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THE TEXTILE INDUSTRIES IN THE EAST AFRICAN SUB-REGION

PRESENT SITUATION AND GROWTH PROSPECTS

Contents

CHAPTER I

Present Textile Situation

1. In 1948 to 1950, the average annual market for textiles in the East African region came to 534 million square yards. This heterogeneous mixture grew to 711 million square yards per year over 1954 to 1956 and expanded further to 870 million square yards a year over 1960 to 1962. A very approximate, and somewhat less representative figure for 1964, a single year, would be in the neighbourhood of 936 million square yards.

2. The rest of this section is directed to an analysis of the different trends at work in the over-all textile situation, and to a statement of its several aspects.

3. Tables 1, 2 and 3 indicate the size of country-markets over 1948 to 1962, and within the limits of accuracy of population data the levels of per caput consumption these imply.

4. The mass of detail presented can be summarized in two broad propositions. One, the numbers to be clothed increased over 1949 to 1961 by one-third. Two, per caput availability increased by 14.86 per cent.

5. The significance of the second proposition needs to be elaborated in some aspects and qualified in others. First of all, an approximate relationship might be established between the rate of growth in GDP per caput and the rate of increase in per caput availability of textiles. Thus per caput GDP might be estimated, on the basis of incomplete data about both GDP and populations, to have increased by between 25 per cent to 31 per cent over 1949 to 1961. Juxtaposing the per caput increase in textile availability (14.86 per cent) against the notions about income rises, a tentative equation might be discerned as follows:

> Over the period 1949 to 1961, taken as a whole, an increase of one per cent, in per caput GDP was accompanied by an increase in per caput availability of the order of 0.48 to 0.59 per cent.

TABLE 1

Textile Markets in the East Africa Region: 1948-1950

Country	Total Home Consumption 1948-50 (Av. An.)	Population (1949)	Per Caput Consumption[d]
Kenya Uganda Tanganyika	180 m.sq.yds.	18.10 m.	10.44
Zanzibar & Pemba	6	0.27	24.50
Somalia[a]	9	1.77	5.76
Fr. Somaliland	2	0.06	30.49
Ethiopia[b]	114	14.70	8.15
Madagascar	52	4.00	13.65
Mauritius	10	0.46	23.50
Reunion	5	0.24	23.18
Rhodesia & Nyasaland	91	6.00	15.92
Fed. of S. Rhodesia Zambia Malawi			
Rwanda[c] Burundi[c]	15	3.72	4.23
	485	49.32 mm	
10% margin for imports of clothing	+ 49		
	534	49.32 mm	10.83 sq. yds.

a/ Population estimates are likely to be very low in the light of later Somali estimates which, however, are not based on a census.

b/ Excluding Eritrea

c/ Estimated

d/ Inclusive of imported clothing

TABLE 2

Textile Markets in the East African Region: 1954-1956

Country	Total Home Consumption 1954-56 (Av. An.)	Population (1955)	Per Caput Consumption[c]
Kenya, Uganda, Tanganyika	243	21.35	9.66
Zanzibar	6	0.28	23.57
Somalia[a]	16	1.90	9.27
Fr. Somaliland	9	0.07	14.14
Ethiopia	148	18.50	9.32
Madagascar	69	4.72	16.08
Mauritius	12	0.55	24.00
Reunion	7	0.29	26.56
S. Rhodesia, Zambia, Malawi	117	8.43	15.27
Rwanda, Burundi	19[b]	4.30	4.86
	646	60.39	
+ 10% margin for imported clothing	65		
	711	60.39	11.77

a/ See note to preceding table.

b/ Estimated

c/ Including imported clothing.

TABLE 3

Textile Markets in the East African Region: 1960-1962

Country	Total Home Consumption 1960-1962 (av. an.)	Total Home Consumption (including imported clothing)	Population (1961)	Per Caput Consumption d/
Kenya	115	127	8.33	15.19 e/
Uganda	81	89	6.81	13.08 e/
Tanganyika	107	118	9.40	12.52 e/
Zanzibar & Pemba	7	8	0.32 f/	24.07
Somalia a/	26	29	2.03 f/	12.43 (5.2) f/
Fr. Somaliland b/	3	33	0.07	47.15
Ethiopia c/	147	162	20.42	7.92
Madagascar	68	75	5.58	13.41
Mauritius	15	17	0.66	24.99
Reunion	6	7	0.35	19.80
Rhodesia & Nyasaland and Fed. of	192	211	10.57	19.98
- S. Rhodesia	81	89	3.72	24.04 g/
- Zambia	72	79	3.28	24.04 g/
- Malawi	39	43	3.57	12.07 g/
Rwanda) Burundi)	24	26	5.40	5.27
	791 m.sq.yds.		69.94 m.	
+ 10% margin for imported clothing	79			
	870 m.sq.yds.		69.94 m.	12.44 sq.yds.

a/ See note to Table 1.
b/ Imports into French Somaliland fluctuate in an extreme range.
c/ If the output on handlooms from handspun yarn were included, the per caput level would be higher by a yard or so.
d/ Inclusive of imported clothing.
e/ A small element of estimation concerning Uganda's exports to Kenya and Tanganyika enters into these estimates.
f/ Somalia's Five-Year Plan gives the population in 1961 at 5 million, and the figure in brackets is based on that estimate. It is felt that the figure in brackets is nearer reality.
g/ The over-all picture for S. Rhodesia, Zambia and Malawi is broken into country components on the rough hypotheses that per caput consumption levels in S. Rhodesia and Zambia are identical and that the per caput level in Malawi is half of the other two countries. Only sometime in 1966 it will be possible to verify those hypotheses.

TABLE 4

The Relationship Between Textile Availabilities Per Caput: 1946 to 1962

	$\frac{1960\text{-}1962 \text{ (an. av.)}}{1948\text{-}1950 \text{ (an. av.)}} \times 100$
Kenya, Uganda, Tanganyika	130
Somali [a]	216
Ethiopia	97
Madagascar	98
Mauritius	106
Reunion	83
S. Rhodesia, Zambia, Malawi	126
Rwanda, Burundi	125
Zanzibar & Pemba	98

6. The proposition, as stated above, is not a statement of income-elasticity for textiles over a period of time, but of the relationship observed over a whole period between the additional quantity of cloth consumption (availability) and the increase in per caput GDP. If other trends in the textile situation - such as a product-mix changing in favour of more expensive fabrics, more expensive ready-made clothing, and rising prices of textiles, etc. - were taken into account, the increase in expenditure on clothing by the consumer would be seen to be substantially higher than is implied above. A tentative guess about income-elasticity of expenditure on clothing would be in the

a/ Data from UN sources is utilized for the purposes of this comparison.

range of 0.65 to 0.80, in contradistinction to the range for quantum of textiles which is placed at 0.48 to 0.59 per cent per increase of one per cent in per caput GDP.

7. The approximate relationship considered above meets with sharper qualification when seen in terms of individual countries. Table 4 brings out three different patterns of country-response to rises in per caput incomes, which though varying from country to country, were fairly general over the years 1949 to 1961.

8. Thus, Ethiopia, Madagascar, Zanzibar and Reunion are seen to be more or less constant in terms of per caput consumption levels, or to put it somewhat differently, the textile consumption response, stated as a quantity, is close to zero or zero.

9. In the next group are countries like Kenya, Uganda and Tanganyika (taken together); Rhodesia, Malawi and Zambia (taken together) and Mauritius.

10. Somalia comprises, with an uncertain implication about representativity, the third group with the fastest rise.

11. While data available are insufficient to permit detailed explanations of each single case, it is clear that over a reasonably long period of time - twelve years in the present case - widely varying consumption responses to an increase in income occurred which limit the usefulness of the over-all regional relationship between income rises and increases in consumption for deriving country-wise projections.

12. Several other trends have been at work in the textile situation, though in vastly varying degrees from one country to another. These are:

(a) The emergence of rayon as a major fibre in the textile markets of the region is the most important of these. The inter-fibre position as it has evolved over the years (in spite of comparatively higher customs duties imposed on non-cotton fabrics) is presented in the next table.

TABLE 5

Share of Different Fibres in the
East African Region: 1948 to 1962

(Million yards)	1948	1955	1962
Cotton	403 (94.8%)	506 (80.1%)	721 (72.6%)
Rayon	7 (1.6%)	104 (16.5%)	211 (21.2%)
Wool	15 (3.5%)	17 (2.7%)	20 (2.0%)
Synthetics	-	6 (0.9%)	41 (4.1%)

The significance of these inter-figures trends - particularly the growth of synthetics - in any normal evolution of the textile market should not be underestimated.

(b) The share of knitwear appears to have been rising.

(c) The shift to ready-made clothing, both imported and home-produced, has become sizable in all markets other than Somalia, and to a smaller extent Ethiopia. One consequence of this development is to reduce the cloth content of a garment. Thus, a factory will need between 2.25 to 2.50 yards to make an adult's shirt, whereas individual tailoring of the same shirt will call for 3 yards.

(d) The market in cotton greys has shrunk to a tiny fraction of its previous size.

(e) There has been a shift in favour of lighter fabrics, often accompanied by mixed fabrics made from more than one basic raw material. Unfortunately, the tables in the present study, using equivalent yardages based on fibre content, do not bring out this element clearly.

(f) As a result of the factors mentioned above under sub-paragrphs (a), (c), (d) and (e), and other generalized trends, there has been a positive up-swing in the quality

(and therefore, price per yard) of cloth demanded by the consumer which, among other factors, has probably tended to inhibit the consumer's quantitative response to income increases. An implication arising from this is that the income-elasticity of expenditure on clothing is in no country - including countries like Ethiopia, Madagascar, etc. with more or less constant levels of per caput availabilities over 1948-1962 - in the neighbourhood of zero, although it does vary widely.

(g) Textile supplies, for the region as a whole, are mostly derived from imports. Production within the region is in the neighbourhood of 200 million yards, or roughly a quarter of the total consumption. Production within the region is reviewed at greater length in the next section.

CHAPTER II

Production and Facilities in the Countries of the Region

13. Production of textiles was confined in 1949 to small, isolated plants, at least one of which (in Ethiopia) has been started in the 1930's. As of now, around 200 million yards of cloth are produced in the countries of the region, distributed as follows on the basis of available data:

TABLE 6

Estimated Output of Cloth in 1964
(including blankets, in million square yards)

Ethiopia[a]	45- 55	m. sq. yards
S. Rhodesia	48	"
Uganda	35	"
Madagascar	20	"
Tanzania	12- 15	"
Kenya	10 (?)	"
Sub-total	170-183	"
Other countries of the region	30	m. sq. yards, approximately

14. The industry in Ethiopia, according to available data, consists of 8 or 9 establishments and includes six composite mills - of which five are spinners, weavers and finishers, and one is a spinner, knitter and finisher. There is one fair-sized wool knitting factory, supplemented by considerable production on a homecraft basis. A blanket factory, using mostly cotton strippings as raw material, has been opened recently. The plans to set up a staple fibre plant with a daily capacity of up to 40 tons a day seem to have run into some hitches, but the plans to set up a woollen weaving mill as well as a rayon-weaving plant are making progress.

a/ Excluding the output on handlooms from handspun yarn.

15. In Southern Rhodesia, the industry has taken several forms on a more horizontal basis than in the case of Ethiopia. As of now it includes: two spinning mills, four canvas and towel factories, five blanket manufacturing plants, four weaving plants working on calicoes, drills, denims, etc., several knitting factories with an annual output of 23 million square yards, five finishing factories and a few independent doublers.

16. The development in Uganda consists of a single composite unit, Nyanza Textiles at Jinja, which is believed to have produced about 35 million square yards in 1964. It is proposed to expand the capacity of this plant to 70 million square-yards in the next few years. Another composite mill, with a capacity of 30-35 million square yards is in the process of erection at Jinja. These developments, as also the developments in Kenya and Tanzania, take place in the context of the East African Common Market.

17. In Tanzania, three cotton-weaving plants are supplemented by two rayon-weaving plants and a few knitting factories. One of the present weaving plants is in the process of adding spinning machinery. Five more projects involving spinning as well as weaving, and a capacity for production rated at 66 million square yards are in varying, early stages.

18. Kenya has a few knitting factories, one of which also spins stable fibre yarn and some production of woven rayon fabrics. Some schemes for further development are also believed to be in hand, but it appears that the main expnasis on textile development, under the East African Common Market framework, is in Uganda and Tanzania. A cotton mill, capable of producing 24 million square yards, is getting under erection at Kisumu.

19. The industry in Madagascar consists of one composite spinning, weaving and finishing plant with an annual output in the neighbourhood of 18 million square yards (2,000 tons). It is proposed to expand this plant over the next four or five years to double its present

capacity. A new weaving plant is proposed at Tamtave capable of producing 500 tons (4.5 million yards) a year.

20. Burundi and Malawi have one blanket manufacturing plant each.

21. Considerable interest exists in Mauritius, Malawi, Rwanda and Burundi in setting up textile plants, but the proposals seem to be yet short of definiteness. In Somalia, a plant is proposed to be set up at Balad with used West German machinery. The plant, it is proposed, will have 10,000 spindles, 336 looms and the necessary bleacing, dyeing and sizing plants, and is expected to produce 9.5 million yards a year.

22. Some general observations can be made about existing production facilities. Firstly, foreign participation, both at the private investor and state levels, is a frequent characteristic. Secondly, the foreign participation, almost invariably, includes expatriate participation in the technical and managerial cadres, although this tends to be significantly smaller in the Ethiopian textile industry. Thirdly, machineries employed are generally modern, of the type which can be briefly called "Europe - 1950's" type. Fourthly, a fair part of the machinery - this is a distinction normally seen in terms of individual mills rather than countries - is second-hand, although this is not true of the bulk of the machinery. Fifthly, men:machine ratios - the number of workers per 1,000 spindles from blowroom to spindlepoint and the number of workers from winding to weaving per 100 looms - vary widely, but in general are higher than in better Indian mills and compare favourably with the more modern Pakistan textile industry which has come up almost entirely during the 1950's. Sixthly, fixed investment costs per unit of equipment vary widely but are generally higher than in India or Pakistan for new mills. Seventhly, the creation of a labour force has not presented any serious problem in most cases, either in the matter of numbers required or in the importing of requisite skills. This is so in spite of the higher levels of labour employment. Finally, the industry seems to have some problems in working equipment (not workers, of course) on a seven-day week, three shifts a day basis.

CHAPTER III

Demand Projections - 1975

23. For the purposes of the present study, two sets of data assumptions are made.

24. On the one hand, GDP rates for the period 1964-1975 are taken as a mix between over-all ECA assumptions about the rates of growth of GDP over 1965-1975 (these, in turn, are mostly based on rates in country plans) and for the most recent years (1964 and 1965) on the basis of fragmentary data (e.g.Uganda) and on the basis of such over-all considerations as the small, but significant improvement in the terms of trade for primary producers. On the other hand, population growth rates are taken on the basis of the "medium" rates of projections as supplied by the Demographic Section of the ECA.

25. Taken together these rates imply a sizable upward shift in GDP per caput over 1964-1975 of the approximate order of 49 per cent.

26. It was seen in an earlier section of the present study that over 1949-1961, an increase of one per cent, in GDP per caput was accompanied by an increase in per caput availability of 0.48 to 0.59 per cent. It is believed that the quantitative response will be identical to 1949-1961, but closer to the lower value (0.49) of the range, around 0.40 per cent for every 1 per cent increase in GDP per caput. The main justifications for this assumption as to patterns of reactions may be briefly stated. Positively, given the low levels of current consumption in most countries of the sub-region (the sub-regional average is only 12.66 yards for 1964) an adequate upward response may be confidently expected in the context of the increase in GDP per caput of the order of 49 per cent.

27. On the negative side, a higher response, in a sub-regional context, is held down by the intrinsic trends in the textile situation and by the known presence of several other more income-elastic demands on the consumer's shilling or dollar. The best examples of the latter would be expenditure on children's education, transportation, and the

smaller but several more ubiquitious illustrations among which the transistor radio is prominent. Moreover, inasmuch as an increase of the order of 49 per cent in GDP per caput is found to be a result of vastly enhanced savings (and investment) rates, the growth of disposable personal income would be considerably smaller, and thereby justify a smaller quantitative response in relation to increases in GDP per caput.

28. In terms of the entire sub-regional market, this would imply an addition of 19.60 per cent in per caput availability of cloth stated as yardage. (40 per cent of 49 per cent, the projected growth of GDP per caput over the period). In other words, the per capita availability of 12.66 yards in 1964 will increase by 2.46 yards in 1975. Taking the population to be clothed at 94 million in 1975, the total market for textiles will thus come to around 1,423 million-square yards.

29. The breakdown of the sub-regional forecast for 1975 into country-markets is complicated by two sets of facts. First of all, as was seen earlier, the country-wise quantitative response of textile consumption cannot be put down in any single relationship. There does seem to be a tendency, on the one hand, in at least some countries (Ethiopia, Madagascar etc.) for an upper ceiling, as it were, to emerge at fairly early levels in the matter of textile consumption. In some other countries the responses are pitched at a lower rate of growth, on the other hand. Again, the precise extent to which each country will experience a more expensive product-mix must necessarily, at the present state, be a matter of guesswork. Secondly, data about countries like Zambia, Malawi and S. Rhodesia as separate entities are at the moment of writing limited to six to eight months in 1964, and unavailable in years prior to 1964. Moreover, data for 1964, uncorrected for fluctuations in year-to-year supplies which are a reflection of uneven incidence of trading activities for one reason or another, will not enable a good judgement of their representativity until the figures for the whole of 1965 are available.

30. In the circumstance, the following dispersion of country-markets in 1975 is placed, broadly speaking, in the over-all framework of the sub-regional market but implies a range of judgements in the case of each country.

TABLE 7

Country-wise Distribution of Textile Markets: 1975

Country	Likely per caput level of textile availability 1975	Population Estimate(1975)	Total Market (million sq.yards)
Kenya	17 to 19 sq.yds.	11.80 m.	201-224
Uganda	14 to 16	9.00	126-144
Tanzania	14 to 16	13.02	182-208
Somalia[a/])	13 to 15	2.65	34-40
)	(7 to 8)	(6.53)	(46-52)
Fr. Somaliland			
Ethiopia	9 to 12	26.45	238-317
Madagascar	15 to 18	6.85	103-123
Mauritius	-	0.96	20-30
Reunion	-	0.45	8-10
S. Rhodesia	28 to 30	6.00	168-180
Zambia	28 to 30	4.90	137-147
Malawi	14 to 15	5.30	74-80
Rwanda) Burundi)	8 to 10	6.95	56-70
Total for the region:	1. According to the ranges above:		1,350 - 1,577 m.sq.yds
	2. According to the regional analysis:		1,423 m.sq.yds.

a/ Figures in brackets are based on Somalia's population estimate for 1961, adjusted for 1975.

31. The 1975 regional market for textiles can be expected to be characterized by the main trends of the period 1948-62, namely a further cut in the share of the predominant material, cotton, and a sizable growth in the share of synthetics and rayon. It is also believed that while wool will remain a relatively unimportant fibre, there will be some rise in absolute consumption in response to the significant rise in disposable GDP per caput. Precise estimates in these categories, at best, are in the nature of informed guesswork based on preceding trends, and of the largely similar world-wide experience elsewhere. Moreover, they are based on the assumption that consumer preference is allowed reasonable free play in the textile market. The next table attempts a distribution of the 1975 market along these lines:

TABLE 8

Share of different fibres in the Textile Market: 1948-75

	1948: %	1962: %	1975: %	1975: m.yds.
Cotton	94.8	72.6	66.0	939
Rayon	1.6	21.2	25.0	356
Wool	3.5	2.0	3.0	43
Synthetics	-	4.1	6.0	85
	100.0	100.0	100.0	1,423

CHAPTER IV

The Rationale of Rapid Import Substitution

32. As has been noted earlier, the textile industries of the sub-region have passed their initial phase of establishment, and that expansion of capacities is on the anvil in many countries. Nonetheless, it is clear that the proposed expansions and current output levels, taken together, will not make the sub-region reasonably self-sufficient in textiles. On the other hand, it is clear that existing experience and skills are capable of being built on at a very rapid pace and that there are powerful economic reasons why the pace should be forced. Subsequent paragraphs, before preceeding to discuss capacities required and over-all investment involved, are directed to a statement of these reasons.

33. Current imports - over 700 million square yards (inclusive of clothing) in recent years - are valued at 210 million US dollars, or roughly between 16 to 20 per cent of the total annual imports in various countries of the region. This annual burden on foreign exchange resources, is in the most part, an avoidable expenditure, as the qualification below brings out illustratively.

34. Thus, an annual level of production of 10 million yards would require (on the basis of two and a half shifts a day, 305 working days in the year, and 40 yards of output per loom-shift) 328 looms. Spinning an average count around 26s, these looms would need to be matched by 40 spindles per loom, giving an aggregate of 13,120 spindles. In addition , capacity would be needed for bleaching, dyeing, finishing, etc. On the basis of cost experience obtained in the region, fixed capital expenditure (inclusive of land and buildings) would be as follows:

(a)	328 looms, from winding to loomstage, @ US$1, 200-2,000 per loom	US$ 393,600 to 656,000
(b)	13,120 spindles, from blowroom to spindle-stage @ US$ 150-250 per spindle	US$ 1,970,000 to US$ 2,950,000

(c) Finishing (ad hoc)	US$	300,000 to 500,000
(d) Total (a + b + c)	US$	2,660,000 to 4,110,000

35. A wide choice of machineries is feasible in the textile industries, and is reflected in the spread over which investment ranges in the above data. The hypothetical calculations of current costs given below are worked out on the basis of the lower value in the range, $2,660,000, although a subsequent paragraph broadly sums up the foreign exchange implications of the higher value in the range.

TABLE 9

Current Costs in a Composite Cotton Textile will be based on 26s

Component	% of total costs	Amount	Foreign exchange expenditure involved: Basis	Amount
1. Raw material	55%	$1,402,500	1/4	$350,625
2. Wages	20%	$ 510,000	nil	nil
3. Salaries	5%	$ 127,500	1/3 of 1/3	14,166
4. Stores and Spares	8%	$ 204,000	3/4	153,000
5. Depreciation	5%	$ 127,500	nil	nil
6. Fuel and power	3%	$ 76,500	1/6	12,750
7. Other costs	4%	$ 102,000	1/2	51,000
8. Sub-total (all costs)		$2,550,000		$581,541
9. Profits prior to taxation		$ 450,000		$153,648 a/
10. Turnover @ 30 cents a yard		$3,000,000		
11. Total current foreign exchange costs				$735,189

a/ Working capital is taken @ 4 months turnover, i.e. $750,000, and its factory-owned portion is taken at one-third, i.e. $250,000. The total investment, therefore, from the factory's point of view is $250,000 + $2,660,000 += $2,910,000. Repatriated profits are taken at 8 per cent of the foreigner's investment, which in turn, is taken at two-thirds of the total investment, i.e. $1,920,600.

36. Of the fixed capital investment of $2,660,000, it is unlikely that more than three-fourths will involve direct foreign exchange expenditure. In other words, foreign exchange expenditure of $1,770,000 in fixed capital, in the first place, is involved.

37. In turn, this initial foreign exchange outlay of $1,770,000 saves the country annually more than the total initial outlay, as may be seen below:

Annual C.I.F. cost of importing 10 million yards (@ 30 cents a yard)....$3,000,000	Annual recurring foreign exchange expenditure included in servicing national industry, $735,189	Net annual saving of foreign exchange $2,264,817

38. In calculating the foreign exchange expenditure, one item should be explained. No debit is made for foreign exchange which might have been earned if the raw material, now locally utilized, had in fact been exported. This argument, plausible at first sight, is irrelevant, because it assumes that the production of raw material is wholly static and will be solely oriented to export, as it has hitherto been in most African countries. In fact, the argument could be carried a step further, and it could be pleaded that substantial consumption in the producing country of a raw material will tend to stabilize prices upward and insulate them to some extent from fluctuations. In any case, it is clear that if all of the raw material were imported, in the above calculations, there would still be a net annual saving in foreign exchange of $1,212,000.

39. Two qualifications need to be made at this stage. In the first place, actuals will vary widely from the hypothetical calculations. Dependence on expatriate sources, whether for capital, raw materials, technicians or stores, could be considerably higher or smaller. In fact, current practices in the countries of the sub-region have examples of both. In the second place, the proportional significance of expatriate sources can be expected reasonably to decline as a massive industry,

functioning under the guidance of independent states, comes into being, creating its own external economies on the one hand and offering scope for production of other, intermediate products.

40. Should higher capital costs be incurred, as in fact does happen, the structure of costs other than raw materials will be somewhat different. Wages would, in such a case, form a lower proportion with a possible lowering of aggregate costs, and if selling prices remain the same, the net result would be higher profits. Nonetheless, all things taken together, the production of textiles (seen above in the context of cotton textiles alone) is bound to have a major import saving effect in the course of which the initial outlay in foreign exchange is matched by a net displacement of imports in equal volume over a period which might be as short as a year and which is unlikely to exceed three years.

41. This, in brief, is the rationale for the major expansion sought in textile production in the next section.

CHAPTER V

Capacities Needed, Investment and Other Implications

42. It is proposed that by 1975, the countries of the sub-region should attempt, as a minimal programme, to achieve the following levels of output.

TABLE 10

Projections of additional production: 1975

Fibre	Demand: 1975	Production Target (in fibre terms)	Current Production	Additional Production (in terms of systems) by 1975
Cotton	937 m.sq.yds.	900	200	800
Rayon	356	300		200
Wool	43	100	negligible	100
Synthetics	85			
	1,423	1,300	200	1,100

43. The above targets imply that production within the sub-region will rise to a shade less than 93 per cent of the market as compared to the current level of less than 25 per cent. This is somewhat less impressive than appears on the face of it because it is not proposed that all raw materials be also produced in the sub-region by 1975. Subsequent discussion amplifies the recommendation, its investment and other implications, and also a pattern of country-wise distribution of productive capacity that might be feasible.

A. 800 million yards, additionally, on the cotton systems:

will utilize raw cotton and staple fibre as raw materials. (This accounts for the difference between the yardage figures, fibre-wise, and in terms of systems used in their projections). In view of the heterogeneity of end-products involved here the

output will need to be broken into plain or automatic looms as such on the one hand and more specialized equipment as involved in knitting, blanket-making, etc. The break-up in any detailed sense can only be made in the feasibility studies to be attempted at country levels in the next phase of this exercise, and for the purposes of the present analysis it is sufficient to note here that about 15 per cent of the cotton system will be directed to the production of these items.

In this somewhat generic sense, the additional output of 800 million yards on the cotton system will call for 26,229 looms (40 yds. a loom-shift, 2-5 shifts a day, 305 working days in the year). The number of spindles needed to match are worked out on the basis of 40 spindle-shifts to a loom-shift at 1.049 m. spindles. To the last figure, an addition of about 100,000 spindles needs to be made in order to replace yarns and threads currently being imported for weaving into cloth or use as sewing and other threads. In addition, it is fair assumption that the 1975 market will have seen more or less complete elimination of the consumer market for greys, and the whole output will need to be matched by bleaching capacity and to a varying, lesser extent by dyeing, mercerizing, printing, etc.

Development of the cotton system on such a scale will require, on the basis of current experience in the East African region, investment in fixed capital (land, building, plant and machinery, etc.) of the order of US$ 233-379 million, distributed as follows:

		Total Fixed Capital Expenditure
1.	Spinning (1.149 m. spindles, from blowroom to spindle point) @ $ 150-250 per spindle	$ 172-287 million
2.	Weaving (26,229 looms, ordinary and automatic, and defined in the somewhat generic sense indicated above; from winding to loomstage) @ $ 1,200-2,000 per loom	$ 31-52 million
3.	Finishing (ad hoc)	" 30-40 million
4.	Total Investment in Fixed Capital in the cotton system (1 + 2 + 3)	" 233-379 million

B. 200 m. yards of rayon weaving

44. In this case as well the term rayon weaving is used in a somewhat generic sense, i.e. inclusive of knitting, the total share of which may be placed around 10 per cent.

45. The investment costs of spinning staple fibre and filaments and other aspects are covered in a separate paper on the chemical industries.

46. Rayon weaving tends to be a more dispersed activity in view of the greater heterogeneity of end-products in the case of rayon and also because the spinning of filament yarn is concentrated in large, capital-intensive units. Hence the assumptions as to shift-working have to be of a lower order in the case of rayon weaving units (this, of course, does not preclude individual units which work on a more intensive basis), while rayon looms, generally speaking, use lower speeds.

47. With these considerations in view, the output per loom-shift is placed at 36 yards, the number of loom-shifts feasible per day is taken as two, and the former are multiplied by 305 working days in the year

to yield an annual output per loom of 21,960 square yards. In turn, an annual output of 200 million yards will need 9,107 looms. The total fixed capital expenditure involved is indicated below:

1.	9,107 looms (incl. of preparatory machinery, land, buildings, etc.)	₹ 11-18 million
2.	Finishing (ad hoc)	₹ 4-6 "
3.	Total fixed investment (1 + 2)	₹ 15-25 "

C. 100 million yards of wool and synthetics

48. The present proposal involves partly knitting and blanket-making on lines similar to the two preceding pieces in the exercise, and is again considered, pending detailed feasibility studies at the country-level, on the same generic basis.

49. The proposal does not involve any spinning of woollen yarns at the present stage (except for blanket-making) and does not imply the production of any synthetics within the region by 1975. The present proposals are exclusively concerned with the weaving and finishing of these fabrics, whether as single-fibre and/or as multi-fibre fabrics. Output per loom per year in the present case might be expected to come to 19,520 sq.yds., on the basis of 2 shifts a day, 305 working days in the year and 32 square yards of output per loom-shift. Investment in the present category might be expected to be more variable and at a higher level than in the case of cotton and rayon. Some very approximate figures are presented below:

1.	Weaving (3,123 looms, etc.) on the basis of ₹ 2,000 to ₹ 4,000 per loom	₹ 10-20 million
2.	Finishing (ad hoc figure)	₹ 3-5 "
3.	Total fixed capital (1 + 2)	₹ 13-25 "

D. Total Fixed Capital Investment in all categories is brought together below.

TABLE 11

Projected Fixed Capital Investment - 1975

(In million US dollars)	Cotton Systems	Rayon Weaving	Weaving of Wool and Synthetics
Spinning	172-237	+	nil
Weaving	31-52	11-18	10-20
Finishing	30-40	4-6	3-5
Total Fixed Capital Investment	233-379	15-25	13-25

50. The over-all expenditure in fixed capital for the 1975 targets would thus fall between 261 to 439 million US dollars, the range to be added to further by the expenditure involved in setting up rayon plants for staple fibre and continuous filament. If future indsutry in the sub-region adopts from the current trends in western countries towards capital intensiveness the upper limit of the range would be considerably higher than 429 million US dollars, indicated earlier.

CHAPTER VI

Some Personnel Requirements

51. Before proceeding to a brief country-wise statement in terms of capacities, it might be useful to arrive at the implications of the proposed targets in terms of certain key categories of personnel. These are tabulated below in terms of systems.

Cotton Systems:

A. Basis: (1) 1 weaving master (senior technician and manager of weaving operations) per 600 looms.
(2) 1 weaving assistant (Junior technician, aide to the weaving master) per 150 loom-shifts.

Numbers required:	Weaving masters:	44	
	Weaving assistants:	437	481

B. Basis: (1) 1 Spinning master per 25,000 spindles
(2) 1 Spinning assistant per 6,000 spindle-shifts

Numbers required:	Spinning Masters :	46	
	Spinning Assistants:	479	525

C. Basis: (1) Ad hoc
(2) On the broad assumption that finishing will be attached, for the most part, to weaving mills.

Numbers required:	Bleaching, Dyeing, Printing and Finishing Masters	40-45
	Assistants to the above	360-400
		400-445

Rayon weaving: (No estimates are made here for manufacture of rayon staple and filament yarn).

Basis: (1) 1 weaving master for 400 looms
(2) 1 weaving assistant for 100 loom-shifts.

Numbers required:	Weaving Masters:	23	
	Weaving Assistants:	182	205

Basis: (1) Ad hoc

(2) On the broad assumption that finishing being organized mill-wire will need roughly similar numbers.

Numbers required:	Bleaching, dyeing, finishing printing, etc. Masters	15-20	
	Assistants	120-150	135-170

Wool and synthetics

Basis: (1) 1 Weaving master per 250 looms

(2) 1 Weaving assistant per 75 loom-shifts

(3) Finishing estimates are made on an ad hoc basis

Numbers required:	Weaving Masters :	21	
	Weaving Assistants:	137	158
	Finishing, etc. Masters:	20	
	Finishing, etc. Assistants:	100	120

52. In the sum, between 2,100 to 2,200 technicians will be required by 1975, over and above other managerial skills, to service the current operations of the equipment outlined and output desired. In order to minimize the proportion of expatriates among these and other categories, and in the context of the 1975 targets it is of the utmost importance that the countries of the sub-region set up a major technical institute in the near future.

53. The Table below brings out the task involved in terms of creating a workforce and implies at least some efforts on the part of the State to provide suitable educational facilities for operatives at the national level.

54. Incidentally, juxtaposing the numbers at work daily in relation to the estimates of investment in fixed capital, a range is arrived at of the cost of creating a work-place (operatives only): $2,933 to $4,821.

The number of operatives required are tentatively set out below :

TABLE 12

Operatives Required for 1975 Projections

	Spinning	Weaving	Finishing, etc.	Total
Cotton Systems				
1. For daily operation	25,857[a/]	32,786[b/]	6,000-8,000[c/]	64,643-66,643
2. Inclusive of absenteeism, etc. (+ 15%)	29,735	37,703	6,900-9,200	74,338-76,638
Rayon weaving				
1. For daily operation	-	11,839[d/]	2,500[e/]	14,339
2. Inclusive of absenteeism, etc. (+ 15%)	-	13,615	2,875	16,490
Wool & Synthetics				
1. For daily operation	-	-	-	10,000[f/]
2. Inclusive of absenteeism, etc. (+ 15%)	-	-	-	11,500
Total:				
1. For daily operation	25,857	44,625	8,500-10,500	88,982-90,982
2. Inclusive of absenteeism, etc. (+ 15%)	29,735	51,318	9,400-12,075	102,328-104,328

a/ On the basis of 9 men per 1,000 spindle-shifts.

b/ On the basis of 50 men per 100 loom-shifts.

c/ e/ Ad hoc figures

d/ On the basis of 65 men per 100 loom-shifts.

f/ On the basis of 100 men, all inclusive, per 100 loom-shifts.

CHAPTER VII

Country-wise Distribution of Capacities

55. The country-wise transcription of sub-regional capacity targets is rendered difficult by a number of considerations. First of all, as was noted earlier, the country totals of the textile market are far more tentative than the demand projections for the sub-region as a whole. Secondly, any attempt at fibre-wise or system-wise break-up is subject not only to the vagaries arising from the first factor but also implies qualitative judgements about consumer responses. Thirdly, the experience in setting up textile industries, on any worthwhile scale, is as of now limited to four or five countries. And insofar as want of experience is a limiting or expansive factor, any projection on a country-wise basis must involve a sizable element of guesswork. Fourthly, count-structures must vary from market to market (and are now known only in a very limited manner) as must reeds and picks in standard cloth constructions. As a result, the number of spindles needed to match a loom will tend to vary very widely. The sub-regional ratio of 40 spindle-shifts to a loom-shift may thus be varyingly reflective of the situation in any single country. Moreover, shift-working feasible in one country, either in terms of numbers of shifts or in terms of the number of hours in a shift, will vary from one country to another. The same variability will also extend to the number of working days in the year.

56. As a result, the tables to follow are indicative rather than definitive, and the results have to be cross-checked against the detailed feasibility studies of the next phase. With this warning in hand, the next table sets out the distribution of the additional output of 1,100 million square yards in a country-pattern according to systems (which, as seen, only partially coincides with the fibre pattern).

TABLE 13

Country-wise Distribution of Additional Output for 1975 Projections

Country	Total market 1975 Estimates[a] (in m.sq.yds.)	New Output by 1975: Projection	Distribution of the Additional Output According to Systems:		
			Cotton Systems	Rayon Weaving	Weaving of Wool and Synthetics
		(In million Square - Yards)			
Kenya	212				
Uganda	135	440	350	50	40
Tanzania	195				
Somalia[b]	37				
	49	30	25	5	-
Ethiopia	280	190	145	25	20
Madagascar	113	75	51	20	4
Mauritius	25	18	13	5	-
Reunion	9	6	4	2	-
S. Rhodesia	174	110	45	45	20
Zambia	142	120	78	30	12
Malawi	77	60	48	10	2
Rwanda Burundi	63	50	42	6	2
		1,099	801	198	100

a/ Mid-values from the earlier table on projections.

b/ Two estimates per notes in earlier tables.

57. The principles generally followed in arriving at the above distribution are:

1. Countries with substantial textile production presently and a large market are likely to have the maximum increases in national production.

2. Conversely, small countries cannot expect to meet a considerable portion of their needs from national output because many items will be toosmall in absolute quantities to be satisfactorily produced nationally.

3. The distribution of the wool and synthetics group, which is generally but not always, a multi-fibre group, is slanted in accordance with climatic considerations as well as per caput GDP levels.

4. Current demand patterns have been taken into account.

5. In the final analysis, the figures cannot shed an element of arbitrariness.

58. In the following table, estimates of the previous table are converted into capacities, and supplemented in the next table by investment in fixed capital by applying the standard sub-regional ratios adopted in earlier discussion.

TABLE 14

Capacities needed for country-projections: Additional Output by 1975

Country	Cotton Systems Spindles	Cotton Systems Looms	Rayon Weaving Looms	Wool and Synthetics Looms
Kenya, Uganda, Tanzania	519,000 a/	11,475	2,277	2,049
Somalia	32,800 a/	820	228	-
Ethiopia	200,160 a/	4,754	1,139	1,075
Madagascar	76,880 a/	1,672	911	205
Mauritius	17,040	426	228	-
Reunion	5,240 a/	131	91	-
S. Rhodesia	79,000 a/	1,475	2,049	1,025
Zambia	102,280	2,557	1,366	615
Malawi	62,960	1,574	456	102
Burundi, Rwanda	56,400	1,410	273	102
Total	1,115,200	26,294	9,018	5,123

a/ The additional 100,000 spindles for offsetting current imports of yarn for weaving into cloth are distributed as follows: Kenya, Uganda, and Tanzania, 60,000; Ethiopia, 10,000; Madagascar, 10,000 and S. Rhodesia, 20,000.

TABLE 15

Fixed Capital Investment for 1975 projections of Additional Output

Country	Cotton systems Spindles	Cotton systems Looms	Rayon Weaving Looms	Looms	Wool & Synthetics Total a/ (M US. $)
Kenya, Uganda, Tanzania	77.85-129.75	13.77-22.95	2.73-4.56	4.10-8.20	115-193
Somalia	4.92-8.20	0.98-1.63	0.27-0.46	-	7-12
Ethiopia	30.02-50.03	5.70-9.50	1.37-2.29	2.15-4.30	46-77
Madagascar	11.53-19.22	2.01.3-35	1.09.1.82	0.41-0.82	18-29
Mauritius	2.56-4.27	0.51-0.85	0.27-0.45	-	4-7
Reunion	0.79-1.32	0.16-0.27	0.11-0.18	-	1-2
S. Rhodesia	1.19-1.98	1.77-2.95	2.46-4.11	2.05-4.10	8-15
Zambia	15.34-25.57	3.07-5.12	1.64-2.74	1.23-2.46	25-42
Malawi	9.44-15.73	1.88-3.13	0.55-0.92	0.20-0.40	14-23
Burundi, Rwanda	8.46-14.10	1.69-2.82	0.33-0.55	0.20-0.40	13-21

a/ Inclusive of investment in finishing equipment on an ad hoc rate of 17 per cent which broadly corresponds to the proportion of investment in finishing equipment in the regional analysis.

CHAPTER VIII

A Sub-regional approach

59. Implicit in the preceding analysis is the fact that economies of scale are achieved at a fairly early stage in most textile industries (with the notable exception of manufacture of rayon staple and filament). Thus, even in current European practice 10,000 spindles are regarded as the "minimum balanced unit" and an "optimum production unit" is placed at 20,000 spindles. On the weaving side, the two criteria yield

(a) 144 conventional automatic looms, and
(b) 400-480 conventional automatic looms.[1/]

60. In the context of the size of the country markets of the East African sub-region however a further crucial distinction has to be made. The economic viability of a single unit or several units is not the same as the viability of national production on a country basis. Textile markets are comprised of vastly heterogeneous end-products[2/] arising out of several cognate but nonetheless distinct technologies, as it were. This heterogeneity running into several thousand end-products precludes all except the vastest textile markets (such as the United States, the Soviet Union, India, China, Japan, etc.) from achieving a state of near self-sufficiency. The next table brings together details of the trade in textiles conducted among themselves by the European members of the Organization for Economic Co-operation and Development and i illustrates this proposition.

1/ Figures from Modern Cotton Industry, A Capital Intensive Industry, O.E.C.D., Paris, 1965, pp. 96-97.

2/ On the eve of the second World War, it was estimated that Indian mills produced as many as 60,000 varieties. See Mehta, S.D., Indian Cotton Textile Industry an Economic Analysis, Textile Association (India), 1953, p. 162.

TABLE 16

Trade in Textiles (Code S.I.T.C. 65) among European Members of O.E.C.D. - 1962

Country	Imports	Exports
Germany (F.R.)	629 m $	307 m $
B.L.E.U.	172	373
Netherlands	282	225
France	107	352
Italy	83	292
Denmark	119	21
Norway	75	11
Sweden	159	28
Austria	109	66
Portugal	16	22
United Kingdom	202	241
Switzerland	102	153
Spain	11	20
Greece	24	2
Ireland	44	26
Iceland	6	-
Turkey	5	2
Total O.E.C.D. Europe	2,144 m $	2,144 m $

Source: Textile Industry in O.E.C.D. countries, 1962-63, O.E.C.D., Table 29.

61. The above table brings out the fact that even among the developed countries of the West, irrespective of the size of country-markets, the task of meeting the heterogeneous final demand is primarily attained by an extensive import and export trade. It will be noticed that the intra-Europe (O.E.C.D.) trade above is seven times as large as the current value of imports and local production in the East African sub-region. It also follows that any setting out of textile perspectives

in the sub-region must contend with the vast range of heterogeneity in end-products, and therefore recognize the near-impossibility of reaching national self-sufficiency in the highest degree if textile production is correlated only to country-markets. Alternatively, a sub-regional approach in the exchange of products is the only rational solution if the kind of over-all targets indicated earlier are to be attained. Such an approach, taking place in the context of agreed mutual trading arrangements, would enable each country to have textile industries more or less co-extensive in output to its total consumption but functioning on the basis of an export-import trade with other countries of the sub-region in order to arrive at each country's own particular mix of final demand. Seen in this light, the development of textile industries cannot possibly reach the highest level of development in the East African sub-region except on a joint, pooled basis. An exclusively country-oriented pattern of development will be a confined one, one of continued reliance on imports from outside of the sub-region on a large scale. The country programmes indicated in the earlier sections are to be seen within this larger framework.

62. These sub-regional arrangements would have several other general contributions to make to the creation of viable, competitive textile industries, by enabling larger factories with lower overheads and capable of benefiting from the newer developments in textile machinery (such as super-speed winding and warping machinery, new sizing plants and continuous bleaching and dyeing ranges). A higher degree of specialization would make larger runs possible as well as enable worker and machine efficiency to be built up faster and higher on the basis of a less variable range of output than would be the case otherwise. Moreover, the possibility of intra-regional competition must make for greater cost-consciousness all round and amount to a better deal for the consumer.

63. In any case, such sub-regional grouping would facilitate the next phase in industrialization when all kinds of stores and spares are increasingly produced within the sub-region. In this phase, which to some extent will coincide with the growth of the textile industries, economies of scale would be generally prohibitive in markets of less than 100 million square yards and barely permissive in markets even as large as 500 million yards, the projected size of the present Common Market of Kenya, Uganda and Tanzania in 1975.

ANNEX I

Note on Statistical Materials Used

Figures of fibre consumption, exports and imports are regularly published by the FAO. These figures are available, in varying coverage, up to 1962.

For the purposes of the paper, the FAO figures were converted into yardage by applying the standard FAO ratios, ignoring the small quantity (in Africa) of fibres going into non-cloth uses. With this as the basis, all other statistical material has been worked out independently at the ECA, and in part, derived from an earlier ECA study: Industrial Growth in Africa, a Survey and Outlook, 1962 (E/CN.14/INR/1), after making an allowance, necessarily arbitrary, of the cloth content of imported clothing.

The application of standard ratios, it is realized, is not entirely satisfactory. But in the present state of incomplete classification in External Trade Statistics (where often only value figures are given and in other cases, such as clothing imports, no breakdown at all is made available) the application of standard ratios offers the least unsatisfactory way out. Moreover, depending on the purpose of an immediate analysis textile data are better seen as weight, yardage, value and so on. In still other cases, for example, when determining the requirement of spindles, it would be most helpful to set out the entire market as yarn requirements stated in terms of counts.

The analysis in the paper tries to make allowances for these and other considerations.