than previously.

Sources: Compiled from FAO (15, 17, 18, 19, 23, 25, and Trade Yearbooks), GATT (30, 31) and USDA (57).

Cotton Textile Trade

Trends in world cotton textile trade are less susceptible to accurate description than raw cotton trade because of data problems. 2/ The general trend has definitely been upward. On a simple weight basis, exports of cotton textiles are currently around 1.6 million metric tons, double the level of the early 1950's. On a value basis, which reflects price differences and mix changes as well as quantity changes, world cotton textile exports expanded from $3.1 to $3.8 million, or by 23 percent in the 7-year period, 1960 (earlier data not available) to 1967.

Much of this trade expansion in cotton textiles has been in clothing items which nearly doubled in value traded, as opposed to little change in trade in yarn and fabrics. Between 1960 and 1967, clothing's share increased from 24 to 37 percent of the total value of cotton textile trade (table 7).

Cotton textile trade is also suffering from the competition of manmade fibers. On a value basis, cotton's share of total textile trade dropped from 41 percent in 1960 to 32 percent in 1967.

Unit Value of Trade

The average unit value of textile exports exceeds that of lint by over 4 times (table 8). In 1967, the average unit value of world exports of cotton textiles was about $2,450 per metric ton, compared with under $600 for cotton lint. The unit value of lint trade has been trending downward since 1960; that of textiles is indefinite because quantity data for 1964-67 are more inclusive of cotton clothing than previous years.

World Cotton Prices 3/

World cotton prices have been trending downward since 1954, with sizable drops occurring in 1955, 1956, and 1958 (fig. 1). The average price in 1958 was about 31 cents per pound for SM 1 1/16 inch cotton, c.i.f., Liverpool, compared with over 45 cents (constant 1968 currency) in 1954. Prices strengthened in 1959 and 1960 before beginning a gradual decline to about 29 cents in 1968. The indications for the 1969/70 crop year is for price to average around 28 cents.

2/ The principal problem is aggregation. Cotton textiles include yarn, fabrics, clothing, and manufactured articles, all of which may contain some noncotton materials. Aggregation is easiest on a value basis (GATT uses this, see 30 and 31), but annual variation may reflect price and mix changes more than volume would. Aggregation on a simple weight basis, as used by FAO (see 23), requires conversion from numbers and yardage to weight. The most ideal means would be on a raw cotton equivalent (weight) basis, which would further consider the differences in manufacturing loss of various items.

3/ The term "world cotton prices" generally refers to price quotations, c.i.f., Liverpool, England, or Bremen, Germany. Prices on these two large markets are taken to reflect world supply and demand conditions. These price quotations have two weaknesses: first, they are offering prices, and may differ from transaction prices; and second, the volume moving at the particular quotation is not known, permitting only simple averaging of prices. A separate quotation exists for each available growth and staple of cotton.
One practice in cotton price analysis is to take the price over time of a large volume growth--such as U.S. SM 1-1/16 inch, c.i.f., Liverpool--as reflecting changes in world price level. Another is to take an average of all or of several available quotations for a given staple length. This study used as a proxy for the world price of cotton an average of all but the highest quotation, c.i.f., Liverpool, of the following growths of SM 1 1/16; United States, Mexican, Iranian, Nicaraguan, Syrian, and Greek (see appendix table A-2).

Table 7.--Mix of cotton textile trade and cotton's share of trade in all textiles, 1960-67

Calendar year	Mix of cotton textile trade			Cotton's share of trade in all textiles 1/
	Yarn and fabrics	Clothing	Total	
	Percent of value			
1960	76	24	100	41
1961	74	26	100	39
1962	71	29	100	37
1963	68	32	100	35
1964	68	32	100	34
1965	66	34	100	34
1966	64	36	100	33
1967	63	37	100	32

1/ Excluding flax and silk.

Source: GATT (30, 31).

Table 8.--Average unit values of cotton trade, 1959-67

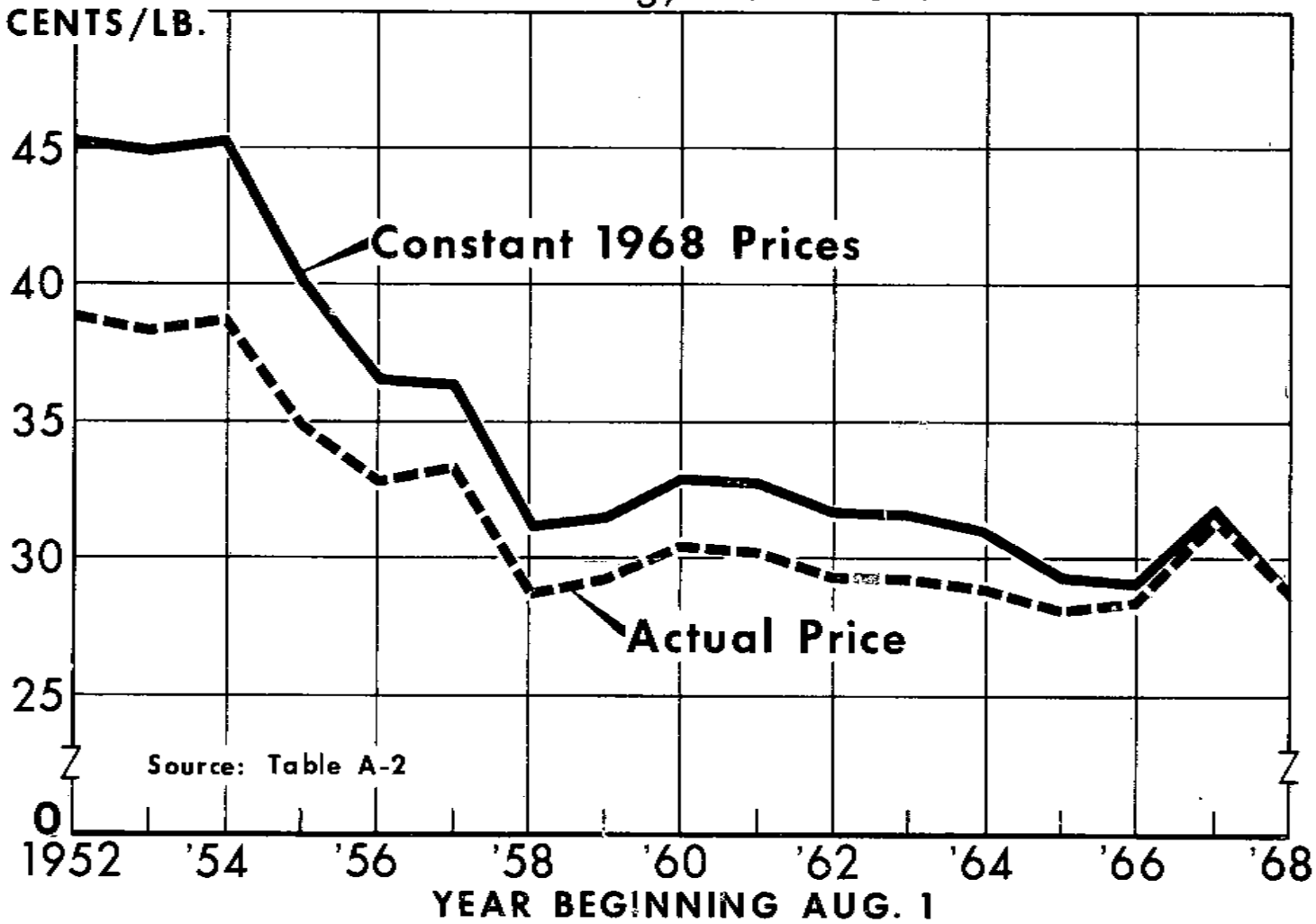
Calendar year	Textile exports	Lint exports	All cotton	Ratio textiles to lint
	Dollars/metric tons 1/			
1952-58	n.a.	n.a.	n.a.	n.a.
1959	n.a.	570	n.a.	n.a.
1960	2,540	650	1,100	3.9
1961	2,660	630	1,110	4.2
1962	2,670	590	1,100	4.5
1963	2,730	610	1,120	4.5
1964	2/2,340	610	1,140	4.6
1965	2/2,460	600	1,560	4.1
1966	2/2,400	590	1,560	4.1
1967	2/2,450	590	1,590	4.2

1/ Rounded to nearest 10 dollars. 2/ Reflects quantity data more inclusive of clothing than in previous years.

Source: Table 6.

Figure 1. COTTON PRICES, C.I.F., LIVERPOOL

Strict Middling, 1-1/16 Inches



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COTTON DEMAND OUTLOOK

The outlook for future cotton use depends upon population growth, income growth, the effect of income and other factors on per capita total fiber use, and the share of total fiber use that cotton can retain under intense competition.

Population and Income Assumptions

Population Growth

Population projections for countries and regions as compiled by Moe (59) were accepted and used in this study. Basically, the projections are UN projections, with some adjustments based on studies by FAO, OECD, and USDA's long-term supply and demand studies. 4/

The population projections for 1980 are presented in table 9. They show population growth between 1965 and 1980 at an average yearly rate of 1.0 percent in the developed sector, 1.8 in the central plan, and 2.6 in the less developed. Highest regional growth rates are indicated for Mexico, 3.6 percent; Syria, 3.5; and the UAR, 3.1. The lowest rates are projected for regions of Western Europe, 0.6 to 0.7; and for Eastern Europe and Japan, both 0.9 percent.

By 1980, the less developed sector will have about 50 percent of the world's population, up from 46 percent in 1965. In contrast, the developed regions will have 17 percent, down from 20 percent in 1965. The central plan proportion is expected to remain around one-third.

Income Growth

The income growth rates used in this study for the projection period were also those compiled by Moe (59). Again, principal sources were FAO and OECD projections, and the USDA's supply and demand studies.

The basic projections of total and per capita income for 1980 are presented in table 9. The projections represent consumer expenditure of the developed countries, net material product of the central plan countries, and the GNP of the less developed. On a per capita basis, income growth is projected at 3.4 percent per year for the the central plan countries, 3.3 for the developed sector, and 2.1 for the less developed regions as a group. These projected rates are about the same as those which occurred during the 1950-65 period for the developed and less developed, but an improvement for the central plan, principally because of a higher expected growth rate in Communist Asia. Individual regions with high projected rates of increase in per capita income are Japan, 7.2 percent per year; the USSR, 4.4; Eastern Europe, 4.1; and the EC and Other Western Europe, 3.7. Lowest projected rates are for Other East Asia and Pacific (heavily influenced by Indonesia) at 0.9 percent per year, and Syria, 1.3 percent.

For direct projections involving world time series data, a 1965-80 rate of growth in world income per capita was roughly devised by weighting the regional income growth rates by the average 1965-80 population. These calculations indicated a growth rate of world per capita income of about 2.7 percent per year, compared with about 2.3 percent per year in the 1950-65 period (also determined by a weighting process).

4/ These supply and demand studies are listed in Literature Cited.

Table 9.--Regional population and income, 1965, and medium projections for 1980

Regions	Population				Total income 1/		Income per capita 1/			
	1965	Projected 1980	Change-over 1965	Growth rate 1965-80	1965	Projected 1980	1965	Projected 1980	Change-over 1965	Growth rate 1965-80
	Thousands			%/yr.	Million dollars		Dollars			%/yr.
Developed										
United States	194,572	241,079	46,507	1.4	397,800	730,287	2,044	3,029	985	2.7
Canada	19,604	26,024	6,420	1.9	27,142	50,551	1,385	1,942	557	2.3
EC	181,594	198,385	16,791	.6	146,351	274,955	806	1,386	580	3.7
United Kingdom	54,595	60,690	6,095	.7	53,917	85,202	988	1,404	416	2.4
Other Western Europe	87,684	97,489	9,805	.7	48,808	92,635	557	950	393	3.7
Japan	97,960	111,563	13,603	.8	34,887	110,667	356	992	636	7.2
Australia & New Zealand	14,000	18,216	4,216	1.8	14,317	25,883	1,023	1,421	398	2.2
South Africa	17,867	26,676	8,809	2.7	7,165	13,866	401	520	119	1.8
Subtotal	667,876	780,122	112,246	1.0	730,387	1,384,046	1,094	1,774	680	3.3
Central Plan										
Eastern Europe	121,430	138,763	17,333	.9	85,300	176,649	702	1,273	571	4.1
USSR	230,600	277,325	46,725	1.3	219,700	499,852	953	1,802	849	4.4
Communist Asia	795,604	1,077,064	281,460	2.0	85,600	158,669	108	147	39	2.2
Subtotal	1,147,634	1,493,152	345,518	1.8	390,600	835,170	340	559	219	3.4
Less Developed										
Mexico	42,689	72,676	29,987	3.6	19,415	44,803	455	616	161	2.2
Central America & Caribbean	37,389	55,832	18,443	2.7	11,343	26,462	303	474	171	2.5
Brazil	81,568	123,812	42,244	2.8	21,970	46,773	269	378	109	2.4
Colombia	17,984	27,998	10,014	3.0	5,103	10,310	284	368	84	1.8
Peru	11,650	17,558	5,908	2.8	4,281	8,942	367	509	142	2.2
Other South America	54,844	77,817	22,973	2.3	31,916	57,134	582	734	152	1.6
East & West Africa	217,454	315,620	98,166	2.5	22,699	42,136	104	134	30	1.7
United Arab Republic	29,600	46,437	16,837	3.1	4,700	10,192	159	219	60	2.3
Sudan	13,540	19,514	5,974	2.5	1,387	2,684	102	138	36	2.0
Other North Africa	31,466	49,333	17,867	3.0	7,048	13,915	224	282	58	1.6
Iran	24,700	36,123	11,423	2.6	5,933	12,933	240	358	118	2.7
Syria	5,356	8,974	3,618	3.5	1,125	2,272	210	253	43	1.3
Turkey	31,150	46,002	14,852	2.6	8,123	16,967	261	369	108	2.4
Other West Asia	26,671	40,273	13,602	2.8	11,469	25,681	430	638	208	2.7
India	486,820	690,427	203,617	2.3	49,220	99,361	101	131	30	2.0
Pakistan	113,925	169,158	55,233	2.7	11,160	21,909	98	130	32	2.1
Other South Asia	37,329	54,070	16,741	2.5	3,679	6,910	99	128	29	1.8
South East Asia	81,057	117,969	36,912	2.5	8,427	16,042	104	136	32	1.9
Hong Kong	3,804	5,507	1,703	2.5	1,600	3,157	421	573	152	2.1
South Korea	28,377	42,917	14,540	2.8	2,901	5,587	102	130	28	1.7
Taiwan	12,963	18,321	5,358	2.3	2,750	5,910	212	323	111	2.9
Other East Asia & Pacific	153,453	232,175	78,722	2.8	20,819	39,534	136	170	34	.9
Subtotal	1,543,779	2,268,515	724,734	2.6	257,068	510,614	166	225	59	2.1
Total World	3,359,289	4,541,787	1,182,498	2.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

1/ Consumer expenditure (1958 prices) in developed countries, net material product (1961-63 prices) in central plan countries, and GNP (1965 prices) in less developed countries.

Source: (59), except for revised (upward) population projections for India and Pakistan.

For the less developed regions, separate high and low income projections were generated. The high projections assumed substantial improvement over the past in agricultural and total economic growth, while the low projections assumed reduced rates of growth. 5/ Under the high assumptions, growth on a per capita basis for the LDC sector averages out to 3.9 percent per year, compared with the basic or medium projected rate of 2.1 percent. Under the low assumption, sector income per capita grows at only 0.7 percent per year.

Outlook for Per Capita Use of All Fiber

Trends in Per Capita Use

Per capita use of textile fibers (excluding flax and silk) has not increased equally in all regions. Use levels 6/ and (absolute) increases in use are considerably higher in most of the developed regions, Eastern Europe, and the USSR than in Communist Asia and the less developed sectors (table 10). The United States has by far the highest per capita use, followed by Australia and New Zealand, and Canada. Lowest levels of use are found in East and West Africa and Other East Asia and Pacific. 7/

In the period from 1953 to 1967, per capita fiber use expanded most (in absolute amounts) in Australia and New Zealand, Japan, the United Kingdom, Eastern Europe, and the USSR. In the less developed regions, expansion was greatest in Other West Asia (mostly Israel), Iran, Turkey, South Korea, and Taiwan. Very little or no permanent improvement in use occurred in Communist Asia, most of South America, India, and Other East Asia and Pacific.

Absolute increases in per capita fiber use in the higher income countries (developed, Eastern Europe, and the USSR), especially Japan, have been very large. Most of the increase in the United States has occurred since 1964.

Factors Affecting Use

Major factors affecting trends in per capita fiber use are per capita income, fiber prices, fiber availability, and trade promotion. Climate may also have some influence.

Per capita income generally has more influence than other factors. Increases in per capita income go in part towards increased consumption of clothing and other items containing fibers (carpeting, automobiles, furniture, etc.). The regions with the largest increases in per capita fiber use have also generally had large increases in per capita incomes. Good examples are Japan, Iran, and Taiwan.

The relative magnitude of the response in fiber use to changes in income has been analyzed or estimated in other studies (see table 11). In general, these studies conclude that income has a positive but decreasing effect, i.e., a decreasing elasticity as per capita income increases. For very low income countries, they indicate that a given 1 percent increase in income results in a nearly equal percentage increase in per capita fiber use. For higher income countries, they indicate a response of less

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5/ The rationale and magnitude of the high and low projections are discussed in the overall study report.

6/ Use is defined as availability, and thus changes in stocks are not accounted for. This distorts the Hong Kong figure considerably, and may affect other regions to a lesser extent.

7/ Total fiber availability may be underestimated for these regions because trade in rags and used clothing is not considered.

Table 10.--Regional per capita fiber availability, excluding flax and silk, 1953 and 1965-67

Region	1953 1/	1965-67 average	Range during 1953-1967 period	Change 1953 to 1965-67	Average annual growth rate 1953 to 1965-67
	Kilograms				Percent
Developed					
United States	17.0	20.2	15.2-20.9	3.2	1.3
Canada	11.7	15.2	10.4-15.6	3.5	2.0
EC	7.8	10.8	7.8-11.5	3.0	2.5
United Kingdom	10.5	14.8	10.5-15.6	4.3	2.7
Other Western Europe	5.8	9.2	5.8- 9.3	3.4	3.6
Japan	6.3	11.4	6.3-12.9	5.1	4.7
Australia & New Zealand	9.1	15.8	9.1-16.3	6.7	4.3
South Africa	5.1	8.1	5.1- 8.8	3.0	3.6
Total sector	10.4	14.0	10.0-14.2	3.6	2.3
Central Plan					
Eastern Europe	5.6	9.6	5.6-10.0	4.0	4.2
USSR	6.2	10.2	6.1-10.7	4.0	3.9
Communist Asia	2.0	1.8	1.5- 2.5	-0.2	-0.8
Total sector	3.2	4.3	3.2- 4.5	1.1	2.3
Less Developed					
Mexico	3.4	4.3	3.4- 4.6	0.9	1.8
Central America & Caribbean	2.4	3.3	2.4- 3.5	0.9	2.5
Brazil	4.1	4.0	4.1- 4.7	-0.1	-0.2
Colombia	3.5	4.0	3.4- 4.1	0.5	1.0
Peru	2.4	2/3.2	3/2.4- 3.2	3/0.8	3/2.2
Other South America	5.1	4/4.7	4.2- 5.6	3/ -	3/ -
East & West Africa	1.1	1.6	1.1- 1.7	0.5	2.9
United Arab Republic	3.5	4.4	3.5- 4.8	0.9	1.8
Sudan	1.6	2.0	1.5- 2.4	0.4	1.7
Other North Africa	2.3	2.6	2.2- 2.8	0.3	0.9
Iran	1.8	4.3	1.8- 4.5	2.5	6.9
Syria	5.2	6.2	4.6- 7.0	1.0	1.4
Turkey	4.7	6.2	4.7- 6.5	1.5	2.2
Other West Asia	1.6	4.7	1.6- 4.9	3.1	8.6
India	2.1	2.2	2.1- 2.5	0.1	0.4
Pakistan	1.5	2.1	1.5- 2.3	0.6	2.6
Other South Asia	1.3	1.7	1.3- 2.1	0.4	2.1
South East Asia	1.4	2.0	1.4- 2.1	0.6	2.8
Hong Kong	7.6	5.7	3.9-12.8	-1.9	-2.2
South Korea	2.0	3.2	2.0- 3.8	1.2	3.7
Taiwan	3.1	4.3	3.1- 4.9	1.2	2.5
Other East Asia & Pacific	1.5	1.6	1.1- 1.8	0.1	0.5
Total sector	2.2	2.6	2.0- 2.7	0.4	1.3
Total World	4.4	5.4	4.4- 5.5	1.1	1.6

1/ 1952-1954 average. 2/ 1964. 3/ 1953-1964. 4/ Includes Peru.

Sources: Calculated from FAO total fiber use data (15, 19, 23, 25) and population data compiled by Moe (59), except 1953 U.S. figure from USDA (72).

Table 11.--Income elasticities of per capita use of total fibers

Country or region	FAO 1/ 1960	ICAC 2/ 1962	FAO 3/ 1962	FAO 4/ 1967	NACFF 5/ 1967	Others	Analysis this study 6/	Accepted for projection 7/ High E	Accepted for projection 7/ Medium E
Developed									
United States	-0.63		0.0	0.0 or 1.5	0.47	8/0.8	1.12-1.15	0.8	0.7
Canada			.15	.45 or .55	.57		1.04-1.06	.8	.7
EC	.72-1.44		.5			9/1.0	.63- .64	.64	.6
United Kingdom	1.12	.67	.5	.4 or .6	.60		1.06	.8	.7
Other Western Europe	.47-1.58		10/.75			11/1.3	.90- .91	.91	.7
Japan	.91		.9	.4	.40	12/0.8	.65- .76	.47	.45
Australia & New Zealand	2.1 -5.6		.3	.5 or .7	.56	13/1.38	.92- .96	.92	.7
South Africa	1.43		1.0	.7 or .8	.79		.79- .82	.8	.8
Central Plan									
Eastern Europe				.4 or .5	.67		.85- .90	.8	.7
USSR				.3 or .4	.59		.59- .62	.62	.6
Communist Asia				.7	1.00		1.7	1.0	1.0
Less Developed									
Mexico	1.00		1.0	.5	.85	14/.60- .65	.81- .82	.81	.81
Central America & Caribbean	15/.53		1.05	1.1	.79		.17 N.S.	.8	.7
Brazil	1.30		1.1	1.0	.80		W.S.	.8	.7
Colombia	.77			1.3			.80- .84	.84	.84
Peru	1.67		1.05	1.0		16/1.07	.73- .74	.8	.73
Other South America	.33- .96		17/.9	18/1.2	.84- .85		W.S.	.8	.7
East & West Africa	19/1.2	1.3	1.15	1.1	.80		W.S.	.8	.7
United Arab Republic	1.99	1.2	1.1	.9			.24 N.S.	.8	.7
Sudan				1.6			1.7 -1.8	.9	.8
Other North Africa			1.15				n.a.	.8	.7
Iran							3.8 -4.0	.9	.8
Syria			1.1				n.a.	.8	.7
Turkey		1.2		1.1	.88	20/.7 -1.3	.89- .93	.89	.8
Other West Asia	21/1.2		1.15				n.a.	.8	.7
India			1.1	1.2	1.00	22/.77- .83	.58 N.S.	.8	.7
Pakistan			1.1	.9		23/.82	1.0 N.S.	.8	.7
Other South Asia				1.2			5.2 -5.3	.8	.7
South East Asia	24/-1.41			1.2			.67- .69	.8	.69
Hong Kong			1.1	1.2	.80		1.2 N.S.	1.0	.9
South Korea				1.2			.88-1.0	1.0	.9
Taiwan				1.5			.92- .96	1.0	.9
Other East Asia & Pacific				25/1.4			n.a.	1.0	.9

1/ (47, pp. 16-33). The elasticities noted were calculated from the semilog equations. They were usually the same or very close to those based on log-log equations. 2/ (48). 3/ (16, vol. II, p. 67). Estimated from analysis of 1952-58 data. 4/ (21). Estimates based on econometric studies and judgment. Where two figures are given, lower refers to apparel use while higher refers to household use. 5/ (60, p. 60). Estimates based on time series, cross-section analysis, and judgment. 6/ Calculated from the coefficients of linear, semilog, and log-log equations fitted mostly to 1953-64 data. See discussion in appendix A and tables A-5 and A-6. W.S. means that the regression coefficient had a wrong (negative) sign. N.S. means regression coefficient was not statistically significant. 7/ E refers to accepted elasticity. 8/ (14, pp. 53-61). Based on multiple regressions on 1927-60 data. 9/ (13). France only. 10/ Greece only. 11/ Denmark only. 12/ For cotton yarn only, value based calculation. 13/ (39). Clothing only. 14/ (70, p. 36). 15/ Guatemala only. 16/ (65). All clothing expenditures, urban areas only. 17/ Argentine only. 18/ Uruguay only. 19/ Congo (K) only. 20/ (24, volume on Near East). Cotton only. Range is for countries within the region. 21/ Israel only. 22/ (61, p. 213). Lower figure is for rural areas. 23/ (2, p. 198). East Pakistan, cotton cloth only. 24/ Burma only. 25/ Indonesia only.

than 1 percent. In nearly all cases, the elasticities calculated or used in these studies were gross, in that the effects of other factors on per capita use were not held constant.

New analyses of the effects of income on fiber use were made in this study, using both time series and cross-sectional data. 8/ One significant conclusion of the analyses was that the gross response (income elasticity) of fiber use does not drop (or no longer drops) as countries or regions climb the economic ladder, except possibly for countries moving up from the lowest echelons. This, of course, contradicts the conclusions of previous studies. The explanation seems to be that factors other than per capita income per se are increasingly playing a role not only in the level of per capita use but also the response to changes in income. For example, restrictive trade policy and high prices may be dampening the response in some countries with low income levels. In countries with high income levels, factors such as lower manmade fiber prices and increased promotion could be stimulating the gross income response.

One income-connected factor not considered in the analysis, which may be of some importance, is distribution of income. Conceivably, the more highly concentrated a region's income is in the hands of a few, the lower would be both that region's per capita fiber use and the response to increases in income, other factors equal.

Prices of textile fibers, including cotton lint, have been trending downward. These lower prices have probably stimulated textile fiber use, particularly in the developed countries, in two ways: First, lower prices have very likely spurred the use of synthetic fibers in carpeting and in twine, burlap, netting, backing for rugs, etc. (substituting in the last-named products for jute, sisal, hemp, and other vegetable fibers not included in total fiber use). Second, lower raw material prices may have helped provide a margin for increased advertising and other promotion of end products.

Analysis of the relationship of prices to per capita use has generally not been attempted because of data problems. Although raw cotton prices are fairly available, prices of manmade fibers are not. In a few developed countries, wholesale list prices are quoted, but these are frequently deceptive because of off-list selling. 9/ Donald, et al, had some success in such an analysis (14, pp. 52-53). They found a 1 percent decrease in a weighted fiber price index associated with an 0.3 percent increase in U.S. per capita fiber use.

New analysis of price effects was attempted in this study, but with disappointing results. 10/ It proved impossible in most cases to obtain any significant or conclusive measurement of the separate effects of either cotton price or synthetic fiber price apart from that of income. 11/

8/ Details of the analytical results are discussed in appendix A.

9/ For further discussion of the price problems, see appendix A.

10/ See appendix A for details.

11/ The ideal variable to have included as a proxy for the general level of fiber prices for each region would have been a weighted average price in which the price of each component fiber was weighted by its share of total fiber use. However, at most, this could be done on only a very gross basis, using a representative price for the numerous types of cotton, another for the various types of rayon, etc. The unavailability and frequent unreliability of manmade fiber prices, as well as the time involved in calculation, prohibited the use of such a weighted price in this study.

Fiber availability, in the absence of price setting, is reflected in prices. Import restrictions on raw fiber or textiles in the form of quotas, high tariffs, or Government buying have slowed expansion of fiber use in many less developed countries and Communist Asia. The policy behind the restrictions is, of course, the protection or stimulation of domestic industries and the conservation of foreign exchange. Developed countries also have import restrictions, but the effect on per capita fiber use quite likely has been much less because of the higher average incomes and the relative efficiency of domestic textile manufacture. 12/

Modern promotion and modern communication is stimulating consumer desire for new and larger quantities of clothing, carpeting, automobiles, tires, furniture, and numerous articles containing fibers. This has been an important factor in the high responses to changes in income in the developed countries, as indicated in the analysis made for this study.

A generally cool or variable climate may stimulate clothing use over what it would otherwise be with a given income per capita. However, most countries with temperate climates are also more developed than tropical or semitropical countries, so that it is difficult to separate the effects of climate from those of income.

To measure the combined effect on fiber use of factors other than income and price, the initial time series analysis of this study included a time trend variable. However, income and time trend were so highly intercorrelated in most cases that time trend had to be eliminated to avoid confounding the income results.

Projections of Fiber Use to 1980

Two procedures were used to develop projections of per capita fiber use to 1980: (1) linear, semilog, and log-log equations developed in the time series analysis; and (2) log-log functions and assumed income elasticities.

Direct projections from time series equations were made for 24 of 33 regions, and for the developed sector and total world (table 12). 13/ The semilog equation, which assumes a decreasing income elasticity of fiber use, always produced the lowest projection. The highest projection was usually that of the linear equation, which assumes an increasing elasticity. The middle projection was usually that of the log-log equation, which assumes a constant income elasticity.

Some of the regional projections from the semilog and log-log equations appear reasonable. The semilog projections for the United States, Canada, the United Kingdom, and Japan are the most acceptable. For the EC, the projection from log-log equation appears the most reasonable.

Many of the projections from the linear equations are clearly unrealistic. For Japan, achievement of the linear projection would give her the world's highest per capita use, even above that of the United States. Although Japan's projected income growth rate is the world's highest, it will still have a lower per capita income in 1980 than all other developed regions except Other Western Europe and South Africa.

For the developed sector as a whole, the direct projections indicated lower per capita fiber use levels than did the weighted average of the regional projections. The

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12/ Trade restrictions are discussed in more detail in the sections on cotton textiles and cotton lint trade.

13/ No direct projections were attempted for regions with low R^2's, or with nonsignificant or negative income coefficients.

Table 12.--Projection of per capita fiber use in 1980
(Based on equations fitted to historical data)

Region	1965-67 use	Projected use 1/		
		Y = a + b log I	Log Y = a + b log I	Y = a + b I
	Kilograms			
Developed				
United States	20.2	28.4	31.7	31.0
Canada	15.2	18.1	19.5	19.4
EC	10.8	14.2	15.6	16.6
United Kingdom	14.8	19.6	21.4	21.3
Other Western Europe	9.2	12.3	14.6	14.8
Japan	11.4	19.2	28.1	31.9
Australia & New Zealand	15.8	15.1	15.4	16.3
South Africa	8.1	7.9	8.3	8.3
Weighted average	14.0	19.4	22.6	23.2
Direct sector		17.2	18.8	19.8
Central Plan				
Eastern Europe	9.6	13.4	16.6	17.5
USSR	10.2	13.3	15.2	15.9
Communist Asia	1.8	3.2	3.5	3.3
Weighted average	4.3	5.6	6.4	6.4
Direct sector		no analysis		
Less Developed				
Mexico	4.3	5.4	5.7	5.7
Central America & Caribbean	3.3	unacceptable 2/		
Brazil	4.0	4.2	4.2	4.2
Colombia	4.0	4.9	5.0	5.0
Peru	3/3.2	3.8	4.0	4.1
Other South America	4/4.7	unacceptable		
East & West Africa	1.6	unacceptable		
United Arab Republic	4.4	4.4	4.5	4.6
Sudan	2.0	3.2	3.7	3.4
Other North Africa	2.6	no analysis		
Iran	4.3	9.2	14.0	11.4
Syria	6.2	no analysis		
Turkey	6.2	7.4	7.8	7.9
Other West Asia	4.7	no analysis		
India	2.2	unacceptable		
Pakistan	2.1	3.1	n.a.	3.2
Other South Asia	1.7	4.2	7.7	4.7
South East Asia	2.0	2.1	2.2	2.2
Hong Kong	5.7	unacceptable		
South Korea	3.2	4.1	4.5	4.3
Taiwan	4.3	6.1	6.8	7.1
Other East Asia & Pacific	1.6	unacceptable		
Weighted average	2.6	n.a.	n.a.	n.a.
Direct sector		unacceptable		
Total World				
Weighted average	5.4	n.a.	n.a.	n.a.
Direct world		6.4	6.7	6.9

1/ Projections are based mostly on extension of 1953-64 trends, since 1965-67 data were generally unavailable at time of analysis; see appendix D for implications. 2/ Unacceptable because of very low R^2 or negative income coefficients. See appendix A for R^2 values and details of analysis. 3/ 1964. 4/ Includes Peru.

Source: Table 11 and equations developed in time series analysis. See appendix A.

cause for this was a sector income elasticity (0.72 to 0.74) lower than most of the regional income elasticities (see table A-6 of appendix A). However, the high regional elasticities for the United States, the United Kingdom, Canada, and Australia and New Zealand, are probably biased upwards because of revised, more inclusive data in the later years of the time period. 14/ Thus, the sector elasticity and projections may be the most acceptable.

The direct projection of world per capita fiber use shows a 1980 figure of 6.4 to 6.9 kilograms, based on a mean income elasticity of 0.62.

Comparison with a weighted regional average use is not possible, either because no analysis could be made in some regions or because the equations were unacceptable.

Log-log projections under alternative elasticity and income level assumptions are presented in table 13. 15/ Again, these projections hold the income elasticity of fiber use constant through the projection period, an assumption suggested by the analytical results of this study. 16/

Some of the log-log projections purposely equal or approximate the direct projections from semilog equations; elasticities for the log-log function were chosen arbitrarily to produce that result.

Elasticities from the time series analysis which appeared reasonable were used either for the high or medium elasticity projections. 17/ Elasticities for the United States, Canada, and the United Kingdom were dropped from unity or above to 0.8 and 0.7 for the high and medium projections, because of the probable upward bias in the higher figures. Elasticities were reduced to more reasonable levels for Communist Asia, the Sudan, Other South Asia, Hong Kong, and South Korea. For Communist Asia, an elasticity was selected which would increase fiber use per capita, using a log-log function, to about the same level as the late 1950's before use dropped off substantially. Any other assumption seemed out of line with what government policy in that country would allow. Elasticities based on those of surrounding regions and judgment factors were selected for Central America and Caribbean, Brazil, Other South America, East and West Africa, the UAR, Other North Africa, Other West Asia, Pakistan, Other South Asia, Hong Kong, and Other East Asia and Pacific.

Japan's estimated elasticity was the lowest for any region, below 0.5, simply because a figure as high as that of other developed regions, along with Japan's rapid expansion in per capita income, would shoot per capita fiber use to an unbelievable level.

For the developed sector, the weighted averages of high and medium elasticity--medium income projections are 19.9 and 19.0 kilograms per capita. The latter figure would represent absolute growth of 5.0 kilograms over 1965-67, a change which is greater in itself than the per capita levels of nearly all less developed countries. Nearly equal absolute (but higher relative) increases are indicated for Eastern Europe and the USSR.

14/ See discussion in appendix A.

15/ $\log Y_{1980} = \log Y_{\text{base period}} + E_I(\log I_{1980} - \log I_{\text{base period}})$ where Y = per capita fiber use; E_I = income elasticity of per capita fiber use; I = per capita income, either actual or an index.

16/ See appendix A.

17/ The elasticities accepted for projection were noted previously in table 11.

Table 13.--Projections of per capita total fiber use in 1980
(Based on assumed constant income elasticities) 1/

Region	High elasticity and medium income	Medium elasticity			Change 1965-67 to medium 1980 2/
		Medium income	High LDC income	Low LDC income	
	Kilograms				
Developed					
United States	27.9	26.8			6.6
Canada	17.8	17.0	Same as		1.8
EC	15.6	15.3	medium		4.5
United Kingdom	19.3	18.4			3.6
Other Western Europe	14.6	12.8			3.6
Japan	19.2	18.5			7.1
Australia & New Zealand	15.4	14.6			-1.2
South Africa	8.3	8.3			.2
Weighted average	19.9	19.0			5.0
Central Plan					
Eastern Europe	15.3	14.4	Same as		4.8
USSR	15.2	14.9	medium		4.7
Communist Asia	2.5	2.5			.7
Weighted average	6.0	5.9			1.6
Less Developed					
Mexico	5.7	5.7	7.0	4.6	1.4
Central America & Caribbean	3.6	3.5	5.3	3.0	.2
Brazil	5.3	5.2	7.4	4.5	1.2
Colombia	5.0	5.0	6.1	4.2	1.0
Peru	4.1	4.0	5.2	3.5	.8
Other South America	6.3	6.2	7.3	5.4	1.5
East & West Africa	1.5	1.4	1.7	1.3	-.2
United Arab Republic	5.6	5.5	6.6	4.7	1.1
Sudan	2.9	2.8	3.4	2.4	.8
Other North Africa	2.9	2.8	3.4	2.5	.2
Iran	6.0	5.8	7.3	4.7	1.5
Syria	7.0	6.8	8.3	5.8	.6
Turkey	7.8	7.7	9.9	7.0	1.5
Other West Asia	4.6	4.5	5.6	3.8	-.2
India	3.0	2.9	3.5	2.6	.7
Pakistan	2.9	2.8	3.5	2.5	.7
Other South Asia	2.6	2.5	3.0	2.2	.8
South East Asia	2.3	2.2	2.7	1.9	.2
Hong Kong	11.6	11.2	14.5	9.0	5.5
South Korea	4.1	4.0	5.1	3.3	.8
Taiwan	6.8	6.7	10.6	6.0	2.4
Other East Asia & Pacific	1.9	1.9	2.1	1.5	.3
Weighted average	3.3	3.2	4.0	2.8	.6
Total World	7.1	6.8	7.2	6.6	1.4

1/ Log-log function used for projecting, see text for discussion. Elasticities used are shown in table 11. Base period for projecting was generally 1964 since 1965-67 data were not available at the time. In light of the new data, the projections are too low for several regions; notably Australia-New Zealand, East and West Africa, and Other West Asia; see appendix D for discussion.
2/ See table 10 for 1965-67 per capita use.

For the less developed sector, the high and medium elasticity--medium income projections are 3.3 and 3.2 kilograms. The change over 1965-67 would be some 0.6 to 0.7 kilograms. As small as this absolute increase is in comparison with that projected for the developed sector, it is large compared with LDC sector increases in the past.

With high income growth in the LDC sector, and assuming medium elasticity, the projections indicate that average per capita fiber use in the sector could reach 4 kilograms by 1980, an increase of 1.4 kilograms over 1965-67. Alternatively, a retardation in LDC income growth could limit the sector's per capita fiber use increase to 0.2 kilograms, reaching only 2.8 kilograms by 1980.

Per capita use of fibers in 1980 will probably be highest in the United States, with Japan possibly moving above the United Kingdom for second highest. Lowest use will continue to be in East and West Africa, and in the Asian regions.

Conclusions on Outlook for Fiber Use

Per capita use.--The log-log projections based on the medium elasticity and medium income growth assumptions are accepted as the most likely. These projections average out to a world per capita use in 1980 of about 6.8 kilograms, about the same as that indicated by the direct projection of world per capita use, based on a log-log time series equation.

Less likely, but possible, if either income growth should improve markedly in the LDC sector or elasticities should be higher, there would be a world per capita use of over 7 kilograms. A dropping off in LDC income growth, could restrict world use in 1980 to some 6.6 kilograms per capita.

The accepted medium projections are generally above those for 1980 published by the National Advisory Commission on Food and Fiber (appendix table C-3). In that study, world per capita use was projected at 6.4 kilograms or 0.4 kilograms less than that accepted here. This study's accepted projections are higher because of higher assumed elasticities in the developed and central plan regions, and slightly higher income growth rates in the less developed sector.

Total fiber use.--Multiplying the accepted per capita use projections by projected 1980 population (4,541.7 million worldwide) indicates a total world fiber use in 1980 of 31 million metric tons, compared with 17 million metric tons in 1964 and about 19 million metric tons in 1967. The 31 million metric tons would be distributed approximately as follows:

	Million metric tons	Percent 1980	Percent 1964
Developed. . . .	14.9	48	51
Central plan . .	8.8	28	27
Less developed .	7.3	24	22
	31.0	100	100

The projections indicate that an increasing proportion of world fiber use will occur in the less developed regions because of higher population growth, with a decreasing proportion mainly in the developed regions.

Higher elasticities in all sectors or high income growth rates in LDC's would boost total world fiber use in 1980 to over 32 million metric tons or, if both occurred, up to nearly 34 million metric tons. If income growth were to drop off in the LDC's, world fiber use in 1980 might not exceed 30 million metric tons.

Outlook for Cotton's Share

Trends in Cotton's Share

Cotton's share has been trending downward in about four-fifths of the regions established in this study (table 14). Surprisingly, the largest decreases in share between 1953 and 1967 occurred in less developed countries: Taiwan, Iran, South Korea, and South East Asia, all with drops of 16 to 36 percentage points. Decreases of 14 to 17 percentage points occurred in the USSR, Peru, Other North Africa, the United States, and the EC.

Regions in which cotton use increased as a percentage of total fiber use were Hong Kong 18/, Syria, the Sudan, Colombia, the UAR, and Central America.

Factors Affecting Cotton's Share

The major factors affecting cotton's share of total fiber use are price competition among fibers, domestic availability of cotton versus manmade fibers, physical differences among fibers, and extent of promotion.

Prices of cotton and competing fibers are the factors most influencing cotton's share of total fiber use. An increase in the price of cotton--other prices and factors remaining constant--or a decrease in the price of competing fibers relative to cotton could be expected to affect a decrease in cotton's share and, in turn, in per capita cotton use over what it would otherwise be.

Rayon and polyester staple are the fibers most intensely competitive with cotton. Wholesale list prices of these two fibers, as available in a few countries, have been trending downward. 19/ The decreases in rayon prices have corresponded with those of cotton. However, the decreases in polyester prices have been relatively greater than those of cotton, particularly in recent years. In the United States, the cotton/polyester price ratio increased from 0.24 in 1952 to 0.38 in 1965 and then to 0.62 in 1967 (see appendix table A-3).

List prices of manmade fibers (including both polyester and rayon) are sometimes deceptive because of discounting or off-list selling. In the United States, for example, actual prices of branded polyester fiber during January 1969 were reportedly some 10 cents per pound below the list price of 61 cents (52, p. 6). Prices of unbranded fibers were reported to be below 40 cents per pound. Regular rayon listed in early 1969 at 28 cents per pound was reportedly available at around 25 cents per pound.

Discount prices of particular manmade fibers vary according to competitive conditions, including the level of cotton prices, even though the list price remains the

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18/ Estimate for cotton's share in Hong Kong may not be accurate because of large stocks for export.

19/ List prices are available on some fibers for most highly developed countries, but series are frequently incomplete, noncomparable, or deceptive because of off-list selling. The prices used here were compiled by FAS/USDA largely from Skinner's Record, a British publication which ceased to publish such international price series in September 1966 because of (paraphrased) the vastly increased number of fiber producers, complexity of fiber types and brands, and introduction of different price scales (see Sept. 1966 issue of Skinner's Record).

Table 14.--Cotton's share of domestic fiber availability, 1953 and 1965-67

Region	1953	1965-67 average	Range 1953-1967	Point change 1953 to 1965-67
			Percent	
Developed				
United States	68	54	68-53	-14
Canada	59	51	59-50	-8
EC	56	42	57-42	-14
United Kingdom	49	43	53-42	-6
Other Western Europe	58	47	58-45	-11
Japan	57	44	58-43	-13
Australia & New Zealand	50	48	58-47	-2
South Africa	51	46	53-44	-5
Weighted average	61	49	61-48	-12
Central Plan				
Eastern Europe	59	46	59-45	-13
USSR	82	66	82-65	-16
Communist Asia	97	92	97-90	-5
Weighted average	83	69	83-69	-14
Less Developed				
Mexico	74	68	77-65	-6
Central America & Caribbean	75	77	68-79	+2
Brazil	82	77	83-76	-5
Colombia	72	78	71-80	+6
Peru	73	1/58	2/73-55	2/-15
Other South America	66	3/63	2/70-65	-6
East & West Africa	83	80	83-64	-3
United Arab Republic	83	87	83-88	+4
Sudan	72	87	72-91	+15
Other North Africa	62	47	62-38	-15
Iran	82	46	82-45	-36
Syria	51	67	44-75	+16
Turkey	75	73	82-72	-2
Other West Asia	60	54	60-50	-6
India	95	90	95-89	-5
Pakistan	93	91	98-90	-2
Other South Asia	82	69	84-67	-13
South East Asia	92	76	92-72	-16
Hong Kong	47	71	83-47	+24
South Korea	83	65	83-57	-18
Taiwan	94	63	94-56	-31
Other East Asia & Pacific	79	72	88-69	-7
Weighted average	83	77	83-76	-6
Total World				
Weighted average	72	60	72-60	-12

1/ 1964. 2/ 1953-64. 3/ Includes Peru.

Source: Calculated from FAO total fiber use data (15, 19, and 25).

same. 20/ This is particularly so for rayon prices. Neither the extent or duration of the discounts are reported systematically. 21/

The outlook for long-run changes in price levels, which the list prices roughly depict, is for little real change in rayon prices and continuing declines in real polyester prices. Rayon has apparently about achieved available economies of scale in production, given present and foreseeable technology. The leveling out of the rayon list prices in recent years suggest this, although a rather major factor has been the leveling out of world cotton prices. Recently, an increase in U.S. rayon list prices (in current dollars) has occurred, suggesting inflationary pressures and tightening margins.

The downward trend in real polyester prices occurring in countries with available data showed no leveling off as of 1964-67 (fig. 2). More recent data, when available, will probably show some slackening in the rate of price decline in the United States and the United Kingdom, such as occurred in the case of nylon prices in the United States beginning in the early 1960's. In the United States and the United Kingdom, a continuation of this drop would result in polyester list prices under 20 cents per pound by the late 1970's--an improbability. According to the International Cotton Advisory Committee, (ICAC) reductions in real price may result from increases in production capacity and additional research and development efforts (52, p. 7). The ICAC also notes that profit margins on many manmade fibers have already declined significantly with the result that producers will find it necessary to increase production and sales to maintain profit levels.

A subjective guess as to what may happen to polyester list prices in the 1970's is depicted in figure 2. It is expected that list prices in major manufacturing areas will continue declining but at a lessening rate, leveling off at around 38-40 cents (1968 constant prices) by the late 1970's. Again, these are projected wholesale list prices; actual wholesale prices could be from 5 to 10 cents below these.

A further element involved in price competition should also be mentioned. Cotton prices have been more unstable than prices of competing fibers because of fluctuating supply (caused by weather conditions and government policies), textile inventory cycles, and other factors. This situation may have contributed to the conversion of mills from cotton to manmade fibers in some countries. Supplies of manmade fibers are more certain and prices more predictable.

Domestic availability is sometimes a crucial factor in less developed countries. The increases in cotton's share between 1953 and 1964 which occurred in Hong Kong, Syria, the Sudan, Colombia, the UAR, Central America, and Turkey were the result of installation of cotton textile mills as a part of industrialization. Import protection has usually accompanied mill installation.

Cotton textile mills appeal to some less developed countries because cotton is often produced domestically, whereas manmade fibers must still be imported, or produced locally on a high cost basis unless large volumes can be achieved.

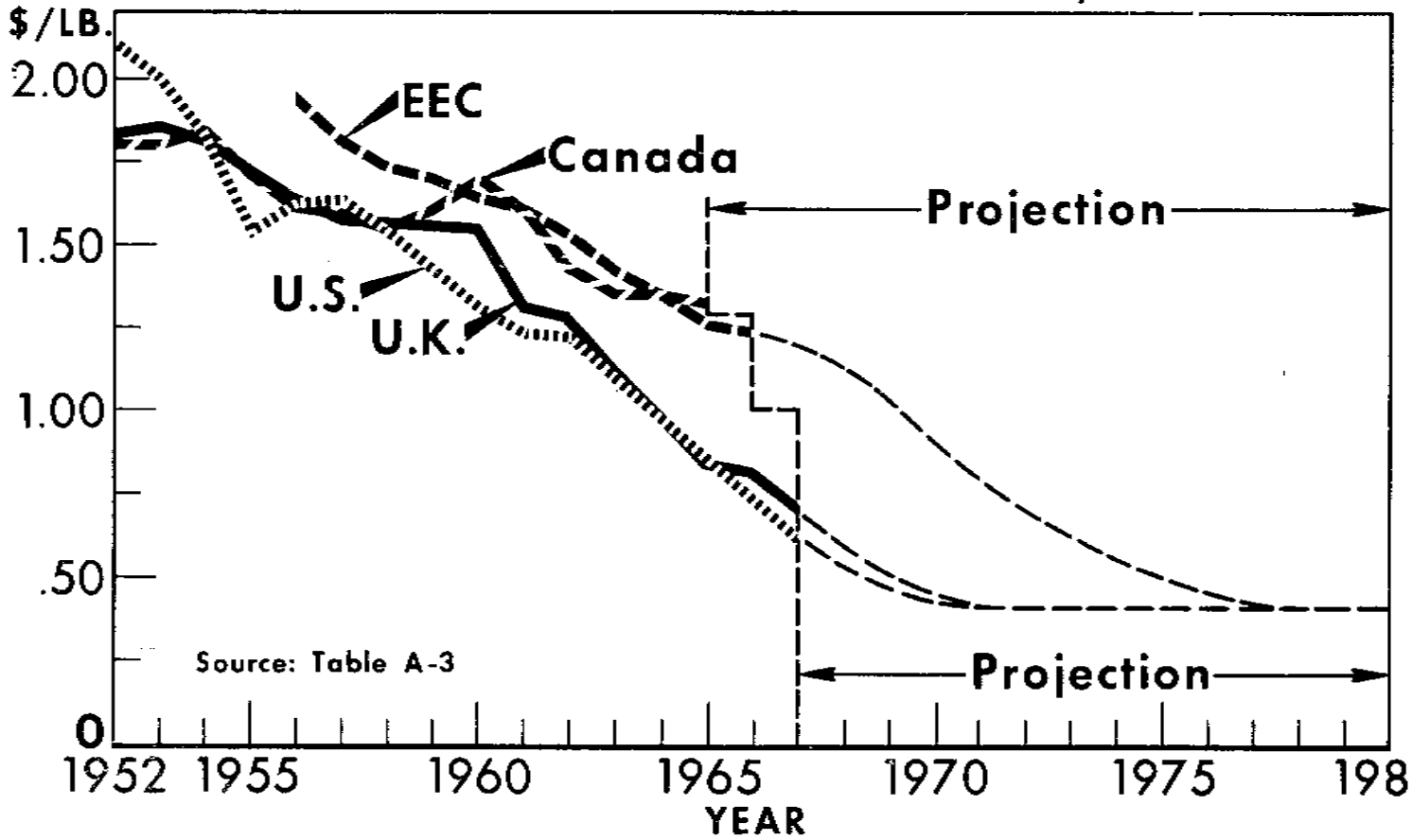
Future expansion in cotton textile production in Africa, South East Asia, Other East Asia and Pacific (Indonesia, Malaysia, and Philippines), and Other West Asia will help maintain cotton's share in these regions over what would otherwise be the case.

20/ For example, see (44, p. 9, 52).

21/ Because of the inavailability and discounting problems, analysis of cotton use involving prices of competing fibers usually has not been undertaken in the past or has proved inconclusive (8, p. 25, 14, 52, p. 8).

Figure 2. LIST PRICES OF POLYESTER STAPLE FIBER, SELECTED REGIONS, 1952-1967 AND PROJECTIONS TO 1980

(Prices in Constant 1968 Currency)



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However, manmade fiber production is also expanding in some LDC's (e.g., Mexico, Peru, Colombia). Cotton's share in these regions will drop at a faster rate in the future than in the past.

Physical differences have both positive and negative effects on cotton's share. Manmade fibers generally have greater strength and durability than cotton, while cotton has greater absorbency (and thus coolness) and softness or comfort.

The introduction of the wash-and-wear and permanent press processes has favored manmade fibers. Consumers in high income countries are increasingly purchasing these convenient, time-saving textiles (promotion as well as income is a factor here), even though they sacrifice some coolness and softness. The permanent press process, although it requires cotton to absorb the chemical, so weakens the cotton fibers that a 100-percent cotton fabric is not sufficiently durable for consumer acceptance. Manmade fibers are blended in to strengthen the fabric.

Although the prices of permanent press fabrics have generally been higher than nonpermanent press items, the consumer response has been great and a key factor in recent decreases in cotton's share. This has been particularly so in the United States and is becoming so in other developed countries and some less developed.

Efforts to develop a 100-percent cotton permanent press fabric continue. However, considerably more funds have gone into research and development of the manmades. Although this is likely to continue, cotton interests have stepped up their efforts. The International Institute for Cotton (IIC) is increasingly undertaking or financing research and development efforts with funds received from cotton producers in many countries.

Promotion is rapidly becoming a key factor in fiber competition. Advertising played an important role in making manmade fibers acceptable to consumers, and manmade fiber producers still expend many times more funds on advertising than cotton producers do. They frequently influenced the fabric blend ratio by subsidizing the promotional efforts of clothing manufacturers.

Promotion to date has not been as important in less developed and central plan countries as in developed countries. However, it will certainly be a major factor along with price and availability in future decreases in cotton's share in many less developed areas (e.g., Mexico, South America, South Korea, Taiwan, and Hong Kong).

Projections of Cotton's Share

Time trend projections.--Significant time trends of the historical period were extended to 1980 using two equations: linear and semilog. 22/ The linear projection shows what would happen if cotton's share continued dropping in the same absolute average yearly amount as in the historical period. The semilog projection permits a decrease in the yearly absolute amount of change over time.

About two-thirds of the regions had statistically significant downward time trends in the historical period. Extension of these trends to 1980 indicates large decreases in cotton's share from 1967 for the United States, the USSR, Communist Asia, Canada, Peru, Taiwan, Brazil, and Other South America.

Similar time trend projections made for the developed sector showed cotton's share dropping from 49 percent in 1965-67 to 37-40 percent in 1980. These projections come

22/ For R^2 values and significance of trends, see appendix table A-8.

out slightly higher than the weighted averages of the regional time trend projections. No sector projections were made for the central plan countries because of the economic diversity of the included countries. For the less developed sector, the historical trend was too weak for projection.

Projections at different price levels.--One set of projections of cotton's share in 1980 was made with equations using the difference (D) between projected prices for cotton and those for competing fibers. World cotton price in 1980 was set at levels ranging from 24 to 30 cents per pound. 23/ Synthetic fiber price was lowered to 40 cents per pound, wholesale list.

Another set of projections made from the equations involving the ratio (R) of cotton to synthetic fiber price were generally somewhat lower than those involving price difference (D) (table 15). 24/ In most cases, the price ratio projections seemed unrealistically low; two were negative, while others were in the 4 to 20 percent share range.

The accepted projections for most regions were arrived at by selecting from the alternative projections the one which seemed most reasonable under the particular price assumption. However, for those regions with upward, level, or nonsignificant trends in the historical period, projections were made simply from available information on likely direction and magnitude of share changes.

A lowering of world cotton price from 30 to 24 cents per pound in the price difference equations tended to increase cotton's projected share for 1980 by 1 to 2 percentage points. 25/ In the price ratio equations, share increased much more, up to 10 points. The latter increase seemed unreasonable in lieu of the promotional and product differences, so the former range was accepted. Even small changes in share for several regions add up to important increases in world cotton use.

By 1980, cotton's shares of fiber use in the various developed regions will range from 30 up to 42 percent, depending on the region and price assumption, compared with 42 to over 50 percent in 1965-67 (table 15). For the developed sector as a whole, cotton's share is projected to drop to 33-35 percent by 1980, or 14 to 16 percentage points below the 1965-67 level.

In the central plan regions, cotton's share in 1980 is expected to range from 36-37 percent in Eastern Europe up to 75 percent in Communist Asia. This will be down from 46 and 92 percent, respectively, in 1965-67. For the central plan sector as a whole, the projected drop in share will be from 69 percent in 1965-67 to 54 percent in 1980. Lower world cotton prices probably will not affect cotton's share in the USSR and Communist Asia because of central planning and barter trade.

Cotton's share can also be expected to drop rather sharply in many LDC's. By 1980, the projections show cotton's share ranging from around 35-37 percent in Other North Africa up to 80 percent in India, Pakistan, and the UAR. In 1965-67, the range among the LDR's was from 46 percent to 92 percent. For the less developed sector as a whole, the expected drop in cotton's share will be from 76 percent in 1967 to 66-68 percent in 1980.

23/ Thirty cents was about the 1965-68 average for SM 1-1/16 inch cotton, c.i.f., Liverpool (appendix table A-2).

24/ Statistical results of the time series equation are presented in appendix table A-8.

25/ See appendix table A-9.

Table 15.--Projections of cotton's share of domestic fiber use to 1980

Region	1965-67 share	Projected 1980 share 1/					Change 1965/67-80
		Time trends	30¢ cotton price			24¢ price accepted 2/	(24¢ price)
			D	R	Accepted		
	Percent of total fiber use						Points
Developed							
United States	54	32-36	33-44	12-27	33	34	-20
Canada	51	40-42	32-39	20	32	34	-17
EC	42	32-35	32	19	32	34	-8
United Kingdom	43	29-31	30-34	20-26	30	32	-11
Other Western Europe	47	41-44	41	neg.	40	41	-6
Japan	44	30-34	41	4	34	35	-9
Australia & New Zealand	48	41-42	40-41	11-14	38	40	-8
South Africa	46	level	n.a.	n.a.	40	42	-4
Weighted average	49	33-36	n.a.	n.a.	33	35	-14
Direct projection		37-40	37-43	14-27	33	35	
Central Plan							
Eastern Europe	46	36-39	n.a.	n.a.	36	37	-9
USSR	66	48-51	n.a.	n.a.	48	48	-18
Communist Asia	92	82-84	n.a.	n.a.	75	75	-17
Weighted average	69	56-58	n.a.	n.a.	54	54	-15
Less Developed							
Mexico	68	61-63	56-65	26-44	56	58	-10
Central America & Caribbean	77	up	n.a.	n.a.	70	71	-6
Brazil	77	72-73	73-74	52	62	64	-13
Colombia	78	level	n.a.	n.a.	65	67	-11
Peru	4/58	36-40	33-34	WS	40	42	-16
Other South America	5/63	48-50	47-50	27-30	47	49	-14
East & West Africa	80	up	n.a.	n.a.	75	75	-5
United Arab Republic	87	level	n.a.	n.a.	80	80	-7
Sudan	87	53-57	63-65	52	75	75	-12
Other North Africa	47	10-20	n.a.	n.a.	35	37	-10
Iran	46	18-25	n.a.	n.a.	35	37	-9
Syria	67	up	n.a.	n.a.	60	62	-5
Turkey	73	65-67	66-67	51	67	69	-4
Other West Asia	54	level	n.a.	n.a.	45	46	-8
India	90	87-88	3/(86)	n.a.	80	80	-10
Pakistan	92	83-84	3/(83)	n.a.	80	80	-12
Other South Asia	69	level	n.a.	n.a.	6/70	6/71	6/+2
South East Asia	76	65-68	n.a.	n.a.	65	66	-10
Hong Kong	71	up	n.a.	n.a.	60	62	-9
South Korea	65	50-53	48	37	50	52	-13
Taiwan	63	38-45	28	15-neg.	45	47	-16
Other East Asia & Pacific	72	level	n.a.	n.a.	65	67	-5
Weighted average	77	n.a.	n.a.	n.a.	66	68	-9
Total World							
Weighted average	60	n.a.	n.a.	n.a.	47	48	-12
Direct projection		49-51	n.a.	n.a.	47	48	

1/ Projections are based mostly on analysis of 1953-64 data, since 1965-67 data were generally unavailable at the time; see appendix D for implications. Time trend refers to extension of simple trend to 1980. Lower figure is linear trend, while upper is semilog (time logged) trend. Cotton price refers to price of SM 1-1/16 inch, Liverpool, in constant 1968 currency. The "D" projections are based on price difference between polyester and cotton, while the "R" projections are based on ratio of cotton to polyester price. Polyester list price in 1980 is assumed to be 40¢/pound. For details of equations and statistical results, see appendix table A-8. 2/ Based in part on time series analysis (see appendix table A-9). 3/ Based on price of cotton only, rather than price difference or price ratio. 4/ 1964. 5/ Includes Peru. 6/ These projections are too high in light of more recent data; 63-65 percent share in 1980 now appears more realistic, which would be 4-6 percentage points below the 1965-67 average.

Source: 1965-67 share is calculated from FAO data (25).

Worldwide, cotton's share in 1980 is projected at 47-48 percent, compared with 60 percent in 1967. The 47-48 percent is just below the 49-percent share indicated by the linear time trend projection.

The "accepted" projections of cotton's share in 1980 are generally lower than those arrived at in the NACFF study published in 1967 (appendix C-1). The differences range from 3 to 7 percentage points for the three sectors and 4-5 points for the entire world. The use of slightly more recent data and the outlook for a more rapid than then expected increase in manmade fiber use account for most of the differences.

Outlook for Cotton Use

Trends in Per Capita Cotton Use

Per capita cotton use has been increasing in most of the regions, the exceptions being the United States, Communist Asia, Brazil, Other South America, Other North Africa, India, Taiwan, and Other East Asia (table 16). As noted previously, cotton's decreasing share was the major problem in the United States and Other North Africa, while low income and per capita total fiber growth joined in to bring about the drop in the other regions.

Between 1953 and 1965-67, each of the sectors showed an expansion in average per capita use of between 0.2 and 0.4 kilograms. The largest increase was in the developed sector, while the smallest was in the less developed.

Projections of Per Capita Cotton Use

Projected per capita cotton use in 1980 was obtained by multiplying projected per capita total fiber use by cotton's projected share. The results are presented in table 16. The medium projections are the most likely.

Medium projections.--For the world as a whole, per capita cotton use in 1980 is projected at 3.2-3.3 kilograms, with world price at 30-24 cents per pound, and medium income growth and medium income elasticities. At the 24-cent price, projected use of 3.3 kilograms would be slightly above the 1967 level. At a 30-cent price, projected use would be slightly below the 1967 level. Per capita use in the developed sector is projected to decrease over 1967 use while that in the central plan and less developed sectors will increase.

Of the 33 regions, the projections show 21 with higher per capita use in 1980 than in 1967, and 9 with lower. The largest increases in per capita cotton use are projected for Hong Kong 26/, Japan, Other Western Europe, Eastern Europe, and Turkey. The largest decreases are projected for the United States, Canada, and Australia-New Zealand.

Direct projections of per capita fiber use in 1980 were also attempted for the developed and less developed sectors and the total world (appendix table C-2). The statistical results were good only for the less developed sector. For this region, the direct projections indicated a per capita use of 2.3-2.4 kilograms, compared with the accepted 2.1-2.2 kilograms. The lower accepted projections result from a greater expected decrease in cotton's share in some LDC's than is indicated by historical trends.

Alternative projections.--Per capita cotton use in the LDC sector would increase substantially under the high LDC income growth rate assumption (table 16). Use could

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26/ The change in Hong Kong is probably overstated. Large year-to-year fluctuations in stocks make Hong Kong's consumption extremely difficult to estimate.

Table 16.--Domestic per capita cotton availability, historical and projected 1980

Region	1953 1/	1965-67 average	Projected 1980 2/			Change 1965-67 to 1980 (medium)
			Medium income	High LDC income	Low LDC income	24¢ price
			Kilograms			
Developed						
United States	11.6	11.0	8.8-9.1			-1.9
Canada	7.0	7.7	5.4-5.8	Same		-1.9
EC	4.3	4.6	4.9-5.2	as		+0.6
United Kingdom	5.5	6.4	5.5-5.9	medium		-0.5
Other Western Europe	3.3	4.3	5.2-5.4			+1.1
Japan	3.6	5.0	6.3-6.5			+1.5
Australia & New Zealand	4.5	7.4	5.6-5.9			-1.7
South Africa	2.6	3.7	3.3-3.5			-0.2
Weighted average	6.4	6.8	6.3-6.6			-0.2
Central Plan						
Eastern Europe	3.2	4.4	5.2-5.3			+0.9
USSR	5.1	6.7	7.2	Same		+0.5
Communist Asia	1.9	1.6	1.9	as		+0.3
Weighted average	2.7	3.0	3.2	medium		+0.2
Less Developed						
Mexico	2.4	2.9	3.2-3.3	3.9-4.1	2.6-2.7	+0.4
Central America & Caribbean	1.8	2.5	2.4-2.5	3.7-3.8	2.1-2.2	-
Brazil	3.4	3.1	3.1-3.2	4.4-4.6	2.7-2.8	+0.1
Colombia	2.5	3.1	3.2-3.3	4.0-4.1	2.7-2.8	+0.2
Peru	1.7	3/1.8	1.6-1.7	2.1-2.2	1.4-1.5	4/+0.1
Other South America	3.3	5/3.0	2.9-3.0	3.4-3.6	2.5-2.6	4/-0.3
East & West Africa	0.9	1.3	1.0	1.3	1.0	-0.3
United Arab Republic	2.9	3.9	4.4	5.3	3.8	+0.5
Sudan	1.3	1.8	2.1	2.6	1.8	+0.3
Other North Africa	1.4	1.3	1.0-1.1	1.2-1.3	0.9	-0.2
Iran	1.4	2.0	2.0-2.2	2.5-2.7	1.6-1.7	+0.2
Syria	2.7	4.1	4.1	5.0	3.5	-
Turkey	3.6	4.5	5.2-5.3	6.6-6.8	4.7-4.8	+0.8
Other West Asia	1.0	2.5	2.0-2.1	2.5-2.6	1.7-1.8	-0.4
India	2.0	2.0	2.3	2.8	2.1	+0.3
Pakistan	1.4	1.9	2.2	2.8	2.0	+0.3
Other South Asia	1.1	1.2	1.8	2.1	1.5	+0.6
South East Asia	1.3	1.5	1.4-1.6	1.8-2.0	1.2-1.4	+0.1
Hong Kong	3.6	4.2	6.7-6.9	8.7-9.0	5.4-5.6	+2.7
South Korea	1.7	2.0	2.0-2.1	2.6-2.7	1.6-1.7	+0.1
Taiwan	2.9	2.8	3.0-3.1	4.8-5.0	2.7-2.8	+0.3
Other East Asia & Pacific	1.2	1.2	1.2	1.4	1.0	-
Weighted average	1.8	2.0	2.1-2.2	2.7-2.8	1.9	+0.2
Total World	3.12	3.25	3.2-3.3	3.5-3.6	3.1-3.2	-

1/ 1952-54 average for individual country regions. 2/ Lower figure in the range assumes an average price for SM 1-1/16 inch cotton, c.i.f., Liverpool, of 30¢/pound; while the higher figures assume a price of 24 cents. Where no range is shown, change in projected per capita use was less than 0.05 kilograms. Some of the regional projections now appear low in light of improved 1965-67 data not available at the time; see appendix D. 3/ 1964. 4/ 1964-1980. 5/ Includes Peru.

Sources: Historical figures are calculated from FAO total cotton use data (15, 19, 23, 25), except 1953 U.S. figures are USDA. Projections are based on medium elasticity projections of per capita fiber use and projected cotton's share.

reach 2.7-2.8 kilograms, compared with the medium projections of 2.1 to 2.2. Average world use would also be greater, possibly by 0.3 kilograms per capita. Alternatively, low LDC income growth would lower both LDC and world average cotton use to or below 1965-67 levels.

Trends in Total Cotton Use

Total domestic end use of cotton has been increasing in all the regions delineated in this study, even those with decreases in per capita use (table 17). Expansion has been greatest in the less developed sector, as evidenced by its increasing share of world cotton use--28 percent in 1967, compared with 26 percent in 1953. The lowest expansion occurred in the developed sector.

Projections of 1980 Total Cotton Use

Projections of total domestic cotton end use in 1980 were made by multiplying each region's projected per capita use at alternative prices by projected population. The results are presented in table 17.

Medium projections.--Under the medium income assumptions, world use in 1980 is projected to range from about 14.6 to nearly 15 million metric tons, depending on the level of world cotton prices, compared with around 11 million tons in 1965-67. (In terms of bales, the projections indicate 67 to 69 million, compared with about 52 million in 1965-67). Nearly half of projected expansion in world cotton use will take place in the less developed sector, with its share projected to increase to 33 percent by 1980, up from 28 percent in 1967. The least expansion will occur in the developed sector, with a substantial decrease from 1967 projected in share of world use.

The projections indicate that total cotton use will continue increasing in all regions, except for possibly the United States, Canada, the United Kingdom, and Australia-New Zealand, if world cotton price should climb back to the 30-cent level of 1965-67. With prices declining to 26 cents, some expansion in total use is projected even for these countries, except for Canada.

At a 26-cent world cotton price, the greatest increases in total domestic cotton use are projected for Communist Asia, India, the USSR, Japan, the EC, Eastern Europe, and Pakistan.

The projected effect of world price on total domestic cotton use differed by sectors, with the least effect likely in the central plan sector because of government intervention. The projections indicate that a 1-cent decrease in price will result over the long run in an average increase in total cotton use of about 40,000 metric tons in the developed sector, 3,000 in the central plan, 25,000 in the less developed, and 68,000 metric tons worldwide.

Alternative projections.--Total cotton use in 1980 would differ somewhat from the projected 14.8 million metric tons at the 26-cent price if income growth rates should be higher or lower than the medium assumptions. Higher income growth in the less developed sector could raise projected world use to 16.1 million metric tons. A sizable deterioration in LDC's income growth could lower projected world use to around 14.2 million metric tons.

Table 17.--Domestic total cotton use, historical and projected 1980

Region	1953 1/	1965-67 average	Projected 1980 2/						Change 1965-67 to 1980 (Medium 26¢)	
			Medium Income				High LDC income	Low LDC income		
			30¢	28¢	26¢	24¢	26¢	26¢	Quantity	Percent
	Million metric tons									Percent
Developed										
United States	1.854	2.165	2.12	2.14	2.17	2.20			--	--
Canada	.103	.156	.14	.14	.15	.15			-.01	-6
EC	.687	.840	.97	.99	1.01	1.03	Same as		.17	20
United Kingdom	.281	.350	.33	.34	.35	.36	Medium 26¢		--	--
Other Western Europe	.271	.378	.50	.51	.51	.52			.13	34
Japan	.311	.495	.70	.71	.72	.73			.22	44
Australia & New Zealand	.053	.108	.10	.10	.11	.11			--	--
South Africa	.033	.069	.09	.09	.09	.09			.02	27
Subtotal	3.593	4.560	4.95	5.02	5.11	5.19	5.11	5.11	.51	11
Percent of world	(44)	(41)	(34)	(34)	(35)	(35)	(32)	(36)	(14)	
Central Plan										
Eastern Europe	.358	.538	.72	.73	.73	.74	Same as		.19	35
USSR	.957	1.576	2.00	2.00	2.00	2.00	Medium 26¢		.40	25
Communist Asia	1.130	1.399	2.05	2.05	2.05	2.05			.65	46
Subtotal	2.445	3.524	4.77	4.78	4.78	4.79	4.78	4.78	1.27	36
Percent of world	(30)	(31)	(33)	(33)	(32)	(32)	(30)	(34)	(35)	
Less Developed										
Mexico	.071	.129	.23	.23	.24	.24	.30	.20	.11	85
Central America & Caribbean	.048	.095	.13	.13	.14	.14	.21	.12	.04	40
Brazil	.187	.258	.39	.40	.40	.41	.57	.35	.14	54
Colombia	.031	.058	.09	.09	.10	.10	.12	.08	.04	67
Peru	.016	3/.020	.03	.03	.03	.03	.04	.03	4/.01	4/50
Other South America	.147	5/.206	.23	.23	.23	.23	.27	.20	4/.05	4/31
East & West Africa	.157	.251	.32	.32	.32	.32	.41	.32	.07	28
United Arab Republic	.064	.117	.20	.20	.20	.20	.25	.18	.08	67
Sudan	.012	.024	.04	.04	.04	.04	.05	.03	.02	50
Other North Africa	.034	.039	.05	.05	.05	.05	.06	.04	.01	25
Iran	.025	.050	.07	.07	.08	.08	.10	.06	.03	60
Syria	.010	.022	.04	.04	.04	.04	.05	.03	.02	50
Turkey	.082	.143	.24	.24	.24	.24	.31	.22	.10	71
Other West Asia	.020	.073	.08	.08	.08	.08	.10	.07	.01	14
India	.751	1.007	1.60	1.60	1.60	1.60	1.93	1.45	.59	58
Pakistan	.108	.219	.37	.38	.38	.39	.48	.34	.16	73
Other South Asia	.030	.043	.09	.10	.10	.10	.12	.09	.06	150
Southeast Asia	.069	.124	.16	.17	.18	.20	.23	.15	.06	50
Hong Kong	.008	.016	.04	.04	.04	.04	.05	.03	.02	100
South Korea	.036	.059	.09	.09	.09	.09	.11	.07	.03	67
Taiwan	.024	.035	.06	.06	.06	.06	.09	.05	.02	50
Other East Asia & Pacific	.126	.182	.28	.28	.29	.30	.34	.23	.11	61
Subtotal	2.056	3.151	4.83	4.87	4.93	4.98	6.19	4.34	1.78	57
Percent of world	(26)	(28)	(33)	(33)	(33)	(33)	(38)	(30)	(50)	
Total World	6/8.094	6/11.225	14.55	14.67	14.82	14.96	16.08	14.23	3.59	
Percent	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	

1/ 1952-54 average. 2/ Price refers to SM 1-1/16 inch cotton, c.i.f., Liverpool, constant 1966 currency. 3/ 1964. 4/ 1964-1980. 5/ Includes Peru. 6/ Differ slightly from ICAC totals (table 4) because of use of FAO and USDA data.

Sources: Historical data are FAO (15, 19, 25) and USDA.

Production Situation and Trends

In recent years, about 45 percent of the world's cotton has been produced in less developed countries, 32 percent in central plan areas, and 23 percent in the developed sector (table 18).

The world's largest producer is the United States, with one-fifth of total world production in 1965-67 (table 18). The USSR is the second largest, with about 18 percent of world production. Mainland China ranks third and India fourth. Brazil has recently pushed ahead of Mexico for fifth position. Others, in order, are the United Arab Republic, Pakistan, Turkey, the Sudan, Syria, and Iran.

Regions showing the highest absolute increases in production over the last decade have been the USSR, Turkey, Brazil, Central America, India, Pakistan, the UAR, and the Sudan. Other regions with high relative increases have been Australia, Colombia, and Greece. Recent production has been below levels of a decade ago in the United States, Argentina, and Eastern Europe.

Both cotton area and yields have been increasing in most of the producing countries of the world (table 19). In absolute terms, the greatest area expansion has taken place in Tropical (East and West) Africa 27/, Brazil, the USSR, the Sudan, Pakistan, and Central America (in that order). Significant expansion has also occurred in South East Asia, Colombia, and Iran. Large decreases in area occurred between 1955 and 1967 in the United States, Communist Asia (mostly Mainland China), Mexico, and Other South America (mostly Argentina).

Increase in yield has been phenomenal in Australia; the absolute increase itself being higher than the average yield of most other countries. 28/ Regions with less spectacular, but sizable yield increases were Turkey, Other West Asia, Other Western Europe, and Central America.

India has by far the largest area in cotton of any country, nearly 20 million acres, but its yields are among the lowest in the world. Mainland China has the second largest acreage, over 12 million, but with better yields. The United States is third in acreage, but first in production because of much higher yields.

Australian cotton yields averaged over 900 pounds per acre in 1965-67. The next highest yield shown--727 pounds per acre--occurred in the USSR, but Soviet cotton acreage is over 100 times that of Australia. Other regions with average yields over 600 pounds per acre were Central America and Mexico. Lowest yields occurred in Other East Asia and Pacific, India, East and West Africa, and South East Asia.

27/ Area statistics for Tropical African countries are not considered reliable, so those used here must be considered only an order of magnitude.

28/ Australia began subsidizing cotton production in the early 1960's. The subsidies attracted new farmers, many of them American. There was an increase in acreage, a shift to irrigated land, the introduction of new techniques and the resulting phenomenal yield increase.

Table 18.--Cotton production in 1965-67 and change over 1955-57

Region	1965-67 average		Change over 1955-57 average		
	1,000 bales	1,000 metric tons	1,000 bales	1,000 metric tons	percent
Developed					
United States	10,642	2,317	-2,234	-486	-17
Canada	-	-	-	-	-
EC	14	3	-32	-7	-70
United Kingdom	-	-	-	-	-
Other Western Europe	754	164	300	65	140
Japan	-	-	-	-	-
Australia & New Zealand	109	24	106	23	+++
South Africa	70	15	41	9	141
Subtotal	11,589	2,523	-1,819	396	-14
Percent of world	(23)	(23)			
Central Plan					
Eastern Europe	113	25	-14	-3	-11
USSR	9,133	1,988	2,600	566	40
Communist Asia	6,713	1,462	108	24	2
Subtotal	15,959	3,475	2,694	586	20
Percent of world	(32)	(32)			
Less Developed					
Mexico	2,292	499	250	54	12
Central America & Caribbean	1,123	244	716	156	176
Brazil	2,417	526	967	211	67
Colombia	388	84	283	62	269
Peru	485	106	-9	-2	-2
Other South America	575	125	-126	-27	-248
East & West Africa	1,731	377	500	109	85
United Arab Republic	2,162	471	533	116	33
Sudan	847	184	400	87	89
Other North Africa	40	9	24	5	150
Iran	564	123	284	62	101
Syria	685	149	246	54	56
Turkey	1,683	366	1,010	220	150
Other West Asia	177	39	84	18	90
India	4,833	1,052	690	150	17
Pakistan	2,107	459	687	150	48
Other South Asia	114	25	42	9	58
South East Asia	213	46	88	19	70
East Asia & Pacific	21	5	-54	-12	-72
Subtotal	22,457	4,889	6,615	1,440	42
Percent of world	(45)	(45)			
Total World	50,005	10,887	7,490	1,631	18

Note: Figures may not add or convert exactly because of rounding.

Source: USDA/FAS.

Table 19.--Cotton area and yields in major producing regions and worldwide, average 1955-57 and 1965-67

Country	Area				Yields			
	1955-57 average	1965-67 average	Change		1955-57 average	1965-67 average	Change	
	1,000 acres			Percent	lbs./acre			Percent
Developed								
United States	15,367	10,388	-4,979	-32.4	402	492	90	22.4
Canada	--	--	--	--	--	--	--	--
EC	115	28	-87	-75.7	192	240	48	25.0
United Kingdom	--	--	--	--	--	--	--	--
Other Western Europe	862	806	-56	-6.5	253	449	196	77.5
Japan	2	--	-2	-100.0	96	--	--	--
Australia & New Zealand	10	58	48	480.0	144	902	758	526.4
South Africa	47	83	36	76.6	296	405	109	36.8
Subtotal	16,403	11,363	-5,040	-30.7	392	490	98	25.0
Central Plan								
Eastern Europe	608	203	-405	-66.6	100	267	167	167.0
USSR	5,233	6,033	800	15.3	599	727	128	21.4
Communist Asia	14,633	12,288	-2,345	-16.1	217	262	45	20.1
Subtotal	20,474	18,524	-1,950	-9.5	311	414	103	33.1
Less Developed								
Mexico	2,347	1,798	-549	-23.4	418	612	194	46.4
Central America & Caribbean	439	861	422	96.1	445	626	181	40.7
Brazil	4,333	5,367	1,034	23.9	161	216	55	34.2
Colombia	170	414	244	143.5	296	450	154	52.0
Peru	582	550	-32	-5.5	407	423	16	3.9
Other South America	1,650	1,182	-468	-28.4	204	234	30	14.7
East & West Africa	5,736	6,824	1,088	19.0	103	122	19	18.4
United Arab Republic	1,829	1,863	34	1.9	428	557	129	30.1
Sudan	697	1,164	467	67.0	308	349	41	13.3
Other North Africa	35	60	25	71.4	219	320	101	46.1
Iran	633	874	241	38.1	212	310	98	46.2
Syria	637	650	13	2.0	331	506	175	52.9
Turkey	1,555	1,741	186	12.0	208	464	256	23.1
Other West Asia	205	193	-12	-5.9	218	440	222	101.8
India	19,956	19,767	-189	-.9	100	117	17	17.0
Pakistan	3,592	4,044	452	12.6	190	250	60	31.6
Other South Asia	180	301	121	67.2	192	182	-10	-5.2
South East Asia	484	755	271	56.0	124	135	9	7.3
Hong Kong	--	--	--	--	--	--	--	--
South Korea	250	47	-203	-81.2	131	184	53	40.4
Taiwan	10	4	-6	-60.0	144	360	216	150.0
Other East Asia & Pacific	34	15	-19	-55.9	115	96	-19	-16.5
Subtotal	45,354	48,474	3,120	6.9	168	222	54	32.1
Total World 1/	82,202	78,303	-3,899	-4.7	248	305	58	23.4

1/ Total may not equal sum of items because of rounding.

Source: USDA/FAS.

Factors Affecting Production Trends

Factors which affect trends in cotton production are: (1) world cotton prices; (2) government intervention in production, marketing, and prices; (3) comparative advantage; (4) land availability; and (5) technological change. 29/

World cotton prices.--Prices in major importing markets have been trending downward because world supply has been increasing faster than demand. The outlook is for further decreases in the future (see projection sections).

Declining price has had and will continue to have the effect of dampening world production from what it otherwise would be. When other affecting factors are held constant, price and cotton production are positively correlated.

The net response of acreage or production to changes in price has been the subject of other studies (table 20). The elasticity coefficients encountered have generally fallen in the 0.2 to 2.5 range (production or acreage changes by 0.2 to 2.5 percent for each 1-percent change in price), depending upon the region or country, the time period, and whether the price series used was world or domestic.

Government intervention frequently modifies the extent to which domestic prices reflect the world price situation. An example is the USSR, where the government recently raised domestic prices to stimulate production, even though world prices were trending downward. Also, in the UAR the government sets both prices and the area seeded, with the goal of maximizing foreign exchange earnings. In still other countries, prices are supported and imports restricted to stimulate domestic production and conserve foreign exchange. The United States uses price supports and import restrictions to increase producer returns.

The outlook is for more rather than less intervention. As brought out in the Introduction, export earnings from cotton are extremely important to many LDC's. The inclination will be to assure continuance of such earnings unless the land can be put into other export-earning or import substitution crops.

Comparative advantage.--Many factors enter into the determination of comparative advantage in cotton production. Production costs and returns are the most easily measurable indicators. But the availability of alternative land uses, the location of producing countries, processing costs, and product quality are equally important determinants.

Until recently, little information was available on comparative costs and profitability of growing cotton in the major competing countries. The Foreign Agricultural Service (FAS) of the U.S. Department of Agriculture is now investigating this subject in visits to foreign producing countries. Some roughly comparable information has already been gathered in Brazil, Mexico, Central America, Pakistan, and Iran.

South Brazil, Pakistan, Guatemala, and Iran appear to have both a total and direct cost advantage over Mexico, the United States, and El Salvador (table 21). 30/ Returns

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29/ A general discussion of these factors is given here. For more specific details on factors (2) to (5) for the various regions, see appendix B.

30/ Total cost includes land rental, whereas direct cost does not. Direct costs are believed to be the better indicators of short-run production incentives, except in those cases where cotton is grown on rented land by persons whose main interests lie outside of agriculture.

Table 20.--Estimates of price elasticity of cotton production and acreage

Country or region	Time period	Price elasticity	Independent variables 1/	Source
United States:				
Production	1910-1924	0.22		Walsh (74)
Production	1925-1933	0.25		Walsh (74)
Production	1962 estimated	8.0 average 20-22¢		S-42 Tech. Com. (67, table 17)
Production	1962 estimated	3.5 average 22-25¢		S-42 Tech. Com. (67, table 17)
Production	1962 estimated	0.9 average 25-30¢		S-42 Tech. Com. (67, table 17)
Foreign Free World:				
Acreage in 43 countries	1948-1963	0.20 (3.4) 2/	P, T-1948-55, T-1956-63, zero one 3/	Cathcart & Donald (8)
Acreage--total FFW	1953-1968	0.67 (6.0)	P, T, T^2	Unpublished USDA/FAS
Production--total FFW.	1953-1968	0.75 (3.3)	P, T, T^2	Unpublished USDA/FAS
Production--total FFW.	1953-1957	0.89 (3.3)	P, T, T^2	Unpublished USDA/FAS
Acreage	1953-1968	0.08 (0.6)	P, T	Unpublished USDA/FAS
Production	1953-1968	0.32 (2.2)	P, T	Unpublished USDA/FAS
Other Countries or Regions:				
Central America:				
Acreage	1953-1967	2.27 (2.6)	P, T	Unpublished USDA/FAS
Acreage	1953-1967	3.59 (3.1)	P, T, T^2	Unpublished USDA/FAS
Production	1953-1967	2.00 (1.8)	P, T	Unpublished USDA/FAS
Mexico--acreage	1953-1967	2.06 (3.1)	P, T, T^2	Unpublished USDA/FAS
Brazil--acreage	1953-1967	1.26 (1.9)	P, T, T^2	Unpublished USDA/FAS
Colombia--acreage	1953-1967	wrong sign	P, T, and P, T, T^2	Unpublished USDA/FAS
Peru--acreage	1953-1967	wrong sign	P, T, and P, T, T^2	Unpublished USDA/FAS
Argentina--acreage	1953-1967	wrong sign	P, T, and P, T, T^2	Unpublished USDA/FAS
Greece--acreage	1953-1967	2.64 (2.4)	P, T, T^2	Unpublished USDA/FAS
Spain--acreage	1953-1967	wrong sign	P, T, and P, T, T^2	Unpublished USDA/FAS
Syria--acreage	1953-1967	2.28 (2.5)	P, T, T^2	Unpublished USDA/FAS
Turkey--acreage	1953-1967	0.25 (2.0)	P, T	Unpublished USDA/FAS
Turkey--production	1953-1967	2.08 (4.1)	P, T	Unpublished USDA/FAS
UAR--acreage	1953-1967	wrong sign	P, T, and P, T, T^2	Unpublished USDA/FAS
India--acreage	1953-1967	0.58 (2.7)	P, T, T^2	Unpublished USDA/FAS
Pakistan--acreage	1953-1967	0.35 (1.1)	P, T	Unpublished USDA/FAS
Pakistan--acreage	1953-1967	0.43 (0.9)	P, T, T^2	Unpublished USDA/FAS
Pakistan--production	1953-1967	1.10 (3.4)	P, T	Unpublished USDA/FAS

1/ P = price, usually led 1 year; T = time trend; T^2 = time trend squared to give curvilinear effect. 2/ Number in parenthesis is t-value of the regression coefficient. 3/ Included to account for change in trend.

Table 21.--Rough estimates of costs and returns to cotton production in a few countries

Country and year	Producer prices	Cost		Net returns		Average yield	Net returns per acre	
		Direct	Total	Over direct cost	Over total cost		Over direct cost	Over total cost
	cents/pound					lbs./acre	$ per acre	
United States, 1966/67								
Including allotment payments	30.5	17.0	23.9	13.5	6.6	540	77	41
Excluding allotment payments	20.6	17.0	23.9	3.6	-3.3	540	19	-18
Mexico, 1969/70								
Average	23.7	22.5	25.5	1.2	-1.8	706	8	-13
West coast	23.8	21.9	24.8	1.9	-1.0	775	14	-8
Central America, 1967/68								
El Salvador	27.0	(17.5)	(24.0)	(9.5)	(3.0)	763	(72)	(23)
Guatemala	27.0	14.1	20.1	12.9	6.9	771	116	70
Iran, 1968/69								
Average	24.0	17.1	21.2	6.9	2.8	351	24	10
Superior producers	24.5	13.5	n.a.	11.0	n.a.	743	82	n.a.
Pakistan, 1968/69								
Average	22.0	15.7	20.1	6.3	1.9	268	17	5
Superior producers	22.7	12.4	n.a.	10.3	n.a.	587	60	n.a.
South Brazil, 1968/69								
Average	17.5	12.0	16.3	5.5	1.2	366	20	4
Efficient producers	17.5	9.9	13.1	7.6	4.4	585	44	25

Source: U.S. data are from 1966 Supplement to Costs of Producing Cotton in the United States, Agr. Econ. Report No. 99, except figures are adjusted to a net weight, prior growing basis, to be comparable with the foreign data. The foreign data are USDA/FAS, except figures in parentheses are derived from original FAS estimates and revised data on yields (41; 42; p.4, 73).

per pound of cotton and per acre appeared to be the highest in the United States (when allotment payments are included) and Central America, lower in Iran, Pakistan, and South Brazil, and lowest in Mexico. However, the U.S. advantage in profitability would disappear if the allotment payments were withdrawn. There is slight subsidization of cotton production in some foreign countries through credit terms, input prices, etc., but probably not enough to alter the picture. Adequate data are not available on production costs in other countries, but most observers characterize Greece, Australia, South Africa, Colombia, Peru, and Syria as relatively high-cost producers; while Tropical African countries and Turkey are low-cost producers.

Alternative land use is another important component of comparative advantage. If cotton is the most profitable crop within a given producing area, it is not likely to be replaced, regardless of how production costs compare with those of other areas. In parts of South Brazil, cotton holds an economic advantage over both peanuts and corn, the major competing crops (64). It also has a strong comparative advantage over crops for the use of the considerable amount of newly cleared land available in most years. In Central America, farmers who obtain good yields with reasonable production efficiency find cotton much more profitable than alternative products (40). In both Pakistan and Iran, farmers look upon cotton as a sure, profitable crop, and acreage has been expanding despite declining world cotton prices (42). In Mexico, high yielding land will give profitable returns at the present or even lower prices (41). In the UAR, the profitability of cotton is above that of sugarcane, and considerably above that of grains and oilseeds (75). In the Sudan, the profitability of cotton is more than double that of any other major crop (75, p. 32). In some countries, where no alternative export crops have been developed, cotton holds an advantage just because it has an export market.

A further factor in the competition between cotton and alternative crops is the institutionalization of cotton production. Production loans, credit extension for fertilizer, etc., is frequently more available for cotton than for other crops because of the marketability of the product. This is changing as communications improve and marketing channels for other products build up, but it still causes farmers in many areas to plant cotton when other crops could be as profitable.

The location of cotton-producing countries is a determinant of comparative advantage. Exporters near major importing areas, or with cotton-producing regions near their points of embarkation have advantages over other exporters. In these respects, cotton exporters of the Mediterranean area, like Egypt, Syria, Turkey, and Greece, are likely to have a transport cost advantage in European markets not enjoyed by more distant producers. Countries with poor or difficult transport facilities for exports (Afghanistan and Chad are extreme examples) suffer a disadvantage, compared with countries whose cotton is grown nearer to their ports.

Processing costs, particularly ginning, can be a determinant of comparative advantage. As table 22 shows, ginning costs vary widely from country to country. These costs can make a 1- or 2-cent difference in the cost per pound of cotton.

Countries that produce higher quality cotton (e.g., longer staple and higher grade) benefit from higher export prices. Egypt, the Sudan, and Peru, in particular, benefit from higher world prices for long and extra-long staple cottons, but their growing costs are also somewhat higher. Handpicked cotton is usually cleaner (higher grade) than machine-picked cotton. Grade of cotton is also affected by soil types, rainfall, defoliation methods, temperature, insect damage, ginning methods, storage, and transportation.

Comparative advantage also underlies shifts in area within countries and among producers. Such shifts have been responsible for a sizable part of the increase in average yeilds in many countries. Shifts occur most rapidly in times of dropping prices and absence of government programs and price intervention.

Table 22.--Ginning charges and output 1/ in selected countries

Country	Gin installations 2/	Production	Average	
			Output per gin	Estimated charge per bale 3/
	- Number 4/ -	1,000 bales 5/	Bales 5/	- - US $ - -
Brazil, Southern	229	2,500	10,900	12.50
Colombia	60	650	10,800	7.43
El Salvador	13	205	15,800	14.00
Greece	67	404	6,000	7.00
Guatemala	27	335	12,400	12.50
Iran	250	519	2,100	7.50
Mexico	214	2,400	11,200	15.00
Tanzania	34	235	6,900	11.52-15.84
Turkey	676	2,000	6/	10.00-12.00
Uganda	52	348	6,700	16.00
United States	4,218	10,948	2,596	18.64

1/ 1968/69 season, except 1966/67 season for Greece and Iran. 2/ Saw gins in all countries except Tanzania and Uganda where all were roller gins and in Turkey where all but 34 were roller gins. 3/ Includes bagging and ties in all countries, and seed cotton drying in the United States. 4/ Partly estimated. 5/ 500 pounds gross weight. 6/ Not applicable.

Source: Vernon L. Harness. "Comparison of U.S. and Foreign Cotton Ginning." Foreign Agriculture, Jan. 19, 1970.

Land availability.--Cotton acreage and production have expanded during the last decade in Australia, Brazil, Central America, and Colombia because of new lands coming into cultivation and/or under irrigation. In Mexico, cotton acreage has moved into new areas, and much of the old cotton acreage has been turned over to competing crops. In the Sudan, and to a lesser extent in Australia, most of the cotton cropland expansion was into newly irrigated arid lands. The expansion in Brazil, Central America, and Colombia was principally into previously underutilized pastureland. Considerable amounts of new land suitable for cotton production remain in Australia, Brazil, other Latin American countries, the Sudan, many Tropical African countries, the USSR, and elsewhere. Some of this available land, particularly in Australia, the Sudan, and the USSR, would require irrigation before it could be brought under cotton cultivation.

Technological change, particularly as it affects yields and production efficiency, has great potential in many producing countries. Central America has had severe problems with insect control which, along with inefficient use of insecticides, raised costs. This is now being corrected, farm sizes are getting larger and, in general, production efficiency is increasing (73). In South Brazil, cotton is now considered a permanent rather than a transition crop and efforts are underway to increase yields through improved soil fertility, insecticide application, and better seed (64). Other areas, like India, Pakistan, and Tropical Africa, with relatively inefficient production methods, can be expected to make technological advances during the 1970's. These changes will be principally in the area of better seeds, improved cultivating practices, and the use of some modern inputs, especially insecticides.

In Pakistan, India, Mainland China, and several African countries, considerable potential exists for improving presently low yields. Progress has been slow to date, but the demonstration effect of the "Green Revolution" may considerably change farmer attitudes and adaptive practices. Use of improved cotton varieties could greatly increase yields in some areas. In Iran, yields are improving with advances in reclamation, irrigation, and insecticide use. As yet, little fertilizer is used, so considerable potential exists here.

Statistical Analysis

Time and resource limitations of this study did not permit extensive new statistical analysis of the factors affecting cotton supply in the various regions to use as input for projections. However, analysis to provide some guidelines was made of 1955-69 time series data on area, yield, and production for the following sectors: foreign developed (excluding the United States), central plan, less developed, and foreign world. The equations fitted and statistical results are summarized in table 23.

The regressions were generally better (higher R^2 values and higher levels of significance of coefficients) for yields and production than for area. However, acceptable results for area were obtained for the less developed sector and for total foreign world. The statistical results of the linear and semilog equations provided no basis for choosing one over the other.

The price of cotton had a significant and positive relationship with both area and yields in the less developed sector, with yields in the foreign developed sector, and with area in the total foreign world. 31/ For the less developed sector, the elasticities of response to price were 0.19 to 0.23 for acreage, about 0.21 for yields, and 0.32 to 0.46 for production. The higher elasticity of production than of acreage

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31/ Cotton price used in all cases was the average Liverpool price of SM 1-1/16 inch cotton, lead 1 year and deflated to constant 1968 currency (see appendix table A-2).

Table 23.--Direct projections of sector and foreign world cotton area and average yields in 1980

Sector and equation 1/	Area			Yield			Production			Price elasticities 2/		
		Significance level			Significance level		Direct projections					
	R^2	Time	Price	R^2	Time	Price	R^2	Significance level: Time	Price	Area	Yield	Production
Foreign Developed												
$Y = a + b \log T$	0.02	0.70		0.89	0.001							
$Y = a + b T$	.03	.60		.90	.001							
$Y = a + b \log P + c \log T$	.11	.25	.30	.92	.001	.05	0.75	0.10	0.40	n.s.	0.84	n.s.
$Y = a + b P + c T$	.15	.20	.25	.94	.001	.02	.74	.01	.70	n.s.	.71	n.s.
Central Plan												
$Y = a + b \log$	.21	.05		.73	.001							
$Y = a + b T$	.20	.10		.73	.001							
$Y = a + b \log P + c \log T$	.26	.80	.50	.75	.05	.40	.26	.40	.90	n.s.	n.s.	n.s.
$Y = a + b P + c T$	.28	.90	.90	.75	.05	.30	.27	.30	.99	n.s.	n.s.	n.s.
Less Developed												
$Y = a + b \log T$	.69	.001		.96	.001							
$Y = a + b T$	.69	.001		.96	.001							
$Y = a + b \log P + c \log T$	.84	.001	.005	.97	.001	.10	.97	.001	.005	.23	.21	.46
$Y = a + b P + c T$	.82	.001	.02	.96	.001	.25	.99	.001	.02	.19	n.s.	.32
Foreign World												
$Y = a + b \log T$	.24	.10		.92	.001							
$Y = a + b T$	.25	.10		.92	.001							
$Y = a + b \log P + c \log T$	.66	.05	.005	.92	.001	.99	.91	.001	.25	.23	n.s.	n.s.
$Y = a + b P + c T$	.69	.05	.001	.92	.001	.70	.91	.001	.40	.20	n.s.	n.s.

1/ In the equations: Y = area, yield, or production; T = time; and P = price of SM 1-1/16 inch cotton, Liverpool, deflated and led 1 year (see appendix table A-2). Time series analysis covered period 1955-69. 2/ n.s. means regression coefficient not significant.

Source: Time series data were FAS/USDA.

reflects the effect of price on yields, suggesting that area response is generally greater in regions where yields are also more responsive to price, or that area response is greater in those regions where yields are higher. For the foreign world, the area response to price changes was near 0.23. The insignificance of the price variable in the central plan sector is evidence of a high level of government intervention in domestic pricing and production planning.

Regional Price Elasticities

Estimated long-run responses of acreage in various countries and regions to change in world price levels are presented in table 24. These responses are based on the statistical analysis of the major sectors just discussed, on the statistical analysis performed by others (see previous discussion and table 20), and on judgments derived from reports by USDA personnel traveling or stationed in the various countries. Again, the time and scope limitations of this study did not permit extensive new statistical analysis on regional supply.

The highest area responses are estimated for Mexico and Central America, both at 1.5, and for Colombia, South Brazil, Peru, Turkey, and Syria, at 0.6 to 1.0. Price is not expected to influence area in the central plan countries because of government intervention or in India because of high domestic use. It is likely that price will only marginally affect area in Africa, North Brazil, and in many Asian producing countries because of low costs, protected markets, or few alternative crops of similiar profitability.

If yields are fairly homogeneous among producing areas, the response of production to change in price is the same as that of acreage. However, if the acreage response occurs primarily in areas of high yields relative to the average yield of all areas, the production response would be higher than the acreage response.

It may be valid to assume homogeneous yields within certain countries, but it cannot be valid to do so for large aggregates of countries, such as the less developed world where average yields vary greatly among countries.

Higher production responses frequently occur in areas with higher yields, such as Central America, Mexico, and Turkey. Thus, the result of a 1-percent drop in world price would be an aggregate decrease of 0.46 percent in production in LDC's, compared with a 0.25-percent decrease in acreage (table 24). Such a divergence would hold for the foreign free world as a whole, because of the importance of less developed producing countries. For the developed foreign producing countries, the aggregate coefficients came out to be 0.27 for acreage and 0.26 for production.

Projections of Production in 1980

Direct projections of foreign sector and world area, yields and production for 1980 were made by extension of the equations (with significant coefficients) developed in the time series analysis (table 25). In the multiple equations, world price for 1980 was set at levels ranging from 24 to 30 cents per pound for SM 1-1/16 inch cotton, c.i.f., Liverpool (in constant 1968 currency).

The linear projections always came out higher than the semilog, because of the upward trends and because the former function assumes that the average (absolute) rate of increase in the historical period will continue through 1980, while the latter

Table 24.--Estimated long-run responses of cotton acreage in foreign producing countries and regions to changes in world price levels, projection period of 1970-80

Country or region	Estimated price elasticity	Comments 1/
Developed		
Western Europe	0.3	In Greece, government policies (high subsidies and production goals) isolate producers from world price levels. However, high production costs and importance of exports permit some price responsiveness. In Spain, growers produce for a protected home market, but the increasing importance of imports allows price to play some role.
Australia & South Africa	0.1	Low response because production is for a protected domestic market.
Weighted average 2/.	0.27 for acreage; 0.26 for production	
Central Plan		
USSR	0.0	Government sets the price independently of world prices. The growers, however, are very responsive (E = 1.0 to 2.0) to prices set by the government.
Eastern Europe	0.0	Production is very minor and isolated from world prices.
Mainland China	0.0	Production entirely for domestic market, which is isolated from international prices. Cotton imports are not an alternative to domestic supply.
Weighted average	0.0	
Less Developed		
Mexico	1.5	Based in part upon FAS unpublished analysis. Mexico is a relatively high cost producer. Average price for lint (before ginning) was 23.7¢ in 1969/70. Direct cost of production (weighted average) was 22.5¢ per pound and total cost 25.5¢. There are several alternatives to cotton production.
Central America.	1.5	Based in part upon FAS unpublished analysis. Central America is a high cost area. About 90% of production is exported. Weighted average costs for the region (67/68) are approximately 20.2¢ per pound direct and 26.0¢ total. The average farm price in 1967/68 was 26.5¢ per pound. Only Nicaragua is highly dependent upon cotton exports.
Brazil, North.	0.0	Most cotton here is a perennial type (and therefore unresponsive to annual price changes); where this cotton is grown there is very little in the way of alternative crops. Perennial cotton has the advantage of being able to survive drought.

--Continued

Table 24.--Estimated long-run responses of cotton acreage in foreign producing countries and regions to changes in world price levels, projection period of 1970-80--Continued

Country or region	Estimated price elasticity	Comments 1/
Less Developed--continued		
Brazil, South.	0.8	Based in part upon FAS unpublished analysis. This is a very low cost area, 12.0¢ per pound average direct and 16.3¢ total, while farm price in 1968/69 averaged 17.5¢ per pound. However, farmers have good alternative crop potentials, making this area more price responsive than might otherwise be the case.
Colombia	1.0	Farmers are considered to be price responsive. Costs are relatively high (total costs of 23¢ per pound average against an average price of 24¢ in 1968/69). There are good alternative crops but their profitability does not approach cotton's.
Peru	0.8	Cotton is produced on irrigated land, expansion potential is limited, and production costs are relatively high (26¢ per pound), although Peru's long and extra-long staple varieties command high prices. In some areas alternative crops are limited, but recent trends in the Tanguis area (2/3 of crop) indicate relatively high price responsiveness by producers.
Other South America. .	0.4	Mostly Argentina and minor producers. Most production is for domestic use, as a means of saving foreign exchange.
East & West Africa . .	0.1	Cotton production relatively isolated from international prices. In many places there are no alternative cash crops. In most countries, input costs (especially labor) are very low.
United Arab Republic .	0.1	The UAR is the world's major supplier of extra-long staple cotton (ELS). The Government sets the acreage and farm price, isolating the grower from prices on world markets. Egypt is an efficient producer and the domestic market takes about a third of the crop.
Sudan.	0.1	The Sudan is the world's other major supplier of ELS. Growers are isolated by government intervention from prices on world markets. There are few other alternative export crops.
Other North Africa . .	0.4	Mostly Morocco. Growers here are not subject to as many government controls as in the UAR and the Sudan.
Iran	0.2	Should be relatively inelastic. The Ministry of Agriculture controls acreage and regions of cotton cultivation. Domestic consumption (about one-third) is important. Low cost producer. Average price in 1968/69 was 24¢ per pound, direct cost of production only about 17.1¢, and total cost was 21.2¢ per pound.

--Continued

Table 24.--Estimated long-run responses of cotton acreage in foreign producing countries and regions to changes in world price levels, projection period of 1970-80--Continued

Country or region	Estimated price elasticity	Comments 1/
Less Developed--continued		
Syria	0.6	Based in part upon FAS unpublished analysis. About 85 percent of total production is for the export market.
Turkey	0.8	There are good alternative crops and markets. Domestic demand (one-third) is relatively important and a moderating factor.
Other West Asia	0.4	Cotton does not play a major role in the economies of these countries.
India	0.0	Production goes mostly into domestic mill consumption. World prices should have little or no influence.
Pakistan	0.3	Low response because of low cost production. The 1968/69 price averaged 22¢ per pound and direct costs of production were only about 15.7¢, and total cost was 20.1¢ per pound.
Other South Asia	0.2	Mainly Afghanistan. Low response because of high domestic consumption needs and because much of the trade is for barter (with USSR).
South East Asia	0.4	High cost producers. Cotton production supplements imports. World price plays little or no role in Burma.
East Asia & Pacific	0.2	Production of minor importance.
Weighted average 2/	0.27 for acreage; 0.47 for production	
Total Foreign Free World 2/	0.27 for acreage; 0.46 for production	
Total Foreign World	0.20 for acreage; 0.28 for production	

1/ A large domestic market and/or a low cost position generally contributes to a relatively inelastic acreage. High cost and a greater dependence on the export market contribute to greater elasticity. However, if cotton exports are an important part of foreign exchange earnings, a country could be an inelastic supplier even though it is a high cost producer. This is especially so where few alternative export crops (or markets) exist. 2/ The aggregate elasticity of acreage was obtained by weighting the individual elasticities by the respective 1965-67 average area. The aggregate elasticity of production resulted from weighting by 1965-67 average production. On an aggregate basis, the latter is higher (and more useful) than the former because of the usually higher yields which exist in the countries or regions with the greatest acreage responses to price (see discussion in text).

Source: Largely judgment based on review of historical trends, analysis of others (see table 20), USDA/FAS trip reports and attache reports, and the sector analyses presented in table 23.

Table 25.--Direct projections of cotton area, yields, and production in 1980

Sector and equation 1/	Area	Yield	Production	
			Area x yield	Direct 2/
	Mil. acres	lbs./acre	-- Million bales --	
Foreign Developed				
Y = a + b log T	3/-	723	-	n.a.
Y = a + b T	-	773	-	n.a.
Y = a + b log T + c log P				
where P = 30¢	-	809	-	-
28	-	788	-	-
26	-	765	-	-
24	-	741	-	-
Y = a + b T + c P				
where P = 30¢	-	864	-	-
28	-	848	-	-
26	-	832	-	-
24	-	817	-	-
Central Plan				
Y = a + b log T	16.0	501	16.7	n.a.
Y = a + b T	15.7	518	17.0	n.a.
Less Developed				
Y = a + b log T	52.8	295	32.4	n.a.
Y = a + b T	53.4	307	34.2	n.a.
Y = a + b log T + c log P				
where P = 30¢	55.9	307	35.8	33.9
28	55.2	304	35.3	33.3
26	54.3	301	34.1	32.6
24	53.4	297	33.1	31.9
Y = a + b T + c P				
where P = 30¢	56.6	316	37.2	35.1
28	56.0	314	36.7	34.7
26	55.5	313	36.2	34.4
24	54.9	311	35.6	34.0
Foreign World				
Y = a + b log T	69.5	347	50.2	n.a.
Y = a + b T	70.0	359	52.3	n.a.
Y = a + b log T + c log P				
where P = 30¢	73.9	4/347	53.4	51.9
28	72.8	4/347	52.6	51.4
26	71.7	4/347	51.8	50.9
24	70.4	4/347	50.9	50.3
Y = a + b T + c P				
where P = 30¢	74.7	4/359	55.9	53.7
28	73.9	4/359	55.3	53.4
26	73.1	4/359	54.6	53.0
24	72.2	4/359	54.0	52.4

1/ In the equations Y = area, yield, or production; T = time, and P = average price of SM 1-1/16 inch cotton, Liverpool, 1968 constant prices. 2/ Where Y in the equation represents production. 3/ No projections made where either the time or price coefficient was not statistically significant, see table 23. 4/ Held constant because price coefficient was not significant.

assumes a dropping off in rate of increase. 32/ Also, the inclusion of cotton price in the equations, with price set at 24 cents and above, always resulted in higher projections of area than the simple time trend projections. The latter assume a continuation of the declining prices of the historical period which, by 1980, would be less than 24 cents.

In brief, the projections provide the following guidelines for 1980:

(1) Foreign developed: average yields for sector could exceed 700 pounds per acre, perhaps even 800 at a 30-cent cotton price (these seemingly too high yields will be explained later). Area not significantly affected by changes in world cotton prices.

(2) Central plan: average yields for the sector could reach 475 to over 520 pounds per acre. Yields and area not significantly affected by changes in world cotton prices.

(3) Less developed: area affected appreciably and average yields slightly by price changes. Under constant prices, total area could reach 55.9 to 56.7 million acres, average yields for sector could reach 307 to 316 pounds per acre, and production (area x yields) 35.8 to 37.2 million bales.

(4) Total foreign world: area affected by changes in world cotton prices because of response in less developed sector. Yields not affected. Under constant prices, area could reach 73.9 to 74.7 million acres, yields 345 to 359 pounds per acre, and production 53.1 to 55.2 million bales.

The accepted projections of regional area, yields, and production are shown in table 26. The choices were made after examining linear trends, projections made by others, the guidelines provided by the direct sector projections, and by judgments based on an analysis of the factors discussed under "Factors Affecting Production Trends." The linear trends were mostly run on 10- or 11-year periods ending with the 1968/69 crop year.

Initial projections were made under the assumption of a 30-cent price. Projections at 28-, 26-, and 24-cent prices were made by adjusting downward the initial area projections in accordance with the price elasticities estimated for each region. Regional yields in 1980 were assumed to be not affected by price changes, which is a simplifying abstraction. However, in each sector except the central plan, sector yields did decrease with decreases in price because of the higher area responses in regions with the highest yields.

The regional projections add up to a foreign world production in 1980 ranging from 54.4 million bales (11.8 million metric tons) at a 24-cent price up to 57.4 million bales (12.5 million metric tons) at a 30-cent price. These foreign world production projections as well as the area and average yield projections on which they are based fall close to the linear direct projections presented earlier.

To balance world cotton production with cotton use, U.S. production in 1980 would need to range from 9.4 million bales at the 30-cent world price to 14.3 million bales

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32/ Note that in the semilog equations, time, not the dependent variable, is expressed in logarithms (i.e., $Y = a + b \log T$). This equation was used because projections with a decreasing rate of growth over time were desired.

Table 26.--Accepted projections of cotton area, yields, and production in 1980 1/

Region	Cotton area				Yield	Production in bales				Production in metric tons 2/			
	30¢	28¢	26¢	24¢	(at 26¢)	30¢	28¢	26¢	24¢	30¢	28¢	26¢	24¢
	Million acres				lbs./acre	Million bales				Million metric tons			
Developed													
United States 3/	7.18	8.31	9.61	10.90	630	9.40	10.89	12.59	14.28	2.05	2.37	2.74	3.11
Other Western Europe	.65	.64	.62	.61	640	.87	.85	.83	.82	.19	.19	.18	.18
Australia & New Zealand	.10	.10	.10	.10	1,000	.21	.21	.21	.21	.05	.05	.05	.05
South Africa	.15	.15	.15	.15	700	.22	.22	.22	.21	.05	.05	.05	.05
Subtotal	8.08	9.20	10.48	11.76	695	10.70	12.17	13.85	15.52	2.34	2.66	3.02	3.39
Percent of world	(10)	(11)	(12)	(14)		(16)	(18)	(20)	(23)	(16)	(18)	(20)	(23)
Central Plan													
Eastern Europe	.10	.10	.10	.10	290	.06	.06	.06	.06	.01	.01	.01	.01
USSR	7.00	7.00	7.00	7.00	775	11.30	11.30	11.30	11.30	2.46	2.46	2.46	2.46
Communist Asia	12.50	12.50	12.50	12.50	350	9.11	9.11	9.11	9.11	1.98	1.98	1.98	1.98
Subtotal	19.60	19.60	19.60	19.60	501	20.47	20.47	20.47	20.47	4.45	4.45	4.45	4.45
Percent of world	(24)	(24)	(24)	(24)		(31)	(30)	(30)	(30)	(31)	(30)	(30)	(30)
Less Developed													
Mexico	1.60	1.44	1.28	1.12	750	2.48	2.25	2.00	1.75	.54	.49	.44	.38
Central America & Caribbean	.89	.80	.71	.62	670	1.24	1.12	.99	.87	.27	.24	.22	.19
Brazil	7.50	7.20	6.89	6.59	300	4.68	4.50	4.31	4.12	1.02	.98	.94	.90
Colombia	.70	.65	.61	.56	600	.89	.82	.76	.70	.19	.18	.16	.15
Peru	.60	.57	.54	.50	550	.69	.65	.61	.58	.15	.14	.13	.13
Other South America	1.04	1.01	.98	.96	350	.75	.74	.72	.70	.16	.16	.16	.15
East & West Africa	9.30	9.24	9.17	9.10	200	3.87	3.85	3.82	3.78	.84	.84	.83	.82
United Arab Republic	1.80	1.79	1.78	1.76	700	2.63	2.61	2.59	2.57	.57	.57	.56	.56
Sudan	1.50	1.49	1.48	1.47	500	1.56	1.55	1.54	1.53	.34	.34	.34	.33
Other North Africa	.06	.06	.06	.06	400	.05	.05	.05	.05	.01	.01	.01	.01
Iran	1.00	.99	.97	.96	500	1.04	1.03	1.01	1.00	.23	.22	.22	.22
Syria	.80	.77	.74	.70	600	1.00	.96	.92	.88	.22	.21	.20	.19
Turkey	1.80	1.72	1.63	1.54	700	2.60	2.48	2.36	2.25	.57	.54	.51	.49
Other West Asia	.25	.24	.24	.23	520	.27	.26	.26	.25	.06	.06	.06	.05
India	20.00	20.00	20.00	20.00	180	7.50	7.50	7.50	7.50	1.63	1.63	1.63	1.63
Pakistan	4.80	4.74	4.66	4.56	400	3.99	3.95	3.88	3.79	.87	.86	.85	.83
Other South Asia	.30	.30	.29	.29	240	.15	.15	.14	.14	.03	.03	.03	.03
South East Asia	.84	.81	.79	.77	170	.29	.28	.28	.27	.06	.06	.06	.06
East Asia & Pacific	.02	.02	.02	.01	240	.01	.01	.01	.01	-	-	-	-
Subtotal	54.80	53.84	52.84	51.80	307	35.68	34.76	33.75	32.74	7.76	7.56	7.35	7.12
Percent of world	(66)	(65)	(64)	(62)		(53)	(52)	(50)	(47)	(53)	(52)	(50)	(47)
Foreign World 4/	75.30	74.33	73.31	72.26	363	57.45	56.51	55.48	54.45	12.50	12.30	12.08	11.85
Total World	82.48	82.64	82.92	83.16	389	66.85	67.40	68.07	68.73	14.55	14.67	14.82	14.96

1/ Assumes medium economic growth and various price levels. Price refers to SM 1-1/16 inch cotton, c.i.f., Liverpool, 1968 constant currency. 2/ Figures may not add or convert exactly because of rounding. 3/ What U.S. area and production would need to be if world production were to equal world cotton use at the given price. 4/ Excluding United States.

at 24 cents. 33/ This would require only between 7.2 and 10.9 million acres, compared with an average of 11.4 million in 1965-67.

At a 26-cent world cotton price in 1980, world cotton productions would equal world cotton use of 14.8 million metric tons, with a U.S. production level of 2.74 million metric tons (12.6 million bales). This level of world production would be around one-third larger than the average output of 1965-67 (table 27). Nearly two-thirds of this increase in world production is projected to occur in the less developed sector, increasing this sector's share of world production from about 45 percent in 1965-67 to 50 percent in 1980. Shares of both the developed and central plan sectors would decrease by 2 to 3 percentage points.

Regions with the largest projected increases in production at the 26-cent price level are India, Mainland China, the USSR, East and West Africa, the United States 34/, Brazil, and Pakistan. Mexican and Central American production at this price level in 1980 is likely to be below 1965-67 averages. At a 26-cent price, the United States would remain the world's largest producer, but at a higher price (which is likely only if the United States cuts back production) it would probably be surpassed by the now second place USSR.

Large acreage expansion is projected for East and West Africa, Brazil, the USSR, Pakistan, and the Sudan. In most other regions, the production increases will come heavily from yield improvements.

The projections accepted here at a 26-cent price are higher than those made in 1967 under a similar price assumption for the National Advisory Commission on Food and Fiber (NACFF). 35/ The principal differences are higher projections for South Asian and African countries, which now seem more probable than then.

The Indicative World Plan (IWP) projections show for 12 less developed regions a total production in 1980 of 30.9 million bales, a slightly higher figure than the 29.2 million bales projected for the same regions at a high 30-cent price. The IWP appears extremely optimistic for South Asia, with 4 million bales over what seems reasonable. However, Brazilian production may well be a million bales above the IWP goal.

Supply and Demand study (S&D) projections available for some countries tend to be optimistic. 36/ Compared with the S&D projections, substantially lower production is anticipated in 1975 and 1980 in Mexico, Central America, Peru, Brazil, and India. However, expected 1980 production in Pakistan would be nearly 1 million bales above the S&D projection.

Alternative high and low projections of LDC production in 1980, which correspond to the high and low LDC income projections of cotton use, are presented in table 28.

33/ This residual production assumption does not imply a passive role, since U.S. pricing and export policy could influence world price and thus the size of the residual in the long run.

34/ This would be an increase over the low 1965-67 production level but a decrease over levels of the late 1950's and early 1960's.

35/ Projections by NACFF and others are presented in appendix tables C-3 and C-4.

36/ These studies, which were made in the respective countries under contract with the USDA, are footnoted in the Literature Cited.

Table 27.--Cotton: Projected changes in area, yields, and production, 1965-67 to 1980 1/

Region	Change in area		Change in yields		Change in production	
	Million acres 2/	Percent	Pounds/ acre	Percent	Million bales 2/	Percent
Developed						
United States	0.77	7	138	28	1.94	18
EC.	-.03	-100	-	-	-.01	-100
Other Western Europe.	-.19	-23	191	43	.08	10
Australia & New Zealand	.04	72	98	11	.10	93
South Africa.	.07	81	295	73	.15	214
Subtotal.	-.88	-8	144	30	2.26	20
Central Plan						
Eastern Europe.	-.10	-49	23	9	-.05	-45
USSR.	.97	16	48	7	2.16	24
Communist Asia.	.21	2	88	34	2.40	36
Subtotal.	1.08	6	87	21	4.51	28
Less Developed						
Mexico.	-.52	-29	138	23	-.29	-13
Central America & Caribbean	-.15	-18	44	7	-.13	-12
Brazil.	1.52	28	84	39	1.89	78
Colombia.	.20	47	150	33	.37	95
Peru.	-.01	-2	127	30	.12	27
Other South America	-.20	-17	116	50	.14	24
East & West Africa.	2.34	34	78	64	2.09	121
United Arab Republic.	-.08	-4	143	26	.43	20
Sudan	.31	27	151	43	.69	81
Other North Africa.	-	-	80	25	.01	25
Iran.	.10	11	190	61	.45	80
Syria	.09	14	94	19	.23	35
Turkey.	-.11	-6	236	51	.68	40
Other West Asia	.05	24	80	18	.08	31
India	.23	1	63	54	2.67	55
Pakistan.	.62	15	150	60	1.77	84
Other South Asia.	-.01	-4	68	37	.03	23
South East Asia	.03	5	35	26	.07	33
East Asia & Pacific	-.05	-70	88	58	-.01	-50
Subtotal.	4.37	9	85	38	11.29	50
Foreign World 3/.	5.34	8	85	31	16.12	41
Total World	4.57	6	88	29	18.06	36

1/ Assuming medium economic growth and 26-cent cotton price. Price refers to SM 1-1/16 inch cotton, c.i.f., Liverpool, constant 1968 currency. 2/ Rounded to two decimal places. 3/ Excluding United States.

Sources: Tables 18, 19, and 26.

Table 28.--Alternative projections of cotton production in 1980 1/

Region	Production in bales 2/			Production in metric tons 2/		
	Medium	High LDC	Low LDC	Medium	High LDC	Low LDC
	-- Million bales --			- Million metric tons -		
Developed						
United States 3/	12.59	14.10	12.93	2.74	3.07	2.82
Other Western Europe	.83	.83	.83	.18	.18	.18
Australia & New Zealand	.21	.21	.21	.05	.05	.05
South Africa	.22	.22	.22	.05	.05	.05
Subtotal	13.85	15.36	14.19	3.02	3.35	3.10
Percent of world	(20)	(21)	(22)	(20)	(21)	(22)
Central Plan						
Eastern Europe	.06	.06	.06	.01	.01	.01
USSR	11.30	11.30	11.30	2.46	2.46	2.46
Communist Asia	9.11	9.11	9.11	1.98	1.98	1.98
Subtotal	20.47	20.47	20.47	4.45	4.45	4.45
Percent of world	(30)	(28)	(31)	(30)	(28)	(31)
Less Developed						
Mexico	2.00	2.00	2.00	.44	.44	.44
Central America & Caribbean	.99	1.08	.94	.22	.24	.20
Brazil	4.31	4.69	4.07	.94	1.02	.89
Colombia	.76	.79	.75	.16	.17	.16
Peru	.61	.70	.55	.13	.15	.12
Other South America	.72	.75	.48	.16	.16	.10
East & West Africa	3.82	4.69	3.29	.83	1.02	.72
United Arab Republic	2.59	2.77	2.48	.56	.60	.54
Sudan	1.54	1.82	1.37	.34	.40	.30
Other North Africa	.05	.06	.04	.01	.01	.01
Iran	1.01	1.13	.92	.22	.25	.20
Syria	.92	1.05	.83	.20	.23	.18
Turkey	2.36	2.59	2.20	.51	.56	.48
Other West Asia	.26	.27	.25	.06	.06	.05
India	7.50	8.53	6.73	1.63	1.86	1.47
Pakistan	3.88	4.60	3.42	.85	1.00	.74
Other South Asia	.14	.18	.13	.03	.04	.03
South East Asia	.28	.32	.25	.06	.07	.05
East Asia & Pacific	.01	.01	.01	-	-	-
Subtotal	33.75	38.03	30.70	7.35	8.28	6.68
Percent of world	(50)	(51)	(47)	(50)	(51)	(47)
Foreign World 4/	55.48	59.76	52.43	12.08	13.01	11.41
Total World	66.07	73.86	65.36	14.82	16.08	14.23

1/ Price refers to SM 1-1/16 inch cotton, c.i.f., Liverpool, constant 1968 currency. 2/ Figures may not add or convert exactly because of rounding. 3/ What U.S. production would need to be if world production and cotton use were to be in balance at the given price. 4/ Excluding United States.

The low projections assume a substantial decline in rate of production growth. 37/ Both assume a world cotton price of 26 cents in 1980.

Under the high growth assumption, LDC and foreign world production would be some 0.9 million metric tons (4.2 million bales) above the accepted (medium) projections, and U.S. production would need to increase by 300,000 metric tons (1.5 million bales) to balance world production and consumption. The required increase in U.S. production on top of the increase in LDC production seems an inconsistency, but results from the increase in LDC cotton use under the high assumption exceeding the growth in LDC production under the same assumption. This would leave a larger "residual" for the United States to fill, as we shall see better when we project cotton lint exports.

Under the low LDC growth assumption, the projected increase in LDC production, although still sizable, would be less than the projected expansion of cotton use under the same assumption. This would again leave an additional residual, but a smaller one than the high growth case, for the United States to fill. 38/

37/ The high projections were made by increasing the compared growth rate in production between 1965-67 and 1980 (26-cent price assumption) by 1.4 times. The low projections were made by dividing the same growth rate by 1.4.

38/ LDC cotton use increases more than production in both the high and low cases, but not in the medium or most likely case, because of the income projections. Under the high assumption, per capita income and thus projected cotton use are substantially above the medium projections. However, under the low assumption, per capita income and thus projected cotton use are lower than the medium projections, but not to nearly the same extent as the high projections are above.

OUTLOOK FOR COTTON TRADE

About one-fourth of total cotton trade volume in recent years has moved as textiles, and three-fourths as cotton lint. The outlook for each is considered in this section.

Outlook for Cotton Textile Trade 39/

Situation and Trends

Developed regions of the world handled over half of the total world trade in cotton textiles in 1965-67 (table 29). Central plan areas exported about 17 percent and imported about 5 percent of the total quantity. Less developed regions accounted for about a third of world exports and 38 percent of the imports.

Major trading regions.--The EC countries together export and import more cotton textiles than any other region. However, Hong Kong and Japan are the largest export countries, followed by India and Mainland China. Other major exporters are the United States, the individual EC countries, Egypt, Portugal, the United Kingdom, the USSR, the countries of Eastern Europe, Taiwan, Spain, and South Korea.

On the import side, the United States ranks second behind the EC, followed by the United Kingdom, East and West Africa, Other Western Europe, Other East Asia and Pacific, Hong Kong (mostly for clothing manufacture and reexport), Australia-New Zealand, and Canada.

Net trade.--Cotton textile imports exceed exports in all the DR's except the EC and Japan (table 30). The CPR's were all net exporters in 1965-67. The LDR's are divided about equally into net exporters and net importers.

Japan, with little imports to offset its exports, is the world's major net exporter of cotton textiles. Next to Japan in net exports are Hong Kong, Mainland China, and India.

Changes in quantity of trade.--Significant changes in cotton textile trade have occurred since the early 1950's. Imports of the DR's have grown much more than exports, while just the opposite has occurred among the CPR's and LDR's as groups (table 30). For the DR's, the relative change was over 300 percent for imports, but only about 30 percent for exports. During the same period, total textile exports of the CPR's increased almost fourfold and those of the LDR's more than doubled. Imports of the LDR's in total increased only slightly.

39/ Data on cotton textile trade are less comparable and up-to-date than those on cotton lint. Problems include: the separation of cotton items from trade in other textiles, the estimation of the cotton content or value of blended items, and the conversion of quantities of different items to a common denominator, such as metric tons. FAO quantity data have most of these problems; in particular, they omit the trade of many clothing items and at the time of analysis were fairly complete only up to 1964. FAO has improved and updated the series; (this became available in the spring of 1970, but too late for inclusion in the analysis of this study). Revised data for 1960-66 are available for a few selected countries. GATT gathers and publishes both quantity and value data for countries participating in the Long-Term (Cotton Textile) Agreement. However, again the quantity data are frequently incomplete. The value data are more inclusive of all cotton textile trade, but since they reflect price and mix changes, also are not good indicators of changes in physical trade. The textile trade data used in this study were on an actual weight basis, rather than lint cotton equivalent. For more discussion, see appendix A.

Table 29.--Quantity of regional cotton textile trade, 1953 and 1965-67

Country or region	Imports		Exports	
	1953	1965-67 1/ average	1953	1965-67 1/ average
	1,000 metric tons			
Developed				
United States	15.8	183.7	95.8	76.4
Canada	30.5	60.6	0.4	8.4
EC	47.7	253.9	210.1	296.5
United Kingdom	18.5	163.4	118.7	45.7
Other Western Europe	56.5	139.7	32.0	123.3
Japan	0.3	6.1	114.5	191.5
Australia and New Zealand	17.3	69.3	0.1	1.6
South Africa	27.8	23.7	1.1	2.9
Subtotal	214.4	900.3	572.7	746.1
Central Plan				
Eastern Europe	3.2	34.6	35.0	133.8
USSR	-	37.5	16.0	41.0
Communist Asia	2.0	11.7	2.8	87.2
Subtotal	5.2	83.8	53.8	261.9
Less Developed				
Mexico	1.0	0.3	2.2	11.7
Central America & Caribbean	32.4	49.2	0.4	4.8
Brazil	.2	-	-	7.7
Colombia	1.7	-	0.1	5.0
Peru	1.5	2/1.2	-	2/-
Other South America	12.7	3/9.7	-	3/0.2
East & West Africa	134.7	159.8	2.4	3.5
United Arab Republic	2.9	4.7	6.1	56.0
Sudan	8.6	11.9	0.7	0.1
Other North Africa	31.5	23.4	0.9	0.6
Iran	8.3	1.3	0.5	0.1
Syria	2.6	4.1	0.8	3.3
Turkey	13.5	0.2	-	1.1
Other West Asia	12.2	41.6	1.3	10.6
India	2.0	0.2	86.4	93.5
Pakistan	11.8	0.8	-	64.4
Other South Asia	14.0	25.6	-	-
Southeast Asia	70.9	51.5	-	0.1
Hong Kong	17.2	81.4	50.8	190.8
South Korea	4.1	1.6	-	17.2
Taiwan	5.2	0.3	-	29.1
Other East Asia & Pacific	144.5	136.3	15.5	24.6
Subtotal	533.5	604.0	168.1	524.2
Total World	753.1	1,588.1	794.6	1,532.2

1/ 1967 trade more inclusive of clothing than 1953. 2/ 1964. 3/ Includes Peru.

Sources: (15, 25).

Table 30.--Changes in quantity of regional cotton textile trade, 1953 to 1965-67; net trade, 1953 and 1965-67

Country or region	Change 1953 to 1965-67				Net imports 1/	
	Quantity		Percent		1953	1965-67 average
	Imports	Exports	Imports	Exports		
	1,000 metric tons		- - Percent - -		1,000 metric tons	
Developed						
United States	167.9	-19.4	2/+++	20	-80.0	107.3
Canada	30.1	8.0	99	+++	30.1	52.2
EC	206.2	86.4	432	41	-162.4	-42.6
United Kingdom	144.9	-73.0	783	-61	-100.2	117.7
Other Western Europe	83.2	91.3	147	285	24.5	16.4
Japan	5.8	77.0	+++	67	-114.2	-185.4
Australia & New Zealand	52.7	1.5	301	+++	17.2	67.7
South Africa	-4.1	1.8	-15	164	26.7	20.8
Subtotal	685.9	173.4	320	30	-358.3	154.2
Central Plan						
Eastern Europe	31.4	98.8	981	282	-31.8	-99.2
USSR	37.3	25.0	+++	156	-16.0	-3.5
Communist Asia	9.7	84.4	485	+++	-0.8	-75.5
Subtotal	78.6	208.1	+++	387	-48.6	-178.1
Less Developed						
Mexico	-0.7	9.5	-70	432	-1.2	-11.4
Central America	16.8	4.4	52	+++	32.0	44.4
Brazil	-0.2	7.7	-100	+++	0.2	-7.7
Colombia	-1.7	4.9	-100	+++	1.6	-5.0
Peru	3/-0.3	3/-	3/-20	3/-	1.5	4/1.2
Other South America	3/-3.9	3/-	3/-31	5/-	12.7	5/9.5
East & West Africa	25.1	1.1	19	46	132.3	156.3
United Arab Republic	1.8	49.9	62	818	-3.2	-51.3
Sudan	3.3	-0.6	38	-86	7.9	11.8
Other North Africa	-8.1	-0.3	-26	-33	30.6	22.8
Iran	-7.0	-0.4	-84	-80	7.8	1.2
Syria	1.5	2.5	58	313	1.8	0.8
Turkey	-13.3	1.1	-99	+++	13.5	-0.9
Other West Asia	29.4	9.3	241	715	10.9	31.0
India	-1.8	7.1	-90	8	-84.4	-93.3
Pakistan	-11.0	64.4	-93	+++	11.8	-63.6
Other South Asia	11.6	-	83	-	14.0	25.6
South East Asia	-19.4	0.1	-27	+++	70.9	51.4
Hong Kong	64.2	140.0	373	276	-33.6	-109.4
South Korea	-2.5	17.2	-61	+++	4.1	-15.6
Taiwan	-4.9	29.1	-94	+++	5.2	-28.8
Other East Asia & Pacific	-8.2	9.1	-6	59	129.0	111.7
Subtotal	70.5	356.1	13	212	365.4	79.8
Total World	835.0	737.6	111	93	-41.5	55.9

1/ A minus indicates net exports. 2/ Percentage increase over 1,000. 3/ 1953-64. 4/ 1964. 5/ Includes Peru.

Source: Calculated from table 29.

Between 1953 and 1965-67, regions with the largest absolute increases in export quantity were Hong Kong, Eastern Europe, Other Western Europe, EC, Mainland China, Japan, and Pakistan. Largest increases in import quantity occurred in the EC, the United States, the United Kingdom, Other Western Europe, and Hong Kong (mostly for processing and reexport).

The significance of the changes is most evident in net trade. Since 1953, both the United States and the United Kingdom changed from net exporters to substantial net importers of cotton textiles. Net exports of the EC have dropped by three-fourths. In contrast, Hong Kong's net export position more than tripled, and those of the UAR, South Korea, Taiwan, and Pakistan increased by even larger proportions. Japan's net exports expanded by one-half, but declined greatly in 1967.

Many LDC's of minor importance in world textile trade have expanded exports or reduced imports through expansion of domestic textile industries. Brazil, Colombia, Turkey, Pakistan, South Korea, and Taiwan have all moved from net imports in 1953 to net exports now. Iran, Other North Africa, Other South America, Southeast Asia, and Other East Asia and Pacific have all reduced net imports.

Factors Affecting Cotton Textile Trade

The extent to which a country or region imports and exports cotton textiles depends upon: (1) comparative cost of textile manufacture, (2) product pricing policies, (3) import restrictions on cotton textiles, and (4) trade and economic development policies.

Textile manufacturing costs.--Classification of regions and countries, according to their level of development and cotton textile trade patterns, can be made as follows: (1) importing DC's, (2) low price exporters, (3) self-sufficient LDC's, and (4) net importing LDC's.

The first group, which includes all of the DC's except Portugal and Japan, provides the principal markets for the low cost exporters. Although many--the United States, the United Kingdom, and EC members--still have substantial exports, most trade remains within the group. 40/ The Canadian and Australian cotton textile industries have always supplied less than their domestic needs.

The second group, low price exporters, includes Japan, Portugal, Hong Kong, South Korea, Taiwan, India, Pakistan, the UAR, several Eastern European countries, and Mainland China. These countries accounted for most of the increase in world textile exports during the past decade. 41/

The third group, self-sufficient LDC's, encompasses many countries which supply most of their domestic textile needs but, as yet, do not export large quantities. Included are the larger Latin American countries (e.g., Argentina, Brazil, Colombia, and Mexico), and some West Asian countries (e.g., Turkey, Syria, and Iran). Some of these countries are potential low price exporters, but the majority support relatively inefficient industries behind tariff protection.

The last group, net importing LDC's, include the smaller Latin American Republics, most African, and many Asian countries. Many of these countries are developing cotton

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40/ Many individual Western European countries, notably Belgium, France, Italy, Greece, Spain, and Switzerland remain net exporters.

41/ Not all these countries are low cost producers, see discussion under "Product Pricing Policy." Japan's costs of production are rising rapidly and may move the country out of the low price exporter category.

textile industries to supply their domestic markets. Not many of the countries in this group are likely to emerge as important low price textile exporters before 1980.

Regional differences in the costs of cotton textile production were major determinants in shifts of mill consumption and cotton textile trade over the past decade and a half. By 1967, the low price exporters were supplying substantial proportions of the cotton textiles consumed in the DC's: 7.5 percent in the United States; 5.2 percent in the EC; and 30.2 percent in the United Kingdom. 42/

Several Asian exporters and Portugal enjoy a total cost advantage over the United States and Western European textile producers of 10 to 25 percent in cotton yarn spinning and of 10 to 30 percent in weaving gray cotton fabrics (69, pp. 31 and 121). Tariffs in the DC's do not compensate for cost differences of this magnitude. These average cost advantages (for upper quartile mills) are achieved because of lower labor costs (table 31), and--to a lesser extent--lower raw cotton costs in the low cost countries (69, pp. 33 and 37), even though labor productivity is much higher in Western Europe and (especially) the United States.

Where labor is expensive and the textile industry more capital intensive, as in the DC's, it is necessary to use better quality cotton to minimize breakages. The low labor cost countries are therefore able to save additionally on input costs by using lower quality cotton. Average cost per pound for cotton used in spinning 20-count yarn ranged from 27.9 to 33.4 cents in November 1967 for the nine countries listed in table 31 (69, p. 37). The cotton costs correlated closely with the wage costs. 43/

Low price exporters which grow cotton, such as Pakistan, may have an additional slight advantage in the purchase price of raw cotton. However, only about 30 percent of textiles exported over the past decade originated in cotton-producing countries (table 29). This percentage has remained quite stable.

During the next decade it is possible that the DC's may be able to improve their competitive positions vis-a-vis the low price exporters. Low cost areas may have less incentive for installing more modern looms and new capital intensive machinery, thereby giving the DC's a faster rate of growth in labor productivity. According to GATT figures, labor and machine productivity is already increasing at a faster rate in the DC's (35, p. 29). Nevertheless, it is unlikely that the DC's will be able to completely overcome the low cost textile producers' price advantage by 1980.

Product-pricing policy.--Many importing countries claim that some of the low price exporters are able to compete not because of low production costs but because of below cost selling. This complaint applies principally to the UAR and central plan exporters whose prices may frequently bear no relation to costs, but also applies to many LDC's whose need for foreign exchange makes them willing to subsidize textile exports. Among the latter, countries frequently mentioned are Pakistan, India, Mexico, and South Korea (69, p. 22, and U.S. Embassy Report, Seoul, November 1969).

Import restrictions on cotton textiles.--Restrictions on cotton textile imports are numerous. In addition to fairly high tariffs, there are other taxes, quotas, and restrictive arrangements. These restrictions for selected countries and regions are summarized in table 32.

42/ The very high figure for the United Kingdom is partially due to the tariff-free status granted cotton textile imports from the Commonwealth and the EFTA (Portugal).

43/ This argument is disputed by some, but cotton cost data is difficult to obtain. The argument, moreover, does not apply to countries which manufacture high quality domestic cotton as, for example, the UAR.

Table 31.--Indices of labor costs and productivity for cotton spinning and weaving in upper quartile mills, selected countries, November 1967

Country	Spinning			Weaving		
	Wage cost per hour	Output per man hour	Labor cost per pound of yarn	Wage cost per hour	Output per man hour	Labor cost per pound of yarn
	Index					
United States	100	100	100	100	100	100
United Kingdom	40	27	143	44	51	87
France	40	36	107	40	36	104
West Germany	54	38	136	53	46	117
Japan	18	30	57	16	33	48
Portugal	10	12	71	9	18	57
Hong Kong	14	22	57	11	23	52
India	8	11	71	7	13	52
Pakistan	6	11	50	4	13	39

Source: (69, pp. 35, 38).

Table 32.--Import restrictions on cotton textiles, selected countries and regions, 1969

Country or region	Tariffs	Kennedy Round Concessions	Nontariff barriers
Developed			
United States 1/	9 to 23% on most important items. Highest rates on clothing. Preferential rates to the Philippines until 1974.	On most items. Range to be lowered to 7-1/2 to 21%.	Bilateral agreement levels generally allow for annual average increases of around 5% in accordance with spirit of the LTA.
Canada 1/	10 to 22%. Highest on clothing, lowest on yarns. Commonwealth preference to the U.K., India, Pakistan, and Singapore, but not to Hong Kong. Preferential rates are from free to 1/2 the MFN rates.	On most items. Full 1972 cuts already made.	Various taxes plus quantitative restrictions and arrangements. Under an exception to terms of the LTA, Canada does not agree to annual import increases of a full 5%.
EC 1/	Common external tariff of 6.4 to 18% for most items. Highest on clothing. No tariffs on intra-EC trade.	On most items. Range to be lowered to 4 to 17%. Has reserved right to repeal its Kennedy Round tariff cuts if LTA is not renewed when it expires in 1970.	Various taxes. All except France require import licenses. Quantitative restrictions and bilateral arrangements. France has a quota system.
EFTA	No common external tariff. Most duties in 10 to 20% range, highest on clothing. No tariffs on intra-EFTA trade, except Portugal which gives preferential rates.	On most items by most members.	Various taxes in all countries. Switzerland and Portugal license imports.
United Kingdom 1/	7-1/2 to 28% on most important items. Lowest on yarns, highest on clothing. No tariffs on imports from EFTA or Commonwealth countries. However, duty-free status of latter will be eliminated by 1972.	On most items. Range to be reduced to 7-1/2 to 20%.	Tax to compensate for taxes on domestic products. Quantitative restrictions and arrangements. Under terms of the LTA, the U.K. accepts only a 1% annual increase in imports.
Japan 1/	4.4 to 22%. Highest rates on fabrics and clothing. No preferential rates.	On all items.	Various taxes and many other restrictions intended to keep imports very low.
Australia 1/	30 to 60%. Highest rates on clothing. Commonwealth preference given to U.K., Canada, and Ireland. Other Commonwealth members negotiate for preferences. A special LDC preference is given on a limited number of yarn and fabric items within quotas.	None.	Various taxes.
South Africa	17% average on yarns. Fabric, $0.14 to 0.17/sq. yard. Clothing, 20 to 25% average. Preferential rate on fabric imports from the U.K.	None.	Quotas on most items. Import licenses required. Minor taxes. Complex invoice system.
Central Plan			
Eastern Europe	None.	Not a party.	Import licenses plus quotas. All imports controlled by a central buying agency.
Less Developed			
LAFTA	No common external tariff. Rates of member countries are generally high, 85-over 100%. Very few concessions yet on intratrade although more are likely among Andean Group countries.	None.	Import licenses required but usually difficult or impossible to obtain.

1/ Members of the Long-Term Agreement on Cotton Textiles.

Sources: Tariff books of the cited countries; also 29, 61, 69.

The tariffs of the developed countries on cotton textile imports range between 5 and 25 percent ad valorem for most countries, with the prominent exception being Australia where duties range from 30 to 60 percent. The tariff rates generally increase with the degree of processing (i.e., the rates are lowest on yarns and highest on clothing). The tariffs imposed by the LDC's are generally in the range of 100 percent or more, if imports are allowed at all.

Kennedy Round tariff cuts on cotton textile products granted by most of the developed countries were generally in the range of 20 to 25 percent. These are programmed to take place in stages and will be complete in 1972.

Special tariff preferences on cotton textiles are given within the various trading blocs. In the EC there are no tariffs on trade among the six members and a common external tariff applies to third countries. However, tariff concessions are given to associate members - Greece, Turkey, the 18 African associates 44/, political dependencies of France and the Netherlands, and to partial associates - Morocco, Tunisia, and the East African Community (Kenya, Tanzania, and Uganda). 45/

The eight member states of EFTA have eliminated tariffs on intra-EFTA trade in industrial goods, except for Portugal and Iceland which are in the process of eliminating tariffs. Also, special trade concessions are given Finland, an associate member.

Great Britain levies no tariff duties on textile imports from Commonwealth members 46/, and other members grant special tariff rates to all or some of the Commonwealth countries. Many members also grant Commonwealth preferential rates to Ireland and the Republic of South Africa, although these countries are no longer members.

The Central American Common Market (CACM) has a common external tariff, but levies no tariff on intratrade. The Latin American Free Trade Association (LAFTA) has no common external tariff and grants few concessions on intraregional trade.

Nontariff measures are often much more restrictive than tariffs and are applied by both developed and less developed countries. These restrictions take the form of taxes to compensate for similar taxes on domestic products, other special taxes, import licensing, quotas, and "voluntary" arrangements which restrict the quantity of imports. Some LDC's (e.g., Pakistan, Brazil, and the UAR) prohibit the importation of cotton textiles.

The Long-Term Agreement on Cotton Textiles (LTA) is a multilateral agreement under GATT intended to regulate the growth of cotton textile exports from low price exporters to the United States, Canada, Australia, and Western Europe. The LTA became effective for 5 years on October 1, 1962, and has since been extended for 3 additional years. The present agreement expires September 30, 1970. As of 1969, 30 countries were members of the LTA:

44/ Burundi, Cameroon, Central African Republic, Chad, Congo (Brazzaville), Congo (Kinshasa), Dahomey, Gabon, Ivory Coast, Madagascar, Mali, Mauritania, Niger, Rwanda, Senegal, Somali Republic, Upper Volta, Togo.

45/ The agreement with the East African Community is dependent upon the completion of the ratification procedure.

46/ Beginning in 1972, tariffs will be applied to Commonwealth countries.

Australia	Mexico
Austria	Pakistan
Canada	Poland
Colombia	Portugal (including Macao)
Denmark	Taiwan
EC (all 6 members)	South Korea
Finland	Spain
Greece	Sweden
India	Turkey
Israel	UAR
Jamaica	United Kingdom (including Hong Kong)
Japan	United States

The stated purpose of the agreement is to provide for the "reasonable" expansion of cotton textile exports from the LDC's and Japan without "disruptive" effects on the markets of the importing countries. Importing countries may limit the imports of particular products from LTA members if these imports cause or threaten to cause "market disruption."

Before the inception of the LTA (and its predecessor, the Short-Term Agreement), the DC's were accepting very unequal shares of the growth in LDC cotton textile exports. The LTA opened many Western European markets that had previously placed excessive restrictions on cotton textile imports from the LDC's. Two mechanisms protect DC importers from onslaughts of imports which they consider to be disruptive of their markets. The first is a specialized agreement between an importing country and an exporting country which limits the exports of a particular item.

The second is a general bilateral agreement. These are usually of 1 to 5 years duration and cover trade in all textile products. Most major DC importers have bilateral agreements with most of their suppliers of low price cotton textile imports. The United Kingdom, the United States, Japan, Canada, and the Western European countries, roughly in that order, have negotiated the greatest number of bilateral agreements on cotton textile trade.

Bilateral agreements are reached with nonmembers as well as members of the LTA. Under these agreements the United States and most other DC importers have agreed to allow an annual 5-percent increase in imports from each of the low price exporters. However, the United Kingdom, whose market has been penetrated very deeply by low priced imports, has agreed to only a 1-percent annual increase in most of its agreements. Canada's agreements also stipulate a less than 5-percent annual increase in imports.

One of the effects of the LTA has been to boost LDC exports at the expense of Japanese exports. In the United States, the LTA had the effect of putting a ceiling on Japanese imports and thus making it easier for other low price exporters to compete in the U.S. market.

The LTA has had an unexpected effect to the disadvantage of cotton producers. The LTA limitations on the growth of cotton textile imports have caused some textile exporting countries to expand the use of manmade fibers in the production of textiles for export. Most low price exporters have increased their exports of manmade fiber textile exports much more rapidly than cotton textile exports.

The long-term outlook is for continued import restrictions on cotton textiles. The operation of the LTA has demonstrated, however, that the DC's are willing to allow gradual and "orderly" increases in imports.

Trade and economic development policy.--Many net importing LDC's, because of the desire to industrialize their economies and save on foreign exchange, have set up cotton textile mills behind protective tariff barriers. These new import substitution industries, as well as the competition from low price exporters in the net importing LDC's, have cut into former markets (and production) of DC cotton textile industries. The principal future impact of this import substitution policy should be the placing of additional pressure on the DC markets to accept imports from the low price exporters (who will be losing LDC markets).

Reliance on Textile Imports

Trends.--Between 1953 and 1965-67, imports supplied a declining proportion of the domestic cotton textile needs of most LDC's, but an increasing proportion of cotton textile use in the CPC's and DC's, except in South Africa (table 33). Reliance on cotton textile imports decreased by one-half or more in Iran, South Africa, Other South America, the Sudan, and South East Asia; and by one-third in East and West Africa, Other North Africa, Syria, and Other East Asia and Pacific. In contrast, the percentage of the market supplied by imports increased substantially in the United Kingdom and the EC.

Prospects.--The expected reliance of various regions on cotton textile imports was projected by trend extension and adjustments to reflect changes in the affecting factors. The results show reliance increasing the most in Canada, the EC, and the United States (table 33). The biggest declines are projected for Central America, Other West Asia, and Other East Asia and Pacific.

It was impossible to determine or project import reliance in Hong Kong because of the large volume of reexports. In all probability, very little of the import volume moves into domestic use.

Import Projections

Projections of cotton textile imports in 1980 were made by applying the projected import reliance to total domestic cotton use. In the case of Hong Kong, direct projections of imports were made from time series data. The results are shown in table 34.

The projections show world cotton textile imports in 1980 at around 2.2 million metric tons, up from 1.6 million in 1965-67. Over two-thirds of the increase will be taken by DC's, and about one-quarter by the central plan countries. Little expansion is shown in LDC imports because of expanding domestic mill capacity.

Individual regions with high projected increases in cotton textile imports are the United States, the EC, the USSR, and Other Western Europe. These four regions alone may take more than 80 percent of the increase in world cotton textile trade.

Changes in the world price of cotton lint are likely to have a minimal affect on 1980 trade in cotton textiles because of the numerous trade restrictions and other factors involved. Thus, only single projections were made for each region.

High LDC economic growth could boost imports by this sector by 0.1 million metric ton over the medium projections, raising world imports to 2.3 million metric tons. Alternatively, low LDC economic growth could reduce the growth in LDC sector imports and hold world imports to possibly around 2.1 million metric tons in 1980.

Most of the changes in LDC imports under the high and low assumptions, compared with the medium projections, would be by countries of Africa, Other East Asia and

Table 33.--Regional cotton textile imports as a percentage of domestic cotton use, 1953, 1965-67, and projected 1980 1/

Region	1953	1965-67 2/	Projected 1980		
			Trend period 3/	Linear projections	Accepted 4/
	Percent of volume			Percent of volume	
Developed					
United States	0.8	8.5	1953-67	12.9	15.0
Canada	28.0	39.0	1953-67	47.6	50.0
EC 5/ 6/ 7/	6.8	30.2	1953-67	37.0	37.0
United Kingdom 7/	6.9	46.6	1953-67	96.0	50.0
Other Western Europe 5/ 7/	21.0	37.0	1953-67	43.9	45.0
Japan	.1	1.2	8/		4.0
Australia & New Zealand 5/	54.6	64.3	1954-64	78.9	70.0
South Africa	79.9	34.3	1953-64	Negative	10.0
Central Plan					
Eastern Europe 5/	.9	6.4	1959-64	Negative	10.0
USSR	-	2.4	1959-66	3.6	10.0
Communist Asia 5/	-	0.8	8/		-
Less Developed					
Mexico	-	0.2			-
Central America & Caribbean	47.7	51.7	1953-64	Negative	15.0
Brazil	-	-	8/		-
Colombia	-	-	8/		-
Peru	9.9	9/6.0	1959-64	15.2	5.0
Other South America 5/	9.2	10/4.7	1953-64	Negative	5.0
East & West Africa 5/	88.6	63.7	1953-64	57.2	50.0
United Arab Republic	-	4.0	8/		-
Sudan	100.0	49.2	1953-64	35.2	35.0
Other North Africa 5/	94.3	59.5	1953-64	64.1	50.0
Iran	36.4	2.6	1953-64	Negative	-
Syria	27.4	18.4	1953-64	Negative	5.0
Turkey	-	.1	8/		-
Other West Asia 5/	58.7	57.3	1953-64	13.5	20.0
India	-	-	8/		-
Pakistan	15.2	.4	1953-67	Negative	-
Other South Asia 5/	67.8	59.5	1953-64	51.9	50.0
South East Asia 5/	86.6	41.4	1953-64	23.6	25.0
Hong Kong	(Meaningless because of large reexports)				
South Korea	13.3	2.7	1958-67	1.1	-
Taiwan	-	0.8	8/		-
Other East Asia & Pacific 5/	105.6	74.8	1953-64	30.4	50.0

1/ Assumes imports move into domestic end use rather than reexport, which is generally true except for those regions indicated. 2/ 1967 imports more inclusive of clothing than 1953. 3/ Period was used which appeared most indicative of trend. Data for 1965-67 were not available for most CP and LD regions at time of analysis and thus were not considered in determining trend, see appendix D for possible adjustments. 4/ See discussion in text and regional outlook notes, appendix B. 5/ Includes intraregional trade. 6/ About one-half of EC trade is intraregional. 7/ Reexports are important. Thus, both the recorded and projected figures exaggerate actual consumer use of textile imports. 8/ Data not applicable to trending because of insignificant quantities or high variability. 9/ 1964. 10/ Includes Peru.

Source: Calculated from FAO data (15, 17, 18, 19, 23, 25).

Table 34.--Cotton textile imports, projected 1980 and change 1965-67 to 1980

Region	1965-67 average	Projected 1980			Change 1965-67 to 1980 (medium)	
		Medium income	High LDC income	Low LDC income	Quantity	Percent
	Million metric tons					Percent
Developed						
United States	0.184	0.33	Same		0.15	83
Canada	.061	.07	as		.01	17
EC	.254	.37	Medium		.12	48
United Kingdom	.163	.20			.04	25
Other Western Europe	.140	.24			.10	71
Japan	006	.03			.02	100
Australia & New Zealand	.069	.07			-	-
South Africa	.024	.02			-	-
Subtotal	.900	1.33	1.33	1.33	.43	48
Central Plan						
Eastern Europe	.035	.07	Same		.03	100
USSR	.038	.16	as		.12	300
Communist Asia	.012	-	Medium		-.01	-100
Subtotal	.084	.23	.23	.23	.15	188
Developed						
Mexico	-	-	-	-	-	-
Central America & Caribbean	.049	.02	.03	.02	-.03	60
Brazil	-	-	-	-	-	-
Colombia	-	-	-	-	-	-
Peru	1/ .001	-	-	-	-	-
Other South America	2/ .010	.01	.01	.01	-	11
East & West Africa	.160	.16	.20	.16	-	-
United Arab Republic	.005	-	-	-	-	-
Sudan	.012	.01	.02	.02	-	-
Other North Africa	.023	.02	.03	.02	-	-
Iran	.001	-	-	-	-	-
Syria	.004	-	-	-	-	-
Turkey	-	-	-	-	-	-
Other West Asia	.042	.02	.02	.01	-.02	-50
India	-	-	-	-	-	-
Pakistan	.001	-	-	-	-	-
Other South Asia	.026	.05	.06	.04	.02	67
Southeast Asia	.052	.05	.06	.04	-	-
Hong Kong	.081	.14	.14	.14	.06	75
South Korea	.002	-	-	-	-	-
Taiwan	-	-	-	-	-	-
Other East Asia & Pacific	.136	.14	.16	.12	-	-
Subtotal	.604	.62	.73	.57	.02	3
Total World	1.588	2.18	2.29	2.13	.59	37

1/ 1964.
2/ Includes Peru.

Source: 1965-67 imports are FAO (25).

Pacific, and South East Asia, all of which have low levels of industrialization. It may be that with high economic growth, domestic mill use in these countries would expand sufficiently to fill domestic needs without additional textile imports. The projections as accepted, however, assumed that the proportion of domestic needs filled by imports would hold constant under the three alternatives.

Export Share Trends and Prospects

Trends.--Between 1953 and 1965-67 the CPC's and LDC's expanded their shares of world cotton textile exports mostly at the expense of the DC's (table 35). The biggest gains in export share were made by Hong Kong, Communist Asia, Pakistan, Other Western Europe, Eastern Europe, the UAR, and Taiwan. Those who gave up the biggest trade shares were the United Kingdom, the United States, the EC, and India.

Projected shares in 1980.--Regional shares of world cotton textile exports in 1980 were projected by extending linear time trends and making adjustments based on the factors discussed earlier. The DC's can be expected to continue losing export markets to the CPC's and LDC's. By 1980, the LDC's may be exporting nearly half the world total up from one-third in 1967. In exact contrast, the DC's share may drop from almost one-half of world cotton textile exports in 1965-67 to one-third by 1980. The CPC's are likely to maintain something near their present share.

The market losses will be shared by most developed regions except Other Western Europe, whose low price exporters (principally Portugal, but including Spain and Greece as well) are likely to continue expanding their market shares. Taiwan, South Korea, Pakistan, and the UAR are all expected to substantially increase their market shares. Slow growth or declines in the market shares of Japan and Hong Kong are attributed in part to rising costs of production and to increased emphasis on manmade fibers by their textile industries.

Export Projections

Total world exports of cotton textiles in 1980 are projected to equal total world imports--2.13 to 2.29 million metric tons, depending upon the economic growth assumptions. Projections of regional textile exports were made by multiplying projected total world figure by each region's prospective share. The results are shown in table 36.

Nearly two-thirds of the increase in world cotton textile exports will come from the less developed sector. The largest increases in exports are projected for the traditional low price exporters: Hong Kong, South Korea, Pakistan, and the UAR. However, some expansion is also projected in exports of Other Western Europe (Portugal, Spain, and Greece, in that order) and Eastern Europe.

Japan's exports of cotton textiles probably will not increase because of the rapid switch to manmade fibers, but Japan will maintain its place behind Hong Kong as the second largest cotton textile exporting country (a position it fell to in 1967). Several less developed countries and regions will have large percentage increases in exports because of small base period exports. Some of these - Mexico, Brazil, Turkey, to name a few - could come on much stronger than projected if domestic industry problems are resolved.

High LDC economic growth could boost sector exports by 0.05 million metric tons over the medium projections, with most of the increase coming from Hong Kong, Pakistan, India, and Taiwan. Exports of the developed and central plan sectors might also be higher if they maintained projected export shares. Alternatively, low LDC economic growth could reduce LDC sector exports by 0.02 million metric tons over the medium projections, and world exports by 0.5 million tons. World exports would be lower because of fewer imports by LDC's from developed and central plan exporters.

Table 35.--Regional shares of world cotton textile exports, 1953, 1965-67, and projected 1980

Region	1953	1965-67	Projected 1980		
			Trend period 1/	Linear projections	Accepted 2/
	Percent of volume			Percent of volume	
Developed					
United States	12.1	5.0	1953-54	Negative	3.5
Canada	0.1	0.5	1957-64	1.2	0.5
EC	26.4	19.4	1953-64	11.6	12.0
United Kingdom	14.9	3.0	1953-64	Negative	3.0
Other Western Europe	4.0	8.0	1953-64	13.4	9.0
Japan	14.4	12.5	1954-64	11.3	7.0
Australia & New Zealand	-	.1	4/	-	-
South Africa	.1	.2	4/	-	-
Subtotal	72.0	3/48.7		5/37.5	5/35.0
			1963-64	25.5	
Central Plan					
Eastern Europe	4.4	8.7	1953-54	10.8	9.0
USSR	2.0	2.7	1953-64	4.2	3.0
Communist Asia	.4	5.7	1956-64	3.0	4.0
Subtotal	6.8	3/17.3		5/18.0	5/16.0
			1953-64	27.9	
Less Developed					
Mexico	.3	.8	4/		.4
Central America & Caribbean	.1	.3	4/		.7
Brazil	-	.5	4/		.5
Colombia	-	.3	4/		.8
Peru	-	-	4/		-
Other South America	-	-	4/		-
East & West Africa	.3	.2	4/		.5
United Arab Republic	.8	3.6	1953-64	7.2	5.0
Sudan	.1	-	4/		-
Other North Africa	.1	-	4/		-
Iran	.1	-	4/		-
Syria	.1	.2	1953-64	0.6	.5
Turkey	-	.1	4/		.6
Other West Asia	.2	.7	1959-64	2.9	1.0
India	10.9	6.1	1953-64	Negative	5.5
Pakistan	-	4.2	1955-64	6.0	6.0
Other South Asia	-	-	4/		-
South East Asia	-	-	4/		-
Hong Kong	6.4	12.4	1953-64	26.0	15.0
South Korea	-	1.1	1958-64	5.0	5.0
Taiwan	-	1.9	1956-64	5.9	6.0
Other East Asia & Pacific	1.9	1.6	1954-64	1.1	1.5
Subtotal	21.2	3/34.2		5/54.7	5/49.0
			1953-64	48.7	
Total World	100.0	100.0		5/110.2 6/102.1	100.0

1/ Period was used which appeared most indicative of trend. 2/ See discussion in text and regional outlook, appendix A. 3/ Totals may not equal sum of components because of rounding. 4/ Data are not applicable to trending because of insignificant quantities or high variability. 5/ Sum of regional projections. 6/ Sum of projections run on total bloc percentages.

Sources: Calculated from FAO data (15, 17, 18, 19, 23).

Table 36.--Cotton textile exports, projected 1980 and change 1965-67 to 1980

Region	1965-67 average	Projected 1980			Change 1965-67 to 1980	
		Medium income	High LDC income	Low LDC income	Medium Quantity 1/	Medium Percent
	Million metric tons					Percent
Developed						
United States	0.077	0.08	0.08	0.07	-	-
Canada	.008	.01	.01	.01	-	-
EC	.297	.26	.27	.26	-.04	-13
United Kingdom	.046	.06	.07	.06	.01	20
Other Western Europe	.123	.20	.21	.19	.08	67
Japan	.192	.15	.16	.15	-.04	-21
Australia & New Zealand	.002	-	-	-	-	-
South Africa	.003	-	-	-	-	-
Subtotal	.746	.76	.80	.74	.01	1
Central Plan						
Eastern Europe	.134	.20	.21	.19	.07	54
USSR	.041	.06	.07	.06	.02	50
Communist Asia	.087	.09	.09	.09	-	-
Subtotal	.262	.35	.37	.34	.09	35
Less Developed						
Mexico	.012	.01	.01	.01	-	-
Central America & Caribbean	.005	.02	.02	.01	.01	100
Brazil	.008	.01	.01	.01	..	-
Colombia	.005	.02	.02	.02	.01	100
Peru	-	-	-	-	-	-
Other South America	-	-	-	-	-	-
East & West Africa	.004	.01	.01	.01	.01	-
United Arab Republic	.056	.11	.11	.11	.05	-
Sudan	-	-	-	-	-	-
Other North Africa	.001	-	-	-	-	-
Iran	-	-	-	-	-	-
Syria	.003	.01	.01	.01	.01	150
Turkey	.001	.01	.01	.01	.01	900
Other West Asia	.011	.02	.02	.02	.01	100
India	.094	.12	.13	.12	.03	33
Pakistan	.064	.13	.14	.13	.07	117
Other South Asia	-	-	-	-	-	-
Southeast Asia	-	-	-	-	-	-
Hong Kong	.191	.33	.35	.32	.14	74
South Korea	.017	.11	.11	.11	.09	53
Taiwan	.029	.13	.14	.13	.10	333
Other East Asia & Pacific	.025	.03	.03	.03	-	-
Subtotal	.524	1.07	1.12	1.05	.55	106
Total World	1.532	2.18	2.29	2.13	.65	42

1/ May not add exactly because of rounding.

Source: 1965-67 exports are FAO (25); projections are based on world import projections and projected shares of world exports.

Net Trade Projections

Projected exports of cotton textiles were subtracted from projected imports to obtain net trade in 1980. The results indicate a substantial increase in net imports by the developed sector, supplied mostly by expanded net exports of the LDC's (table 37).

Of the developed regions, only Japan will remain a net exporter, but with a deteriorated position, compared with the middle 1960's. The EC, which is the only other net exporting region now, is projected to follow the historical precedent of the United States, United Kingdom, and others, and become a net importer by 1980. However, some individual EC and Other Western European countries will remain net exporters, as was brought out in previous discussion.

In the central plan sector, Eastern Europe is projected to substantially increase net exports by 1980. In contrast, the USSR will become a net importer.

Among the LDC's, most of the net exporters of the recent past are projected to expand net exports by 1980. Most of the present net importers are projected to continue with about the same net position, because of expansion in domestic industries at about the same rate as cotton use increases. There could be some surprises here; for example, the Sudan, some other African countries, and Brazil could conceivably become net exporters or larger net exporters.

Under the high and low LDC economic growth assumptions, some interesting changes in net trade are projected. Under the high assumption, the LDC exports are projected lower than the medium projections, because of increased domestic demand for textiles in which the additional imports exceed expanded exports. The developed sector would have lower net imports because of apparent additional exports to the LDC's. The central plan sector would have a slight improvement in net exports, also because of more shipments to LDC's.

Under the high assumption, the projections indicate that Africa, Other East Asia and Pacific, and South East Asia would need to increase net cotton textile imports to satisfy demand. However, demand might be satisfied from a faster rate of expansion in domestic mill capacity than that assumed, in which case the cotton would come from increased lint imports or decreased lint exports.

Outlook for Cotton Lint Trade

Situation and Trends

The less developed sector exports are over 60 percent of world trade in cotton lint, but imports are only about 17 percent (table 38). It is thus a heavy net exporter. In contrast, the developed sector, mainly the United States, exports one-fourth of world trade, but imports nearly 60 percent and provides the major market for LDC exports. The central plan sector exports considerable cotton, but imports even more to provide a market for LDC cotton.

The world's largest cotton exporters in 1965-67 were the United States with about 23 percent of the total, and the USSR, with about one-seventh. Other major exporters are Mexico, the UAR, East and West Africa, Central America, Brazil, Pakistan, the Sudan, Syria, Peru, and Iran. Since 1967, Brazil has moved up to third place ahead of Mexico. In Central America, the largest exporters are Nicaragua and Guatemala. In East and West Africa, they are Uganda, Tanzania, Mozambique, and Chad.

Table 37.--Net cotton textile trade, historical and projected 1980

Region	1953	1965-67	Projected 1980		
			Medium income	High LDC income	Low LDC income
	Million metric tons				
Developed					
United States	-0.080	0.107	0.25	0.25	0.26
Canada	.030	.052	.06	.06	.06
EC	-.162	-.043	.11	.10	.11
United Kingdom	-.100	.118	.14	.13	.14
Other Western Europe	.024	.016	.04	.03	.05
Japan	-.114	-.185	-.12	-.13	-.12
Australia & New Zealand	.017	.068	.07	.07	.07
South Africa	.027	.021	.02	.02	.02
Subtotal	-.358	.154	.57	.53	.59
Central Plan					
Eastern Europe	-.032	-.099	-.13	-.14	-.12
USSR	-.016	-.004	.10	.09	.10
Communist Asia	-.001	-.076	-.09	-.09	-.09
Subtotal	-.049	-.178	-.12	-.14	-.11
Less Developed					
Mexico	-.001	-.011	-.01	-.01	-.01
Central America & Caribbean	.032	.044	-	.01	.01
Brazil	-	-.008	-.01	-.01	-.01
Colombia	.002	-.005	-.02	-.02	-.02
Peru	.002	-	-	-	-
Other South America	.013	1/.010	.01	.01	.01
East & West Africa	.132	.156	.15	.19	.15
United Arab Republic	-.003	.051	-.11	-.11	-.11
Sudan	.008	.012	.01	.02	.01
Other North Africa	.031	.023	.02	.03	.02
Iran	.008	.001	-	-	-
Syria	.002	.001	-.01	-.01	-.01
Turkey	.014	-.001	-.01	-.01	-.01
Other West Asia	.011	.031	-	-	-.01
India	-.084	-.093	-.12	-.13	-.12
Pakistan	.012	-.064	-.13	-.14	-.13
Other South Asia	.014	.026	.05	.06	.04
Southeast Asia	.071	.051	.05	.06	.04
Hong Kong	.034	-.109	-.19	-.21	-.18
South Korea	.004	-.016	-.11	-.11	-.11
Taiwan	.005	-.029	-.13	-.14	-.13
Other East Asia & Pacific	.129	.112	.11	.13	.09
Subtotal	.365	.080	-.45	-.39	-.48
Total World	-.042	.056	0	0	0

1/ Includes Peru.

Sources: Tables 30, 34, and 36.

Table 38.--Cotton lint trade, average 1965-67 and change over average 1955-57

Region	1965-67			Change over 1955-57	
	Imports	Exports	Net	Imports	Exports
	Million metric tons				
Developed					
United States	0.027	0.858	-0.831	-0.003	-0.269
Canada	.087	-	.087	.007	-
EC	.917	.035	.882	-.032	.028
United Kingdom	.196	-	.196	-.144	-.007
Other Western Europe	.246	.057	.189	.016	.024
Japan	.735	-	.735	.176	-
Australia & New Zealand	.012	-	.012	-.007	-
South Africa	.031	.001	.030	.022	-
Subtotal	2.251	.951	1.300	.035	-.224
Central Plan					
Eastern Europe	.648	.003	.645	.232	-.004
USSR	.145	.515	-.370	.054	.199
Communist Asia	.108	.003	.105	.038	-.012
Subtotal	.901	.521	.380	.324	.183
Less Developed					
Mexico	-	.345	-.345	-	.001
Central America & Caribbean	.021	.218	-.197	.010	.141
Brazil	-	.202	-.202	-	.100
Colombia	.005	.020	-.015	-.008	.020
Peru	-	.086	-.086	-	-.007
Other South America	.052	.020	.032	.021	.008
East & West Africa	.016	.298	-.282	.010	.055
United Arab Republic	-	.303	-.303	-	.042
Sudan	-	.151	-.151	-	.058
Other North Africa	.009	.006	.003	.006	.003
Iran	-	.075	-.075	-	.035
Syria	-	.129	-.129	-	.044
Turkey	-	.218	-.218	-	.182
Other West Asia	.012	.015	-.003	.003	.002
India	.124	.036	.088	.025	-.039
Pakistan	.003	.141	-.138	-	.024
Other South Asia	.002	.013	-.011	.001	.002
Southeast Asia	.038	.012	.026	.037	-.001
Hong Kong	.154	-	.154	.099	-.002
South Korea	.080	-	.080	.041	-
Taiwan	.082	-	.082	.052	-
Other East Asia & Pacific	.059	-	[illegible]	.043	-
Subtotal	.657	2.288	-1.631	.340	.668
Total World	3.809	3.760	.049	.699	.627

Source: USDA/FAS.

Raw cotton exports of all major exporting regions have been increasing, except for the United States and Mexico. Between 1955-57 and 1965-67, the largest absolute increases took place in the USSR, Turkey, Central America, Brazil, and the Sudan. U.S. exports dropped by nearly one-fourth. Mexico maintained exports at about the same level.

Major importing regions are EC, about one-third of the total; Japan, over one-fifth; and Eastern Europe, over one-sixth. Other major importers are the U.K., Hong Kong, the USSR, India, Communist Asia, Canada, Taiwan, and South Korea.

World imports of raw cotton increased by about 0.7 million metric tons in the decade 1955-57 to 1965-67. About a third of this increase went to East Asia, mainly Hong Kong, South Korea, and Taiwan. Another third went to Eastern Europe. Japan took about one-fourth (for the largest increase of any one country). Some expanded importation also occurred in the USSR (mostly high quality cotton from the UAR), India (P.L. 480), and Mainland China. Imports by the EC and U.K. actually dropped off because of manmade fiber competition and increased cotton textile imports.

Direction of cotton lint trade

Destination of exports.--Table 39 shows the destination of exports from the major cotton-exporting regions. U.S. cotton lint exports go primarily to Japan, Western European countries, Canada, and the East Asian countries of Hong Kong, South Korea, and Taiwan. In the case of the USSR, about 80 percent of the exports go to Eastern Europe, 15 percent to Western Europe, and some to Japan and Canada (although the proportion to these latter two countries has recently increased substantially). Latin American exports have gone primarily to Japan and Western Europe.

Exports from the North African countries of the UAR and the Sudan move heavily into the central plan areas of Eastern Europe, the USSR, and Mainland China, and considerable exports are also made to Western Europe and, to a lesser extent, to Japan and other East Asian countries. West African exports, as might be expected, move heavily to Western Europe and, to a lesser extent, to Eastern Europe. Exports from East Africa, on the other hand, move heavily to Communist Asia and other East Asian countries. South Asian cotton, produced mostly in Pakistan, moves primarily to Japan, other East Asian countries, and the USSR.

Source of imports.--Table 40 shows the sources of imports into the various regions. U.S. imports are mostly extra-long staple cotton from Latin America (Peru) and North Africa (UAR and Sudan). Canada's imports are mostly from the United States, although less so recently because of increased imports from the USSR (as a reciprocal measure for USSR purchases of Canadian wheat). Japan receives about half its cotton from Latin America, a third from the United States, and most of the rest from Pakistan and North Africa. Western Europe's imports are divided among the United States, Latin America, and, to a lesser extent, West Asia and Africa. A small proportion comes from Greece.

Over half of Eastern Europe's imports are from the USSR, with most of the rest originating in North Africa and West Asia. Half the USSR's imports is extra-long staple cotton from North Africa, with other growths from West Asia, Pakistan, and Latin America making up the rest. Communist Asia's imports come mostly from North and East Africa, West Asia, and Pakistan.

In South Asia, India is the major importer, with about half coming from the United States, a third from North Africa, and a little from East Africa. Almost none comes from its close neighbor, Pakistan. Of East Asian imports, over half has been from the United States, with Latin America and Pakistan the other major suppliers.

Table 39.--Destination of raw cotton exports, average 1963-65

Exporting region \ Destination	Developed							Central Plan			
	United States	Canada	Japan	Western Europe	Australia & New Zealand	South Africa	Subtotal 1/	Eastern Europe	USSR	Communist Asia	Subtotal 1/
	Percent of total										
Developed											
United States	-	8.4	23.2	31.9	1.3	0.8	65.6	5.7	0.1	-	5.8
Canada	-	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	-	-	-	-
Western Europe	-	-	-	94.8	-	.4	95.2	33.6	8.0	-	41.6
Australia & New Zealand	-	-	-	-	-	-	-	-	-	-	-
South Africa	-	-	-	100.0	-	-	100.0	-	-	-	-
Subtotal 1/	-	7.7	21.3	33.7	1.2	.7	64.7	7.7	.7	-	8.4
Central Plan											
Eastern Europe	-	-	-	100.0	-	-	100.0	-	-	-	-
USSR	0.3	0.9	1.5	14.7	-	-	17.4	81.8	-	0.8	82.6
Communist Asia	-	-	-	-	-	-	-	-	100.0	-	100.0
Subtotal 1/	.3	.9	1.4	14.4	-	-	17.1	77.6	4.6	.7	82.9
Less Developed											
Latin America	.2	.5	36.3	43.5	.6	1.4	83.2	1.4	2.6	1.0	5.0
North Africa	2.5	-	6.9	28.3	-	-	37.7	22.7	18.6	10.1	51.4
West Africa	-	-	2.1	84.1	-	-	86.2	7.8	.3	1.9	10.0
East Africa	-	.7	4.8	40.1	.7	.2	46.5	2.0	-	21.4	23.4
West Asia	-	-	1.0	60.6	-	.2	61.9	16.4	6.9	10.9	34.2
South Asia	2.1	-	37.0	14.1	.3	.7	54.2	3.0	10.1	11.9	25.0
Southeast Asia	4.7	-	23.8	23.8	-	-	52.3	7.2	16.7	14.3	38.2
East Asia & Pacific	-	-	33.3	16.7	-	-	50.0	-	-	-	-
Subtotal 1/	1.1	.3	20.9	42.0	.3	.7	65.3	8.7	7.1	7.6	22.7
Total World	.7	2.5	18.9	36.6	.5	.7	60.0	15.7	4.9	4.2	24.9

Exporting region \ Destination	Less developed									1963-65
	Latin America	Africa: North	Africa: West	Africa: East	Asia: West	Asia: South	Asia: Southeast	East Asia & Pacific	Subtotal 1/	World total exports 1/ (1,000 bales) average
	Percent of total									
Developed										
United States	1.2	0.4	0.4	0.3	0.6	6.1	2.4	17.2	28.6	100.0 4,758
Canada	-	-	-	-	-	-	-	-	-	- -
Japan	-	-	-	-	-	-	-	100.0	100.0	100.0 9
Western Europe	0.4	-	-	-	1.6	-	-	1.2	3.2	100.0 381
Australia & New Zealand	-	-	-	-	-	-	-	-	-	100.0 -
South Africa	-	-	-	-	-	-	-	-	-	100.0 9
Subtotal 1/	1.2	.4	.4	.2	.7	5.7	2.2	16.0	26.9	100.0 5,157
Central Plan										
Eastern Europe	-	-	-	-	-	-	-	-	-	100.0 9
USSR	-	-	-	-	-	-	-	-	-	100.0 1,755
Communist Asia	-	-	-	-	-	-	-	-	-	100.0 83
Subtotal 1/	-	-	-	-	-	-	-	-	-	100.0 1,847
Less Developed										
Latin America	5.8	-	.1	-	.1	0.4	0.4	5.0	11.8	100.0 4,359
North Africa	.1	.1	-	.2	.2	9.9	-	0.4	10.9	100.0 2,131
West Africa	-	.3	1.2	.4	-	-	-	1.9	3.8	100.0 491
East Africa	-	-	-	1.7	.3	9.4	-	18.7	30.1	100.0 793
West Asia	-	-	-	-	2.6	.3	-	1.0	3.9	100.0 1,667
South Asia	-	-	-	-	-	2.1	.2	18.5	20.8	100.0 960
Southeast Asia	-	-	-	-	-	-	-	9.5	9.5	100.0 64
East Asia & Pacific	-	-	-	-	-	-	-	50.0	50.0	100.0 10
Subtotal 1/	2.4	-	.1	.2	5	3.0	.2	9.5	12.0	100.0 10,385
Total World	1.8	.1	.2	.2	.5	3.5	.8	8.1	15.1	100.0 17,389

1/ May not add exactly because of rounding.

Source: USDA data (57).

Table 40.--Origin of raw cotton imports, average 1963-65

Origin \ Importing region	Developed								Central Plan		
	United States	Canada	Japan	Western Europe	Australia & New Zealand	South Africa	Subtotal 1/	Eastern Europe	USSR	Communist Asia	Subtotal 1/
	Percent of total										
Developed											
United States	-	90.0	33.4	23.9	66.1	32.4	29.9	9.8	0.3	-	6.3
Canada	-	-	-	-	-	-	-	-	-	-	-
Japan	0.9	-	-	-	-	-	-	-	-	-	-
Western Europe	-	-	-	3.3	-	1.4	2.0	4.7	3.6	-	3.7
Australia & New Zealand	-	-	-	-	-	-	-	-	-	-	-
South Africa	-	-	-	0.2	-	-	-	-	-	-	-
Subtotal 1/	.9	90.0	33.4	27.3	66.1	33.8	31.9	14.5	3.9	-	10.0
Central Plan											
Eastern Europe	-	-	-	.1	-	-	0.1	-	-	-	-
USSR	4.9	3.8	0.8	4.0	-	-	2.9	52.4	-	1.9	33.4
Communist Asia	-	-	-	-	-	-	-	-	9.9	-	1.9
Subtotal	4.9	3.8	.8	4.2	-	-	3.0	52.4	9.9	1.9	35.3
Less Developed											
Latin America	32.9	5.2	48.1	29.8	25.8	55.4	34.8	2.3	13.3	5.8	5.1
North Africa	42.7	-	4.5	9.5	-	-	7.7	17.7	46.4	29.3	25.4
West Africa	-	-	.3	6.5	-	-	4.1	1.4	.2	1.2	1.1
East Africa	-	1.0	1.0	4.4	4.8	1.4	3.1	0.5	-	20.3	3.7
West Asia	-	-	.5	15.9	-	2.7	9.9	10.0	13.5	24.7	13.2
South Asia	15.9	-	10.8	2.1	3.2	6.8	5.0	1.0	11.5	15.6	5.6
Southeast Asia	2.4	-	.5	.2	-	-	.5	.2	1.3	1.2	0.6
East Asia & Pacific	-	-	.1	-	-	-	-	-	-	-	-
Subtotal 1/	93.9	6.2	65.8	68.5	33.9	66.2	65.1	33.1	86.2	98.1	54.7
Total World 1/	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Thousand bales	124	441	3,293	6,366	96	115	10,435	2,737	850	739	4,327

Origin \ Importing region	Less developed									World total imports
	Latin America	Africa			Asia			East Asia & Pacific	Subtotal 1/	
		North	West	East	West	South	Southeast			
	Percent of total									
Developed										
United States	18.9	82.3	73.7	40.0	32.7	48.2	85.1	58.4	51.9	27.6
Canada	-	-	-	-	-	-	-	-	-	-
Japan	-	-	-	-	-	-	-	0.5	0.3	0.1
Western Europe	0.5	-	-	-	6.6	-	-	.3	.5	2.2
Australia & New Zealand	-	-	-	-	-	-	-	-	-	-
South Africa	-	-	-	-	-	-	-	-	-	.1
Subtotal 1/	19.4	82.3	73.7	40.0	39.3	48.2	85.1	59.2	52.7	30.0
Central Plan										
Eastern Europe	-	-	-	-	-	-	-	-	-	.1
USSR	-	-	-	-	-	-	-	-	-	10.1
Communist Asia	-	-	-	-	-	-	-	-	-	.5
Subtotal 1/	-	-	-	-	-	-	-	-	-	10.6
Less Developed										
Latin America	80.1	-	5.3	-	6.6	2.3	13.8	15.5	19.3	25.2
North Africa	.5	11.8	-	15.0	4.9	34.3	-	.7	8.8	12.3
West Africa	-	5.9	21.0	5.0	-	-	-	.7	.7	2.8
East Africa	-	-	-	40.5	3.3	10.9	-	9.4	8.1	4.1
West Asia	-	-	-	-	45.9	1.0	-	1.2	2.5	9.6
South Asia	-	-	-	-	-	3.3	1.1	12.7	7.5	5.6
Southeast Asia	-	-	-	-	-	-	-	.4	.2	.2
East Asia & Pacific	-	-	-	-	-	-	-	.3	-0.2	2/
Subtotal 1/	80.6	17.7	26.3	60.0	60.7	51.8	14.9	40.8	47.3	59.7
Total World 1/	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Thousand bales	512	28	28	32	92	606	133	1,401	2,632	17,394

1/ May not add exactly because of rounding.
2/ Less than 0.5.

Source: USDA data (57).

Factors affecting trade

The extent of a region's imports or exports of cotton lint depend mostly upon the surplus or deficit existing after balancing out domestic cotton use, textile trade, and cotton production. Thus the factors which affect each of these items also affect trade in cotton lint. Since these factors were discussed in previous sections, there is no need for more here. However, two other significant factors affect trade in cotton lint. These are special requirements or considerations and import restrictions.

Mill requirements for special types of cotton or other considerations frequently require some net exporters of cotton lint to import cotton and permit some net importers to export. Also, in multicountry regions, the region as a whole may be a net exporter but some individual countries remain importers, and vice versa.

One-half to two-thirds of U.S. imports are long staple and extra-long staple cotton. It appears that the Soviet imports (mainly from Egypt) and Pakistan imports also consist principally of longer staple cotton.

Net exporting regions in which some countries import cotton to meet domestic needs are Central America and Caribbean (imports are mostly by Caribbean countries), East and West Africa, Other West Asia (Israel imports high quality cotton) and Other South Asia (Afghanistan exports, others import).

India is a net importer of raw cotton, exporting some excess short staple and importing longer staple cotton. In several other net importing regions as set up for this study, there are one or more exporters. In Other Western Europe, it is Greece; in Other South America, Argentina and Paraguay export small amounts; in Other North Africa, Morocco exports some high quality cotton; in South East Asia, Burma is the only exporter.

Import restrictions on raw cotton are generally minor or nonexistent in noncotton-producing countries, or those which produce only a small fraction of the amount required for domestic mill consumption (table 41). However, cotton-producing countries generally place prohibitive restrictions upon raw cotton imports, usually allowing limited entry only of those types of cotton not produced domestically.

Import preferences for raw cotton are given by some countries. In Latin America, importing LAFTA countries give substantial preferences to cotton imports from fellow LAFTA members. The EC, under the first Yaounde Convention (1963-69), supported the price of cotton in many of the 18 Associated Overseas Countries (AOC) in Africa. Under the recently negotiated second Yaounde Convention (1970-75) price-support aid is eliminated, but the Community is sponsoring a new series of trade promotion measures for the AOC countries. In addition, associated countries whose economic situation is endangered by sudden declines in world prices of exported primary products will qualify for exceptional grants in aid.

In central plan countries, most trading is done by government institutions. Barter deals and special arrangements are prevalent. Eastern European countries have strong incentives to purchase cotton lint needs from USSR.

Import restrictions on raw cotton trade are not likely to change much in the decade ahead.

Table 41.--Restrictions on raw cotton imports, selected countries and regions, 1969

Country or region	Summary of restrictions
Developed	
United States	Low tariffs, but restrictive import quotas - about 125,000 bales per year allowed, mostly extra-long staple.
Canada	No restrictions.
EC	No restrictions, except Germany and Netherlands have import quotas for cotton from the USSR or Mainland China.
United Kingdom	No restrictions.
Greece	Low tariff plus prior depcsit.
Portugal	No restrictions for imports from Portuguese overseas territories. Quota for other imports.
Spain	Relatively high tariffs, but exporters of cotton textiles able to import equivalent amounts of raw cotton with substantial discounts in duties. Preferential quota to the UAR.
Other Western Europe	No restrictions except Finland and Austria have preferential quotas for USSR cotton.
Japan	No restrictions.
Australia	Duty-free if all domestic crop is sold first.
South Africa	No restrictions, but informal agreements require local spinners to buy at least 60,000 bales from domestic producers.
Central Plan	
Czechoslovakia & Hungary	Ad valorem tariffs of 5% MFN, and 35% maximum.
Other Communist	State trading.
Less Developed	
Latin America	Most LAFTA members give substantial tariff concessions to other LAFTA members.
United Arab Republic	Imports prohibited.
Syria	A limited quota of ELS.
Turkey	Limited quota of long-staple cotton.
India	Low tariff. Strict import regulations. P.L.-480 imports important.
Pakistan	Imports restricted to cottons not grown locally.
Hong Kong	No restrictions (free port).
South Korea	Low tariff. Free if textiles are exported. P.L.-480 imports important.
Taiwan	Low tariff. Licensing regulations.

Sources: ICAC (50) and material prepared by Joseph Barse, ERS.

Medium Trade Projections

Net cotton lint trade for each region in 1980 was taken as the balance existing after subtracting projected cotton production and textile trade from domestic use. Net trade was then converted to gross trade by projecting directly the imports of net exporting regions and the exports of net importers. 47/

Under the assumption of medium economic growth, cotton lint trade in 1980 is projected to range from over 4.8 million metric tons at a 24-cent cotton price, down to about 4.6 million metric tons at a 30-cent price (table 42). Trade at a 26-cent price is projected at just over 4.7 million tons. This would represent a 0.9 million-ton increase over the 1965-67 average of 3.8 million tons, for an average annual increase of about 65,000 tons per year. The compound growth rate would be about 1.5 percent per year, compared with 2.0 percent per year during the period 1955-57 to 1965-67.

Imports by all three sectors are projected to be above 1965-67 levels (table 42). However, most of the expansion in imports will be taken by the LDC's, increasing their share of imports to around one-fourth, compared with 17 percent in 1965-67. The developed sector will take a decreasing proportion of world imports.

Imports are projected to increase with a lowering of world price, except in the central plan sector. Projected LDC imports are 90,000 tons higher at a 24-cent-price than at 30-cents, while those of the developed sector are 160,000 tons higher.

Regions with the largest projected increases in imports are Eastern Europe, Other East Asia and Pacific, South Korea, Japan, Taiwan, and Other Western Europe. Imports by the EC and U.K. are projected to hold at about 1965-67 levels.

Imports of the USSR will continue at substantial levels, for political and special requirement reasons. Communist Asia may import more cotton lint to fill domestic mill and end use needs. India's imports are not projected to change much, nor are those of Canada. Both South East Asia and Other South Asia will probably have increasing import needs.

Exports by the developed and less developed sectors in 1980 will depend heavily on world price. The projections show LDC exports as ranging from 2.9 million metric tons at a 24-cent world price up to 3.6 million tons at a 30-cent world price, compared with 2.3 million in 1965-66 (table 43). At the 24-cent price, the LDC share of world exports would be about 60 percent, nearly the same as 1965-67; but at the 30-cent price, it could approach 80 percent, a substantial increase.

To maintain the alternative prices in 1980 (unless unexpected changes occur in Soviet production and trade policy), U.S. exports would need to range from a low 0.2 million metric tons at the 30-cent price, up nearly to 1.2 million tons at a 24-cent price. The low export figure would represent a sizeable deterioration in U.S. position-while the higher export volume would maintain the U.S. share at about the 1965-67 level, 25 percent.

At a 26-cent world price the projections indicate U.S. exports of 0.84 million tons, central plan exports of 0.67 million, and LDC exports of 3.15 million tons. This would put U.S. exports at just under the 1965-67 level, but would be a sizeable expansion for the LDC's. Central plan sector (USSR) exports are not likely to be affected by changes in world prices.

The greatest increases in exports (with a 26-cent price level) are projected for East and West Africa, Brazil, Pakistan, the Sudan, and the USSR. Modest increases,

47/ These latter projections were made by extending linear trends and adjusting in accordance with expected changes in affecting factors.

Table 42.--Cotton lint imports, historical and projected 1980

Region	1955-57 average	1965-67 average	Projected 1980						Change 1965-67 to 1980
			Medium income				High LDC income	Low LDC income	
			30¢	28¢	26¢	24¢	24¢	26¢	Medium 26¢
	Million metric tons								
Developed									
United States	0.030	0.27	0.02	0.02	0.02	0.02	0.02	0.02	-0.01
Canada	.080	.087	.08	.08	.09	.09	.09	.09	-
EC	.949	.917	.88	.90	.92	.94	.93	.92	-
United Kingdom	.340	.196	.19	.20	.21	.22	.22	.21	.01
Other Western Europe	.230	.246	.31	.32	.33	.34	.34	.32	.08
Japan	.559	.735	.82	.83	.84	.85	.85	.84	.11
Australia & New Zealand	.091	.012	-	-	-	-	-	-	.01
South Africa	.009	.031	.02	.02	.02	.02	.02	.02	.01
Subtotal	2.216	2.251	2.32	2.37	2.43	2.48	2.47	2.42	.18
Percent of world	(71)	(59)	(51)	(51)	(51)	(51)	(49)	(52)	(19)
Central Plan									
Eastern Europe	.416	.648	.84	.85	.85	.86	.86	.84	.20
USSR	.091	.145	.11	.11	.11	.11	.11	.11	-.03
Communist Asia	.070	.108	.16	.16	.16	.16	.16	.16	.05
Subtotal	.577	.901	1.11	1.12	1.12	1.13	1.13	1.11	.22
Percent of world	(19)	(24)	(24)	(24)	(24)	(23)	(22)	(24)	(24)
Less Developed									
Mexico	-	-	-	-	-	-	-	-	-
Central America & Caribbean	.011	.021	.03	.03	.03	.03	.03	.03	.01
Brazil	-	-	-	-	-	-	-	-	-
Colombia	.013	.005	-	-	-	-	-	-	-.01
Peru	-	-	-	-	-	-	-	-	-
Other South America	.031	.052	.07	.07	.07	.08	.11	.10	.02
East & West Africa	.006	.016	.01	.01	.01	.01	.01	.01	.01
United Arab Republic	-	-	-	-	-	-	-	-	-
Sudan	-	-	-	-	-	-	-	-	-
Other North Africa	.003	.009	.03	.03	.03	.03	.03	.02	.02
Iran	-	-	-	-	-	-	-	-	-
Syria	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-
Other West Asia	.009	.012	.03	.03	.03	.04	.05	.04	.02
India	.099	.124	.11	.11	.11	.11	.22	.12	-.01
Pakistan	.003	.003	-	-	-	-	-	-	-
Other South Asia	.001	.002	.02	.03	.03	.03	.03	.03	.03
Southeast Asia	.001	.038	.05	.06	.07	.09	.10	.06	.04
Hong Kong	.055	.154	.23	.23	.23	.23	.26	.21	.08
South Korea	.039	.080	.20	.20	.20	.20	.22	.18	.12
Taiwan	.030	.082	.19	.19	.19	.19	.23	.18	.08
Other East Asia & Pacific	.016	.059	.17	.17	.18	.19	.21	.14	.13
Subtotal	.317	.657	1.14	1.16	1.18	1.23	1.50	1.12	.52
Percent of world	(10)	(17)	(25)	(25)	(25)	(26)	(29)	(24)	(57)
Total World	3.110	3.809	4.57	4.65	4.73	4.84	5.10	4.65	.91
Percent	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Source: USDA/FAS for historical data.

Table 43.--Cotton lint exports, historical and projected 1980

Region	1955-57 average	1965-67 average	Projected 1980						Change 1965-67 to 1980	
			Medium income				High LDC income	Low LDC income		
			30¢	28¢	26¢	24¢	26¢	26¢	Medium	26¢
	Million metric tons									
Developed										
United States	1.127	0.858	0.20	0.50	0.84	1.18	1.17	0.93	-0.02	
Canada	-	-	-	-	-	-	-	-	-	
EC	.007	.035	.02	.02	.02	.02	.02	.02	-.01	
United Kingdom	.007	-	-	-	-	-	-	-	-	
Other Western Europe	.033	.057	.04	.04	.04	.04	.04	.04	-.02	
Japan	-	-	-	-	-	-	-	-	-	
Australia & New Zealand	-	-	.02	.02	.01	.01	.01	.01	.01	
South Africa	.001	.001	-	-	-	-	-	-	-	
Subtotal	1.176	.951	.28	.58	.91	1.25	1.24	1.00	-.04	
Percent of world	(37)	(25)	(6)	(13)	(19)	(26)	(24)	(22)	(-4)	
Central plan										
Eastern Europe	.007	.003	-	-	-	-	-	-	-	
USSR	.316	.515	.67	.67	.67	.67	.66	.67	.15	
Communist Asia	.015	.003	-	-	-	-	-	-	-	
Subtotal	.338	.521	.67	.67	.67	.67	.66	.67	.15	
Percent of world	(11)	(14)	(15)	(14)	(14)	(14)	(13)	(14)	(15)	
Less Developed										
Mexico	.344	.345	.30	.25	.19	.13	.13	.23	-.15	
Central America & Caribbean	.077	.218	.17	.14	.11	.08	.07	.12	-.11	
Brazil	.102	.202	.62	.57	.53	.48	.44	.53	.33	
Colombia	-	.020	.08	.07	.04	.03	.03	.06	.02	
Peru	.093	.086	.12	.11	.10	.10	.11	.09	.01	
Other South America	.012	.020	.01	.01	.01	.01	.01	.01	-.01	
East & West Africa	.243	.298	.68	.68	.67	.66	.81	.56	.37	
United Arab Republic	.261	.303	.26	.26	.25	.25	.24	.25	-.05	
Sudan	.093	.151	.31	.31	.31	.30	.37	.28	.16	
Other North Africa	.003	.006	.01	.01	.01	.01	.01	.01	-	
Iran	.040	.075	.16	.15	.14	.14	.15	.14	.06	
Syria	.085	.129	.17	.16	.15	.14	.17	.14	.02	
Turkey	.036	.218	.32	.29	.26	.24	.24	.25	.04	
Other West Asia	.013	.015	.01	.01	.01	.01	.01	.01	-	
India	.075	.036	.02	.02	.02	.02	.02	.02	-.02	
Pakistan	.117	.141	.37	.35	.34	.31	.38	.27	.20	
Other South Asia	.011	.013	.01	.01	.01	.01	.01	.01	-	
Southeast Asia	.013	.012	-	-	-	-	-	-	-.01	
Hong Kong	.002	-	-	-	-	-	-	-	-	
South Korea	-	-	-	-	-	-	-	-	-	
Taiwan	-	-	-	-	-	-	-	-	-	
Other East Asia & Pacific	-	-	-	-	-	-	-	-	-	
Subtotal	1.620	2.288	3.62	3.40	3.15	2.92	3.20	2.98	.86	
Percent of world	(52)	(61)	(79)	(73)	(67)	(60)	(63)	(64)	(89)	
Total World	3.133	3.760	4.57	4.65	4.73	4.84	5.10	4.65	.97	
Percent	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	

Source: USDA/FAS for historical data.

but in some cases large relative changes, are shown for Iran, Turkey, Syria, and Colombia. Lower exports than in 1965-67 are projected for Mexico, Central America and the UAR.

Alternative Projections

Alternative projections of cotton lint trade in 1980 were made under assumptions of a 26-cent cotton price and a higher or lower rate of LDC economic growth.

With high economic growth in the LDC's, world cotton lint trade in 1980 is projected at 5.1 million metric tons (table 41). This would be nearly 300,000 tons over the medium projections. Most of the increased importation would be by deficit cotton-producing LDC's; particularly India, Other South America, Other East Asia, Hong Kong, Taiwan, and South Korea. However, the developed regions would import slightly more cotton lint for textile manufacture and export to the LDC's.

Most of the increased lint imports by both LDC's and by DC textile exporters would come from the United States. This results from the higher increase in LDC cotton use than production under the high economic growth assumption. However, if the change in rate of cotton production exceeded the assumed change in the income growth rate, which is conceivable, LDC exports would expand and either price would fall from the 26-cent level or U.S. exports would be cut back.

With low economic growth in the LDC's, world trade is projected at 4.65 million tons, a drop of only 80,000 tons under the medium projection. Nearly all of the decreased importation would be by LDC's, principally Other East Asia, Other South America, Hong Kong, and South Korea. The EC and Eastern Europe would import slightly less lint because of lower LDC demand for their textiles.

With low LDC economic growth, projected LDC imports, even though expanding slower than under the medium assumption, would still outpace exports (because LDC production growth is cut back in the same proportion as income growth), leaving again an additional deficit for the developed exporters to satisfy.

OUTLOOK FOR EXPORT EARNINGS

Unit Values

Cotton Lint

World cotton prices, based upon SM 1-1/16 inch cotton, c.i.f., Liverpool, averaged near 30 cents (constant 1968 currency) per pound during 1965-67. The long-term trend has been downward. The expected further declines in prices of competing fibers, and the number of cotton suppliers in the world today, suggest that cotton prices will continue on a long-run downward trend, and that by 1980 they will be below their 1965-67 levels. On the other hand, the price for cotton is not likely to drop to an extremely low level since demand is projected to remain substantial and governments would intervene with policy changes or possibly some marketing arrangement.

Average 1965-67 unit values (dollars per metric ton) of cotton lint imports and exports, based upon FAO data, are shown in table 44. The unit value of Mexican exports was adjusted upward to compensate for undervaluation. 48/

The projected unit values of imports and exports for 1980, based upon a world price of 26-cents per pound for SM 1-1/16 inch cotton, were estimated by reducing each of the 1965-67 values by 13.3 percent to compensate for the 4-cent (30 to 26 cents) price decline. This method of adjustment assumes that prices of various growths and varieties of cotton would change proportionately, and that the mix of trade (varieties, staple lengths, etc.) would remain constant. Although these are oversimplifications, they should not significantly affect the magnitudes involved. The possible exceptions are regions exporting extra-long staple cotton, for which the supply-demand relationship is more distinct than for other types of cotton.

The world average unit value of cotton imports is projected to decline from $650 per metric ton in 1965-67 to $560 in 1980, while the export unit value is projected to drop from $620 to $500.

The historical and projected unit values of lint imports are higher than export unit values because of the costs of insurance and freight (difference between f.o.b. export price and c.i.f. import price).

Cotton Textiles

Unit values of trade in cotton textiles are more difficult to come by than those for lint trade. Most of the 1965-67 average values presented in table 44 are estimates based upon data given for volume and value of trade by GATT and for volume of trade by FAO. Those figures footnoted are not estimates but were calculated directly from the published GATT data.

The projected 1980 unit values differ from the historical period for most of the regions because of two factors: (1) low price exporters are expected to supply a larger share of the world's total cotton textile exports, and (2) apparel and other products with higher unit values are expected to account for larger proportions of cotton textile exports. To reflect the first factor, all import unit values over $2,400 (1965-67) were lowered by 5 percent, except in the cases of the EC and Other Western Europe which were lowered by more than 5 percent so that the maximum 1980 import unit value would be $2,500 in 1980. To reflect the second factor, all export unit values were raised 5 percent above their 1965-67 values, except for the EC and the United Kingdom, whose unit values were already above $3,000. These two adjustments do not cancel one another out and are compatible. Although textile importing nations

48/ Unit value of exports was raised from $380 per metric ton to $570.

Table 44.--Unit values of cotton lint and cotton textile trade, average 1965-67 and projected 1980

Region	Cotton lint 1/				Cotton textiles			
	1965-67 average (30¢ price)		Projected 1980 2/ (26¢ price)		1965-67 average		Projected 1980 3/	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	Dollars per metric ton 4/							
Developed								
United States	800	530	690	460	5/2,440	5/2,920	2,320	3,070
Canada	540		470		2,140	2,000	2,140	2,100
EC	630		550		5/2,640	5/3,000	2,500	3,000
United Kingdom	630		550		5/1,920	5/3,330	1,920	3,330
Other Western Europe	650	590	560	510	2,830	2,800	2,500	2,940
Japan	590		510		2,200	2,600	2,200	2,730
Australia & New Zealand				490	2,600	2,400	2,470	-
South Africa	530		460		2,500	2,000	2,380	-
Weighted average	620	540	530	450	2,460	2,880	2,350	2,950
Central Plan								
Eastern Europe	730		630		2,300	2,000	2,300	2,100
USSR	830	720	720	620	2,300	2,000	2,300	2,100
Communist Asia	570	550	490	480	-	1,500	1,900	1,580
Weighted average	720	720	620	620	2,300	1,910	2,300	1,970
Less Developed								
Mexico		570		490	-	1,500	-	1,580
Central America & Caribbean	730	520	630	450	2,500	1,600	2,380	1,680
Brazil		470		410	-	1,500	-	1,580
Colombia		500		430	2,500	1,400	-	1,470
Peru		790		680	2,500	-	-	-
Other South America	750	370	650	320	2,500	1,400	2,380	-
East & West Africa	580	580	500	500	2,200	1,500	2,200	1,580
United Arab Republic		970		940	-	5/1,790	-	1,880
Sudan		750		650	2,200	1,650	2,200	-
Other North Africa	560	830	490	720	2,200	1,500	2,200	-
Iran		500		430	2,200	-	-	-
Syria		570		490	2,200	1,500	-	1,580
Turkey		560		490	-	1,500	-	1,580
Other West Asia	780	620	680	540	2,500	1,600	2,380	1,680
India	870		750		-	1,570	-	1,650
Pakistan		480		420	2,500	1,020	-	1,070
Other South Asia	670	760	580	660	2,200	-	2,200	-
South East Asia	640		550		2,200	2,000	2,200	-
Hong Kong	530		460		1,900	2,000	1,900	2,100
South Korea	570		490		1,900	1,800	1,900	1,890
Taiwan	540		470		-	5/1,380	-	1,450
Other East Asia & Pacific	590		510		2,200	1,400	2,200	1,470
Weighted average	650	620	540	520	2,170	1,690	2,140	1,730
Total World	650	620	560	500	2,350	2,300	2,280	2,190

1/ Price refers to SM 1-1/16 inch cotton, c.i.f., Liverpool, constant 1968 currency.

2/ Adjusted from 1965-67 levels by the 26¢/30¢ price ratio (i.e., decreased by a constant percentage from 1965-67 price).

3/ Changes from 1965-67 unit values represent adjustments made to reflect an increasing proportion of exports from low price exporters and an increasing proportion of clothing in total trade. See discussion in text.

4/ Rounded to nearest 10 dollars.

5/ Calculated directly from (32).

Sources: Cotton lint: Calculated from FAO Trade Yearbook. Cotton textiles: Author's estimates based on GATT and FAO data.

will be importing a more highly manufactured mix of products in 1980, a much greater proportion of these products will originate from exporters whose export unit values can remain well below those of the higher cost exporters, even after the former have raised unit values to compensate for more processing. Note, that in 1965-67 the unit value of LDC textile exports was $1,190 per metric ton lower (41 percent) than the unit value of textile exports from the developed sector.

With the above changes, the projected 1980 average unit value of world cotton textile imports comes to $2,280 per metric ton--$70 lower than the 1965-67 estimate. The projected average value of exports is $2,190 per metric ton--$110 lower than in 1965-67. The difference between the two unit values again reflects marketing costs. Among the geographic regions, the unit value of textile exports from the central plan and less developed regions remains well below the level for the developed countries.

Export Earnings and Import Costs

Medium Projections

Assuming a medium rate of economic growth among the LDC's, and a 26-cent per pound price for cotton lint, LDC net earnings from trade in cotton lint and cotton textiles could reach $1.5 billion by 1980--over $600 million above 1965-67 estimated average earnings (table 45). All of the projected increase in LDC export earnings from cotton are shown to accrue from increased net exports of textiles, as net earnings from cotton lint are projected to decline slightly. Hong Kong, India, the UAR, South Korea, Pakistan, and Taiwan--the largest LDC cotton textile exporters in 1965-67--can be expected to provide most of the increase in LDC export earnings.

The central plan sector is projected to have a slightly lower net total cotton import cost in 1980 than in 1965-67. Increased textile imports by the USSR and lint imports by Eastern Europe will probably be more than compensated for by increased lint exports by USSR and textile exports by Communist Asia and Eastern Europe.

In the developed sector, net import costs are projected to increase to over $1.7 billion by 1980, compared with about $900 million in 1965-67. Most of this import cost increase will come from expansion in net textile imports by the United States and the EC (appendix table C-6 gives projections for gross trade in cotton lint and textiles for 1980).

Alternative Projections

The projected net value of total cotton trade in 1980 under high and low economic growth assumptions for the LDC's are presented in table 46.

High LDC economic growth.--Under the high economic growth assumption, LDC net export earnings from all cotton in 1980 is projected to be $307 million less than under the medium growth projections. The decline in earnings would be shared more or less equally by cotton lint and textiles. The reason for the decline is that high economic growth would cause an increase in cotton consumption exceeding that of production. This would result in decreased cotton exports by many countries, and increased textile imports by the principal LDC importers. Most of the increase in textile imports will be accounted for by the East and West Africa and Other East Asia and the Pacific regions. 49/

49/ The projections assume that mill capacity in these regions would expand proportionately to expansion in domestic use. However, the rate of expansion under high economic growth could be greater, in which case, textile imports would be lower and net lint exports lower.

Table 45.--Net value of cotton trade, estimated 1965-67, and projected 1980

Region	Estimated 1965-67 average			Projected 1980 (Medium income-26¢ cotton price)			Change 1965-67 to 1980		
	Textiles	Lint	All cotton	Textiles	Lint	All cotton	Textiles	Lint	All cotton
	Million dollars 2/								
Developed									
United States	190	-444	-254	520	-372	148	330	72	402
Canada	107	52	159	129	42	171	22	-10	12
EC	-165	562	397	145	506	651	310	-56	254
United Kingdom	142	120	262	184	116	300	42	-4	38
Other Western Europe	-46	134	88	12	165	177	58	31	89
Japan	-401	425	24	-344	428	84	57	3	60
Australia & New Zealand	151	10	161	173	-5	168	22	-15	7
South Africa	41	17	58	48	9	57	7	-8	-1
Subtotal	19	876	895	867	889	1,756	848	13	861
Central Plan									
Eastern Europe	-159	452	293	-259	536	277	-100	84	-16
USSR	56	-220	-164	242	-336	-94	186	-116	70
Communist Asia	-75	75	-	-142	78	-64	-67	3	-64
Subtotal	-178	307	129	-159	278	119	19	-29	-10
Less Developed									
Mexico	-18	-210	-228	-16	-93	-109	2	117	119
Central America & Caribbean	81	-117	-36	14	-31	-17	-67	86	19
Brazil	-6	-99	-105	-16	-217	-233	-10	-118	-128
Colombia	-7	-6	-13	-29	-17	-46	-22	-11	-33
Peru	-	-78	-78	-	-68	-68	-	10	10
Other South America	17	36	53	24	42	66	7	6	13
East & West Africa	327	-165	162	336	-330	6	9	-165	-156
United Arab Republic	-101	-315	-416	-207	-210	-417	-106	105	-1
Sudan	13	-103	-90	22	-202	-180	9	-99	-90
Other North Africa	39	-	39	44	7	51	5	7	12
Iran	2	-38	-36	-	-60	-60	-2	-22	-24
Syria	-4	-76	-80	-16	-74	-90	-12	2	-10
Turkey	-3	-118	-121	-16	-127	-143	-13	-9	-22
Other West Asia	18	-	18	14	15	29	-4	15	11
India	-120	83	-37	-198	82	-116	-78	-1	-79
Pakistan	-57	-54	-111	-139	-143	-282	-82	-89	-171
Other South Asia	44	-10	34	110	10	120	66	20	86
South East Asia	132	20	152	110	38	148	-22	18	-4
Hong Kong	-208	75	-133	-427	106	-321	-219	31	-188
South Korea	-61	44	-17	-208	98	-110	-147	54	-93
Taiwan	-50	40	-10	-189	89	-100	-139	49	-90
Other East Asia & Pacific	177	24	201	264	92	356	87	68	155
Subtotal	215	-1,067	-852	-523	-993	-1,516	-738	74	-664
Total World	56	116	172	185	174	359	129	58	187

1/ Price refers to SM 1-1/16 inch cotton, c.i.f. Liverpool, 1968 constant currency.

2/ A minus (-) indicates net earnings, except in the change columns where it indicates an improved position, i.e., increased earnings or lower cost.

Sources: Appendix tables C-5 and C-6.

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WORLD DEMAND PROSPECTS FOR COTTON IN 1980 WITH EMPHASIS ON TRADE BY LESS DEVELOPED COUNTRIES. (Foreign Agricultural Economic Report). / Richard S. Magleby (and others). Washington, DC: Economic Research Service. Jan. 1971.

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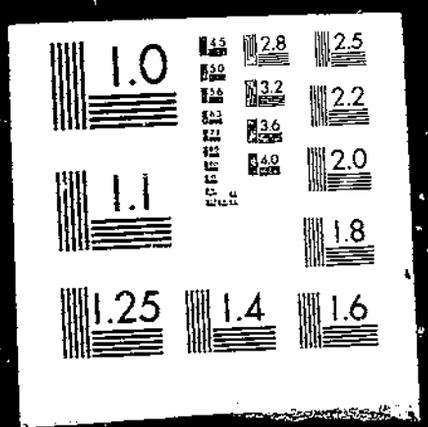

Table 46.--Projected net value of cotton trade in 1980
(Under high and low economic growth assumptions)

Region	High LDC growth			Low LDC growth		
	Textiles	Lint	All cotton	Textiles	Lint	All cotton
	Million dollars 1/					
Developed						
United States	520	-524	-4	551	-414	137
Canada	129	42	171	129	42	171
EC	115	511	626	145	506	651
United Kingdom	151	121	272	184	116	300
Other Western Europe	-17	170	153	41	159	200
Japan	-371	434	63	-344	428	84
Australia & New Zealand	173	-5	168	173	-5	168
South Africa	48	9	57	48	9	57
Subtotal	748	758	1,506	927	841	1,768
Central Plan						
Eastern Europe	-280	542	262	-238	529	291
USSR	221	-330	-109	242	-336	-94
Communist Asia	-142	78	-64	-142	78	-64
Subtotal	-201	290	89	-138	271	133
Less Developed						
Mexico	-16	-64	-80	-16	-113	-129
Central America & Caribbean	13	-13	-	31	-35	-4
Brazil	-16	-180	-196	-16	-217	-233
Colombia	-15	-13	-28	-29	-26	-55
Peru	-	-75	-75	-	-61	-61
Other South America	24	68	92	24	61	85
East & West Africa	424	-400	24	336	-275	61
United Arab Republic	-207	-202	-409	-207	-210	-417
Sudan	44	-240	-196	22	-182	-160
Other North Africa	66	7	73	44	3	47
Iran	-	-64	-64	-	-60	-60
Syria	-16	-83	-99	-16	-69	-85
Turkey	-16	-118	-134	-16	-122	-138
Other West Asia	14	29	43	-10	22	12
India	-215	165	-50	-198	90	-108
Pakistan	-150	-160	-310	-139	-113	-252
Other South Asia	132	10	142	88	10	98
South East Asia	132	55	187	88	33	121
Hong Kong	-469	120	-349	-406	97	-30
South Korea	-208	108	-100	-208	88	-120
Taiwan	-203	108	-95	-189	85	-104
Other East Asia & Pacific	308	107	415	220	71	291
Subtotal	-374	-835	-1,209	-597	-923	-1,520
Total World	173	213	386	192	189	381

1/ A minus (-) indicates net earnings.

Sources: Appendix tables C-5 and C-6.

The central plan countries could lower their projected 1980 net import cost by $30 million under the condition of high LDC income growth. The import cost change is mainly the result of increased textile export earnings by the Eastern European countries and the Soviet Union (recorded as a decline in net imports). The projections also indicate the developed countries would benefit from higher LDC income growth. Their combined import cost would be reduced by $250 million because of increased cotton lint exports by the United States and increased textile exports by the Western European countries and Japan.

Low LDC economic growth.--A lower than expected economic growth rate in the LDC's would have little effect on their earnings from all cotton--net earnings are projected to increase by $4 million. LDC textile imports would decline somewhat and total lint exports would also fall a little. Within the central plan countries, textile exports and lint imports in Eastern Europe would both fall somewhat, causing net import costs for the region to rise by $14 million. In the developed countries, the lower LDC income would have little effect. Total import costs would increase by $12 million, the result mainly of decreased textile exports from the United States and Other Western Europe.

APPENDIX A

ANALYSIS OF FIBER USE AND COTTON'S SHARE

Data Used

Fiber Use

The data used in this study on total fiber use by countries are figures on total domestic availability compiled by FAO, and are complete only up through 1964, except for a few selected countries with data through 1966 (15, 17, 18, 19, 23). In some cases, it was possible to estimate fiber availability through 1967 by using ICAC mill consumption data (World Cotton Statistics) and GATT trade data (30, 31).

FAO data have several shortcomings which FAO is working to remedy. One is the exclusion of flax and silk, and trade in certain clothing items. 1/ Another is that all fibers are aggregated on a simple weight basis, with no consideration given to manufacturing loss. For example, the simple weight of net cotton textile trade is added to domestic mill cotton use to get total cotton use, with no adjustment for the 12-percent or greater loss in weight between raw cotton going into the mill and the resulting textiles.

A third shortcoming of FAO data is the failure to convert the various fibers to a raw cotton (or some other) equivalent basis. The manmades have greater strength and durability than cotton, and thus tend to replace more than an equal weight. 2/ Thus, comparisons of consumption trends and shares among fibers may understate the importance of manmades.

Per capita fiber use levels for the various regions were calculated by dividing total fiber use by population. The population series used are those compiled by Moe (59). In many regions, 3-year running averages of per capita fiber use were used when they provided higher R^2's and more significant results. Such running averages may actually better indicate actual fiber consumption, since stock changes inherent in availability data would be leveled out.

Cotton's Share

Cotton's share of total fiber use for the various regions was calculated by dividing total cotton availability by total fiber availability. Again, the fact that the FAO data are not on a raw cotton or even raw fiber equivalent basis may slightly overstate cotton's share in regions with significant manmade fiber use.

1/ Since the completion of this study the new FAO data have become available. See (25) and appendix D for details.

2/ Examples of the raw cotton equivalent factors developed by the USDA are the following: Rayon and acetate staple, 1.10; high tenacity rayon yarn, 1.80 for 1958 to date; noncellulosic yarn not used in tires, 1.75; wool, 0.55; textile glass fiber, 1.70.

Per Capita Income

The historical income series used were those compiled by Moe (59). Per capita GNP was used for the LDC's, per capita consumer expenditure for the DR's, and per capita net material product for the CPR's. (See details in table A-1). For analysis of some less developed regions with incomplete data, and for analysis of total world, indices of per capita income were developed from apparent growth rates.

Cotton Prices

Spot cotton prices or Liverpool prices for particular growths were used for the major producing regions (table A-1). A world price series was developed and used for all other regions and for sector and total world analysis. The world cotton price was taken as the average of all but the highest available quotation, c.i.f., Liverpool, of the following growths of SM 1-1/16 inch cotton: United States, Mexican, Iranian, Nicaraguan, Syrian, and Greek (table A-2).

All price data used were already in U.S. currency. To reflect more accurately the price situation over time in particular countries, these prices were converted back to the country's currency at yearend exchange rates, the result was then deflated by the country's general wholesale price index, and reconverted to U.S. currency at the 1968 exchange rate. 3/ For multicountry regions, this process proved so cumbersome and time consuming that a less accurate conversion to constant U.S. prices was made by applying a weighted regional wholesale price index (total cotton use as a weight) directly to the undeflated price data. In cases where price indices were incomplete, the U.S. price index was used; this assumes that differences in rate of inflation between the foreign region and the United States are compensated for in the currency exchange rate--a gross assumption in light of fixed exchange rates over time.

Manmade Fiber Prices

Wholesale list prices of polyester fibers were entered into the analysis for regions or sectors with synthetic fiber use over 5 percent (tables A-1 and A-3). For Japan, a nylon staple price series was used because a suitable polyester series was not available.

Prices were converted to constant 1968 U.S. currency in the same way as cotton prices.

Wholesale list prices of manmade fibers are deceptive because of off-list selling. However, since polyester list prices have been declining relative to those of cotton, the series was deemed meaningful. Rayon list prices were not included because of doubtful meaningfulness. Discounted rayon prices have reportedly closely followed cotton prices up and down, suggesting that cotton price, itself, may be a good proxy index for actual rayon prices.

3/ Reasons for such a procedure are discussed by Bjarnason, McGarry, and Schmitz, American Journal of Agricultural Economics, Vol. 51, February 1969. p. 189.

Table A-1 .--Income and price series used in time series analysis of regional fiber use and cotton's share.

Regions	Per capita income series 1/	Cotton price series 2/	Synthetic fiber price series 3/
DEVELOPED			
United States	CE - 1968 prices	Spot SM 1-1/16 inch 4/	U.S. polyester 4/
Canada	CE - 1968 prices	Liverpool average 2/ 4/	Canada polyester 4/
EC	CE - 1968 prices	Liverpool average 2/ 4/	Average EC polyester 4/
United Kingdom	CE - 1968 prices	Liverpool average 2/ 4/	U.K. terylene 4/
Other Western Europe	CE - 1968 prices	Liverpool average 2/ 4/	Average OWE polyester 4/
Japan	CE - 1968 prices	Liverpool average 2/ 4/	Japanese nylon 4/
Australia & New Zealand	CE - 1968 prices	Liverpool average 2/ 4/	U.K. terylene 4/
South Africa	CE - 1968 prices	Liverpool average 2/ 4/	U.K. terylene 4/
CENTRAL PLAN			
Eastern Europe	Polish DNI 1956 prices	None used	None used
USSR	NMP 1955 prices	None used	None used
Communist Asia	NDP 1952 prices	None used	None used
LESS DEVELOPED			
Mexico	GNP - 1962 prices	Spot SM 1-1/32 inch 4/	Average world polyester 4/
Central America & Caribbean	GNP - 1962 prices	Liverpool average 5/	None used
Brazil	GNP - 1962 prices	Liverpool Sao Paulo #5 5/	Average world polyester 5/
Colombia	GNP - 1962 prices	Liverpool average 5/	None used
Peru	GNP - 1962 prices	Spot, tanguis 4/	None used
Other South America	GNP - 1962 prices	Liverpool average 5/	Average world polyester 5/
East & West Africa	Ghana, GNP - 1962 prices	Liverpool average 5/	None used
United Arab Republic	GNP - 1962 prices	Spot, Ashmodi 4/	None used
Sudan	GNP	Liverpool average 5/	None used
Other North Africa	GNP: Morocco & Tunisia - 1962 prices	Liverpool average 5/	None used
Iran	GNP - 1962 prices	Liverpool average 5/	None used
Syria	None available; time trend used	Liverpool average 5/	None used
Turkey	GNP - 1962 prices	Spot, Ismir II 4/	None used
Other West Asia	Same as Other North Africa	Liverpool average 5/	None used
India	GNP - 1962 prices	Spot, Digvijoy 4/	None used
Pakistan	GNP	Spot, 285 SG fine 4/	None used
Other South Asia	Index: 2.9%/year growth	Liverpool average 5/	None used
South East Asia	GNP: Thailand, Burma & Cambodia	Liverpool average 5/	None used
Hong Kong	NDP - at factor cost, 1952 prices	Liverpool average 4/	U.K. terylene 4/
South Korea	GNP - 1952 prices	Liverpool average 4/	Japanese nylon 4/
Taiwan	GNP - 1962 prices	Liverpool average 4/	Japanese nylon 4/
Other East Asia & Pacific	GNP of Philippines - 1962 prices	Liverpool average 5/	Japanese nylon 5/

1/ CE = consumer expenditure. DNI = Dest. national income. NMP = net national product. NDP = net domestic product. GNP = gross national product. For complete series, see Moe (59). 2/ Liverpool average refers to average price of available growths of SM 1-1/16 inch, see table A-2. 3/ Staple prices. For complete series used and details of deflation, see table A-2 . 4/ All series deflated to constant 1968 prices by dividing by the country's wholesale price index, or in the case of a multicountry region, by a weighted index (with total cotton use as weight). Conversion to U.S. currency was done at 1968 year ending exchange rate as reported by IMF. 5/ Deflated to 1968 prices by U.S. wholesale price index. This assumes that relative difference in inflation between the particular country and the United States would be compensated for in currency exchange rates.

Table A-2.--Prices of selected growths of SM 1-1/16 inch cotton, c.i.f. Liverpool, England, 1952-67

Year beginning August 1	Growth						Average price 1/	U.S. wholesale price index	Deflated average price
	United States	Mexico	Iran	Nicaragua	Syria	Greece			
	Cents/pound							1968 - 100	1968 prices
1952	41.14	39.72	-	-	37.96	-	38.84	85.9	45.22
1953	39.62	38.23	-	-	38.54	-	38.38	85.4	44.94
1954	40.68	39.33	-	-	38.24	-	38.78	85.6	45.30
1955	39.34	35.30	34.79	-	34.76	-	34.95	87.1	40.13
1956	33.23	33.11	33.08	-	32.43	-	32.87	89.8	36.60
1957	35.56	34.22	33.44	32.28	33.65	-	33.40	91.8	36.38
1958	32.57	29.45	29.18	27.63	28.84	-	28.78	92.4	31.15
1959	29.41	29.21	29.56	28.43	29.42	29.91	29.21	92.6	31.54
1960	30.51	30.34	30.58	29.81	30.82	31.09	30.41	92.4	32.91
1961	30.83	30.07	30.53	29.93	30.61	30.16	30.26	92.4	32.75
1962	30.03	29.08	29.63	28.89	29.47	29.40	29.29	92.4	31.70
1963	29.12	29.48	29.76	28.59	29.37	29.69	29.25	92.4	31.66
1964	29.49	29.11	29.32	27.65	29.30	29.83	28.97	93.4	31.02
1965	28.59	28.23	28.07	27.10	28.22	29.09	28.04	95.8	29.27
1966	28.36	29.22	28.95	27.60	28.18	28.91	28.40	97.5	29.13
1967	33.76	31.92	32.03	30.42	32.17	31.35	31.58	98.8	31.96
1968	29.98					n.a.	2/ 28.75	100.0	28.75

1/ Simple average of available quotations excluding the highest. 2/ Simple average of the 6 cheapest growths actively traded.

Sources: USDA/FAS and International Cotton Advisory Committee.

Table A-3 .--List prices of polyester or nylon fiber and relationship with cotton prices, 1952-67

Year beginning August 1	Nylon	Polyester staple			
	Japan 1/	United States	Canada	United Kingdom	EC
	Prices in US$ per lb. 2/				
1952	$2.02	$2.10	$1.80	$1.83	n.a.
1953	1.77	2.00	1.80	1.85	n.a.
1954	1.77	1.82	1.84	1.82	n.a.
1955	1.59	1.53	1.71	1.70	n.a.
1956	1.45	1.63	1.61	1.64	$1.94
1957	1.42	1.64	1.59	1.57	1.80
1958	1.38	1.55	1.54	1.56	1.73
1959	1.36	1.43	1.60	1.56	1.70
1960	1.14	1.33	1.70	1.54	1.64
1961	1.08	1.24	1.51	1.31	1.61
1962	1.08	1.23	1.43	1.28	1.53
1963	1.10	1.15	1.35	1.13	1.42
1964	1.10	.98	1.34	.98	1.35
1965	1.09	.86	1.32	.85	1.26
1966	n.a.	.74	n.a.	.81	1.24
1967	n.a.	.63	n.a.	.69	n.a.
	Margin over cotton price 3/				
1952	$1.60	$1.59	$1.38	$1.38	n.a.
1953	1.35	1.51	1.38	1.40	n.a.
1954	1.34	1.30	1.40	1.36	n.a.
1955	1.21	1.01	1.33	1.30	n.a.
1956	1.11	1.15	1.26	1.27	$1.56
1957	1.06	1.15	1.23	1.21	1.42
1958	1.06	1.07	1.24	1.26	1.41
1959	1.04	.98	1.28	1.25	1.37
1960	.81	.90	1.35	1.22	1.30
1961	.75	.78	1.26	1.00	1.28
1962	.76	.77	1.10	.99	1.22
1963	.79	.70	1.03	.84	1.12
1964	.79	.63	1.02	.70	1.06
1965	.79	.53	1.02	.59	.98
1966	n.a.	.43	n.a.	.56	.96
1967	n.a.	.24	n.a.	.36	n.a.
	Ratio of cotton to polyester or nylon price				
1952	0.21	0.24	0.23	0.25	n.a.
1953	.24	.24	.23	.24	n.a.
1954	.24	.29	.24	.25	n.a.
1955	.24	.34	.22	.24	n.a.
1956	.23	.29	.22	.23	0.20
1957	.25	.30	.23	.23	.21
1958	.23	.31	.19	.19	.18
1959	.24	.31	.20	.20	.19
1960	.29	.32	.21	.21	.21
1961	.31	.37	.22	.24	.20
1962	.30	.37	.23	.23	.20
1963	.28	.39	.24	.26	.21
1964	.28	.36	.24	.29	.21
1965	.28	.38	.23	.31	.22
1966	n.a.	.42	n.a.	.31	.23
1967	n.a.	.62	n.a.	.48	n.a.

1/ Suitable price series for polyester staple not available. 2/ Prices in each region have been deflated to constant 1968 currency by dividing by the respective wholesale price indices, 1968 = 100. Conversion to U.S currency also was done at 1968 exchange rates. Prices for EC are a simple average of prices in France, Italy, and West Germany. 3/ Except for the United States, the cotton price used was the average Liverpool price of SM 1-1/16 inch cotton (see table A-2) deflated to constant 1968 currency in same manner as polyester prices.

Sources: U.S. prices are from USDA publications (72, table 220; and Cotton Situation, Jan. 1969, table 11). Foreign polyester and nylon list prices are USDA/FAS compilations, mostly from Skinner's Record. Conversion to constant dollars was done by the authors.

Analysis of Per Capita Fiber Use

Cross Sectional Analysis

To provide a starting point for analysis, data on per capita fiber use in 1964 for the 33 regions of the study were related to the level of per capita GNP in each region. Although such cross-sectional analysis removes the influence of time per se, it does not eliminate the effect of the other factors, except as they are reflected in time.

Several analyses were run. In the first, all 33 regions were considered together, with two functions fitted to the data: semilog and log-log. Both functions had R^2's of 0.82 to 0.84 and mean income elasticities of 0.62 to 0.65 (table A-4).

The two functions differed considerably in the use responses at other than mean incomes (table A-5). The log-log function, by its nature, resulted in a constant elasticity over all levels of incomes. For the semilog function, the elasticity began very high at low levels of income and gradually decreased to a low elasticity at high income levels.

The semilog function did not fit well at very high levels of per capita incomes, such as in the United Kingdom, Canada, and the United States (fig. A-1). If per capita fiber use in the United States is indicative of what will happen in other regions as their income increases towards that of the United States (and there seems no reason for not expecting this), then the elasticity at high levels of income is likely to be somewhat greater than that suggested by the semilog function.

In the second analysis (10 most developed regions), the USSR and Eastern Europe were combined with the eight developed regions and the two functions fitted to the resulting data (fig. A-2). The R^2 values were again very close, 0.73 and 0.75, as were the mean income elasticities, 0.42 and 0.44 (table A-4). For given levels of income, the elasticities indicated by the semilog functions were higher than those indicated by the corresponding function fitted to the data for all 33 regions (table A-5).

The third analysis involved fitting the two functions to only the 27 least developed of the 33 regions, including the 23 LDR's, Communist Asia, Eastern Europe, South Africa, Japan, and Other Western Europe (fig. A-2). The mean income elasticities in each case were higher than those shown by the corresponding functions for the developed regions (table A-4). This suggests that normally the elasticity does decrease as income increases. However, the fit of the functions to the data was poorer than that found in the other analyses because of greater variation in fiber use at given income levels among the less developed regions than among the more developed.

At very low levels of income the variation in fiber use was rather substantial; for example, India and Southeast Asia had somewhat the same per capita use of fibers (fig. A-2). A major question appears to be what will be the magnitude of the response in fiber use as incomes rise in these very low income countries. Will it follow the higher response trend indicated by the UAR, Taiwan, Syria, and Turkey, or will it follow the lower response trend indicated by the Latin American regions (with the exception of Brazil) and Other West Asia? Looking at the pattern of data for all 33 regions, the higher response trend appears to fit better.

Table A-4.--Fiber use per capita related to income per capita, cross-sectional data, 1964

Regions included	F = a + b log I			Log F = a + b log I		
	R^2	b	E	R^2	b	E
All 33 regions	0.84	8.9253 (12.9)	0.65	0.82	0.6212 (11.7)	0.62
10 most developed	0.75	11.4965 (4.9)	0.44	0.73	.4249 (4.7)	0.42
27 least developed	0.64	6.5565 (6.7)	0.66	0.67	.6264 (7.0)	0.63

Note: F is fiber use per capita; I is income (GNP) per capita; E is income elasticity of fiber use figured at mean values. Numbers in parenthesis are t values of the regression coefficient b.

Table A-5.--Income elasticities of per capita fiber use at selected income levels, cross-sectional data, 1964

Regions included and income level	Functions	
	Semilog	Log-log
	-- Elasticity --	
All 33 regions:		
$ 100 per capita	2.45	0.62
200	0.91	.62
500	.50	.62
1,000	.37	.62
2,000	.29	.62
3,000	.26	.62
10 most developed regions:		
500	.67	.42
1,000	.46	.42
2,000	.35	.42
3,000	.31	.42
27 less developed:		
100	1.28	.63
200	.68	.63
500	.42	.63
1,000	.33	.63

Figure A-1. FIBER USE RELATED TO INCOME, CROSS-SECTIONAL DATA FOR 33 REGIONS, 1964

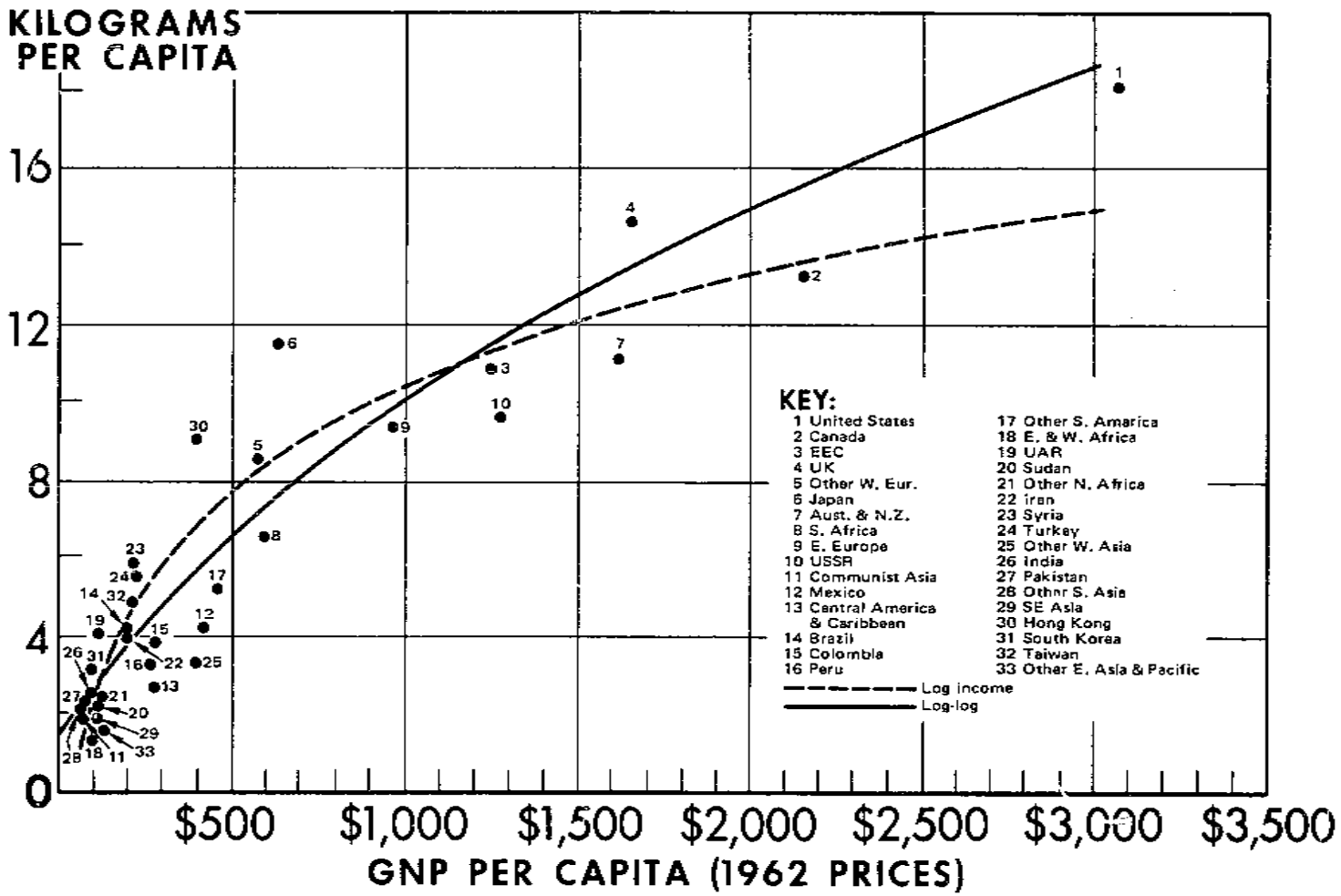

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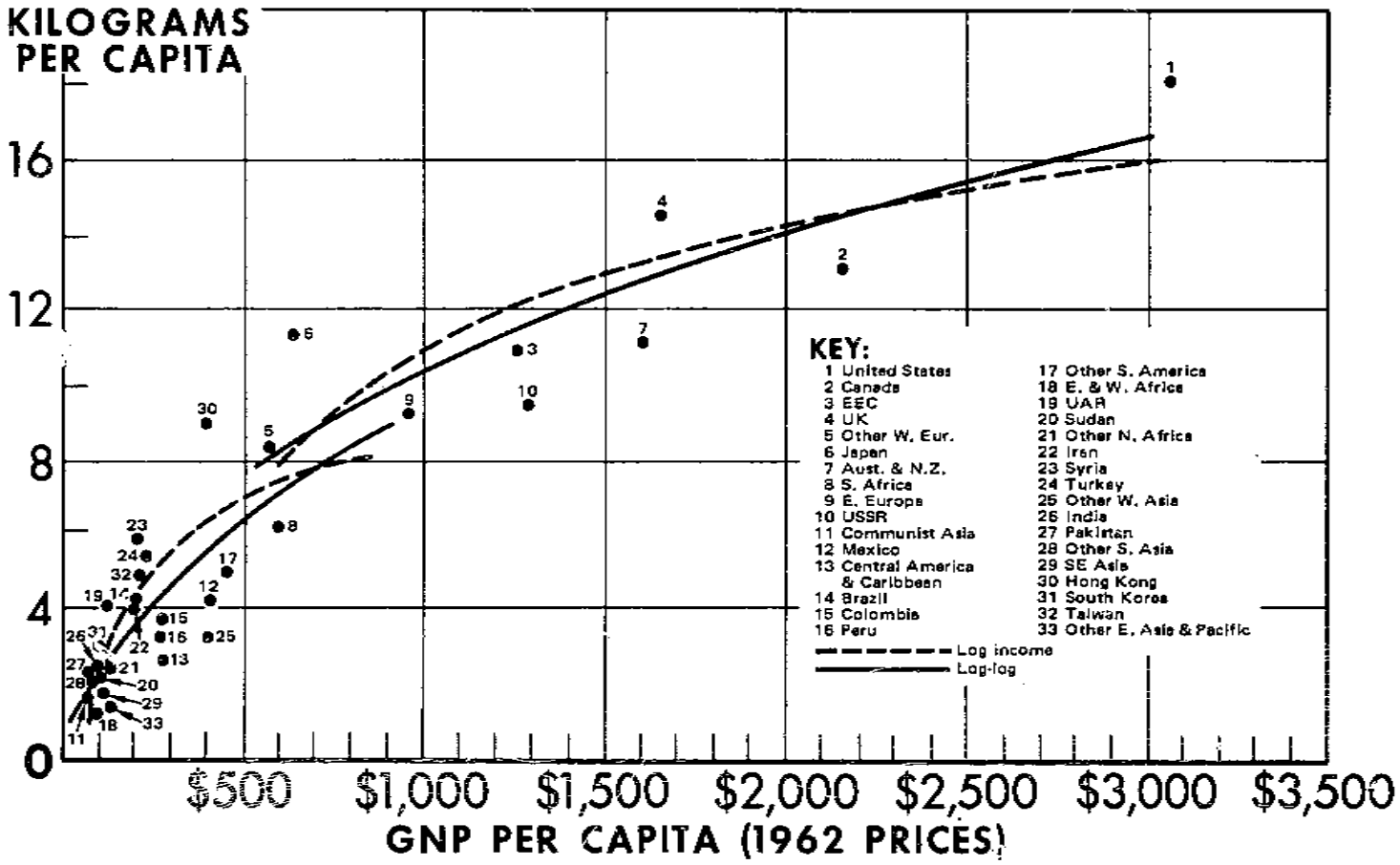
Figure A-2. FIBER USE RELATED TO INCOME, CROSS-SECTIONAL DATA FOR 27 LEAST DEVELOPED AND 10 MOST DEVELOPED REGIONS, 1964



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Time Series Analysis

Equations and variables.--Least squares analyses of regional, sector, and world time series data were carried out using one or more of the following equations:

Initial equations:

(1) $F = a + b\,T$

(2) $F = a + bI + cT$ (central plan regions only)

(3) $F = a + bI + cP_c + dP_s + eT$

(4) $F = a + bI + cP_c + dT$

Subsequent equations:

(5) $F = a + bI + cP_c + dP_s$

(6) $F = a + bI + cP_c$

(7) $F = a + bI + cP_s$

(8) $F = a + bI$

(9) $F = a + b \log I$

(10) $\log F = a + b \log I$

Where

F = per capita fiber use, calendar year average.

I = real per capita income, calendar year average.

P_c = price of cotton, August-July average (thus providing a lead of 5 months on F), deflated.

P_s = price of synthetic fiber, August-July average (thus providing a lead of 5 months in F), deflated.

T = time trend index.

Equation 1 was run for all 33 regions. Equation 2 was employed for the three central plan regions, because fiber price data were not available and use of world price or proxy prices did not seem justified because of the degree of government intervention. Equation 3 was run for the developed sector and those regions in which synthetic fibers had a 10-percent or greater share of the market, otherwise equation 4 was used. The reasoning here was that at least this size of share would be needed for synthetic fiber prices to have any measurable effect on total use of all fibers.

The time period involved was usually 12 years, ending in 1964, 1966, or 1967, depending on availability of data. The time period was shortened to 6 to 8 years in some regions where a definite change in trend was evident.

Results.--The results of equations 3 and 4 were generally disappointing. It proved impossible in most cases to obtain any significant or conclusive measurement of the separate effects of cotton price, synthetic prices, or time trend apart from that of income. In all regions with income data, except Communist Asia and Brazil, per capita income and time were so highly intercorrelated as to confound the results. Also, cotton price and synthetic fiber price were frequently highly intercorrelated.

New equations (5, 6, and 7) were then tried with time excluded. Again, the results were disappointing. When both cotton and synthetic price series were included along with income in the analysis (equation 5), one or the other, or both, had illogical (positive) signs and were nonsignificant. When the equation included income and only one price series (equations 6 and 7), the price coefficient more frequently had a logical (negative) sign, but in all cases no significance (or even an effect on per capita fiber use of much consequence if it had been significant).

Failure to find logical relationships and significance in the multiple regressions forced final reliance on simple analysis of the effects of income (equations 8, 9, and 10). The results of these equations were generally good, with high R^2's and correct signs (table A-6).

The developed sector, total world, and 23 of 33 regions had income coefficients from equations which were both significant and had logical (positive) signs. Unacceptable (negative) signs were encountered only for Brazil, Other South America, East and West Africa, and the less developed sector as a whole. 4/ Nonsignificance and very low R^2's occurred only for Central America, the UAR, India, and Pakistan. Lack of historical income data prevented analysis for Other North Africa, Syria, Other West Asia, and Other East Asia and Pacific. Also, no analysis was made of the total central plan sector because of the diversity of development between Communist Asia and the other two regions of the sector.

The income elasticities of per capita fiber use calculated from the three simple equations were either the same or very close (table A-6). The highest responses to changes in income occurred in Iran (3.8), the Sudan (1.7 to 1.8), Communist Asia (1.7), and Hong Kong (1.2 to 1.3). The lowest significant responses were found in the USSR (0.59 to 0.62) and the EC (0.63 to 0.64).

The elasticities encountered for the DR's, with the exception of South Africa and the EC, and for Eastern Europe were higher than those found by or assumed in most previous studies. For example, the response in the United States of 1.1 was above that of the 0.47 used for projections in the NACFF study (table 10). Among the LDR's, however, no general tendency was noted for the responses to be above or below those of other studies.

The elasticities for most of the individual developed regions were higher than for the developed sector as a whole. The developed regions with the most current data also have the highest elasticities (United States, Canada, United Kingdom, and Australia-New Zealand). One explanation could be that the response (elasticity) is increasing in these regions, and the current data reflect this. However, the more current data are also more complete in their inclusion of cotton clothing imports, compared with those for the first few years in the times series. Thus, it is likely that the elasticities for these particular regions are biased upward, and that they would be lower if the time series were more comparable.

4/ However, analysis of cotton use per capita did show significance and positive signs.

Table A-6.--Statistical results of time series analysis of per capita fiber use

Region	Time period	Y = a + b log I			Log Y = a + b log I			Y = a + b I		
		R^2	F	E	R^2	F	E	R^2	F	E
Developed										
United States	1956-67	0.95	175	1.15	0.89	82	1.15	0.95	182	1.12
Canada	1956-67	.75	30	1.06	.72	26	1.05	.76	31	1.04
EC	1953-64	.90	87	0.63	.90	87	0.64	.89	84	0.63
United Kingdom	1955-66	.93	126	1.06	.92	119	1.06	.93	133	1.06
Other Western Europe	1953-64	.99	1,529	.91	.99	761	.91	.99	787	.90
Japan	1953-64	.95	177	.76	.95	200	.65	.94	146	.76
Australia & New Zealand	1955-66	.55	13	.96	.54	12	.92	.56	13	.96
South Africa	1958-64	.88	38	.82	.87	33	.80	.88	37	.79
Sector	1953-64	.84	55	.73	.84	53	.72	.86	65	.74
Central plan										
Eastern Europe	1953-64	.95	182	.85	.96	267	.87	.97	292	.90
USSR	1955-66	.98	610	.58	.98	530	.62	.97	288	.59
Communist Asia	1953-64	.69	23	1.73	.65	19	1.74	.69	22	1.68
Sector		No analysis								
Less developed										
Mexico	1961-67	.79	19	.82	.80	20	.81	.79	19	.82
Central America & Caribbean	1953-64	.02	-	-	.02	-	-	.02	-	-
Brazil	1956-67	.01	-	neg.	.01	-	neg.	.01	-	neg.
Colombia	1955-66	.77	33	.81	.58	14	.89	.76	31	.80
Peru	1953-64	.88	75	.74	.88	71	.73	.89	80	.73
Other South America	1953-64	.02	-	neg.	.02	-	neg.	.02	-	neg.
East & West Africa	1953-64	.01	-	neg.	.01	-	neg.	.01	-	neg.
United Arab Republic	1955-67	.21	3	.24	.21	3	.24	.21	3	.24
Sudan	1953-64	.88	74	1.77	.88	74	1.73	.89	80	1.77
Other North Africa		No analysis								
Iran	1959-64	.68	8	2.49	.65	8	2.64	.67	8	2.49
Syria		No analysis								
Turkey	1956-67	.65	18	.93	.64	18	.89	.67	20	.93
Other West Asia		No analysis								
India	1953-64	.56	13	.58	.57	6	.58	.57	13	.58
Pakistan	1953-64	.23	3	1.08	n.a.	n.a.	n.a.	.23	3	1.04
Other South Asia	1953-64	.94	148	5.27	.83	49	5.20	.94	159	5.29
South East Asia	1953-64	.79	38	.69	.77	34	.69	.77	34	.67
Hong Kong	1960-66	.34	3	1.18	.33	2	1.28	.33	2	1.15
South Korea	1953-64	.63	17	.92	.61	16	1.03	.58	14	.88
Taiwan	1953-64	.87	69	.96	.90	91	.92	.90	89	.93
Other East Asia & Pacific		No analysis								
Sector 1/	1953-64	.60	15	.49	.60	15	.49	.59	15	.48
Total World	1953-67	.91	130	.62	.91	135	.62	.91	136	.63

Note: F = F value; E = income elasticity of per capita fiber use, calculated at mean values.
1/ Results shown are from analysis of per capita cotton use. Elasticity was negative for per capita total fiber.

The income elasticities encountered in the time series analysis for most of the regions displayed no tendency to drop among regions with successively higher per capita income (fig. A-3). Other than for the very high elasticities of Iran, the Sudan, Hong Kong, and Communist Asia, those of all other regions ranged between 0.6 and 1.1. In fact, if there was any tendency at all among these other regions, it was for elasticity to be a bit greater, the higher the region's per capita income. Supporting this was the higher elasticity indicated for the developed sector, 0.73, compared with 0.62 indicated by the equations for the total world. Also, the elasticity of cotton use was only 0.49 for the less developed sector (suggesting that the coefficient for total fiber use may not be much, if any, greater).

Conclusions Regarding Elasticities

Both the time series and cross-sectional analysis suggest that factors other than per capita income play very decisive roles in both the level of per capita use and the response to changes in income. In many regions these other factors probably offset the "normal" tendency for the response to be greater at low income levels than at high. Among many LDC's the response may be tempered by severely skewed income distributions, higher textile prices relative to other prices, and more stringent restrictions on textile imports.

Among the DR's, fashion consciousness, fashion trends (including obsolescence), and technology in the form of permanent press and new uses of synthetic fibers may all contribute to higher or at least to the maintenance of the response to income changes. The greatly expanding use of carpeting, most of which is now made of synthetic fibers, may be a factor of importance in the high U.S. and Canadian elasticities encountered in the times series analysis. The above ordinary military demand created by the Vietnam struggle could also be exaggerating the U.S. response.

Analysis of Cotton's Share

Cross-Sectional Analysis

To determine the extent to which cotton's share might be related in some way to per capita income, cross-sectional data for 1964 were plotted and regressions calculated (fig. A-4 and table A-7). In the regressions, two equations were fitted, linear and semilog. The curvilinear (semilog) equation provided the best results.

Among the less developed regions, cotton's share tended to decrease the higher the region's per capita income. Among the developed regions, no relationship appeared to exist. In one analysis, including all 33 regions, and another, including only the 27 least developed of the 33 regions, R^2 values were around 0.50 and regression coefficients significant (table A-7). However, a third analysis, including only the 10 most developed regions, showed no relationships between the two variables. Apparently the influence on cotton's share of increases in per capita income either diminishes to nothing, or other factors become overriding after a country reaches a certain level of development.

Time Series Analysis

Equations.--Least squares analyses of regional and world data on cotton's share were carried out involving one or more of the following equations.

All regions and world

$$(1) \quad S = a + b\,T$$

Figure A-3. INCOME ELASTICITY OF PER CAPITA FIBER USE RELATED TO PER CAPITA INCOME, CROSS-SECTIONAL DATA, 1964

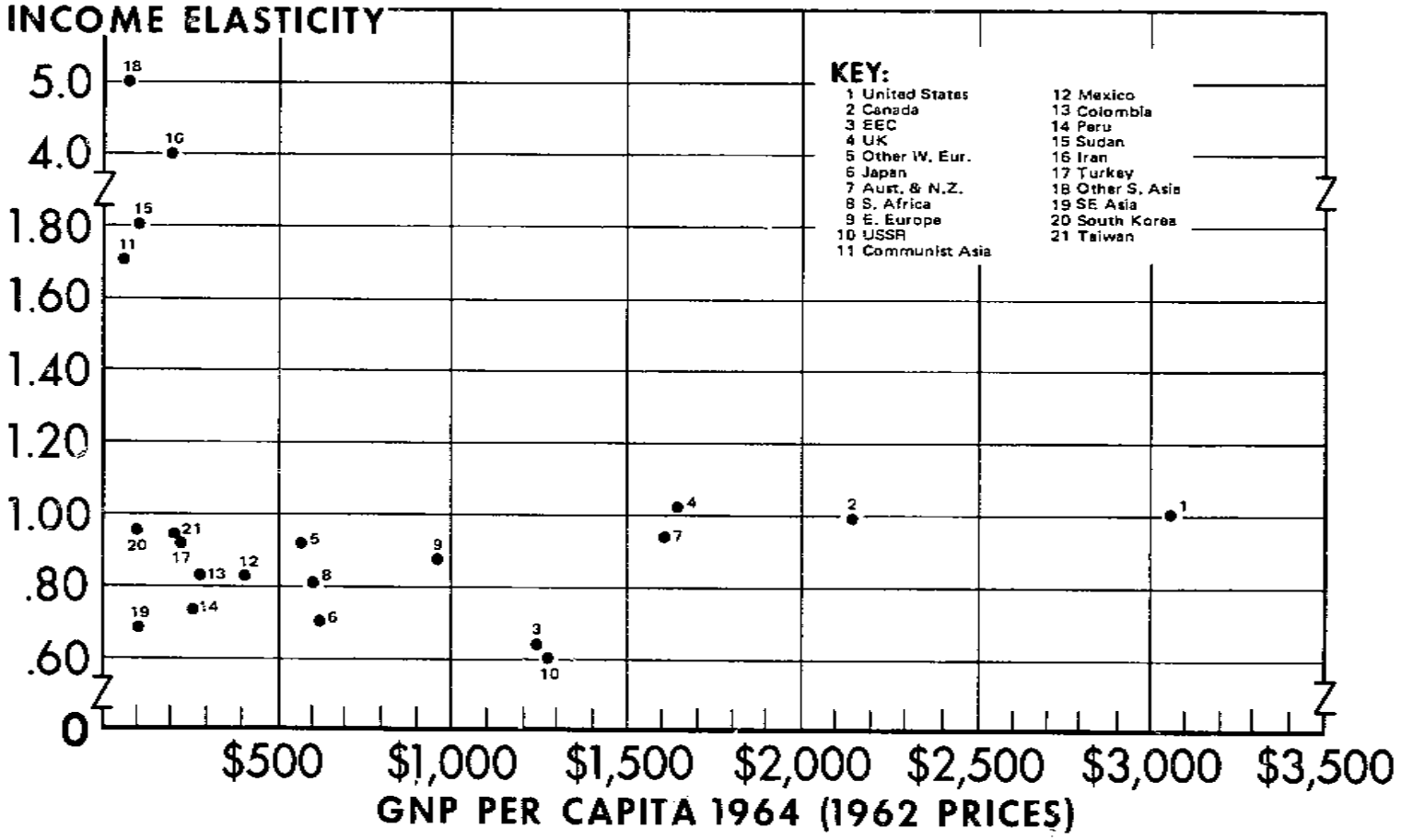

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Figure A-4. COTTON'S SHARE OF FIBER USE RELATED TO INCOME

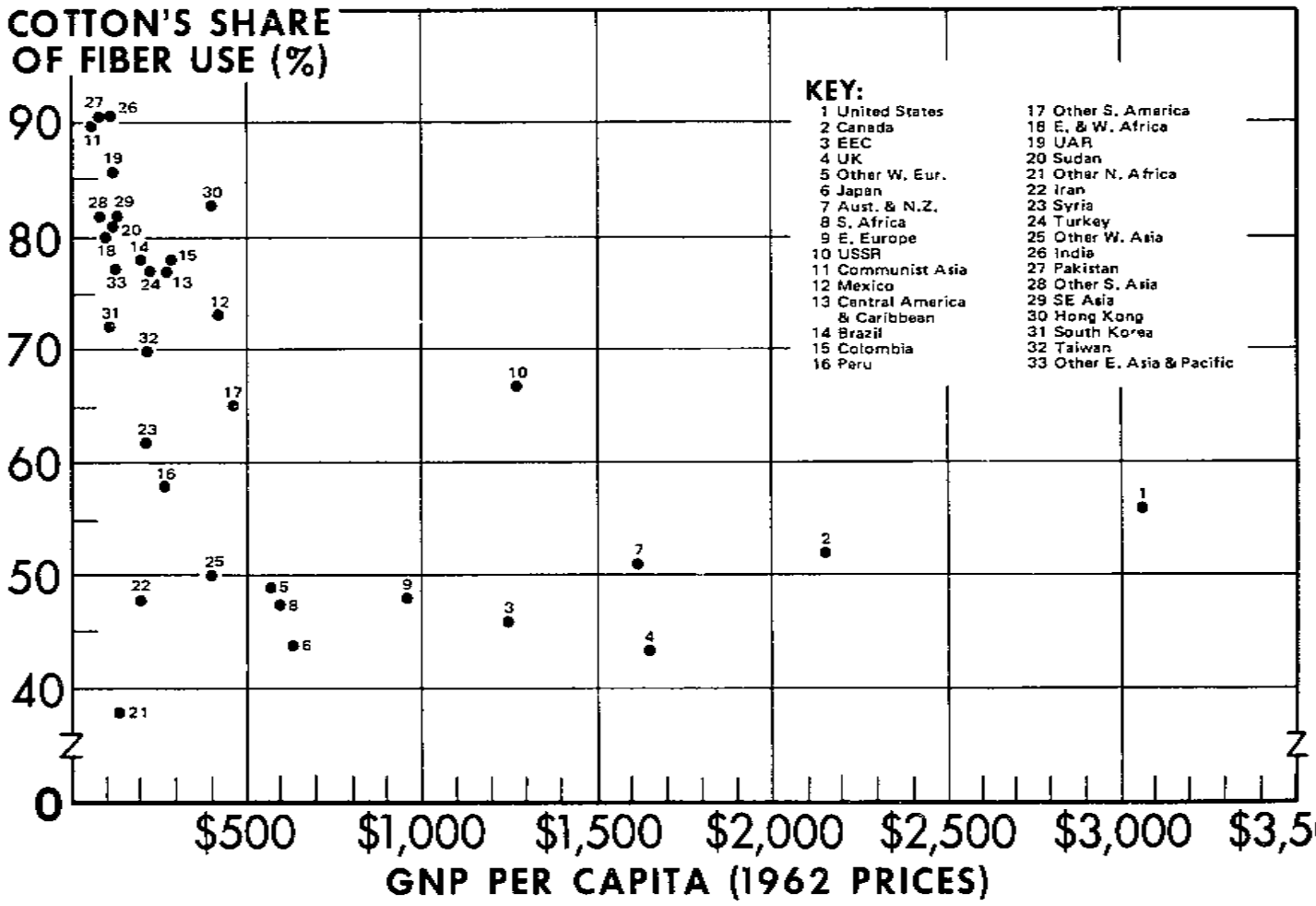

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Table A-7 .--Cotton's share of fiber use related to per capita income, cross-sectional data, 1964

Analysis	S = a + b I			S = a + b log I		
	R^2	b	E_I	R^2	b	E_I
All 33 regions.	0.27	-0.0123 (3.4)	-0.10	0.49	-25.2767 (5.4)	-0.16
10 most developed . . .	.06	0.0020 (0.7)	-.05	.05	6.2063 (0.6)	-.05
27 least developed. . .	.42	-0.0477 (4.2)	-.19	.47	-34.3494 (4.8)	-.21

Note: S = cotton's share; I = per capita GNP; E_I = income elasticity of cotton's share. Numbers in parenthesis are t values of the regression coefficient b.

(2) $S = a + b \log T$

Developed regions only

(3) $S = a + bD + cT$

(4) $S = a + bR + cT$

Less developed regions only

(5) $S = a + bD + cI$

(6) $S = a + bR + cI$

(7) $S = a + bP + cI$

Regions with synthetic fiber share over 5%

(8) $S = a + bD$

(9) $S = a + bR$

Where:

S = Cotton's share of total fiber use, calendar year average.

T = Time trend index.

D = Difference in price (price of synthetic fiber minus the price of cotton), August-July average (thus providing a lead of 5 months on S), deflated.

R = Ratio of cotton price to price of synthetic fiber, calculated from August-July averages (thus providing a lead of 5 months on S), deflated.

P = Price of cotton, August-July average, deflated.

I = Per capita income, calendar year average.

As suggested by the cross-sectional analysis, time trend was used in the equations for the developed regions, while income was used for the less developed countries. Both could not be included because of extremely high intercorrelation.

Equations involving price differences or price ratios (3, 4, 5, 6, 8, and 9) were tried only in those regions with a synthetic fiber share over 5 percent.

Statistical results.--Results of the regression analysis were deemed acceptable for consideration when the R^2 value exceeded 0.40, the overall significance level exceeded 0.05, and the coefficients had the expected signs.

The simple time trend equations (equations 1 and 2) provided generally acceptable and similar statistical results for about two-thirds of the 33 individual regions and for the developed sector and total world (table A-8). In the other regions, as well as in the less developed sector, no significant trend was evident in cotton's share. No analysis was made of the central plan sector because of the diversity of development between Eastern Europe, the USSR, and Communist Asia.

Results from one or more of equations involving price variables (D, R, or P) were acceptable for only 15 regions, or less than half. Although many of the multiple equations in these regions had fairly high R^2's, few had both price and income or time coefficients which were significant at the 0.10 level (indicated in table A-8 by a small "a" between the R^2 value and projection). In about one-sixth of the multiple equations only price was significant (indicated by a small "b") and in another one-sixth, only time or income was significant (indicated by a small "c").

In the simple regressions involving price differences (D) or price ratio (R), the former turned out to be more highly correlated with cotton's share. The coefficients in the equations were generally significant, but of course were gross in that they reflected other factors not held constant.

Equation (7), involving the simple price of cotton and per capita income, provided acceptable results in only 5 of 17 less developed regions. In many cases, there was no significant correlation; in others, the sign of the cotton price coefficient was illogical (positive). This equation was not run for the developed regions because equations with price difference or price ratio seemed more suitable. However, it was run for the developed sector, with good statistical (but poor projection) results.

Effect of price on cotton's share.--The change in cotton's share associated with changes in the price of cotton varied considerably among the five equations (table A-9). In general, the indicated effects were greater in the simple equations than in the multiple, and in the equations with a price ratio (R) as opposed to those with a price difference (D). In the multiple equations, as noted previously, there is a problem of low statistical or nonsignificance of the price and income or time coefficients.

In the simple price difference equation ($Y = a + bD$), a 1-cent decrease in the price of cotton, or a 1-cent increase in the price of polyester, was associated with about a 0.1 to 0.2 percentage point change in cotton's share. This effect was constant regardless of the price difference. However, in the simple cotton/polyester price ratio equation ($Y = a + bR$), the associated change in cotton's share of a 1-cent price change was greater the closer the price of polyester came to cotton. 5/ In the projection period, the average point change in share associated with a 1-cent decrease in cotton price ranged from 0.6 to 2.0, or up to 10 times the point change associated with a 1-cent change in the price difference.

Change in cotton's share of the magnitudes indicated by the simple price ratio equations appear unrealistically high, 6/ while those of the simple price difference equations may be on the low side, especially as the difference becomes smaller in the projection period (polyester prices decrease to 40 cents, while cotton prices hold constant at 30 cents).

The multiple equations also suggest that some of the price effects indicated by the simple equations may be overstated because of inclusion of effects of time trend or income. However, the frequent low level or nonsignificance of the coefficients in the multiple equations prevent any general conclusions. Also, high intercorrelations between the price variable, particularly price difference, and time or income, suggest that measurement of the separate effects may be at best very gross.

5/ This is because the 1-cent change in price causes a larger change in the price ratio when the two prices are close together than when they are widely different.

6/ Use of logrithms in calculation of the price ratio may have provided better results, but time limitations did not permit a rerun of the equations to test this out.

Table A-8.--Results of time series analysis of cotton's share, R^2 values (in parentheses) and projections for 1980

Region	Time period	Results of equations which included as variables: 1/						
		T	Log T	D, T or I 2/	R, T or I 2/	P, T or I 2/	2/ D	2/ R
Developed								
United States	1956-67	(.94) 32	(.93) 36	(.95) 33	(.94)c27	4/ No A	(.95) 44	(.85) 12
Canada	1953-64	(.86) 40	(.86) 42	(.85)c39	(.85)c20	No A	(.64) 32	3/ WS:R
EC	1953-64	(.87) 32	(.86) 35	WS:D	(.87) 19	No A	(.80) 32	WS:R
United Kingdom	1955-66	(.95) 29	(.95) 31	(.96)c30	(.95)c26	No A	(.87) 34	(.31) 20
Other Western Europe	1953-64	(.59) 41	(.57) 44	(.66) 41	(.85)a-12	No A	(.66) 41	No R
Japan	1953-64	(.66) 30	(.65) 34	WS:D	WS:R	No A	(.49) 41	(.43) 4
Australia & New Zealand	1955-66	(.41) 41	(.39) 42	(.67)b41	(.69)b14	No A	(.66) 40	(.60) 11
Developed sector	1953-64	(.90) 37	(.89) 40	(.90)c37	(.92)a27	(.97)a19	(.81) 43	(.37) 14
Central Plan								
Eastern Europe	1953-64	(.87) 36	(.88) 39	No analysis 4/			No analysis 4/	
USSR	1955-66	(.93) 48	(.94) 51	No analysis			No analysis	
Communist Asia	1953-64	(.75) 82	(.73) 84	No analysis			No analysis	
Less Developed								
Mexico	1956-67	(.88) 61	(.87) 73	(.92) 56	(.94)a44	(.93)c52	(.89) 65	(.72) 26
Brazil	1956-67	(.74) 72	(.73) 73	(.83)b74	(.60) 52	WS:P,I	(.80) 73	(.53) 52
Peru	1953-64	(.86) 36	(.86) 40	(.82) 34	WS:R	WS:P	(.78) 33	WS
Other South America	1959-64	(.84) 48	(.84) 50	(.92)b47	(.93)b27	(.93) 40	(.88) 55	(.90) 30
Sudan	1958-64	(.87) 53	(.88) 57	(.63) 63	(.59) 52	WS:P	(.48) 65	No R
Iran	1953-64	(.83) 18	(.83) 25	No analysis		(87)c-46	No analysis	
Turkey	1956-67	(.84) 65	(.83) 67	(.84) 67	WS:R	WS:P	(.79) 66	(.74) 51
India	1956-67	(.49) 87	(.47) 88	No analysis		(.42) 86	No analysis	
Pakistan	1956-67	(.73) 83	(.72) 84	No analysis		(.90)c83	No analysis	
South East Asia	1953-64	(.77) 65	(.78) 68	No analysis		WS:P	No analysis	
South Korea	1953-64	(.58) 50	(.58) 53	(.64)c48	(.47) 37	WS:P	WS	No R
Taiwan	1953-64	(.83) 38	(.82) 45	(.87)c28	(.87)c15	(.87)c28	WS	(.69)-34
Total World	1953-67	(.92) 49	(.90) 51	No analysis				

1/ T = time trend; D = difference--polyester or nylon price minus cotton price; R = ratio--cotton price/polyester or nylon price; I = income per capita; and, P = price of cotton. (See table A-7 for more details). Level of equation significance is not shown but was above 0.05 level for all equations with R^2 values over 0.36 and above 0.01 level for R^2's over 0.50. Significance of the individual coefficients in the multiple regressions is indicated by the following codes: a = both significant at 0.10 level; b = price variable significant only; c = income or time variable significant only. 2/ Projections from equations with a price variable assumed a constant cotton price of 30¢/lb., SM 1-1/16 Liverpool, and a wholesale list price for polyester or nylon of 40¢/lb. 3/ "WS" indicates wrong signs on the coefficients of the variables indicated. 4/ "No analysis" (No A) performed because of inadequate data, data with clearly too much variation to provide results, or because share of synthetic fibers was under 10 percent.

Table A-9.--Indicated effect on cotton's share of a 1-cent decrease in the price of cotton 1/

Region	As indicated by the relationship of cotton's share to:									
	D		D, I or T		2/ R		2/ R, I or T		P, I or T	
	Point change in percentage share									
Developed										
United States	.20	(12.3)	.09	(1.5)	1.7	(7.5)	0.3	(0.9)	No A	
Canada	.21	(4.2)	.06	(1.0)	WS		.5	(0.1)	No A	
EC	.15	(6.1)	WS		WS		.3	(0.4)	No A	
United Kingdom	.12	(8.1)	.02	(1.0)	0.8	(2.1)	.1	(0.9)	No A	
Other Western Europe	.10	(4.4)	.11	(1.3)	No R		1.1	(4.0)	No A	
Japan	.12	(3.1)	WS		1.4	(2.7)	WS		No A	
Australia & New Zealand Sector	.11	(4.4)	.14	(2.7)	1.1	(3.8)	.9	(2.9)	No A	
	.13	(6.6)	.01	(0.2)	0.6	(2.4)	.3	(1.5)	.16	(2.0)
Less developed										
Mexico	.08	(9.2)	.15	(1.2)	1.3	(5.0)	.4	(2.0)	.23	(2.1)
Brazil	.07	(6.2)	.09	(5.6)	0.8	(3.4)	.7	(2.8)	WS	
Peru	.28	(6.4)	.14	(1.3)	WS		WS		WS	
Other South America	.15	(5.4)	.13	(3.8)	1.1	(6.1)	.9	(4.1)	.16	(0.1)
Sudan	.22	(2.2)	.10	(0.8)	No R		.5	(0.5)	WS	
Iran	No A		No A		No A		No A		.53	(1.2)
Turkey	.12	(6.0)	.22	(2.7)	0.8	(1.4)	WS		WS	
India	No A		No A		No A		No A		.24	(2.3)
Pakistan	No A		No A		No A		No A		.15	(1.6)
South East Asia	No A		No A		No A		No A		WS	
South Korea	WS		.29	(0.5)	No R		.6	(0.6)	WS	
Taiwan	WS		.20	(0.5)	2.0	(4.7)	.5	(0.7)	.22	(.7)

1/ Except when cotton price (P) alone is used; also indicates effect on cotton's share of 1-cent increase in polyester prices.
2/ Rough average based on changes in price in the projection period.

Note: Figures in parentheses are t values of the regression coefficient of D, R, or P. WS means wrong sign; No A means no analysis performed. No R means R^2 value below 0.30.

APPENDIX B

Regional Data and Outlook Notes

UNITED STATES

Cotton Textile Use and Trade

Status of the textile industry.--The United States has by far the most capital-intensive and efficient cotton textile industry in the world. However, high wages and raw material costs keep prices up. Manmade fibers continue to make deep and rapid inroads into cotton textile markets.

Trade policy and restrictions.--Tariffs range from 9 to 23 percent on most items, with the highest rates on clothing. Kennedy Round concessions will lower the range to 7-1/2 to 21 percent. Preferential rates are given to the Philippines. Import quotas to Japan and LDC's are allocated by country and generally allow for annual average increases of 5 percent in accordance with the LTA. These import quotas agreed to under the LTA and other bilateral agreements have kept the growth of imports (as a percentage of total consumption) down since 1962.

Outlook

Policy changes.--Policy allowing limited import increases is likely to continue.

Textile trade changes.--Imports are likely to grow through the 1970's, but it is unlikely they will amount to more than 15 to 20 percent of total cotton textile consumption.

Cotton's share of fiber use.--This is likely to continue declining. Research, development, and promotion in the manmade sector plus the interests of the textile firms favor the continuation of present trends despite belated research and promotion by cotton interests.

Raw Cotton Production and Trade

Competitive status and potential production.--Production costs are relatively high (23.9 cents per pound total costs in 1966/67), competition for inputs from other commodities is high, yields are improving slowly, and potential for profitable production is good. However, Government programs supporting prices and controlling acreage limit producer responsiveness to market developments.

Production and trade policy.--Domestic needs, except for some ELS cotton, are supplied exclusively by U.S. producers, and a large share of the foreign export market is actively sought. Exports have declined in recent years because of high prices, limited stocks (brought about in part by deliberate stock reduction), and poor crops. Imports are limited by very restrictive quotas. About 125,000 bales a year, mostly ELS, are allowed in.

Outlook

Policy changes.--None.

Production changes.--There will most likely be some revival from recent small crops, but production is extremely dependent on future Government policy.

Trade changes.--Imports will continue to be restricted. Exports will most likely increase from present low levels, but a complete revival to former high levels is unlikely as long as U.S. prices remain high.

CANADA

Cotton Textile Use and Trade

Status of the textile industry.--The Canadian cotton textile industry is relatively modern and efficient, but is finding it difficult to compete pricewise with imports from low-cost countries. The industry has been consolidating, and textile lines which compete with low-cost imports are being discontinued. Manmade fibers are taking a large and rapidly growing share of the market. Most of the decline in cotton's market share has been absorbed by domestic producers.

Trade policy and restrictions.--Textile exports are encouraged and have been expanding in recent years. Tariffs on imports range from 10 to 22 percent with lowest duties on yarn and the highest on clothing. Full Kennedy Round cuts have already been made. Preferential rates from free to one-half of the MFN rates are given to Commonwealth countries, including the United Kingdom, India, Pakistan, and Singapore, but not to Hong Kong. Various taxes and quantitative restrictions also inhibit imports. Under terms of the LTA, Canada does not agree to annual import increases of 5 percent.

Outlook

Policy changes.--Policy of attempts to control import increases and to expand exports is likely to continue through the 1970's.

Textile trade changes.--Net trade was relatively constant in the 1957-64 period. Imports from low-cost countries can be expected to increase somewhat, but these will be more or less balanced by increasing Canadian textile exports.

Cotton's share of fiber use.--Cotton's share will continue to decline.

Raw Cotton Production and Trade

Competitive status and potential production.--Canada does not produce cotton and is unable to do so.

Production and trade policy.--No restrictions are placed on raw cotton imports. Imports from major trading partners who have trade deficits with Canada (e.g., the USSR), are often encouraged.

Outlook.--No change.

EC

Cotton Textile Use and Trade

Status of the textile industry.--Textile industries are relatively efficient and modern. Total costs are about 10 percent below those in the United States and the United Kingdom, but the industry is beginning to feel the pinch of imports from the low-cost countries. Manmade fibers have achieved deep market penetration in the EC countries.

Trade policy and restrictions.--A common external tariff rate, ranging from 6.4 to 18 percent for most items, will be lowered to 4 to 17 percent by the Kennedy Round concessions. Highest rates are on clothing. There are no tariffs on intra-EC trade. Various taxes and quantitative restrictions are aimed at imports from Asia and Eastern Europe. The EC is a member of the LTA.

Outlook

Policy changes.--Trade policy will continue to be directed at limiting imports from low-cost producers.

Textile trade changes.--Imports from low-cost areas will most likely continue to increase at a rate similar to that of 1953-64.

Cotton's share of fiber use.--Since cotton's share is already very low and much lower than in North America, it will probably decline at a much slower rate than it has in the past.

Raw Cotton Production and Trade

Competitive status and potential production.--Italy produces an extremely small amount of cotton (about 10,000 bales a year), which will probably decline in the future. Production is not feasible in the other member countries.

Production and trade policy.--Policy calls for importing virtually all of the community's raw cotton needs. No restrictions are placed on imports. Low-cost producers (e.g., Turkey and Brazil) have lately been favored by buyers.

Outlook.--No changes.

UNITED KINGDOM

Cotton Textile Use and Trade

Status of the textile industry.--The British textile industry suffers from overcapacity, fragmentation, obsolete equipment, and high costs. Changes are being made, however, and efficiency is expected to improve. Market penetration of manmade fibers is substantial and growing.

Trade policy and restrictions.--Exports are important and encouraged by Government policy. Import tariffs range from 7-1/2 to 28 percent on most important items, but will be reduced to 7-1/2 to 20 percent by the Kennedy Round concessions. Highest rates are on clothing, lowest on

yarns. Presently, no tariffs are imposed on EFTA or Commonwealth imports, although import quotas are applied to the latter. The United Kingdom also taxes imports to compensate for taxes on domestic products. Under the terms of the LTA, the United Kingdom accepts only a 1-percent annual increase in imports from low-cost producers.

Outlook

Policy changes.--Recent policy changes provide for increased incentives for domestic producers to modernize and to export. In addition, the duty-free status of imports from Commonwealth countries is to be eliminated by January 1, 1972. Quotas will also be eliminated for all but central plan country imports, and the Commonwealth countries will receive a small tariff preference. Duty-free status will remain for EFTA exporters. The purpose of these changes is to limit the market penetration of imports.

Textile trade changes.--It appears that the United Kingdom will attempt to limit total cotton textile imports to about 50 percent of consumption or less. Exports may increase somewhat. In 1968, exports increased by 10 percent while imports held constant.

Cotton's share of fiber use.--As in other developed countries, cotton's share will continue to decline.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton is not grown in the British Isles.

Production and trade policy.--There are no restrictions on raw cotton imports.

Outlook.--No changes.

OTHER WESTERN EUROPE

Cotton Textile Use and Trade

Status of the industry.--This region includes many diverse countries. Portugal, Spain, and to some extent Greece, are low-cost net exporters. Switzerland and Malta are also net exporters, but the other countries are net importers. The Scandinavian industries are relatively efficient but small. They cannot compete with imports from low-cost producers, so are consolidating production into those lines which are noncompetitive with low-cost imports. The Greek industry is quite underdeveloped. Both Spain and Portugal are low-cost producers and exporters, but Portugal exports much more than Spain. The Portuguese textile industry is currently plagued by overcapacity, old and inefficient equipment, and rising labor costs. Wage rates, however, still remain comparable to those in South and Southeast Asia. Most exports go to EFTA countries and Portuguese possessions in Africa. Manmade fibers have achieved high market penetration in the more developed countries of this region.

Trade policy and restrictions.--EFTA has no common external tariff. Most duties are in the 10 to 20 percent range with the highest duties on clothing. There are no tariffs on intra-EFTA trade except for Portugal, which gives preferential rates to EFTA imports. Various other taxes in

all countries also hinder imports. The Scandinavian countries have allowed relatively large quantities of low-cost imports to enter. Spain and Portugal continue to promote exports.

Outlook

Policy changes.--None.

Textile trade changes.--The rate of growth in Spanish and Portuguese exports is likely to slow down. Import increases in other areas should continue at present rates.

Cotton's share of fiber use.--Cotton's share will probably continue to decline, especially in the poorer countries where it still remains quite high.

Raw Cotton Production and Trade

Competitive status and potential production.--Only Greece and Spain are cotton producers.

Greece is a relatively high-cost producer but high subsidies and Government production goals (500,000 bales by 1972) tend to isolate producers from world price levels. Past acreage decreases were due to the withdrawal of unirrigated land from cotton, but now 90 percent of cotton is irrigated and acreage has been stable since 1964. Government encouragement of cotton production should keep future acreage at least as high as present levels. It is likely that past yield increases are due partly to the withdrawal of unirrigated land. So, while potential yields remain high, yield increases are not likely to be as rapid as they were in the past.

Spanish producers produce for a protected home market, which isolates them somewhat from world price levels. Government policy favors the withdrawal of unirrigated land from cotton production. Recent acreage declines are due to this, but the rate of decline should decrease somewhat as the proportion of unirrigated cotton decreases. The rate of increase in yields has been influenced by the withdrawal of unirrigated land. This factor should be minimized in the future.

Production and trade policy.--Greece promotes raw cotton production and exports. Spain is becoming more dependent upon imports, but seeks to maintain some domestic production. Greece has low import tariffs. Spain has relatively high tariffs, but exporters of cotton textiles are able to import equivalent amounts of raw cotton with substantial discounts in duties. Other countries in this group have no or minimal restrictions on imports.

Outlook

Policy changes.--None.

Production changes.--Greek production should continue to increase somewhat while Spanish production declines.

Trade changes.--Greek cotton exports will most likely continue to increase gradually.

JAPAN

Cotton Textile Use and Trade

Status of the textile industry.--While synthetic textile production and exports continue to grow, cotton textile production and exports are falling, and cotton textile imports are growing. The Japanese textile industry is in the process of transforming from a cotton-labor intensive basis to a synthetic-capital intensive basis. The Government is assisting the industry to affect this transformation.

Trade policy and restrictions.--Exports are encouraged. Import tariffs range from 4.4 to 22 percent, with the highest rates on fabrics and clothing. These duties will be lowered somewhat by the Kennedy Round concessions. No preferential rates are given. In addition, various taxes and other restrictions considerably hamper the import of cotton textiles.

Outlook

Policy changes.--Cotton textile producers, who are facing heavy competition from lower cost Asian imports, are directing their output and exports more towards higher quality products.

Textile trade changes.--Competition in both domestic and foreign markets from lower cost Asian competitors is expected to lower or eliminate Japan's favorable trade balance in cotton textiles and to accelerate Japan's shift toward manmade fiber textile exports.

Cotton's share of fiber use.--The growth of the synthetic fiber textile industry in Japan indicates further decline in cotton's share of total fiber consumption.

Raw Cotton Production and Trade

Competitive status and potential production.--Japan no longer finds it economical to grow cotton. It is unlikely that cotton will again be grown there.

Production and trade policy.--Policy dictates the importing of all raw cotton needs. There are no restrictions on raw cotton imports.

Outlook.--No change.

AUSTRALIA AND NEW ZEALAND

Cotton Textile Use and Trade

Status of the textile industry.--The Australian cotton textile industry supplies about 16 percent of the domestic market. New Zealand has no cotton textile industry.

Trade policy and restrictions.--Trade policy dictates that the bulk of Australian cotton textile needs be met by imports from Japan and other major trading partners. Tariffs on imports range from 30 to 60 percent with the highest rates on clothing. Commonwealth preferences are given

to the United Kingdom, Canada, and Ireland; and other Commonwealth countries negotiate for preferences. A special LDC preference is given on a limited number of yarn and fabric items within quotas.

Outlook

Policy changes.--None.

Textile trade changes.--None.

Cotton's share of fiber use.--Cotton's share is likely to continue declining.

Raw Cotton Production and Trade

Competitive status and potential production.--Australian production techniques are modern and efficient, but costs are high. New dams and irrigation projects are expanding the potential cotton-growing area, and few if any alternative crops are as profitable as cotton in present growing areas. However, the high costs, lack of foreign markets, the limitation of the domestic market, and the expiration of the cotton bounty program in 1971 should all limit future acreage expansion. Due to the high levels of technology and irrigated land already used, it is doubtful if further large increases in yields are attainable.

New Zealand does not grow cotton.

Production and trade policy.--The Raw Cotton Bounty Acts provided the incentives which have made Australia self-sufficient in cotton. The cotton bounties are due to expire in 1971, but one or more states may continue with their own subsidy programs. Presently only a limited amount of short and long staple cotton is imported. Imports are duty-free, but in effect they are not allowed unless Australian ginners cannot provide the user with the desired grade of cotton.

Outlook

Policy changes.--The Commonwealth cotton bounty will be completely phased out by 1971, but one or more states may continue subsidizing growers.

Production changes.--Australian production will probably increase somewhat from present levels but not at anywhere near the rate of increase achieved during the past decade.

Trade changes.--Australian exports will grow somewhat as imports remain at minimal levels.

REPUBLIC OF SOUTH AFRICA

Cotton Textile Use and Trade

Status of the textile industry.--South Africa has been striving for self-sufficiency in cotton textiles and by 1980 it should produce most of its needs domestically. Some textile items may still be imported for cost and/or political reasons.

Trade policy and restrictions.--Cotton textile imports face many restrictions. Tariffs average 15 percent on yarns, 14 to 17 cents per square yard on fabrics, and 20 to 25 percent on clothing. Preferential rates on fabrics are given to the United Kingdom. There are quotas on most items, import licenses, minor taxes, and a complex invoice system.

Outlook

Policy changes.--No changes.

Textile trade changes.--Imports should continue to decline.

Cotton's share of fiber use.--Cotton's share is likely to decline at a slower rate than in other developed countries.

Raw Cotton Production and Trade

Competitive status and potential production.--South Africa produces about half of her raw cotton needs with high quality cotton at prices about twice as high as lower quality imports. High costs and the limited local market are likely to cause acreage to increase at a less rapid rate during the next decade. The rate of yield increases should also decline as the rate of addition of white-owned acreage declines.

Production and trade policy.--Government policy favors the production of part of the Republic's cotton production domestically. The Government and textile manufacturers annually decide on prices to be paid for domestic cotton. Political considerations will demand some reliance on Rhodesian and Malawian cotton during the 1970's.

Outlook

Policy changes.--None.

Production changes.--Production will continue to increase but not as rapidly as in the recent past.

Trade changes.--An increasing amount of import needs will be met by Rhodesian and Malawian cotton.

EASTERN EUROPE

Cotton Textile Use and Trade

Status of the textile industry.--Many of the East European countries, particularly Poland, Hungary, Yugoslavia, and Czechoslovakia, are emerging as important low-cost exporters. Efficiency and costs of production are difficult to determine, but it appears that export prices have little relationship to costs. The use of manmade fibers is increasing and becoming relatively important.

Trade policy and restrictions.--Exports, especially to Western Europe, are being promoted. Many importing countries complain that East European cotton textiles are exported at prices below cost. Cotton textile imports to East European countries are controlled and limited by central buying agencies.

Outlook

Policy changes.--Efforts are being and will continue to be made to improve the efficiency of mills.

Textile trade changes.--These countries will continue to need the export income from cotton textiles, but they will also be pressured to increase their imports from LDC's.

Cotton's share of fiber use.--Cotton's share is presently quite large but it is likely to decline gradually through the 1970's.

Raw Cotton Production and Trade

Competitive status and potential production.--Bulgaria and Yugoslavia produce relatively small amounts of cotton, but production is inefficient and has no potential for expansion. Almost all raw cotton needs are met by imports.

Production and trade policy.--Imports are controlled by central buying agencies. Czechoslovakia and Hungary impose tariffs of 5 percent MFN and 35 percent maximum.

Outlook

Policy changes.--None.

Production changes.--Cotton production is not likely to increase and may decline.

Trade changes.--None.

USSR

Cotton Textile Use and Trade

Status of the textile industry.--The Soviet cotton textile industry is large and growing rapidly. Finished cotton goods are very high priced. Cotton consumption has been expanding steadily in recent years. The use of cotton is much more important than that of all other natural and man-made fibers, but the utilization of cellulosic fibers is developing rapidly.

Trade policy and restrictions.--The Soviet Union imports and exports relatively large quantities of cotton textiles annually.

Outlook

Policy changes.--None.

Trade changes.--The Soviet Union will most likely find it necessary to import substantial amounts from the LDC's, but will not permit a trade deficit of the magnitude which would result if the trend of 1953-66 were continued.

Cotton's share of fiber use.--Despite increased competition from man-made fibers and a gradually declining share of total fiber use, cotton is likely to remain very dominant in Soviet fiber use.

Raw Cotton Production and Trade

Competitive status and potential production.--Soviet cotton production is technologically advanced and relatively efficient, and is entirely under irrigation. Soil salinity is a problem in some districts. Cotton prices are set by the Government independently of world prices, but growers are apparently very responsive (elasticity = 1.0 to 2.0) to these Government prices. Most recent production increases were due to yield improvements (achieved by fertilization and reducing damages from plant diseases and soil salinity). Plenty of new cotton land is available, but future acreage increases may be minimized if manmade fibers begin to provide serious competition to Soviet cotton consumption. Maintenance of the past rate of yield increases is unlikely because of the relatively high level of modern inputs already being used and the limitations of the climate.

Production and trade policy.--Soviet Government plans call for an increase in cotton production during the next few years to 10.9 million bales.

Since 1963, Soviet cotton exports have grown from about 1.5 million bales to over 2.5 million bales. Most of the increase has come from exports to non-Communist countries, although the bulk of exports still go to East Europe. The high level of exports is maintained in part by a high level of imports, principally from the UAR, the Sudan, and other Middle East nations. Generally, imported fiber is more expensive (higher quality) than exported fiber. Besides satisfying the need for long staple fibers, USSR cotton imports facilitate Government policy of accepting available export products from other countries to balance and maintain high levels of two-way trade. Secondly, the transportation of foreign cotton to Soviet mills is often more rapid and sometimes more economical than transportation from domestic producing areas which are more than 2,000 miles from most cotton mills.

Outlook

Policy changes.--None. The Government will continue to encourage increased production.

Production changes.--Production will continue to increase, but less rapidly than it has in the past.

Trade changes.--Exports are not likely to increase as rapidly as they have in the recent past.

COMMUNIST ASIA

Cotton Textile Use and Trade

Status of the textile industry.--Mainland China is self-sufficient in cotton textiles. It may be assumed that the efficiency of the industry is relatively low. Mill consumption has grown slowly due to a shortage of raw cotton. Despite low domestic levels of consumption, China is becoming an important low-cost exporter of cotton textiles. Cotton is the all

dominant fiber in Communist Asia's mill consumption. Manmade fibers have made little impact so far.

Trade policy and restrictions.--China is rapidly expanding cotton textile exports because of a need for foreign exchange. Export prices are thought to have little relation to production costs. Imports are tightly controlled by the state trading agency.

Outlook

Policy changes.--None.

Textile trade changes.--It is likely that textile exports will continue to increase but not at the rapid 1953-66 rate (which benefits from a very low base).

Cotton's share of fiber use.--Cotton's share is likely to remain very high, with only a slight decline from present levels through the 1970's.

Raw Cotton Production and Trade

Competitive status and potential production.--China is practically self-sufficient in cotton production. Cotton must compete with grains and other food crops, and during times of food shortages is sometimes replaced by these. Increased grain yields could free additional land for cotton. Cotton yields in China are low, but are substantially higher than in India. Yields have been increasing gradually during the past decade. Production is isolated completely from international markets and is not responsive to world price levels.

Production and trade policy.--Only minimal amounts of cotton are imported or exported. Lack of foreign exchange makes large cotton imports unfeasible.

Outlook

Policy changes.--None.

Production changes.--Acreage is likely to increase only slightly, if at all. Yields will continue to increase at the rate of the past decade.

Trade changes.--None.

MEXICO

Cotton Textile Use and Trade

Status of the textile industry.--Mexico is self-sufficient in textiles. Its mills consume about a third of the country's raw cotton output. The domestic cotton textile industry is high-cost, operates under capacity, and produces low-grade products. Half of its equipment is relatively modern and a Government-sponsored modernization program is in process. Mexican mills generally receive the lowest grades of domestic cotton. Manmade fibers are making steady inroads in the fiber market.

Production and trade policy.--The Government provides incentives for the modernization and rationalization of the industry. Textile exports are

modest but have been growing. The Government is satisfied with fiber exports but the textile industry would like to export. Their biggest roadblock is high cost. Cotton textile imports are discouraged by tariffs averaging 110 percent plus specific duties and import licenses which are usually difficult to obtain.

Outlook

Policy changes.--None.

Textile trade changes.--Exports by the more efficient mills are likely to increase gradually, but not enough to reach high levels.

Cotton's share of fiber use.--Manmade fibers will continue to gradually increase their share of the market. In Mexico and in other large Latin American countries, the major textile firms have been promoting manmade textile products heavily.

Raw Cotton Production and Trade

Competitive status and potential production.--Mexico is a relatively high-cost producer. In 1969/70 the weighted average total cost of production was 25.5 cents per pound. There are several alternatives to cotton in most producing areas. Acreages have declined in recent years but the desire to maintain export markets should limit future acreage declines. Past yield increases have been due to an increased and more efficient use of modern inputs and shifts of production to more suitable areas. Future yield increases are expected to be limited to those caused by changes in inputs.

Production and trade policy.--Mexico would like to maintain cotton production near 2 million bales to meet domestic needs and maintain current export markets. Government agencies promote efforts to raise yields and lower costs. The best quality cotton is exported.

Outlook

Policy changes.--None.

Production changes.--Output is not expected to increase during the 1970's and may decrease slightly from present levels.

Trade changes.--None.

CENTRAL AMERICA AND CARIBBEAN

Cotton Textile Use and Trade

Status of the textile industry.--The industry is growing rapidly as new and modern mills are being installed. Manmade fibers are growing in importance. Some Caribbean countries are beginning to process imported textiles for reexport.

Production and trade policy.--The CACM countries hope to achieve self-sufficiency in textile production. CACM policy is to limit production capacity to the needs of the CACM market.

Outlook

Policy changes.--None.

Textile trade changes.--Textile imports will probably continue to decrease, and are likely to be eliminated by 1980.

Cotton's share of fiber use.--Cotton's share will decline gradually.

Raw Cotton Production and Trade

Competitive status and potential production.--Central America is a high-cost area. About 90 percent of its production is exported, but only Nicaragua is highly dependent upon cotton exports. Weighted average total costs for Central American (1967-68) are 26 cents per pound. Acreage increases before 1966 were due to boom conditions. Rising costs and insect problems have prompted much diversification out of cotton. On a limited acreage, cotton is potentially the most profitable crop and in the long run cotton can be expected to remain on this acreage, but acreage cannot be expected to reach again the high levels of the mid-1960's. Little of the crop is irrigated and insect infestation remains a serious problem, so no great yield increases, as in the past, can be expected. However, some yield improvement can be expected as better insect control is achieved and more farms are consolidated in the hands of the more efficient producers.

Production and trade policy.--Inefficient producers are discouraged, diversification from cotton is encouraged, and the Governments conduct only a limited amount of research into new varieties and inputs. The Governments regulate planting dates and stubble clearance. Banks and input suppliers assist in the implementation of Government production policies. No subsidies are given. The Governments assist in export promotion.

Outlook

Policy changes.--None.

Production changes.--Production should increase slightly from recent levels by 1980.

Trade changes.--Slightly larger proportions of future production will be utilized domestically.

BRAZIL

Cotton Textile Use and Trade

Status of the textile industry.--Brazil is self-sufficient in cotton textiles. The industry faces many problems--managerial, technical, and structural. The per capita consumption of textile products is low and declining. Synthetic fibers offer increasing competition to cotton.

Production and trade policy.--The Government is offering the cotton textile industry incentives to modernize. Textile imports are effectively discouraged by very high import duties and other restrictions. Attempts are being made to expand textile exports, which are of minor importance.

Outlook

Policy changes.--None.

Textile trade changes.--Cotton textile exports by some of the more efficient firms are likely to expand somewhat, but the prospects for high levels of exports are very limited.

Cotton's share of fiber use.--As in other important Latin American countries, the textile industry is strongly promoting the increased use of manmade fibers. Their use should increase greatly during the next decade.

Raw Cotton Production and Trade

Competitive status and potential production.--Brazil is a low-cost producer of cotton and production has increased greatly (about 50 percent) over the past 3 years. About a quarter of the crop grown in the North is of a perennial variety and is very unresponsive to price changes. In the South, where the remaining three-quarters of the crop is grown, total production costs averaged about 16.3 cents per pound in 1968/69. Farmers have good alternative crop potentials but are presently very satisfied with returns from cotton. All of the recent increases in cotton production have been in the South. Marginal land recently entered into cotton production may not remain in cotton, but total future acreage should decrease little from present levels as more western and State of Parana lands come into production. Future average yield increases will probably be at a rate similar to past increases. Recent yield increases have been due to an increased portion of the crop being grown in the South where yields are higher but a heavier use of modern inputs should speed up future rate of yield increases in the South, so that the rate of yield increase in all of Brazil during the 1970's will match that of the 1960's.

Production and trade policy.--Production is much more dependent upon the price of peanuts, corn, and other alternative crops than upon Government policy. Cotton export markets are sought in the major importing countries.

Outlook

Policy changes.--None.

Production changes.--Production will probably continue to increase but not at anywhere near the extremely rapid pace of the past few years.

Trade changes.--Gradual increases in exports can be expected.

COLOMBIA

Cotton Textile Use and Trade

Status of the textile industry.--Colombia, self-sufficient in textiles, has the most modern and efficient cotton textile industry in Latin America. The use of manmade fibers has been increasing rapidly.

Production and trade policy.--Government policy encourages the constant modernization of the textile industry by a liberal capital goods import policy. Government and industry efforts to promote exports have been rewarded by constant increases in exports. Textile imports are effectively discouraged by very high tariffs and other import restrictions.

Outlook

Policy changes.--Restrictions on imports from Andean Group partners may be liberalized.

Textile trade changes.--Exports have good prospects of continued gradual increases. Trade (both exports and imports) with the other Andean Group countries is likely to increase.

Cotton's share of fiber use.--The two dominant textile firms are conducting apparently successful promotional campaigns to increase the public's acceptance of manmade fibers.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton production has almost doubled within the last few years. Presently, about half of Colombia's cotton production is exported. Production costs are relatively high (23 cents per pound in 1968/69), and farmers are considered to be price responsive. There are good alternative land uses, but most cotton farmers are presently satisfied with returns from cotton. Recent acreage increases have been due, in part, to Government incentives to produce "secondary exports." But production problems have multiplied recently, and acreage should stabilize near or below present levels as production problems manifest themselves. Future yield increases are not likely to be as rapid as in the past as the factors that accounted for past increases (switch to more modern inputs) become less important, and production problems (e.g., insect infestation) become worse than at present.

Production and trade policy.--Government assistance to cotton farmers is through technical advice, the development of new varieties, subsidized credit in kind and a 15-percent tax rebate on cotton exports.

Outlook

Policy changes.--The Government can be expected to do what is necessary to retain newly obtained cotton export markets.

Production changes.--Production is likely to increase only slightly if at all from present very high levels by 1980.

Trade changes.--Exports may increase to some of Colombia's new Andean Group partners, especially Chile.

PERU

Cotton Textile Use and Trade

Status of the textile industry.--The cotton textile industry is growing and presently meets most of the country's needs. Many producers are very inefficient. Manmade fibers are capturing an increasing share of the textile market.

Production and Trade Policy.--The Peruvian cotton textile industry will continue to expand to obtain greater self-sufficiency. Textile imports face high tariff barriers.

Outlook

Policy changes.--None.

Textile trade changes.--Imports will continue to decline as the country becomes even more self-sufficient in textiles.

Cotton's share of fiber use.--Cotton's share will continue to decline.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton is produced on irrigated land and expansion potential is limited. Average total production costs are high (26 cents per pound), but the long and extralong staple varieties command high prices. In some areas alternative crops are limited, but recent trends in the Tanguis cotton area (two-thirds of Peru's cotton) indicate relatively high price responsiveness by producers and a willingness to switch to alternative crops. Total cotton acreage is unlikely to reach the high levels of the early 1960's again, but cotton is an important export commodity. Acreage should increase from present low levels as more irrigation water becomes available and insect control problems are resolved. Recently, yields have been declining because of poor weather and insect problems. Yield potentials, possibly with new varieties, improved efficiency in the use of irrigation facilities, and improved insect control are much greater than those currently being achieved.

Production and trade policy.--Government policy includes increasing agricultural land on the coast (where cotton is grown) by irrigation projects. A new canal in the North Coastal region is expected to increase the area in ELS cotton. The Government has recently liberalized both import duties on agricultural raw material and taxes on cotton production. These should help producers to meet foreign price competition.

Outlook

Policy changes.--None.

Production changes.--By 1980, production should recover somewhat from present low levels.

Trade changes.--None.

OTHER SOUTH AMERICA

Cotton Textile Use and Trade

Status of the textile industry.--Argentina and Chile are self-sufficient in cotton textiles. The remaining nations in this group produce substantial portions of their cotton textile needs. Industry efficiency varies,

but on the whole it is relatively low. Cotton textiles face heavy competition from manmade fibers, especially in the wealthier countries. In Chile, cotton consumption is increasing very slowly because most of the increase in demand for textiles is being met by manmade fibers. In Argentina, cotton consumption is declining because of the heavy competition from synthetics and declining real wages.

Production and trade policy.--Domestic markets for cotton textiles are heavily protected. Few concessions are given to LAFTA textile exporters, but some liberalization in trade among Andean Group countries is expected. Many of the smaller countries hope to enlarge their cotton textile industries in order to supply greater percentages of their domestic markets. Textile exports to countries outside the LAFTA region are not anticipated.

Outlook

Policy changes.--None.

Textile trade changes.--Total imports are likely to decline over the next decade. An increased proportion of total imports will be from other LAFTA countries.

Cotton's share of fiber use.--Cotton's share will continue to decline, especially in the wealthier countries like Argentina, Chile, and Venezuela.

Raw Cotton Production and Trade

Competitive status and potential production.--Chile and Uruguay must import all or most of their raw cotton needs. The remaining nations in their group grow all or the greater part of their domestic raw cotton needs. Argentina accounts for about three-quarters of the cotton grown in this region. Production in Argentina and the other countries is relatively inefficient. Acreage in Argentina is not expected to decline as rapidly as it has been. Recent price increases have stabilized acreage. Gradual yield increases are expected to continue, but the relative unimportance of cotton cultivation and the stagnant demand indicate that little emphasis will be placed on the application of new yield-improving inputs. Similar conditions apply to the other cotton producers in the region.

Production and trade policy.--Argentine cotton policy has had the objective of maintaining self-sufficiency in the crop. The remaining producers, especially Ecuador and Venezuela, hope to obtain self-sufficiency. Most of these countries tax the import of raw cotton, but grant substantial preferences to other LAFTA members. Chile's principal suppliers are Mexico, Peru and Brazil.

Outlook

Policy changes.--None.

Production changes.--It is likely that by 1980 Ecuador and Venezuela will have achieved self-sufficiency in cotton production.

Trade changes.--None.

EAST AND WEST AFRICA

Cotton Textile Use and Trade

Status of the textile industry.--Cotton textile industries in East and West Africa are mainly based on import substitution in local markets. In most cases, production is high-cost and inefficient. Manmade fibers have only a small share of the textile market. This share will increase gradually. The largest cotton textile industries are in Nigeria, Congo (K), and Uganda. Nigeria accounts for almost a third of the cotton textiles produced within the region. Trade restrictions imposed during the recent civil war induced large production increases in the Nigerian cotton textile industry. Mill consumption of cotton has been increasing in the Congo (K), but efficiency is hurt by antiquated machinery and methods. The principal mills operate at less than optimum capacity. Uganda is nearly self-sufficient in cotton textiles and would like to develop export markets.

Production and trade policy.--Most cotton textile producing countries in this region are still attempting to develop industries based on import substitution. Import barriers in these countries are high, but competition from low-cost East Asian producers continues to pose difficult problems. Some raw cotton exporters have aspirations to export cotton textiles in the future.

Outlook

Policy changes.--Trade barriers will continue to go up as more countries begin to develop cotton textile industries.

Textile trade changes.--Cotton textile imports will decline as local industries develop. The outlook for textile exports is not good.

Cotton's share of fiber use.--Cotton's share should remain very high but will decline somewhat as the use of manmade fibers increases.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton production is quite inefficient, but input costs (principally labor) are quite low and in many countries and regions there are few alternative crops. Acreage and yield statistics are generally unreliable for most countries, thus 1980 production projections were based on past production, not on acreages and yields. It is expected that most regions will increase production over the next several years. Changes are expected to be very gradual with some expansion in acreage, especially among the most minor producers, and some improvements in technique--leading to increased yields. The demands of local textile mills spur production in some countries.

Production and trade policy.--Most producing countries seek to expand production to gain increased foreign exchange, or to save foreign exchange by supplying their own textile mills.

Outlook

Policy changes.--None.

Production changes.--Production should continue to increase gradually during the next decade.

Trade changes.--Raw cotton importers should become increasingly self-sufficient. Total exports from the region will increase very gradually.

UNITED ARAB REPUBLIC (EGYPT)

Cotton Textile Use and Trade

Status of the textile industry.--Egypt is self-sufficient in cotton textiles, and is a major low-cost exporter. Most exports go to central plan countries and to other Arab countries. The industry has been expanding rapidly since the early 1950's, but currently faces many problems because of the lack of capital for machinery and spare parts imports, and inefficient labor use. Manmade fiber use is unimportant and is unlikely to increase significantly during the next decade.

Trade policy and restrictions.--The Government actively promotes cotton exports. Cotton textile imports are prohibited.

Outlook

Policy changes.--None.

Textile trade changes.--Exports are likely to increase gradually.

Cotton's share of fiber use.--Cotton's share is unlikely to decline significantly.

Raw Cotton Production and Trade

Competitive status and potential production.--The UAR is an efficient producer of cotton and the world's largest supplier of long and extra-long staple fibers. The Government sets the acreage and farm price, isolating the growers from prices on world markets. There are few alternative export crops. Future acreage is expected to stabilize near 1969 levels. It should not expand much beyond this point because of the demand for competing crops--rice, corn, and wheat. Future yield increases are expected to be moderate, slightly less than the rate of increase achieved in the recent past, because the adaptation of new inputs is not likely to be as rapid as it has been.

Production and trade policy.--The Government hopes to maintain production near the 1969/70 level, but above the lower level of recent years. Long-range goals emphasize stabilization of cotton production and expansion of food crop production. Cotton export policy takes maximum advantage of the high quality of Egyptian cotton. Cotton imports are prohibited.

Outlook

Policy changes.--None.

Production changes.--By 1980, production should be slightly higher than current levels.

Trade changes.--None.

SUDAN

Cotton Textile Use and Trade

Status of the textile industry.--The cotton textile industry has grown rapidly since 1960. Consumption has increased from 5,000 bales in 1960 to 65,000 bales in 1968. A large proportion of domestic cotton textile demand is now met by domestic production, but the industry finds it very difficult to meet foreign competition. Manmade fibers are of no importance.

Trade policies and restrictions.--The eventual elimination of the need for textile imports is foreseen. Textile imports are controlled.

Outlook

Policy changes.--Tighter restrictions on textile imports are probable before 1980.

Textile trade changes.--Textile imports will probably be eliminated by 1980.

Cotton's share of fiber use.--The use of manmade fibers is likely to remain very insignificant.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton production has been increasing steadily because of increased acreage. Most production consists of long and extralong staple cotton. About 75 percent of cotton cropland is irrigated. Growers are isolated from world market trends by Government regulations regarding acreage, prices, etc. There are few alternative export crops. Acreages should continue to trend upward, but competition from other crops, like peanuts and wheat, should keep acreage from increasing as fast as in recent years. Yields have been stagnant, but there is potential for much greater yields than those currently obtained. Increases should come as farmers learn new techniques and as more modern inputs are used. A developing labor shortage should speed the use of new inputs.

Production and trade policy.--The Government is attempting to teach some farmers newer techniques. There is a growing feeling that future prospects for medium staples will be better than those for the longer staples. Government technicians are experimenting in new varieties. Efforts are being made to diversify, but no good alternative to cotton production has yet been found. About a quarter of cotton exports are under bilateral agreements.

Outlook

Policy changes.--None.

Production changes.--Production will continue to increase by substantial amounts.

Trade changes.--None.

OTHER NORTH AFRICA

Cotton Textile Use and Trade

Status of the textile industry.--Textile industries in these North African countries are growing very rapidly, but they still do not meet all of their needs for cotton textiles. Morocco has the largest cotton textile industry in the region, and Algeria's industry is the fastest growing. Algerian raw cotton imports increased more than fourfold from 1964 to 1967. Many mills are modern and are probably relatively efficient. Manmade fibers are not yet important but their use will probably grow gradually through the 1970's.

Trade policies and restrictions.--The principal policy is the development of local industries to substitute for imports. These policies are aimed at developing self-sufficiency in cotton textiles.

Outlook

Policy changes.--None.

Textile trade changes.--Imports will continue to decline at a relatively rapid rate through the 1970's.

Cotton's share of fiber use.--Cotton's share will remain high despite some increased market penetration by manmade fibers.

Raw Cotton Production and Trade

Competitive status and potential production.--Most of the cotton in these countries is grown in Morocco. A small amount is also grown in Algeria. Most of the production is long-staple. About half of this is exported, and medium staple cottons are imported.

Production and trade policy.--Morocco exports about half of its long-staple cotton production and imports cheaper staples for domestic use. Algeria is apparently attempting to increase cotton production to supply a larger proportion of national needs.

Outlook

Policy changes.--None.

Production changes.--The region will probably increase its production somewhat.

Trade changes.--None.

IRAN

Cotton Textile Use and Trade

Status of the textile industry.--Iran is nearly self-sufficient in cotton textiles. The industry has grown rapidly since 1957 and is quite modern.

Efficiency, although poor, is improving. Manmade fibers are presently of minor importance, but their use has increased rapidly in recent years.

Trade policy and restrictions.--Only the import of specialized textiles is permitted. Tariffs are about 25 percent of value. Cotton textile exports are not promoted or foreseen.

Outlook

Policy changes.--None.

Textile trade changes.--Imports will continue at a very low level.

Cotton's share of fiber use.--Cotton's share will decline somewhat, but cotton will remain dominant.

Raw Cotton Production and Trade

Competitive status and potential production.--Iran is a relatively low-cost cotton producer. Average total cost per pound in 1968/69 was about 21.2 cents. Cotton quality is high and about two-thirds of the crop is exported. Production technology has been advancing with improvements in wells for irrigation, land leveling, mechanical land preparation, and aerial insecticide application (Government subsidized). Very little fertilizer is used. The Ministry of Agriculture controls acreage and regions of production. However, despite Government encouragement of cotton production, acreage has changed little since 1961, and labor shortages and competition from food crops may keep acreage from expanding as much as the Government desires. Further use of modern inputs and improved management techniques are expected to contribute to a faster rate of yield increase than was achieved during the 1959-68 period.

Production and trade policy.--The 1968-73 development plan anticipates increases in acreage and yields to raise production to 1,000,000 bales by the later year. Cotton is the second most valuable export commodity (oil is number one), and the Government encourages and to some extent subsidizes its production and export.

Outlook

Policy changes.--None.

Production changes.--Moderate increases through the 1970's.

Trade changes.--Moderate increases in exports.

SYRIA

Cotton Textile Use and Trade

Status of the textile industry.--Syria is nearly self-sufficient in cotton textile production. Some two-way trade in textiles is carried on with neighboring countries. The industry is quite inefficient and the Government lacks the resources to modernize it. Rayon consumption is high, but the use of other manmade fibers is not important.

Trade policy and restrictions.--All foreign trade is controlled by the Government and it can be assumed that it would not allow large quantities of cotton textiles to be imported. The Government would like to export textiles in the future, but high costs, low quality, and limited capacity make significant exports unlikely.

Outlook

Policy changes.--None.

Textile trade changes.--None.

Cotton's share of fiber use.--Cotton's share is likely to decrease only gradually.

Raw Cotton Production and Trade

Competitive status and potential production.--The Syrian economy is very dependent upon cotton exports. Domestic use of cotton counts for a relatively unimportant proportion of the crop. Syria is a relatively high-cost producer of cotton, but there are no important alternative export crops. Acreage has been somewhat stable since 1966. The economy's dependence upon cotton necessitates at least the maintenance of present acreage. The completion of a new dam on the Euphrates River (the first phase is to be completed in 1973) could allow substantial expansion of cotton acreage.

Yield increases are not likely to be as rapid as they were in the 1959-68 period because the principal factors that accounted for those increases (more modern inputs) are no longer as operative, and substantial production problems are now becoming apparent.

Production and trade policy.--The 1966-70 development plan proposed a one-third increase in production over the 5 years, but by 1969 the production increase was minimal. Cotton production increases were to be obtained by yield improvements, not acreage expansion. Exports, of course, are promoted. A limited quota of ELS imports is allowed.

Outlook

Policy changes.--None.

Production changes.--Cotton production will increase through the 1970's.

Trade changes.--None.

TURKEY

Cotton Textile Use and Trade

Status of the textile industry.--Turkey is self-sufficient in cotton textiles, and exports are of minor importance. The industry is long established, growing, and appears to be relatively efficient. The private sector of the industry (two-thirds of production) actively seeks new techniques, products, and markets. Manmade fibers have captured a small but rapidly growing portion of the market.

Trade policy and restrictions.--Textile imports have been effectively excluded. Some mills are interested in exporting textiles, but the Government appears to be satisfied with fiber exports.

Outlook

Policy changes.--None.

Textile trade changes.--Cotton textile exports should increase gradually.

Cotton's share of fiber use.--Cotton's share will decline gradually.

Raw Cotton Production and Trade

Competitive status and potential production.--Turkey is an efficient producer of relatively low-quality cotton. About two-thirds of the crop is exported. There are good alternative crop opportunities, especially fruits and vegetables, which can be exported to the EC. This potential for alternative crops is expected to be the principal factor behind future cotton acreage stagnation or declines. The rate of yield increase has slowed since 1964. Future yield increase can be expected to be relatively moderate, compared with 1959-68 trend. This is mainly because the rate of improvements in practices and shifts to irrigated acreage is likely to slow down.

Production and trade policy.--The Government provides some technical aid to producers and sets minimum prices shortly before harvest time. The Government assists in export promotion. A limited import quota of long-staple cotton is allowed.

Outlook

Policy changes.--None.

Production changes.--Production may increase somewhat from present levels as yields continue to improve.

Trade changes.--None.

OTHER WEST ASIA

Cotton Textile Use and Trade

Status of the textile industry.--This is a diverse group of countries whose cotton textile industries are in various states of development. The region still must import part of its textile needs, but the capacity of local industries is expanding relatively rapidly. The use of manmade fibers is gaining rapidly in some countries of the region.

Trade policy and restrictions.--Policies vary widely from country to country. No one country dominates the area.

Outlook

Policy changes.--None.

Textile trade changes.--Imports are likely to decline, but some of these countries will continue to import a portion of their needs from their neighbors and low-cost exporters. Most exports originate in Israel, but high labor costs and a strong domestic demand should prevent these from rising very rapidly.

Cotton's share of the fiber market.--Cotton's share will decline gradually.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton does not play an important role in the economies of these countries. Israel produces over two-thirds of the region's cotton with very modern techniques. Part of the crop is exported, but most is utilized domestically. The limitations on irrigated land and competition from other crops should prevent acreage in all of the region's countries from increasing faster than it has in the past. Yields have been stable since 1964. Israel has already achieved very high yields, and further large yield increases there are unlikely.

Production and trade policy.--Cotton production is promoted to supply domestic needs and, in the case of Israel, an additional small surplus for export.

Outlook

Policy changes.--None.

Production changes.--Production will increase gradually through the 1970's.

Trade changes.--None.

INDIA

Cotton Textile Use and Trade

Status of the textile industry.--India's cotton textile industry, the second largest in the non-Communist world, is plagued by antiquated machinery, "sick mills" (inefficient, money-losing mills), and rising production costs. India has not been able to fill its U.K. textile quota in recent years, and Indians fear that the new U.K. tariff (1972) will cut exports to that country (one-third of total exports) by 65 percent. However, modernization and expansion of the industry is continuing, and 90 percent of production is still sold domestically. The synthetic fiber industry is growing rapidly, but still only accounts for about 10 percent of total cloth production.

Trade policy and restrictions.--The Government has a program to assist the textile industry to modernize and to rehabilitate the "sick mills." Exports have been subsidized as of April 1968. Cotton textiles are not imported.

Outlook

Policy changes.--The Government will probably be forced to increase its efforts to assist the industry to modernize. India cannot afford continued losses in its important cotton textile exports because of inefficiency in the industry.

Textile trade changes.--Trade is likely to be maintained near current levels, but the new U.K. tariff may make this difficult.

Cotton's share of fiber use.--Manmade fibers will continue to make gradual inroads, but cotton will remain dominant in the market.

Raw Cotton Production and Trade

Competitive status and potential production.--India grows about 90 percent of her raw cotton needs, and is the fourth largest producer of cotton in the world. Very low yields per acre, however, indicate that production is rather inefficient. Heavy competition from food crops for the land should prevent acreage from increasing above current levels during the next decade. Yields, however, are likely to rise above the gradual upward trend of the last decade. The reason is the economy's dependence upon a large domestic cotton crop to supply growing mill needs, and unwillingness to divert food acreage to cotton. This will necessitate increased inputs into improved techniques and the use of more modern inputs. Cotton yields are starting from a very low base and could easily increase faster than they have been.

Production and trade policy.--The Government has recently adjusted cotton policy in an attempt to increase production. The minimum support price was raised by 5 percent and regulations restricting the internal movement of cotton have been abolished. Long-range goal is to become self-sufficient by increasing yields while maintaining acreage. However, a policy to grow more long-staple needs domestically has been unsuccessful, mainly because producer prices were set too low. Tariffs on cotton imports are low but import regulations are very strict. P.L. 480 imports are important.

Outlook

Policy changes.--Policies aimed at increasing yields will be more strongly emphasized.

Production changes.--Production, through the 1970's, will increase at a more rapid pace than it did in the 1960's.

Trade changes.--Imports are likely to decrease somewhat, but long staple imports will continue to be necessary.

PAKISTAN

Cotton Textile Use and Trade

Status of the textile industry.--Pakistan is a major low-cost exporter. The textile industry grew rapidly through the 1950's, more slowly in the 1960's, and is presently suffering from underutilized capacity. Production is relatively inefficient but very low wages keep costs down. Quality control on export items is a problem. The Government has given top priority to the modernization of the industry and is encouraging the use of unutilized capacity via a capacity tax.

Trade policy and restrictions.--The Government favors textile exports over raw cotton exports. Incentives are given to cotton textile exporters in the form of bonus vouchers. The Government feels that the new U.K. tariff (1972) will adversely affect its cotton textile exports. Textile imports are tightly restricted.

Outlook

Policy changes.--None.

Textile trade changes.--Textile exports may gradually rise above current levels, but the new U.K. tariff (1972) will make the task difficult.

Cotton's share of fiber use.--The inroads of manmade fibers will continue to be very minimal.

Raw Cotton Production and Trade

Competitive status and potential production.--Cotton is grown almost entirely on irrigated land in West Pakistan. Production costs are low (20.1 cents per pound average total cost), but returns per acre are small because of low yields. Primitive cultural practices and low-potential varieties have kept yields down, but the acceptance of new techniques and inputs in limited areas has permitted average yields to increase very gradually through the 1960's. More widespread application of modern practices may help yields to increase a little more rapidly through the 1970's. Increased competition from other crops is expected to cause a leveling off of cotton acreage after 1970.

Production and trade policy.--Government policy is based on increasing production through technical assistance to farmers while maintaining acreage near present levels. Both raw cotton and cotton textile exports are considered to be important foreign exchange earners which must be increased.

Outlook

Policy changes.--None.

Production changes.--Production is expected to continue increasing rapidly, although not as rapidly as it did during 1958-68. Future increases will come mostly from increased yields.

Trade changes.--Exports are expected to increase gradually.

OTHER SOUTH ASIA

Cotton Textile Use and Trade

Status of the textile industry.--This region is dependent upon imports for

more than half of its cotton textile needs. Most of the area's cotton textile manufacturing capacity is accounted for by Afghanistan's small but modern industry. Afghan textile producers have trouble competing with imported textiles. A small quantity of rayon textiles is produced in Afghanistan.

Trade policy and restrictions.--Afghanistan has no present intention of exporting cotton textiles. Textiles which compete directly with domestic products are not allowed to be imported.

Outlook

Policy changes.--None.

Textile trade changes.--This region will continue to be a textile importer.

Cotton's share of fiber use.--Cotton's share is not likely to decline much, if any.

Raw Cotton Production and Trade

Competitive status and potential production.--Afghanistan produces almost all of this area's cotton. About half of the annual production is exported to the USSR (some for reexport) and most of the rest is used domestically. Cotton is an important foreign exchange earner. Growing conditions are not particularly favorable, and producer prices are low, so it is not likely that acreage will increase above the level it has maintained since 1963. Yields have been trending downward, but they were often over 200 pounds per acre in the late 1950's and early 1960's. It should be possible to approach similar yields on a regular basis by 1980.

Production and trade policy.--The Government of Afghanistan encourages cotton production to meet demands for the domestic textile industry and for foreign exchange.

Outlook

Policy changes.--None.

Production changes.--Production should increase gradually as more farmers begin to use modern yield-improving techniques.

Trade changes.--None.

SOUTH EAST ASIA

Cotton Textile Use and Trade

Status of the textile industry.--This region is expanding its cotton textile production, but remains highly dependent upon imports to satisfy its needs. About two-thirds of the area's cotton textile production is concentrated in Thailand. Thailand's cotton textile industry has grown rapidly during the past decade. Most of its equipment is quite modern and apparently is efficiently operated. Manmade fibers have gained a relatively important and growing share of the market.

Trade policies and restrictions.--The cotton textile industries of Thailand and her South East Asian neighbors are intended to produce almost exclusively for domestic consumption. The Thai Government protects the domestic industry by tariffs on items which compete with domestic produce. In 1965, the ad valorem tariff was 32 percent on these items.

Outlook

Policy changes.--None.

Production changes.--Production will continue to increase, but more gradually than it has over the past decade.

Trade changes.--Imports may decline slightly.

Raw Cotton Production and Trade

Competitive status and potential production.--In 1968/69, Thailand produced two-thirds of the region's cotton, but due to a drastic drop in acreage, its 1969/70 average is estimated to be less than half the region's total. Burma and Cambodia produce the remainder of South East Asia's cotton. Production throughout the area is primitive and inefficient, but increasing numbers of Thai farmers are adopting more modern techniques that have increased average yields there. Yields in Burma and Cambodia are much lower than in Thailand. The drastic Thai acreage decline in the 1969/70 season was reportedly due to credit agencies being reluctant to extend credit to many producers who were unable to pay their entire accounts from the previous season. South East Asian cotton acreage is not expected to rise much during the 1970's because of the strong competition from other crops and the relative inefficiency of cotton production. Yields are currently running ahead of the 1959-68 trend and can be expected to remain there. Minor changes in inputs or techniques should have appreciable impact on yields (as they have in the past).

Production and trade policy.--Thailand would like to reduce dependence upon imported cotton. The Government has encouraged cotton production through its emphasis on farm diversification.

Outlook

Policy changes.--None.

Production changes.--Production will increase gradually as yields improve.

Trade changes.--The region will continue to be partially dependent upon imported cotton.

HONG KONG

Cotton Textile Use and Trade

Status of the textile industry.--Hong Kong is a major low-cost exporter of cotton textiles. Its industry is modern and very efficient, but its growth has slowed recently because of a labor shortage and the heavy competition from manmade fibers. The textile industry is becoming more capital intensive and is shifting heavily toward the production of synthetics and cotton-synthetic blends. The import of textiles for processing and reexport is very important in Hong Kong.

Trade policy and restrictions.--In response to world demand, the industry is shifting more to cotton-synthetic blends in its textile products. Hong Kong is a free port so there are no restrictions on imports or exports of textiles.

Outlook

Policy changes.--None.

Textile trade changes.--All cotton textiles will become less important in Hong Kong's exports.

Cotton's share of fiber use.--Cotton's share will continue to decline.

Raw Cotton Production and Trade

Competitive status and potential production.--Hong Kong does not produce cotton.

Production and trade policy.--There are no restrictions on raw cotton imports.

Outlook.--No changes.

SOUTH KOREA

Cotton Textile Use and Trade

Status of the textile industry.--Although a relative newcomer, South Korea is an important low-cost exporter of cotton textiles. Exports of total textiles and clothing have increased from about $27 million in 1964 to $173 million in 1968. During this time, clothing exports have increased much more rapidly than other textiles, and manmade and blended textile-product exports have increased much faster than cotton textile exports. Despite the importance of exports, the cotton textile industry is principally dependent upon the domestic market. However, the domestic market is growing rather slowly, and although cotton is expected to retain its leadership in the market, the demand for manmades has been increasing much more rapidly than the demand for cottons. The cotton textile industry is plagued by old and obsolete equipment and dependent upon subsidies to maintain exports, but hopes to remedy some of the inefficiencies by a modernization program.

Trade policy and restrictions.--The Government encourages textile exports by a program of subsidies for textile exporters. These include interest rate concessions, tax exemptions, lower tariffs and other raw material import assistance, and concessional rail and electric power rates. Cotton and synthetic fabrics apparently get the highest subsidies. These subsidies are in part negated, however, by the overvaluation of Korean currency (as of November 1969). The domestic market is protected from imports, and domestic prices for cotton textiles are apparently higher than export prices.

Outlook

Policy changes.--None.

Textile trade changes.--Manmades will account for an increasing percentage of textile exports.

Cotton's share of fiber use.--Cotton will maintain its top rank in the market, but its share of the market will decrease rapidly.

Raw Cotton Production and Trade

Competitive status and potential production.--Only small amounts of cotton are presently grown in South Korea, but the country has cotton-growing potential. In 1945, undivided Korea produced 289,000 bales of cotton, compared with 25,000 bales in the two Koreas in 1969. Cotton is presently not grown because grain production is considered more profitable, and imports from the United States under P.L. 480 and CCC concessional terms make local production uneconomic.

Production and trade policy.--Agricultural policy favors the import of cotton. There is a low tariff on cotton imports, but this is waived if the importer exports cotton textiles.

Outlook.--No changes.

TAIWAN

Cotton Textile Use and Trade

Status of the textile industry.--Taiwan's cotton textile industry, an important low-cost exporter, has been rapidly expanding production and exports in recent years. Apparently the industry is relatively efficient, but is burdened by numerous small-scale mills with insufficient capital. However, a continuous effort to modernize has increased efficiency and improved product quality. Japanese textile interests are active in the expansion and modernization of Taiwan's industry, especially in manmade fibers. Manmade fiber production is low but is expanding much more rapidly than cotton.

Trade policy and restrictions.--Government policy encourages the export of textiles, the diversification of export markets, and the modernization of the industry. Cotton textiles are not imported.

Outlook

Policy changes.--None.

Textile trade changes.--Exports should continue to increase, but a growing share of exports will consist of manmade fiber products.

Cotton's share of fiber use.--Cotton's presently large share will decline rapidly.

Raw Cotton Production and Trade

Competitive status and potential production.--Taiwanese cotton production is insignificant, accounting for less than 1 percent of total cotton use. It is unlikely that production will increase before 1980.

Production and trade policy.--There is a low tariff and licensing requirement on raw cotton imports.

Outlook.--No changes.

OTHER EAST ASIA AND PACIFIC

Cotton Textile Use and Trade

Status of the textile industry.--This is a textile-importing region. The principal cotton textile producers and consumers are the Philippines and Indonesia. The industries in both countries are based on import substitution. The Philippine industry grew rapidly through the 1950's and slower in the 1960's, while the Indonesian industry began a period of rapid growth in 1965. Cotton is the dominant textile fiber in both countries, but the use of manmade fibers is increasing in the Philippines. The Philippines also has a growing embroidery and apparel industry which processes imported fabrics for reexport.

Trade policies and restrictions.--The domestic markets of both Indonesia and the Philippines are protected. The Philippines has severe restrictions on textile imports and offers various incentives for investment in the textile industry.

Outlook

Policy changes.--None.

Textile trade changes.--Imports will probably decline to very low levels by 1980.

Cotton's share of fiber use.--Cotton is likely to remain dominant, but its market share will decline more so in the Philippines than in Indonesia.

Raw Cotton Production and Trade

Competitive status and potential production.--No country or territory in the region grows significant amounts of cotton. In 1969, Indonesia grew about 3,000 bales, or 2 percent of its raw cotton consumption. It is not likely that cotton production will be increased in the region.

Production and trade policy.--Domestic raw cotton needs are supplied by imports. Indonesia buys large quantities of P.L. 480 cotton.

Outlook.--No changes.

Table C-1.--Projections by others of per capita total fiber and cotton use; cotton's share, 1975 and 1980

Region	Per capita total fiber		Cotton's share 1/		Per capita cotton	
	1975 FAO-CP	1980 NACFF	1975 FAO-CP	1980 NACFF	1975 FAO-CP	1980 NACFF
	Kilograms		Percent		Kilograms	
Developed						
United States	19.0-21.1	24.5	47	41	8.9-9.8	10.0
Canada	13.5-14.5	15.9	44	37	5.5-5.9	5.9
EC	12.4-13.4		37		4.6-4.9	
United Kingdom	13.7-14.9	15.4	33	37	4.5-4.9	5.7
Other Western Europe	12.6-13.8		44		5.5-6.2	
Japan	14.2-15.8	15.9	37	35	5.2-5.8	5.6
Australia & New Zealand	11.9-13.1	11.3	41	48	4.6-5.1	5.4
South Africa	6.0- 6.9	5.9	45	50	2.7-3.2	2.9
Weighted average	13.6-15.0	17.8	42	39	5.7-6.3	6.9
Central Plan						
Eastern Europe	11.7-12.3	13.6	50	37	5.8-6.1	5.0
USSR	10.7-11.3	13.2	55	55	5.9-6.2	7.3
Communist Asia	2.1- 2.4	2.4	80	76	1.7-1.9	1.8
Weighted average	4.5- 4.9	5.5	62	57	2.8-2.1	3.2
Less Developed						
Mexico	4.2- 5.2	4.5	65	65	2.7-3.4	2.9
Central America & Caribbean	n.a.	3.4	n.a.	70	n.a.	2.4
Brazil	4.5- 5.2	5.4	70	74	3.1-3.6	4.0
Colombia	4.1- 4.6	2/3.6	65	2/67	2.7-3.0	2/2.4
Peru	3.0- 3.6		50		1.5-1.8	
Other South America	3/6.2- 7.0	4/7.7	3/63	4/65	3/3.9-4.4	4/5.0
East & West Africa	1.5- 1.7		65		1.1-1.1	
United Arab Republic	4.5- 4.8	2.0	85	73	3.8-4.1	1.5
Sudan	2.6- 3.0		90		2.4-2.7	
Other North Africa	n.a.		n.a.		n.a.	
Iran	n.a.		n.a		n.a	
Syria	n.a.	5/5.4	n.a.	5/55	n.a.	5/3.0
Turkey	5.7- 7.0		65		3.7-4.5	
Other West Asia	n.a.		n.a.		n.a.	
India	2.9- 3.6	2.7	80	85	2.3-2.8	2.3
Pakistan	2.7- 2.3		80		2.2-2.7	
Other South Asia	n.a.		n.a.		n.a.	
South East Asia	n.a.		n.a.		n.a.	
Hong Kong	n.a.	5/2.5	n.a.	5/76	n.a.	5/1.9
South Korea	3.2- 3.7		n.a.		2.3-2.6	
Taiwan	5.5- 6.9		n.a.		3.6-4.5	
Other East Asia & Pacific	6/1.1- 1.3		6/91		6/1.0-1.2	
Weighted average	2.6- 3.1	3.0	73	73	1.9-2.3	2.2
Total World	5.4- 6.1	6.4	55	52	3.0-3.4	3.4

1/ Share is approximate. Calculated before conversion and rounding. 2/ Includes Colombia, Peru, Bolivia, Chile, Venezuela, and the Guianas. 3/ Argentina and Uruguay only. 4/ Argentina, Uruguay, and Paraguay. 5/ Afghanistan is included in Other West Asia. 6/ Indonesia only.

Sources: (20) and (60).

Table C-2.--Direct projections of per capita cotton use in 1980

Sector and equation used	Y 1980	R_2	F value	t_b	t_c	E_I	E_P
Developed (1953-64)							
Y = a + b T	7.11	0.24	3.1	1.8	-	-	-
Y = a + b log I	7.22	.28	3.9	2.0	-	.16	-
log Y = a + b log I	7.25	.27	3.7	1.9	-	.16	-
(All equations with price variables had wrong signs)							
Central Plan (No analysis or projections)							
Less Developed (1953-64)							
Y = a + b T	2.35	.58	16.0	4.0	-	-	-
Y = a + log I	2.35	.59	15.2	3.9	-	.49	-
log Y = a + b log I	2.41	.60	15.0	3.9	-	.49	-
Y = a + bI - bP	2.42	.60	6.6	1.6	0.2	.44	-.22
Total World (1953-67)							
All equations	3.29-3.32	.01	0.1-0.2	-	-	-	-

Note -- Y = per capita cotton; T = time index or year; I = per capita income; P = average price of cotton; t_b = t value of regression coefficient; E_I = income elasticity of demand; and E_p = price elasticity of demand.

Table C-3.--Regional cotton production projections for 1975 and 1980

Region	1975			1980		
	FAO-CP 1/	FAO-IWP 2/	S & D 3/	NACFF 4/	FAO-IWP 2/	S & D 3/
	1,000 bales					
Developed						
United States	15,616			16,260		
Greece	689			5/1,380		
Spain	689					
Australia	115		133	220		147
South Africa	161		115	150		
Subtotal (excluding United States)	1,654			1,750		
Central Plan						
Eastern Europe	5/344			70		
USSR	10,679			11,480		
Communist Asia	7,808			8,620		
Subtotal	18,831			20,170		
Less Developed						
Mexico	3,100		3,123	3,070		3,343
El Salvador	459					510
Guatemala	505					890
Nicaragua	758			2,300		537
Other Central America & Caribbean	6/					
Brazil	2,871	2,788	6,182	3,040	3,056	
Colombia	299	597	615		880	740
Peru	666	882	772	7/1,670	983	936
Other South America	6/1,217	749			817	
East & West Africa	8/2,526	2,567			3,350	
United Arab Republic	2,641	2,540	9/2,572		2,920	
Sudan	965	1,226	9/1,378	6,950	1,425	
Other North Africa	8/					
Iran	827	799			970	
Syria	987	1,015		10/5,090	1,190	
Turkey	2,067		1,828			
Other West Asia	10/367					
India	6,315	8,511	8,575	6,000	10,752	
Pakistan	2,985	3,215	2,549		4,325	2,889
Other South Asia	10/	211		10/3,230	270	
South East Asia, East Asia & Pacific	367					
Subtotal	29,922			31,350	30,938	
Total World	11/66,023			69,530		
Foreign World 12/	50,407			53,270		

1/ Food and Agriculture Organization-Commodity Projections, (20, Vol. I, p. 276). Figures shown are an average of low and high projections. 2/ Food and Agriculture Organization-Indicative World Plan, (24). These projections are objectives rather than most likely estimates. The 1980 data are simple averages of 1975 and 1985 projections. 3/ Supply and demand studies done under contract for the U.S. Department of Agriculture. See Bibliography. 4/ National Advisory Commission on Food and Fiber (69). 5/ Includes Other Western Europe (a small residue accounting principally for Italy). 6/ Other Central America and Caribbean is included with Other South America. 7/ Includes only Argentina, Paraguay, and Uruguay. 8/ Other North Africa is included with East and West Africa. 9/ (75). 10/ Afghanistan is included in Other West Asia. 11/ Sum of individual regions. Simple average of world low (61.9 million) and high (69.8 million) is 65.8 million bales. 12/ Excluding the United States.

Table C-4.--Regional cotton acreage and average yield projections for 1980

Region	Area 1/			Yield 1/		
	FAO-IWP 2/	S & D	NACFF	FAO-IWP 2/	S & D	NACFF
	1,000 acres			Pounds per acre		
Developed						
United States			10,547			740
Other Western Europe			1,100			600
Australia			150			720
South Africa			150			480
Subtotal 3/			1,400			600
Central Plan						
Eastern Europe			100			340
USSR			7,300			755
Communist Asia			12,000			345
Subtotal			19,400			499
Less Developed						
Mexico		2/2,100	1,950		4/714	755
Central America & Caribbean		1,236	1,500		783	735
Brazil	7,413		5,500	202		265
Colombia	778		450	487		480
Peru	828	677	500	515	692	480
Other South America	5/1,236		6/1,000	5/243		6/250
East & West Africa	8,535		)	184		
United Arab Republic	2,235		) 11,650	618		
Sudan	1,452		)	464		
Iran	1,065		)	430	)	
Syria	877		) 7/4,250	643	)	7/575
Turkey		4/1,685)			4/461)	
India	30,380	4/30,030	18,000	170	4/136	
Pakistan	5,286	3,499	)	376	396)	
Other South Asia	350		) 8/5,250	361	)	7/294
Southeast Asia			)			
East Asia & Pacific	49		)	157		
Subtotal						
Total World			81,597			409
Foreign World 3/			71,050			360
Foreign Free World 3/ 9/			51,630			369

1/ No data on area and yield projections were published in the FAO-CP study. 2/ FAO-IWP figures are arithmetic averages of 1975 and 1985 projections of area and yields. 3/ Excluding the United States. 4/ 1975. 5/ Argentina only. 6/ Argentina, Uruguay, and Paraguay only. 7/ Afghanistan included. 8/ Afghanistan included with Iran, Syria, and Turkey. 9/ Excluding central plan countries.

Sources: FAO-IWP (24); S&D (see notations in Literature Cited); NACFF (60).

Table C-5.--Trade in cotton lint, projected 1980
(With price at 26 cents)

Regions	Low income			Medium income			High income		
	Imports	Exports	Net imports	Imports	Exports	Net imports	Imports	Exports	Net imports
	Million dollars								
Developed									
United States	14	428	-414	14	386	-372	14	538	-524
Canada	42	--	42	42	--	42	42	--	42
EC	506	--	506	506	--	506	511	--	511
United Kingdom	116	--	116	116	--	116	121	--	121
Other Western Europe	179	20	159	185	20	165	190	20	170
Japan	428	--	428	428	--	428	434	--	434
Australia & New Zealand	--	5	-5	--	5	-5	--	5	-5
South Africa	9	--	9	9	--	9	9	--	9
Subtotal	1,294	453	841	1,300	411	889	1,321	563	758
Central Plan									
Eastern Europe	529	--	529	536	--	536	542	--	542
USSR	79	415	-336	79	415	-336	79	409	-330
Communist Asia	78	--	78	78	--	78	78	--	78
Subtotal	686	415	271	693	415	278	699	409	290
Less Developed									
Mexico	--	113	-113	--	93	-93	--	64	-64
Central America & Caribbean	19	54	-35	19	50	-31	19	32	-13
Brazil	--	217	-217	--	217	-217	--	180	-180
Colombia	--	26	-26	--	17	-17	--	13	-13
Peru	--	61	-61	--	68	-68	--	75	-75
Other South America	65	4	61	46	4	42	72	4	68
East & West Africa	5	280	-275	5	335	-330	5	405	-400
United Arab Republic	--	210	-210	--	210	-210	--	202	-202
Sudan	--	182	-182	--	202	-202	--	240	-240
Other North Africa	10	7	3	14	7	7	14	7	7
Iran	--	60	-60	--	60	-60	--	64	-64
Syria	--	69	-69	--	74	-74	--	83	-83
Turkey	--	122	-122	--	127	-127	--	118	-118
Other West Asia	27	5	22	20	5	15	34	5	29
India	90	--	90	82	143	82	165	--	165
Pakistan	--	113	-113	--	143	-143	--	160	-160
Other South Asia	17	7	10	17	7	10	17	7	10
South East Asia	33	--	33	38	--	38	55	--	55
Hong Kong	97	--	97	106	--	106	120	--	120
South Korea	88	--	88	98	--	98	108	--	108
Taiwan	85	--	85	89	--	89	108	--	108
Other East Asia & Pacific	71	--	71	92	--	92	107	--	107
Subtotal	607	1,530	-923	626	1,619	-993	824	1,659	-835
Total World	2,587	2,398	189	2,619	2,445	174	2,844	2,631	213

Table C-6.--Trade in cotton textiles and net lint plus textile trade, projected 1980
(With cotton lint at 26 cents)

1980	Cotton textiles									Lint plus textiles		
	Low income			Medium income			High income			Net imports		
	Imports	Exports	Net imports	Imports	Exports	Net imports	Exports	Imports	Net imports	Low	Medium	High
	Million dollars											
Developed												
United States	766	215	551	766	246	520	766	246	520	137	148	-4
Canada	150	21	129	150	21	129	150	21	129	171	171	171
EC	925	780	145	925	780	145	925	810	115	651	651	626
United Kingdom	384	200	184	384	200	184	384	233	151	300	300	272
Other Western Europe	600	559	41	600	588	12	600	617	-17	200	177	153
Japan	66	410	-344	66	410	-344	66	437	-371	84	84	63
Australia & New Zealand	173	--	173	173	--	173	173	--	173	168	168	168
South Africa	48	--	48	48	--	48	48	--	48	57	57	57
Subtotal	3,112	2,185	927	3,112	2,245	867	3,112	2,364	748	1,768	1,756	1,506
Central Plan												
Eastern Europe	161	399	-238	161	420	-259	161	441	-280	291	277	262
USSR	368	126	242	368	126	242	368	147	221	-94	-94	-104
Communist Asia	--	142	-142	--	142	-142	--	142	-142	-64	-64	-64
Subtotal	529	667	-138	529	688	-159	529	730	-201	133	119	89
Less Developed												
Mexico	--	16	-16	--	16	-16	--	16	-16	-129	-109	-80
Central America & Caribbean	48	17	31	48	34	14	47	34	13	-4	-17	--
Brazil	--	16	-16	--	16	-16	--	16	-16	-233	-233	-196
Colombia	--	29	-29	--	29	-29	--	15	-15	-55	-46	-28
Peru	--	--	--	--	--	--	--	--	--	-61	-68	-75
Other South America	24	--	24	24	--	24	24	--	24	85	66	92
East & West Africa	352	16	336	352	16	336	440	16	424	61	6	24
United Arab Republic	--	207	-207	--	207	-207	--	207	-207	-417	-417	-409
Sudan	22	--	22	22	--	22	44	--	44	-160	-180	-196
Other North Africa	44	--	44	44	--	44	66	--	66	47	51	73
Iran	--	--	--	--	--	--	--	--	--	-60	-60	-64
Syria	--	16	-16	--	16	-16	--	16	-16	-85	-90	-99
Turkey	--	16	-16	--	16	-16	--	16	-16	-138	-143	-134
Other West Asia	24	34	-10	48	34	14	48	34	14	12	29	43
India	--	198	-198	--	198	-198	--	215	-215	-108	-116	-50
Pakistan	--	139	-139	--	139	-139	--	150	-150	-252	-282	-310
Other South Asia	88	--	88	110	--	110	132	--	132	98	120	142
Southeast Asia	88	--	88	110	--	110	132	--	132	121	148	187
Hong Kong	266	672	-406	266	693	-427	266	735	-469	-309	-321	-349
South Korea	--	208	-208	--	208	-208	--	208	-208	-120	-110	-100
Taiwan	--	189	-189	--	189	-189	--	203	-203	-104	-100	-95
Other East Asia & Pacific	264	44	220	308	44	264	352	44	308	291	356	415
Subtotal	1,220	1,817	-597	1,332	1,885	-523	1,551	1,925	-374	-1,520	-1,516	-1,209
Total World	4,861	4,669	192	4,973	4,788	185	5,192	5,019	173	381	359	386

APPENDIX D

TEXTILE CONSUMPTION AND TRADE STATISTICS, 1964-67

The analysis in this study was based on statistics of textile consumption and trade which were complete for all world regions only through 1964. Data through 1966 or 1967 from FAO or GATT were available only for a limited number of regions.. However, since the completion of the study, a new FAO publication, Per Caput Fibre Consumption, 1964-1967 (25), has become available. In addition to supplying more updated statistics on world consumption and trade, this publication has more complete coverage of trade in clothing than previous publications, and includes estimates of the raw fiber equivalent of textile trade.

Although it was not possible to include these new statistical data in the analysis of this study, it was possible to insert them in the historical discussions--which was done. The more inclusive coverage of trade in clothing in the new statistics limits to some extent the comparison between these data and the older data. The lack of comparable pre-1964 data prohibited the use of statistics expressing textile trade in terms of raw fiber equivalent.

Other problems are certain instances where new data do not compare at all with what was previously available, and apparent changes in trends since 1964. These types of problems are apparent in only a few regions, however, and do not seriously affect the conclusions of the study. However, in light of the newly available statistics, the following criticisms of the 1980 projections could be made. The 1980 projections of fiber use and cotton use in Canada, Australia-New Zealand, Republic of South Africa, and East and West Africa may be too low. The regional shares of exports, and thus the amounts of and earnings from exports of cotton textiles projected for 1980 may be too low for Communist Asia and Mexico, and too high for Turkey, India, South Korea, and Hong Kong.

The following tables are a summary of the consumption and trade statistics in Per Caput Fibre Consumption, 1964-1967. Annual figures for 1964-1967 allow some examination of the most recent trends. Trade expressed on a raw fiber equivalent basis is also shown in comparison with trade on an actual weight basis.

Table D-1.--Domestic total fiber availability, excluding flax and silk, 1964-67 1/

Region	1964	1965	1966	1967
	1,000 metric tons			
Developed				
United States	3,399.5	3,816.6	4,111.2	4,015.0
Canada	282.4	294.3	301.8	318.9
EC	1,979.0	1,937.6	2,115.5	1,918.7
United Kingdom	848.2	804.9	813.9	810.5
Other Western Europe	767.8	807.7	810.3	813.6
Japan	1,079.1	1,066.4	1,041.3	1,291.0
Australia & New Zealand	198.3	227.0	215.3	230.2
South Africa	150.8	157.9	139.6	150.7
Subtotal	8,705.1	9,112.4	9,547.9	9,548.6
Central Plan				
Eastern Europe	1,050.2	1,113.5	1,176.1	1,235.8
USSR	2,128.7	2,252.4	2,379.0	2,520.8
Communist Asia	1,534.5	1,463.0	1,497.1	1,610.7
Subtotal	4,513.4	4,828.9	5,052.2	5,367.3
Less Developed				
Mexico	172.7	188.0	176.5	207.2
Central America & Caribbean	125.2	122.2	125.7	125.8
Brazil	330.9	322.6	331.0	351.9
Colombia	69.1	71.2	75.1	78.1
Other South America 2/	311.0	339.7	333.3	314.2
East & West Africa	302.4	326.7	310.7	307.5
United Arab Republic	119.1	116.3	137.8	147.7
Sudan	23.8	24.7	29.3	29.3
Other North Africa	80.2	79.3	91.8	79.5
Iran	97.4	104.1	107.7	119.5
Syria	29.6	31.4	37.7	31.2
Turkey	168.5	178.5	197.7	211.1
Other West Asia	123.1	133.2	140.7	131.1
India	1,153.8	1,133.1	1,104.0	1,120.1
Pakistan	242.8	238.2	246.4	237.6
Other South Asia	62.7	61.8	65.0	60.1
Southeast Asia	153.2	166.0	166.3	157.2
Hong Kong	27.7	18.8	30.2	15.2
South Korea	53.9	72.0	90.2	112.3
Taiwan	53.1	55.5	54.9	58.6
Other East Asia & Pacific	221.5	245.7	244.0	276.2
Subtotal	3,921.7	4,029.0	4,096.0	4,171.4
Total World	17,140.2	17,970.3	18,696.1	19,087.3

1/ Raw fiber equivalent. 2/ Includes Peru.

Source: (25).

Table D-2--Per capita total fiber availability, excluding flax and silk, 1964-67 1/

Region	1964	1965	1966	1967
	Kilograms			
Developed				
United States	17.7	19.6	20.9	20.1
Canada	14.7	15.0	15.0	15.6
EC	11.0	11.6	11.5	10.4
United Kingdom	15.6	14.8	14.8	14.7
Other Western Europe	8.9	9.3	9.2	9.2
Japan	11.1	10.9	10.5	12.9
Australia & New Zealand	14.4	16.3	15.1	15.9
South Africa	8.6	8.8	7.6	8.0
Sector	13.2	13.7	14.2	14.0
Central Plan				
Eastern Europe	8.7	9.2	9.6	10.0
USSR	9.3	9.8	10.2	10.7
Communist Asia	1.6	1.8	1.8	1.9
Sector	4.0	4.2	4.3	4.5
Less Developed				
Mexico	4.2	4.4	4.0	4.6
Central America & Caribbean	3.5	3.3	3.3	3.2
Brazil	4.2	4.0	4.0	4.1
Colombia	4.0	4.0	4.0	4.1
Other South America 2/	4.7	5.0	4.8	4.4
East & West Africa	1.7	1.7	1.6	1.6
United Arab Republic	4.1	3.9	4.6	4.8
Sudan	1.8	1.8	2.1	2.1
Other North Africa	2.6	2.5	2.8	2.4
Iran	4.0	4.2	4.2	4.5
Syria	5.8	6.0	7.0	5.6
Turkey	5.5	5.8	6.2	6.5
Other West Asia	4.5	4.8	4.9	4.4
India	2.4	2.3	2.2	2.2
Pakistan	2.2	2.1	2.1	2.0
Other South Asia	1.7	1.7	1.7	1.6
Southeast Asia	2.0	2.1	2.0	1.9
Hong Kong	7.7	5.1	8.1	3.9
South Korea	2.0	2.6	3.1	3.8
Taiwan	4.4	4.4	4.2	4.4
Other East Asia & Pacific	1.5	1.6	1.5	1.7
Sector	2.7	2.7	2.6	2.6
Total World	5.2	5.3	5.4	5.5

1/ Raw fiber equivalent. 2/ Includes Peru.

Source: (25).

Table D-3.--Cotton's share of total fiber availability, excluding flax and silk, 1964-67 1/

Region	1964	1965	1966	1967
	Percent			
Developed				
United States	58.0	55.2	54.8	53.1
Canada	53.9	52.1	50.7	50.2
EC	45.1	42.4	41.7	42.5
United Kingdom	48.3	44.1	43.6	42.0
Other Western Europe	48.8	48.6	46.6	44.5
Japan	42.7	46.1	42.6	42.6
Australia & New Zealand	51.0	47.9	49.3	47.0
South Africa	47.1	43.6	49.3	46.1
Sector	50.9	49.4	48.6	47.5
Central Plan				
Eastern Europe	46.0	46.5	45.9	45.1
USSR	67.9	66.9	66.6	65.0
Communist Asia	90.0	91.1	92.4	91.9
Sector	69.3	69.6	69.4	68.5
Less Developed				
Mexico	71.5	70.0	68.2	65.4
Central America & Caribbean	79.0	78.4	77.5	73.7
Brazil	80.0	78.5	76.7	75.6
Colombia	79.2	78.8	77.9	77.1
Other South America 2/	64.6	63.7	62.8	60.9
East & West Africa	80.1	79.2	79.3	80.4
United Arab Republic	86.3	86.4	86.8	87.5
Sudan	83.2	85.8	84.6	90.8
Other North Africa	44.8	45.4	47.6	48.1
Iran	46.9	44.6	45.6	46.4
Syria	64.5	65.0	61.3	75.0
Turkey	76.6	75.6	72.1	71.8
Other West Asia	55.4	53.2	52.2	56.1
India	91.8	91.0	90.3	88.8
Pakistan	91.1	90.5	90.0	92.8
Other South Asia	73.2	71.0	68.8	67.2
Southeast Asia	81.3	80.6	76.4	71.5
Hong Kong	61.0	72.9	76.2	65.1
South Korea	71.2	73.9	64.4	57.3
Taiwan	72.3	69.5	63.6	56.0
Other East Asia & Pacific	74.5	75.7	69.3	69.4
Sector	79.4	78.4	76.6	75.7
Total World	62.3	61.3	60.4	59.6

1/ Based on raw fiber equivalent. 2/ Includes Peru.

Source: (25).

Table D-4.--Domestic cotton availability for home use, 1964-67 1/

Region	1964	1965	1966	1967
	1,000 metric tons			
Developed				
United States	1,972.4	2,108.2	2,255.2	2,132.0
Canada	152.3	153.2	153.1	160.1
EC	891.6	822.7	881.8	815.0
United Kingdom	409.6	355.3	354.9	340.4
Other Western Europe	374.7	392.8	377.8	362.3
Japan	460.6	491.4	443.3	550.2
Australia & New Zealand	101.2	108.8	106.1	108.2
South Africa	71.0	68.9	68.8	69.4
Subtotal	4,433.4	4,501.3	4,641.0	4,537.6
Central Plan				
Eastern Europe	483.3	518.2	539.7	556.9
USSR	1,445.1	1,507.7	1,583.6	1,638.7
Communist Asia	1,201.5	1,332.6	1,384.2	1,481.0
Subtotal	3,129.9	3,358.5	3,507.5	3,676.6
Less Developed				
Mexico	123.1	131.6	120.4	135.5
Central America & Caribbean	98.9	95.6	97.3	92.8
Brazil	264.6	253.2	253.8	266.1
Colombia	54.7	56.1	51.5	60.2
Other South America 2/	200.8	216.4	209.2	191.5
East & West Africa	242.1	258.8	246.4	247.4
United Arab Republic	102.8	100.5	119.6	129.3
Sudan	19.8	21.2	24.8	26.6
Other North Africa	35.9	36.0	43.7	38.2
Iran	45.7	46.4	49.1	55.5
Syria	19.1	20.4	23.1	23.4
Turkey	129.1	134.9	142.5	151.5
Other West Asia	68.2	70.8	73.4	73.5
India	1,059.6	1,030.7	996.7	994.1
Pakistan	221.1	215.5	221.9	220.5
Other South Asia	45.9	43.9	44.7	40.4
Southeast Asia	124.5	133.8	127.0	112.4
Hong Kong	16.9	13.7	23.0	9.9
South Korea	38.4	53.2	58.1	64.4
Taiwan	38.4	38.6	34.9	32.8
Other East Asia & Pacific	165.1	186.0	169.0	191.6
Subtotal	3,114.7	3,157.3	3,137.1	3,157.6
Total World	10,678.0	11,017.1	11,285.6	11,371.8

1/ Raw fiber equivalent. 2/ Includes Peru.

Source: (25).

Table D-5.--Per capita cotton availability, 1964-67 1/

Region	1964	1965	1966	1967
	Kilograms			
Developed				
United States	10.2	10.8	11.5	10.7
Canada	7.9	7.8	7.6	7.8
EC	5.0	4.5	4.8	4.4
United Kingdom	7.5	6.5	6.5	6.2
Other Western Europe	4.3	4.5	4.3	4.1
Japan	4.8	5.0	4.5	5.5
Australia & New Zealand	7.4	7.8	7.4	7.5
South Africa	4.0	3.8	3.7	3.7
Sector	6.7	6.7	6.9	6.7
Central Plan				
Eastern Europe	4.0	4.3	4.4	4.5
USSR	6.3	6.5	6.8	6.9
Communist Asia	1.5	1.6	1.6	1.7
Sector	2.8	2.9	3.0	3.1
Less Developed				
Mexico	3.0	3.1	2.7	3.0
Central America & Caribbean	2.7	2.6	2.6	2.4
Brazil	3.4	3.1	3.1	3.1
Colombia	3.1	3.1	3.1	3.1
Other South America 2/	3.1	3.2	3.0	2.7
East & West Africa	1.3	1.4	1.3	1.3
United Arab Republic	3.6	3.4	4.0	4.2
Sudan	1.5	1.6	1.8	1.9
Other North Africa	1.2	1.2	1.4	1.2
Iran	1.9	1.9	1.9	2.1
Syria	3.8	3.9	4.3	4.2
Turkey	4.2	4.4	4.5	4.6
Other West Asia	2.5	2.5	2.6	2.5
India	2.2	2.1	2.0	2.0
Pakistan	2.0	1.9	1.9	1.8
Other South Asia	1.3	1.2	1.2	1.1
Southeast Asia	1.6	1.7	1.5	1.3
Hong Kong	4.7	3.7	6.2	2.6
South Korea	1.4	1.9	2.0	2.2
Taiwan	3.2	3.1	2.7	2.5
Other East Asia & Pacific	1.1	1.2	1.1	1.2
Sector	2.1	2.0	2.0	1.9
Total World	3.2	3.3	3.3	3.2

1/ Raw fiber equivalent. 2/ Includes Peru.

Source: (25).

Table D-6.--Cotton textile imports, 1964-67

Region	Actual weight				Raw fiber equivalent			
	1964	1965	1966	1967	1964	1965	1966	1967
	1,000 metric tons							
Developed								
United States	123.5	149.3	214.0	187.8	149.3	179.9	257.9	226.1
Canada	52.9	55.2	62.7	63.8	62.4	65.2	74.1	75.4
EC	241.0	251.8	262.2	247.1	281.3	294.7	308.2	291.5
United Kingdom	196.0	153.1	162.3	174.7	234.9	184.2	195.7	209.7
Other Western Europe	128.7	132.3	138.2	148.5	150.4	154.9	161.8	174.0
Japan	2.2	1.4	1.8	15.1	2.6	1.7	2.2	17.1
Australia & New Zealand	64.1	70.4	68.6	68.9	75.5	83.0	80.5	81.1
South Africa	32.0	26.9	22.5	21.7	38.2	32.0	27.0	26.1
Subtotal	840.4	840.0	932.3	928.1	994.6	995.6	1,107.4	1,101.0
Central Plan								
Eastern Europe	22.9	28.5	33.1	42.3	26.6	33.2	38.3	48.8
USSR	31.6	35.1	36.1	41.2	36.1	40.1	41.3	46.9
Communist Asia	9.6	15.6	13.1	6.5	11.3	18.0	15.3	7.5
Subtotal	64.1	79.2	82.3	89.9	74.0	91.3	94.9	103.2
Less Developed								
Mexico	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
Central America & Caribbean	53.8	48.7	52.8	46.1	63.1	57.3	59.3	53.8
Brazil	--	--	--	.1	.1	.1	.1	.1
Colombia	.8	--	--	--	.9	--	--	--
Other South America 1/	13.6	10.9	9.5	8.7	15.9	13.1	11.2	10.2
East & West Africa	170.9	176.6	155.9	146.9	201.0	208.1	184.7	173.1
United Arab Republic	2.0	2.1	6.6	5.5	2.4	2.5	7.4	6.2
Sudan	11.0	11.4	12.6	11.8	12.9	13.3	14.9	13.9
Other North Africa	25.8	23.5	26.8	20.0	30.1	27.2	31.2	23.2
Iran	1.2	1.6	1.2	1.2	1.4	1.8	1.5	1.4
Syria	3.6	3.7	4.9	3.7	4.2	4.4	5.7	4.3
Turkey	.1	.1	.2	.2	.1	.1	.2	.3
Other West Asia	39.0	39.6	42.4	42.9	45.7	46.6	50.3	50.8
India	.1	0.3	.1	.1	.1	.3	.2	.1
Pakistan	1.3	1.0	.7	.8	1.5	1.1	.8	.9
Other South Asia	28.6	26.5	27.2	23.2	33.3	30.8	31.6	26.8
Southeast Asia	67.0	66.6	52.5	35.3	76.9	76.7	60.2	41.0
Hong Kong	78.6	60.4	97.5	86.2	91.7	70.7	113.4	100.7
South Korea	1.1	1.5	1.6	1.7	1.3	1.7	1.9	2.0
Taiwan	.2	.1	.2	.6	.2	.2	.3	.7
Other East Asia & Pacific	128.2	150.5	124.5	133.8	149.0	173.8	145.5	156.3
Subtotal	627.2	625.4	617.5	569.2	732.2	730.2	720.8	666.3
Total World	1,531.7	1,545.0	1,632.1	1,587.2	1,800.8	1,817.1	1,923.1	1,870.5

1/ Includes Peru.

Source: (25).

Table D-7.--Cotton textile exports, 1964-67

Region	Actual weight				Raw fiber equivalent			
	1964	1965	1966	1967	1964	1965	1966	1967
	1,000 metric tons							
Developed								
United States	96.6	73.0	78.9	77.2	115.2	87.2	94.4	92.2
Canada	6.6	8.4	10 1	6.6	7.7	9.9	11.8	7.9
EC	288.0	295.8	304.5	289.1	336.6	345.6	356.7	339.6
United Kingdom	52.9	49.4	45.2	42.4	62.4	58.4	53.4	49.9
Other Western Europe	106.5	106.7	128.7	134.4	128.2	128.7	154.2	160.1
Japan	208.7	203.1	205.2	166.1	248.4	242.1	243.3	197.6
Australia & New Zealand	1.3	1.5	1.8	1.6	1.8	1.9	2.2	1.8
South Africa	1.8	3.0	3.2	2.4	2.0	3.3	3.4	2.6
Sub total	762.6	740.9	777.6	719.8	902.3	877.1	919.4	851.7
Central Plan								
Eastern Europe	128.1	130.3	134.5	136.5	151.9	154.1	159.4	161.8
USSR	42.3	43.8	34.0	45.1	49.1	51.0	39.6	52.4
Communist Asia	84.5	69.5	92.0	100.0	98.7	81.1	107.5	116.7
Subtotal	254.9	243.6	260.5	281.6	299.7	286.2	306.5	330.9
Less Developed								
Mexico	2.0	2.9	20.0	12.1	2.3	3.4	22.7	13.9
Central America & Caribbean	2.8	3.3	5.0	6.1	3.4	4.0	5.7	6.8
Brazil	3.7	8.9	9.8	4.4	4.3	10.2	11.0	5.0
Colombia	5.1	6.0	4.7	4.2	5.9	6.8	5.3	4.8
Other South America 1/	.5	.1	.2	.2	.5	.1	.2	.2
East & West Africa	4.0	4.3	3.1	3.0	4.5	4.9	3.6	3.6
United Arab Republic	41.5	56.3	56.1	55.7	46.9	63.5	63.2	63.0
Sudan	.1	.1	.1	.1	.1	.1	.1	.1
Other North Africa	.8	.6	.6	.6	1.0	.8	.8	.7
Iran	--	--	.2	.1	--	--	.3	.1
Syria	4.2	4.0	3.3	2.5	5.0	4.7	3.8	2.9
Turkey	2.9	2.5	.4	.3	3.3	3.0	.4	.4
Other West Asia	10.7	10.2	10.6	11.1	12.1	11.7	12.2	12.6
India	95.3	101.0	93.4	86.0	111.3	118.4	109.2	102.3
Pakistan	50.3	56.1	60.6	76.4	58.3	65.1	70.6	88.4
Other South Asia	--	--	--	--	--	--	--	--
Southeast Asia	--	--	--	.4	--	--	--	.4
Hong Kong	167.1	158.6	204.0	209.8	201.1	190.5	244.3	251.7
South Korea	28.6	15.4	15.9	20.2	33.5	18.4	19.1	24.2
Taiwan	19.9	20.7	27.9	38.6	23.6	24.6	33.0	45.6
Other East Asia & Pacific	23.1	26.5	25.0	22.3	27.6	31.6	29.8	26.5
Subtotal	462.6	477.5	540.0	554.1	544.7	561.8	635.3	653.2
Total World	1,480.1	1,462.0	1,579.0	1,555.5	1,746.7	1,725.1	1,861.2	1,835.8

1/ Includes Peru.

Source: (25).

Table D-8.--Net cotton textile trade, 1964-67 1/

Region	Raw fiber equivalent			
	1964	1965	1966	1967
	1,000 metric tons			
Developed				
United States	+34.1	+92.7	+163.5	+133.9
Canada	+54.7	+55.3	+62.3	+67.5
EC	-55.3	-50.9	-48.5	-48.1
United Kingdom	+172.5	+125.8	+142.3	+159.8
Other Western Europe	+22.2	+26.2	+7.6	+13.9
Japan	-245.8	-240.4	-241.1	-180.5
Australia & New Zealand	+73.7	+81.1	+78.3	+79.3
South Africa	+36.2	+28.7	+23.6	+23.5
Subtotal	+92.3	+118.5	+188.0	+249.3
Central Plan				
Eastern Europe	-125.3	-120.9	-121.1	-113.0
USSR	-13.0	-10.9	+1.7	-5.5
Communist Asia	-87.4	-63.1	-92.2	-109.2
Subtotal	-225.7	-194.9	-211.6	-227.7
Less Developed				
Mexico	-1.9	-3.0	-22.3	-13.4
Central America & Caribbean	+59.7	+53.3	+53.6	+47.0
Brazil	-4.2	-10.1	-10.9	-4.9
Colombia	-5.0	-6.8	-5.3	-4.8
Other South America 2/	+15.4	+13.0	+11.0	+10.0
East & West Africa	+196.5	+203.2	+181.1	+169.5
United Arab Republic	-44.5	-61.0	-55.8	-56.8
Sudan	+12.8	+13.2	+14.8	+13.8
Other North Africa	+29.1	+26.4	+30.4	+22.5
Iran	+1.4	+1.8	+1.2	+1.3
Syria	-0.8	-0.3	+1.9	+1.4
Turkey	-3.2	-2.9	-0.2	-0.1
Other West Asia	+33.6	+34.9	+38.1	+38.2
India	-111.2	-118.1	-109.0	-102.2
Pakistan	-56.8	-64.0	-69.8	-87.5
Other South Asia	+33.3	+30.8	+31.6	+26.8
Southeast Asia	+76.9	+76.7	+60.2	+40.6
Hong Kong	-109.4	-119.8	-130.9	-151.0
South Korea	-32.2	-16.7	-17.2	-22.2
Taiwan	-23.4	-24.4	-32.7	-44.9
Other East Asia & Pacific	+121.4	+142.2	+115.7	+129.8
Subtotal	+187.5	+168.4	+85.5	+13.1
Total World	+54.1	+92.0	+61.9	+34.7

1/ (+) signifies net imports and (-) signifies net exports. (2) Includes Peru.

Source: (25).

LITERATURE CITED

(1) Aarhus Universitets Okonomiske Institut
1969. Projections of Supply and Demand for Agricultural Products in Denmark (1970-1980). Aarhus (Denmark). 1/

(2) Abbas, S.A.
1967. Supply and Demand of Selected Agricultural Products in Pakistan 1961-1975. Lahore. 1/

(3) Arthur D. Little, Inc.
1966. Projected Exports and Imports of Selected Agricultural Commodities of South Africa. Cambridge, Massachusetts. 1/

(4) Battelle Memorial Institute
1969. Projections of Supply and Demand for Selected Agricultural Products in Central America through 1980. Printed in Israel for USDA/ERS. 1/

(5) Blakley, Leo V.
1962. Quantitative Relationships in the Cotton Economy with Implications for Economic Policy. Okla. State Univ. Tech. Bul. T-95. 50 pp., illus.

(6) Braum, Gaston
1968. Belgian Cotton Mills Are Hit Hard by 'Abnormal Imports.' Cotton International. Memphis. pp. 111, 113.

(7) Burns, Arthur F.
1934. Production Trends in the United States Since 1870. Nat. Bur. Econ. Res. New York.

(8) Cathcart, William E. and J.C. Donald
1966. Analysis of Factors Affecting U.S. Cotton Exports. U.S. Dept. Agr., Econ. Res. Serv., Agr. Econ. Rpt. 90. 63 pp.

(9) Centre de Recherches et de Documentation sur la Consommation
1967. Production and Uses of Selected Farm Products in France. Projections to 1970 and 1975. Paris.

(10) Chin, Rockwood
1965. Management, Industry and Trade in Cotton Textiles. New Haven.

(11) Comtel-Reuters
Reuters Commodity Index, Comtelburo Limited. London. (Yearly).

(12) Consejo de Bienestar Rural
1965. Long-Term Forecasts of the Supply and Demand of Agricultural and Livestock Products in Venezuela. Printed in Israel for USDA/ERS. 1/

1/ This study was conducted under contract with the USDA as part of a series to evaluate long-term supply and demand prospects for agricultural products throughout the world. The complete study may be obtained on request from the Division of Information, Office of Management Services, U.S. Department of Agriculture, Washington, D.C. 20250

(13) Cox, Clifton B. and V.W. Pherson
1959. The Competitive Potential of the United States Cotton Industry. Harvard Univ. Press. Boston. 201 pp., illus.

(14) Donald, James R., Frank Lowenstein, and Martin S. Simon
1963. The Demand for Textile Fibers in the United States. U.S. Dept. Agr. Tech. Bul. 1301.

(15) Food and Agriculture Organization of the United Nations
1960. Per Caput Fiber Consumption Levels 1948/1958. Commodity Bul. Series No. 31. July. Rome.

(16) _____
1962. Agricultural Commodities - Projections for 1970. FAO Commodity Rev. 1962. Special Supplement, E/CN. 13/48, CCP 62/5. Rome.

(17) _____
1962. Per Caput Fiber Consumption Levels. Mon. Bul. Agr. Econ. & Stat. Vol. II, No. 1. Jan. pp. 1-29. Rome.

(18) _____
1964. World Apparel Fiber Consumption, 1960 to 1962. Mon. Bul. Agr. Econ. & Stat. Vol. 4, No. 13. Apr. pp. 1-33. Rome.

(19) _____
1966. Per Caput Fiber Consumption 1962 to 1964 (Cotton, Wool and Man-made Fibers). 58 pp. Rome.

(20) _____
1967. Agricultural Commodities - Projections for 1975 and 1985. Vols. I and II. CCP 67/3 (Rev.). Rome.

(21) _____
1968. Correspondence received from J.W. Evans, Deputy Director, Commodities and Trades Division, regarding elasticities used in projecting demand for apparel fiber to 1975. Rome.

(22) _____
1968. Monthly Bulletin of Agricultural Economics and Statistics. Vol. 17. April. Rome.

(23) _____
1968. Per Caput Fiber Consumption in Selected Countries, 1960 to 1966. 26 pp. Rome.

(24) _____
1969. Provisional Indicative World Plan for Agricultural Development. 3 Vols. (and) Regional Studies for Latin America, Africa South of the Sahara, Near East and North West Africa, and Asia and the Far East. Rome.

(25) _____
1970 Per Caput Fibre Consumption, 1964 to 1967. (Cotton, Wool, Flax, Silk and Man-made Fibers). ESCR: FC 70/1, Rome.

(26) Foote, Richard J.
1958. Analytical Tools for Studying Demand and Price Structures. U.S. Dept. Agr. Handbook 146. 217 pp., illus.

(27) Fowler, Mark L.
1958. Export Demand for United States Cotton. Okla. State Univ. Bul. B-616. 39 pp., illus.

(28) Fowler, Marquis Lyndon
1961. An Economic-Statistical Analysis of the Foreign Demand for American Cotton. Unpublished PhD. dissertation in agricultural economics. Univ. of Calif.

(29) General Agreement on Tariffs and Trade (GATT)
1963. Long-Term Arrangement Regarding International Trade in Cotton Textiles. Geneva.

(30) _____
1966. A Study on Cotton Textiles. GATT/1966-4. 172 pp. Geneva.

(31) _____
1968. Recent Developments in Production and Consumption of and Trade in Cotton Textiles. Cot/W/100. Oct. 18. 14 pp.

(32) _____
1968. Recent Developments in Production, Consumption of and Trade in Cotton Textiles, Addendum. Cot/W/100/Add. 1. Oct. 18. 75 pp.

(33) _____
1969. Cotton Textiles 1962-1968, Abstract of Cotton Industry Data and General Observations of Development in Cotton Sector. Cot/W/115/Add. 2. Sept. 24. 63 pp.

(34) _____
1969. Cotton Textiles 1962-1968. Statistical Appendix to Pts. I, II and III. Cot/W/115/Add. 1. Sept. 26. 31 pp.

(35) _____
1969. Cotton Textiles 1962-1968, Trends in Production and Trade and Policy Measures Affecting Them. Cot/W/115. Sept. 26. 67 pp.

(36) Getulio Vargas Foundation
1968. Projections of Supply and Demand for Agricultural Products of Brazil through 1975. Printed in Israel for USDA/ERS. 1/

(37) Glover, James W.
1930. Tables of Applied Mathematics in Finance, Insurance, Statistics. George Wahr, Pub. 678 pp. Ann Arbor, Michigan.

(38) Goering, T.J.
1963. Cotton Price Policy and Foreign Production. 17(3):10-11, illus. Univ. Calif., Berkeley, Calif. March.

(39) Gruen, F.H., et al.
1968. Long-Term Projections of Agricultural Supply and Demand: Australia 1965 and 1980. Printed in Israel for USDA/ERS. 1/

(40) Harness, Vernon L.
1965. Statistical Projections of Exports of U.S. Cotton. Unpublished study, FAS, U.S. Dept. of Agr.

(41) _____
1969. Mexican Cotton Production - A 1969 Close-Up. U.S. Dept. Agr., Foreign Agr. p. 2. July 28.

(42) _____
1969. Pakistan, Iran Vie with the U.S. on World Cotton Markets. U.S. Dept. Agr., Foreign Agr. p. 2. Feb. 17.

(43) Hervey, Jack Lee
1966. 1938 - Effects of U.S. Cotton Export Policies on the Prices and Quantities of Raw Cotton Exported by Five Major Competitors, 1950-62. Unpublished PhD. dissertation. Univ. of Calif.

(44) Hornbeck, Bernice M.
1961. Competition Between Cotton and Man-made Fibers in Western Europe. U.S. Dept. Agr., Foreign Agr. Rpt. 118. 61 pp. June.

(45) Horne, M.K., Jr., F.A. McCord, and Geo. Townsend
1955. Price and Future of United States Cotton. Am. Natl. Cotton Council. 58 pp., illus. Memphis, Tennessee.

(46) Howell, L.D.
1941. Cotton - Price Relationships and Outlets for American Cotton. U.S. Dept. Agr. Tech. Bul. 775. 40 pp., illus.

(47) International Cotton Advisory Committee
1960. Studies of Factors Affecting Consumption of Textile Fibers. 137 pp. July. Wash., D.C.

(48) _____.
1962. Prospective Trends in Consumption of Textile Fibers. Doc. 10 B XXI. 255 pp. March. Wash., D.C.

(49) _____
1964. Government Regulations of Cotton, 1964. Doc. 17 XXIII. 46 pp. Wash., D.C.

(50) _____
1968. Government Regulations on Cotton. 53 pp. Wash., D.C.

(51) _____
1969. MMF's and Inter-Fibre Competition Report. IS-N-153, Attachment I. 5 pp. Jan. 13.

(52) _____
1969. Report on Inter-Fibre Competition. Doc. 20-Eng. June.

(53) Institut fur Wirtschaftsforschung (IFO)
1967. Long Term Development of Demand and Supply for Agricultural Products in the Federal Republic of Germany. Munich. 1/

(54) Landbouw-Economisch Instituut
1969. Summary of "Supply and Demand, Imports and Exports of Selected Agricultural Products in the Netherlands: Forecast of 1970 and 1975." USDA/ERS Foreign 245. Wash., D.C. 1/

(55) Lowenstein, Frank
1964. Extra Long Staple Cotton, Demand and Price Prospect. Internatl. Bank for Reconstruction and Development. Rpt. No. EC-125. Apr. 16.

(56) Ludwig, Mario
1968. An IFCATI Vision: Free Competition for Mill Industry. Cotton Internatl. pp. 124, 134. Memphis, Tennessee.

(57) Mackie, Arthur B.
1968. World Trade in Selected Agricultural Commodities, 1951-65. Vol. III. Textile Fibers: Cotton, Jute, and Other Vegetable Fibers. U.S. Dept. Agr., Foreign Agr. Econ. Rpt. No. 43. 76 pp.

(58) Mills, Frederick C.
1932. Economic Tendencies in the United States. The Natl. Bur. Econ. Res., Inc. 639 pp. New York.

(59) Moe, Lyle E.
1968. World Population and Income by Countries 1950-65 and Projections to 1980. FRAD Working paper. U.S. Dept. Agr., Econ. Res. Serv. October.

(60) National Advisory Commission on Food and Fiber
1967. "World Fiber Balances - Past, Present, and Future," Cotton and Other Fiber Problems and Policies in the United States. pp. 1-79. Wash., D.C.

(61) National Council of Applied Economic Research
1962. Long-Term Projections of Demand and Supply of Selected Agricultural Commodities 1960-61 to 1975-76 (India). New Delhi. 1/

(62) Palmer, Edgar
1966. Agriculture in Turkey: Long Term Projections of Supply and Demand. Istanbul.

(63) Pensoy, Izzet
1966. Should Turkey Establish New Cotton Mills to Push Exportation of Textiles? Cotton Trade Jr., Internatl. Ed. pp. 110-11. Memphis, Tennessee.

(64) Porter, Horace
1969. Brazilian Cotton Chalks Up Solid Progress. U.S. Dept. Agr., Foreign Agr. p. 7. June 30. Wash., D.C.

(65) Programa de Investigaciones para el Desarrollo
1969. Peru: Long Term Projections of Demand for and Supply of Selected Agricultural Commodities through 1980. Universidad Agraria, La Molina. Printed in Israel for USDA/ERS. 1/

(66) Ross, Seton
1968. Egyptian Cotton: An Unfolding Drama of Progress. Cotton International. pp. 141-143, 146-152. Memphis, Tennessee.

(67) S-42 Technical Committee
1966. Cotton: Supply, Demand, and Farm Resource Use. Southern Cooperative Series Bul. 110. 94 pp. November.

(68) Shepherd, Robt. E.
1967. Summary of United Kingdom: Projected Level of Demand, Supply, and Imports of Agricultural Products, 1970, 1975, 1980. U.S. Dept. Agr., Econ. Res. Serv. Foreign 248. Wash., D.C. 1/

(69) The Textile Council
1969. Cotton and Allied Textiles, A report on Present Performances and Future Prospects (1). Manchester, U.K.

(70) Urban, Francis J.
1968. Summary and Evaluation of Projections of Supply and Demand for Agricultural Products in Mexico to 1970, 1970 and 1975. U.S. Dept. Agr., Econ. Res. Serv., Foreign 108. Jan.

(71) U.S. Department of Agriculture
1968. Foreign Regulations Affecting U.S. Textile/Apparel Exports. Office of Textiles. Wash., D.C.

(72) _____
1969. Statistics on Cotton and Related Data. Stat. Bul. No. 417 and Supplements. Econ. Res. Serv.

(73) _____
1969. Central American Cotton Output. Foreign Agr. Service, FAS-M-64. March.

(74) Walsh, Robt. M.
1944. Response to Production of Cotton and Cottonseed. Jr. Farm Econ., XXVI(2):399. May

(75) Warren, Cline F.
1968. Agricultural Development and Expansion in the Nile Basin. U.S. Dept. Agr. Foreign Agr. Econ. Rpt. 48. Wash., D.C.

(76) Waugh, Frederick V.
1964. Demand and Price Analysis. U.S. Dept. Agr. Tech. Bul. 1316. 94 pp., illus.

(77) Weaver, James H. and Ira Winakur
1968. Impact of U.S. Cotton Textile Quotas on Underdeveloped Countries. Southern Econ. Jr. XXXV. pp. 26-38.

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