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THE KENYAN TEXTILE INDUSTRY

II. Technical Report
Part A: Survey and observations
Part B: Recommendations

Munich, October 1968
Ulrich Metzker, consulting engineer - Munich 23 - Leopoldstrasse 173e

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PART A: S u r v e y a n d O b s e r v a t i o n s

PART A: Survey and Observations

1 Basic Datas / Informations / Observations

On request of the Government of the Republic of Kenya a general survey of the Kenyan Textile Industry was made in March 1968.

The beginning of Kenya textile industry goes back to 1950, when the first spinning plant at Thika started to produce yarn. Then some other smaller plants, mostly weavers, opened and since 1966 a big growth of textile industry in Kenya started, as well as in Uganda.

The report consists of

I - ECONOMICAL REPORT, and
II - TECHNICAL REPORT

held actually in hand and which contains in Part A the necessary technical informations and datas, as well as other observations of interest. In Part B of this report there will be brought forward the technical recommandations.

1.1 Cotton

1.11 Cotton (Cultivation)

Cotton growth in Kenya dates only few decades back but became an important factor in the national economy of the country.
The cotton regions are:

Area	
Western area	PB 52
Nyanza area	UK 51
Eastern and Central area	UK 51
Coastal area	UK 51 - super qual.
Lamu	UK 51
Galole (irrigated area)	UK 249 (a var. of UK 51)

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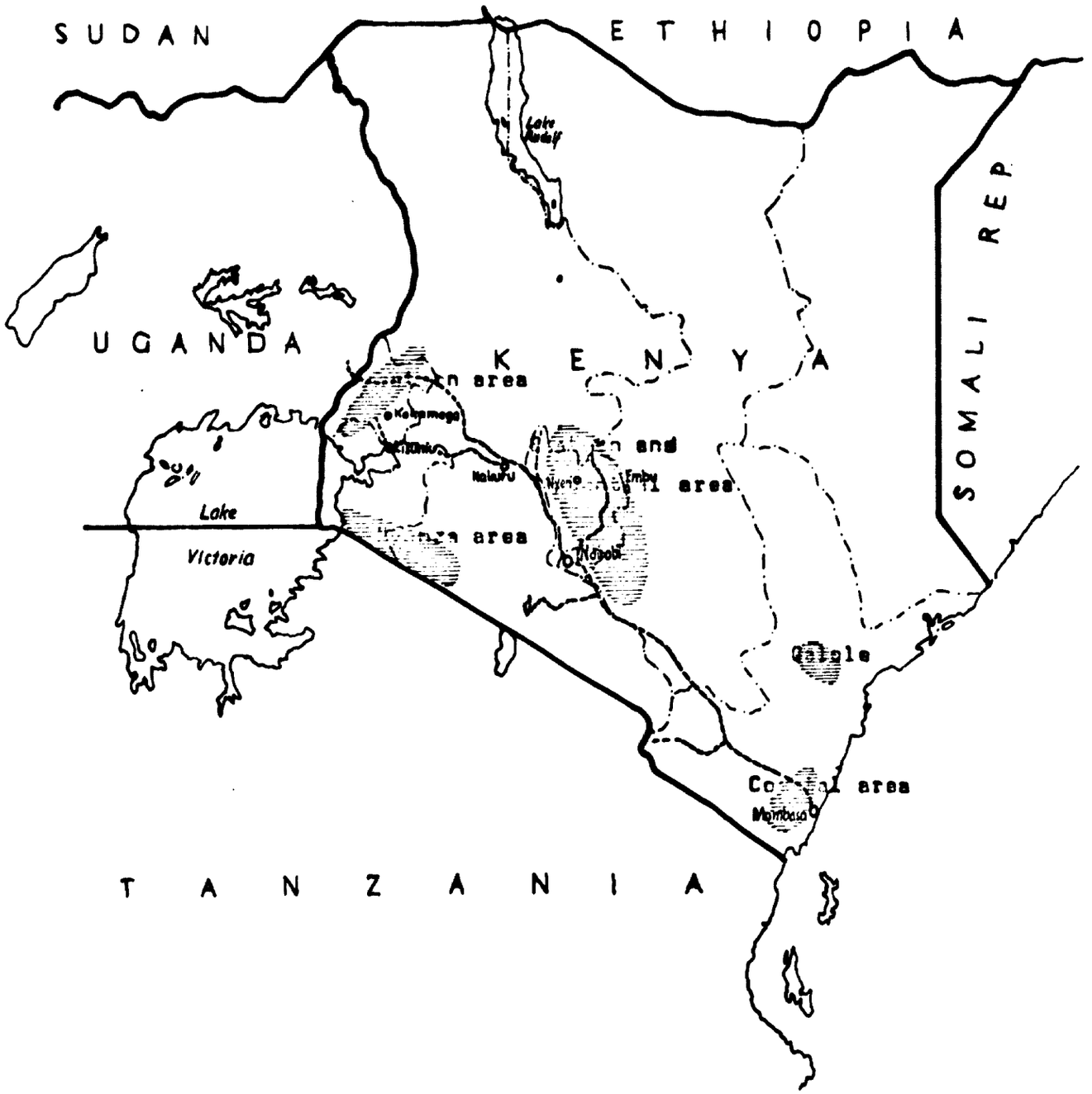

COTTON GROWTH IN KENYA

1.12 Cotton Qualities and Quantities

The quenlity of Kenya cotton is very good, but depends from the eree in which it has grown and from the seed.
Typical dates for A-quality cotton:

Seed	staple	classific.	micronair	Presaley	adequ.use	loss up to carding
UK 51	1 1/8"	strict middling	3.8-4.3	81-83	4o-5o hosiery yarns and popline	4%
BP 52	1 1/8-1 5/32"	strict middling to good middling	3.5-3.8	85-88	as above	4%
UK 249	1 3/16"	good middling	3.7-4.o	91	sewing thread	1%

The quantities produced are far behind the possibilities and could reach 3 times as much per acre.
For the year 1968 the following production of cotton is expected:

Western Area	12 ooo bales
Nyanza Area	5 ooo bales
Eastern & Central Area	8 ooo bales
Coastal Area	5 ooo bales
Lamu Island	5 ooo bales
Galole Area	1 5oo bales

Cotton is sold in two qualities:

AR	first quality	85 - 9o%
BR	third quality	1o - 15%

the latter one mostly exported to Hongkong and the Far East.
The losses of B-quality up to carding amount up to 1o-12%, even 18%.

The presumed output will be increased in the next years and will reach ybout 1oo ooo bales in 1973.

1.13 The Cotton Market

The cotton market is not yet so organised as it were necessary. The first uncertainty occure in the purchase from the farmers being partly effected by the ginneries, partly by the cotton grower's cooperative societies. The classification into AR and BR - qualities is often lacking the necessary know-how and accuracy. Above all

"The Cotton Lint and Seed Marketing Board - Kenya "
Church House, Government Road
P.O.Box 30477 - N a i r o b i

is competent for the distribution.
The inland prospective buyers place their orders with the Board mentioned according to quality and quantity. We won't miss to mention here that the organisation - according to statements of some factories - doesn't work yet in a satisfactory way.

- The deliveries are not executed accurately
- In the precedent paragraph we had pointed out that Kenya cotton is of high quality and therefore suitable for higher counts. The actual production ranges in 2o' and for that the cotton is too expensive. The possibility of replacing it by cheaper Indian cotton would have two advantages:
  - - the competitivity of the factories would improve
  - - the proceeds of Kenyan cotton export would be higher than the import debit for the quantities consumed.

Since 1966 Messrs. Anderaen, Clayton & Hunt (Cotton Brokers Ltd.) are dealing with the exportation of cotton. They are as well advisers but have above all to guaranty the government the sale of cultivated cotton.

1.2 Wool

At present more than 5oo.ooo sheep are kept in Kenya:

approx.
5o% Merino
3o% Corriedale
2o% various breeds

The Merino-wool is one of the world's best and achieves good prices on the international markets. The lower qualities are sold cheaper. Instruction work should make it possible to intensify the sheepbreeding and to cut out the bad breeds.

The wool being relatively pure conteins only about 3o% impurities (about 8% fet). On the London Stock Exchenge the proceeds emount to about 4/-eh p.lb., o/64 eh of which ere to be deducted for trensport end hendling charges. Even if the wool contains but few soiling there ere still cherges for the transport of the soiling. It is therefore to be figured out if woolwashing or even combing up to the tops would not be edventegeous end profitable.

The evaluations for the exportation 1968 amount to

approx. 12.ooo bales x 32o lbs. = 3.84o.ooo lbs.

For this quentity e woolwashing mill would be entirely occupated in 2 shifts already. As soft water is disponible in sufficient quentities (at least in the western part of the country) the mill could work profitably. However it is to be considered that the storage of raw wool for several months will be expensive.

The demand for woolen tops for 1969 is expected to be about 7oo.ooo lbs. and it is to be covered by imports. The demand will increase quickly in the coming years as soon as domestic factories will start with production. For the year 1972 we have evaluated the following yarn consumption:

Industry	about	1 ooo ooo lbs.
Retail	over	15o ooo lbs.
Total	over	1 15o ooo lbs.

or more than 4o% of the woolproduction of 1968.!

1.3 Labour

In Kenya, as well as in all developing countries, there is actually a considerable unemployment respectively underemployment. (More than 8o% of the population are occupied with farming or rural activities.)

In spite of the fact of unemployment there are severe labour problems for the developing industry, as

skill
unefficiency and wages
labour laws
Trade Unions
housing

1.31 **Skill**

There are actually only few skilled workers available among Africans in Kenya. There is also a considereble lack of efficient typists, clerks and accountants. But there is among the Africans an ability to learn manual operations or to attend a machine within a relatively short period. After this period, mostly 6 months, the workers are called "semi-skilled" workers or attendants. It was pointed out by most of the factories that after this first training skill did not improve any more.

There is a permanent lack of good fitters, mecanicians and foremen. In nearly all factories one tries to skill workers, but unfortunately with little success.
The labourlews in force are not encouraging the employment of apprentices.

1.32 Unefficiency

African workers are cheap but - as most of the factories cleimed and proved - inefficient.
We have tried to find some reasons for this problem:

The entrepreneur gets unskilled personnel, who, according to law, has to be 18 yeers of age to be allowed to enter work. However, men at this age have not anymore the manual ability as those, who have been trained at a much earlier age.
We like to point out that in many African and islamic countries the training towards technical and mechanical skill starts, when the boy has reached his 12 years of age.

The entrepreneur prepares his workers for their task. The training takes about 6 months. During the first 3 months only he has the possibility of dismissing workers. After this period there is neither the possibility of a selection nor of an attraction for the workers to increase their efficiency.

Everywhere in the world women are much more qualified for certain professions than men - as it is in Kenya, too - . Therefore preferably women are employed on spinning-machines and in the hosieries. According to law women are not allowed to work after 1o p.m., except with the special permission of the ministry of labour. The period between the application and getting the licence sometimes is extremely long.

In the meanwhile either (less qualified)men were employed or personnel for the second shift, waiting inactively for the permission of the ministry. In the factories with competent black foremen the selfconfidence and the efficiency of the workers is generally higher. There has not yet started an educational programme for craftsmen and technicians in the field of textiles, thus the coming years will lack real skilled african foremen.

1.33 Wages

" A Guide to Industrial Investment " was published by the "Ministry of Commerce and Industry " in 1967.

On pages 33 to 5o labour-questions are treated objectively. For the textile-industry mostly minimum-wages are applied, agreed between employers and Trade Unions for "Knitting-Mills".
Those are

for the 1st year	175/-sh per month
thereafter	185/-sh per month

After some discussion with the industry we got the impression that the word "thereafter" is not quite correct, it should rather be "second year", as the wages raise according to the years of employment. The effective cost of labour are composed of the basic wage and diverse extra charges: As for example:

	sh.per month	%	total %
Basic salary:	18o/-	1oo	
Nat. Insurance:	9/-	5	1o5
Housing*	3o/-	16,7	121,7
uniforms (guardmen)	1/5o	o,8	122,5
transport	2/-	1,1	123,6
medical expenses**	1/-	o,5	124,1
travelling exp.	3/6o	2.o	126,1
Leave	13/5o	7,5	133,6
sickness leave **	1/-	o,5	137,1

* 5o% for female workers only

** in the beginning low, as only young workers have been employed. Those figures will increase.

1.34 Labour Laws & Trade Union

Labour laws in Kenya are very progressive and correspond to European standard.
Due to the high rate of unemployed the authorities seem to be interested to occupy a great number of workers; dismissals of workers are extremely complicated and require a special permission.

In every factory the workers are represented by the Trade Unions, the spokesmen of whom being elected by the workers themselves. There is the tendency of keeping as many working positions as possible. This principle is in opposition to an increase of efficiency and selection.
In our point of view the minimum-age for employment of 18 years of age is too high.

1.35 Housing

In the big cities is lack of housing for the workers. Numerous firms have built own housing for their staff. The government is interested in the settling of new industries outside the overpopulated areas of Nairobi and Mombasa, where there are no or only little difficulties in accomodating the workers.

1.4 Electrical Supply and Availibility of Water

The power supply is very good in vast parts of Kenya namely in the densly populated parts of the country (being opened up by the railway). The costs of electricity are charged according to the monthly peak of KVA and the consommation in KWh.

We received different basic prices:

1 KVA = 2o/- sh per month
(36/5o sh per month at Thika?)

The rate depends on the region:

1 KWh = o/o925 at Nairobi
= o/1o7 Rift Valley, Coastal Area etc.
= o/135 Eldoret, Kitale etc.

It is generally noticed that the government aspires to decentralise industry as far as possible and to keep it away from Nairobi and Mombasa, but on the same time they harm the industry by charging higher rates for electrical power.

The industry in the western part of the country considers the higher electricity costs a disadvantage and a negative influence on the competition.

There is plenty of water of good quality available in the densly populated parts of the country. There is no or nearly no treatment necessary for the industrial use of the water.

1.5 Transport

The densly populated areas are situated near a railway line which ends in the port of Mombasa. The most important roads of the country are in a good condition. While the railway is above all important for mass goods, the transport of commercial goods on the road is leading.

Road transports are only allowed for holders of transport licences. The law (1-4-1968) distinguishes 3 classes of transport-licences, being marked A,B and C.
They signify:

A-licence (public carriers' licence) This licence shall entitle the holder for the carriage of goods for hire or reward.....or for the carriage of goods for or in connection with his business....

B-licence (limited carriers'licence) This licence shall entitle the holder to use the vehicles...for the carriage of goods or in connection with any trade or business carried on by him and for the carriage of goods for hire or reward.

C-licence (private carriers'licence) This licence shall entitle the holder to use the vehicle.....for the carriage of goods for or in connection with any trade or business carried on by him.

As according to this law every farmer is autometically a C-licence holder other producers were not conceded this right.
The new transport law implements a number of disadvantages in competition.

1.6 Duties & Refunds

In order to protect and to advance the industry, refunds were introduced for certain branches, finishing imported goods. As the refunds were credited late (p.e. after years) and some raw material as for example woollen yarn costs high the prepaid duty exeeds the financial standing of the manufacturer.
For all cotton and rayon febrics except blankets an "exise" duty of c/25 sh per squ.yard was imposed. This tax is discouraging for productio of cheap febrics. Kenya still being in the beginning of its industrialisation first of all produces simple febrics, being cheap and offered at very low prices from Asia. By the tax charging cheap clothes relatively heavier than expensive ones the competition of the Kenyan industry has deteriorated and makes the production of simple febrics prohibitiv.
For exports to Tanzania and Uganda a 2o% transport tax is raised for textils, the Kenyan manufecturers not being refunded or remitted the exise duty or the customs duty charged on the goods.

2 - Short Report on Textile Factories in Kenya

In the following pages we shall give a brief description of the textile factories in Kenya, their main difficulties and the possibilites of a diversification of their production.

In chapter (3) we shall show tables with the most important technical dates of the machinery of each mill as well as the use and conditions of the machines.

Name:	NATH BROTHERS LTD. - THIKA
Scope:	- Spinning of cotton and rayon yarn Weaving of linnen and drille Bleaching, dying and finishing - This factory did not yet reach the final capacity acc. to licence.
Products:	- Yarn for hosiery and fo sale, - Grey linnen and drille, - Bleached, dyed and finished linnen and drills (22 coloure) - Sales to one general agent only, in bales.
Layout:	- Spinning preparation and spinning not ideal; machinery poor and partially absolete; old and narrow buildinge. - Weaving, weaving preparation and finishing plant are modern and in new adequate buildinge.
Maintenence:	- Spinning department poor, but improving - Other sections in very good order - Gardens and yards in disorder - Workshop not adequate to importance of factory - Number of fitters and their standard is not satisfactory.
Management:	- Competent management, but too small in number. 1 millmanager (textile engineer) and 1 engineer, both european, have been engaged recently and have since started their organisation program with good results.
Workers:	- Considerable fluctuation due to vicinity of Nairobi and two brand-new textile factories in Thika. Nearly no skilled workers (mechanicians and fitters) available in Thika. Efficiency can compete with other factories in Kenya and is excellent in the new automatic weaving department.
Difficulties:	- Competition on the market, mostly from Uganda. Sales of grey goods not profitable but expressively asked by the dealer. Supply of cotton by Cotton Board not in conformity with orders. Fluctuation of workers, lack of skilled workers.
Diversification:	- with the existing spinning plant there is not much possibility to produce finer (and more profitable) clothe.
Tables:	viz. pages 25 + 26

Name: UNITED TEXTILE INDUSTRIES (K) - THIKA

Scope:
- Spinning of rayon yarn
  Colourweaving
- This factory did not yet reach its final capacity acc. to licence.
- Spinning and weaving balanced.

Products:
- Gingham - Bed sheets (coloured)
- Surang - Bed licking
- Serge - Lungi
- Kikoy - Nashigi

Sales to one general representative, in bales of mainly 40 yds. or in PVC-wrappings of 2 yds.

Layout:
- Individual buildings for the departments, ample space for future extensions
- The interior flow is ideal, the exterior - from department to department - good.

Maintenance:
- good
- workshop is small but for the time being sufficient

Management:
- Competent management. Mill manager (engineer) and 4 textile engineers from Japan. Factory started first weaving and then with spinning department.

Workers:
- Young male and female workers of good standard (K.P.E.); all applicants had to pass medical and psycho examinations prior to employment.
- Good working conditions and gay athmosphere.
- Efficiency in weaving dept. below Kenyan level.

Difficulties:
- Production cost are due to low efficiency of workers too high.
  Weaving looms are not of recent dwaign.
  The production program was based on the EA-market and 2/3 of the production is absorbed by Tanzenian Markets, where the 20% transfer-tax is a heavy burden and makes sales difficult.

Diversification:
- Spinning & Weaving is ballanced.
  Because of scutcher only rayon can be spun.

Tables: viz pages 27 and 28

Name:	SUNFLAG SPINNING MILLS (EA) LTD - NAIROBI
Scope:	- Spinning of cotton and rayon yarn
Products:	- Yarn for own hosiery (mostly rayon) and for sale. Very good quality. - Sales to Nairobi weaver and to knitting factories in Kenya (as well as to own factory in Tanzania)
Layout:	- Ideal blower room; Spinning preparation, spinning and winding in adequate building but too much squeezed mach. layout.
Maintenance:	- All sections in very good order. - Good, adequate workshop
Management:	- Young but competent management The factory is run by two proprieting managing directors (one commercial and one technical) who are on the same time responsable for the attached hosiery. There are further 2 textile engineers employed. - permanent quality control.
Workers:	- No particular remark
Difficulties:	- Some machinery absolete(still fair but not very effective running) - Spare parts difficult to obtain and dear. - Airconditionning inefficient because of lack of roof insolation; - to reach the high standard in spinning, a cotton of too good quality (an expensive one) is used. - The factory suffered from the import restrictions of the EA-countries and the transport tax for Their (knitted) underwear, which affected their profit margin very hard.
Diversification:	- The factory will be able to produce after a certain time (if modernized) still finer yarns (higher counts). Yarn for poplins of sewing thread however would require a combing section for which is no room in the actual factory.
Tables:	viz page 29

Name: KENYA RAYON MILLS LTD - MOMBASA

Scope:
- Spinning of rayon (and cotton) yarns.
- Weaving of plain and coloured cloth. Finishing including printing.
- This factory did not yet reach the final capacity acc. to licence. No finishing plant has been installed up to date.

Products:
- Rayon yarn for own weaving plant and for sale; plain and coloured cloth sold in PVC-wrapped bales of 3o and 4o yards.

Layout:
- The machinery layout and production flow is very good (with few exceptions);
- The building construction is not ideal and doesn't have sufficient natural ventilation.
- In the weaving sections there are (unusual) unorderly stocks everywhere.

Maintenance:
- Not adequate
- No spare parts

Management:
- 1 mill manager (textilengineer) and two department managers with textile diplome.
- No qualified maintenance personal.

Workers:
- Low standard
- Working conditions unusually poor. Low efficiency.

Difficulties:
- The climat of Mombasa area is not suitable for a textile factory.
- The building constructions do not offer the minimal comfort of natural ventilation. No roof insolation has been installed.
- Extreme high temperature inside the factory effects the efficiency of workers as well as the workability of fiber and yarn.
- The obsolete plant and the poor maintenance.

Diversification:
- The scutcher is not adequate for cotton fiber.

Tables: Viz. pages 3o and 31

Name: KISUMU COTTON MILLS LTD. - KISUMU

Scope:

- spinning of cotton
  weaving and finishing
- This factory did not yet reach the final capacity acc. to licence.
  Acc. to licence the scope includes cotton blankets, heavy sheetings, chadders, poplins, towelling and voiles.

Products:

- Cotton yarn for own weaving and for sale (blend of cotton with manmade fibre in experimental stage)
- linnen, drills, structural fabric and popline
- bleaching, dyeing and finishing (since 1968)
- Sales of grey goods in loom stage in (pressed) bales of about 1200 yards; finished goods in smaller PVC - wrapped bales.

Layout:

- Individual buildings for administration, spinning, weaving department with finishing, powerstation with workshop.
  Material flow:
  Long distance between cotton bals store (inside the town) and spinning department. Flow inside the spinning department ideal; flow in other departments not perfect. There is ample space for extensions.

Maintenance:

- Under the direction of engineers the maintenance of machines is done with perfect acuracy. The factory as well as the machines are kept clean.
- Gardens, yards and roads are poor.

Management:

- competent management by the Bombay know-how partners. The technical management consists of one mill-manager, 7 engineers and 4 textile graduate (all of Indian origin).
  This mill gives a perfect training to gifted African workers to form technicians, craftmen and skilled workers. The training includes theoretical teaching of mecanics.

Workers:

- Working conditions are good. The efficiency is low. In spits of the high efforts in training of workers the output of the factory did not reach yet a reasonable degree.

Difficulties:

- The cost cost of electricity in this region is too high.
- The factory is too far away from the marketing center Nairobi.
- The low efficiency.

Diversification: - Accroding to licence this factory has nearly all possibilities for a future diversification. The technical staff, which is too high in number for the actual production will be sufficient for a much higher and more diversified production. The quality of the weaving-section might oppose to fine weavings.

Tables: Viz. pages 32 and 33

Name:	KENYA TEXTILE MILLS - NAIROBI
Scope:	- Colour piece goods (weaving) the licence includes also a spinning dep.
Production:	- Yarn dyeing for own use - Colour weaving on rayon basis including bed sheets - sales in loom stage to 3 wholesalers
Layout:	- The factory is poor and absolete. The material flow is however good. - A new wide and bright shed has been constructed in the 1st floor (above the weaving department) to shelter the future spinning. - There is no space for extensions.
Maintenance:	- Poor; no spare parts.
Management:	- Good, but not competent. - Sales not promoted!
Workers:	- No remark
Difficulties:	- The production had to be reduced in the last year (1967) from 3 mio. sq. yds. to about 1.25 mio. sq.yds. because of The competition from the new established United Textile Industry The difficulties in sales to EA states.- Especially the transport-taxe etc. The degree of absolescence of machinery, especially the weaving preparation. The shortage of cash due to the construction of the spinning section (the proprietors have been afraid to loose their licence for the weaving sections if they would not build a spinning section, too. As in many other factories there is not paid enough attention towards sales and new designs.
Diversification:	- Towel manufacturing on a trial basis has started on some looms. - The spinning department will produce woollen or synthectic yarn, mainly for hand-knitting.
Table:	Viz. page 35

Name: KENWOOL ENTERPRISES LTD. - KIAMBOA

Scope:
- Piecegoods on woollen and manmade fibre basis
- The licence was obtained for yarns and piecegoods from wool and artificial fibres and mixtures thereof.
- The spinning section has not yet been installed, the capacity is far behind the licence.

Production:
- High quality clothes for men
- Terrylene - polyrop
- Trevira - worsted 100% wool
- Tetron - blazer
- The factory started on a trial basis with the production of upholstery cloth
- Sales of finished goods in bales of 20 yds. to own sales office in Nairobi.

Layout:
- One good building shelters the different departments.
- The material flow is ideal.

Maintenance:
- Good
- Roads and yards well maintained
- Adequate, well equipped workshop under erection.

Management:
- The management is secured by the know-how partner from Prato/Italy.
  There are two Italian engineers, one for production and one for erection and maintenance. One Italian department chief for finishing.

Workers:
- Workers are still under training.
- Working conditions are good.
- Efficiency is too low.

Difficulties:
- Workers for the second shift have been employed already, but no autorisation has been obtained yet for this shift.
- The factory has 7 looms to produce top quality woollen blankets, but production could not yet start, as the licence could not have been obtained yet.
- The import duty on the imported woollen and synthetic fibre yarn is a heavy financial burden for the industry. The management would prefer to pay the tax on sold goods.
- Low efficiency of workers.
- No experience in design.

Diversification:
- This factory is the only one in EA to produce suiting and upholstery cloth.

Tables:
- viz. pages 36 and 37

Name:	NAKURU INDUSTRIES LTD. - NAKURU
Scope:	- Blankets
Products:	- Spinning of weft yarn for own weaving section. - Blankets of 9 different sizes and in different qualities, mainly from cotton and rayon wastes. - Sales well-wrapped to wholesalers.
Layout:	- The different sections are in neighboured buildings. Ideal material flow. - Own workers houses in direct vicinity.
Maintenance:	- Relatively good. - Good workshop - gardens, yards and roads in neat conditions
Management:	- By the Italian know-how partner the maintenance has been secured. There are beside the mill manager two Italian engineers and 3 technicians (of Indian origin).
Workers:	- Most of the workers are since 6 years working in the factory. Working conditions are relatively good, housing conditions are good as the houses have been built by the company. Neither the quality of work nor efficiency of workers have improved since the beginning. Number of workers had to be reduced twice since 1966 due to the reduction of production.
Difficulties:	- The production had to be reduced, as the produced goods could not have been sold. The licenced capacity in Kenya is much higher than the actual demand - Blanket manufacturers have to sell their goods below production cost due to competition. - Exports to EA countries are practically impossible, due to transport taxs. There is no transport taxs for blankets between Tanzania and Uganda. - The low efficiency of labour.
Diversification:	- none.
Table:	viz. page 38

Name:	BLANKET MANUFACTURERS (KENYA) LTD. - MOMBASA
Scope:	- Blanket weaving - This factory did not yet reach final capacity acc. to licence. - The factory has been licenced for blankets, towels, towelling,bedspreads and blazer cloth.
Products:	- Blankets of different qualities and sizes. - Sales well wrapped to general agent in Mombasa.
Layout:	- New building with ideal mach. layout, well aerated. - Space for extensions and factory sporting grounds.
Maintenance:	- Good No workshop
Management:	- Beside mill manager there are 2 Japanese engineers, one for production, the other for erection and maintenance.
Workers:	- Literate workers only. Efficiency satisfactory to good. - Good working conditions. Supervision, maintenance and qualitycontrol by skilled African workers. - Library and sporting grounds will be installed in 1968.
Difficulties:	- Sales are difficult, because of too high production in Kenya. - Export to EA countries not possible due to discrimination of Kenyan blanket industry. - Rentability of factory not secured, as factory is working in two shifts only, against hardest competition. - Too many repairs on the new japanese looms.
Diversification:	- none.
Table:	viz. page 39

Name: SHAH BHAGWANJI KACHRA LTD. - MOMBASA

Scope:
- Blanket weaving

Products:
- Blankets of different sizes and qualities
- Sales to about 200 wholesalers in bales of 50 pcs. for lower qualities, neat wrapping for better qualities.

Layout:
- In a big shed is the machinery, in the neighboured building the stores and finishing department.
- Material flow is ideal.

Maintenance:
- fair
- small workshop

Management:
- for the whole factory there is beside the director one technician only.

Workers:
- Efficiency low.
- Number of workers reduced by one shift on end of March 1968, because of too low sales.

Difficulties:
- Sales are difficult, because of too high production
- Export to EA countries not possible due to diacrimination of Kenyan blanket industry.
- No profit since the market became oversaturated.
- Taxe on raw material (imported yarn) protects the one factory, who has an own spinning plant and buys cotton and rayon waste at most advatageous conditions but kills the other 4 blanket factories.

Diversification:
- none

Table: viz. page 40

Name:	SAMEH TEXTILE INDUSTRY LTD. - MOMBASA
Scope:	- Blanket weaving - This factory did not yet reach its final capacity acc. to licence.
Products:	- Blankets of different sizes and qualities including spun rayon and 100% wool blankets. - Sales of finished blankets in bales of 50 or 100 pcs. for lower qualities and neat wrappings for better qualities to a big number of smaller wholesalers. Best quality of Kenyan blanket factories.
Layout:	- Neat and well-aerated building with good material flow. Factory and offices well designed.
Maintenance:	- good to fair - small workshop
Management:	- Beside the mill manager there are two Japanese engineers, one for production, the other one for maintenance and training.
Workers:	- good working conditions; low efficiency;
Difficulties:	- Sales are difficult, because of too high production in Kenya, but prices are better than of the competitors due to better quality. - Export to EA countries not possible due to discrimination of Kenyan blanket industry; Transport taxe also to be paid for 1st class woollen blankets, which are neither produced in Tanzania nor in Uganda.
Diversification:	- none.
Table:	Viz. page 41

Name:	**TOWELS MANUFACTURERS LTD. - MOMBASA**
Scope:	- Terry towels
Products:	- Terry towels of different sizes from cotton yern. - Goods sold neatly wrapped to wholesalers; excellent quality.
Layout:	- A good designed shed shelters the machinery. The shed was designed for more than the double number of weaving looms. - Good material flow. - Modest offices behind partitions in the same shed.
Maintenance:	- adequate
Management:	- Management secured by one engineer and two technicians from India.
Workers:	- Good working conditions. Actually the workers are under treining for a second shift. - Efficiency still too low.
Difficulties:	- Sales nearly impossible as there is a pressure on the market by chinese manufacturers at prices below meterial cost.
Diversification:	- none
Table:	Viz. page 42

3. Compositition of the equipment

For the future policy regarding textile industry in Kenya the knowledge of the actual composition of the equipment, the technical characteristics of the latter, the stage and the degree of absolescance of machinery and their utilisation are of great importance.

In the following pages we entered for each factory in a separate table the main datas.

Abbreviations used:

- year of construction:	up to 195o
	195o - 1958
	1958 - 1968
- technical datas	ø 1o" refers to can-diemeter in inches
- cleanness	** very clean
	* clean
	*- not clean
	- dirty
	-- very dirty
- air condition	* yes
	- none
	hum.humidification

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FACTORY: [illegible]

machine	make	number	year			heads or spindles	act. stage					technical datas / characteristics: in	out	speed	charact.	spec. outfit	remarks	shifts	[illegible]	[illegible]
			[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]									
[illegible]																				
[illegible]	[illegible]	[illegible]	x			—				X		36mm 1.5den	lap				viscose	2	--	-
"	"	1	x			—			x				"				cotton	2	--	-
[illegible]	[illegible]	6		x					X	x		lap	Ø18				"	3	--	-
"	[illegible]	16	x						x	x		"	Ø14				"	3	--	-
"	[illegible]	12	x				X					"	Ø18				viscose	3	--	-
"	[illegible]	4			x		x					"	Ø..	high			under errection	-		
[illegible] Mach.	[illegible]	1	x					x					"				for poplin yarn	-		
[illegible]	[illegible]	1	x					x				lap	Ø..				up to 80' - idle	-		
[illegible] Frame	[illegible]	6			x	36	X					Ø..	Ø12		6 heads each, 6x			3	-	-
" "	Spintex	2			x	8	x					Ø..	Ø14		4 " " , 6x	high-draft	under err.	-		
[illegible] Frame	[illegible]	1	x							x	x							-		
" "	[illegible]	1	x			96			x	x								3	+-	hu[illegible]
" "	[illegible]	1	x			96		x										3	+-	"
" "	[illegible]	2	x			96x2		x										3	+-	"
" "	[illegible]-Lowell	2	x			...			x	x							idle	-		
[illegible].sp.Frame	[illegible]	18	x			7020		X					20'	7500 rpm	Ø1¾" - 7cm	pneumafil	390 sp. each	3	+-	"
" "	"	[illegible]	x			3780		X		x			20'	6500 rpm	Ø1½" - 7cm		420 sp. each	3	+-	"
" "	"	1	x							x	x						" "	-		
" "	[illegible]	6	x			2200		x					20'	7500 rpm	Ø1⅞" - 3"	pneumafil	380 sp. each	3	+-	"
[illegible]	[illegible]	1		x		96	x											3	+	"
[illegible]	[illegible]	[illegible]	x			2x40		x										3	+	"
"			x			60		x										3	+	"

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FACTORY: [illegible] Ltd. [illegible] (Part 2)

machine	make	number	year: -55	year: [illegible]	year: [illegible]	heads or spindels	act. stage: good	act. stage: fair	act. stage: [illegible]	act. stage: [illegible]	in	out	speed	charact.	spec. outfit	remarks	shifts	cleann.	air cond.
[illegible] winder	Peron	2				—				x						will be dismantled soon	–		
" "	[illegible]Eharst	1			x	72	x										3	+	hum.
[illegible] Department																			
[illegible] mach.	[illegible] Eberst	1			x		x										1	++	
[illegible]izing machine	[illegible]	1			x		x										1	++	
[illegible]. pirn w.	[illegible]	3			x	36	x										3	++	
[illegible]. weaving l.	Picanol	95			x		x						220 ppm	44" reed s.	18 for dril		3	++	hum.
[illegible]ing & Finishing Department																			
[illegible]ning m.		1	x													occ. used only	–	++	
[illegible]iting m.	Industrie-Cy	1			x		x							45"			2	++	
[illegible]	Kel[illegible]berg	2			x		x							45"		for dyeing	2	++	
[illegible]ing calander	[illegible]forts	1			x		x							45"			2	++	
Stenter	"	1			x		x							45"			2	++	
Calander	Kleine[illegible]efers	1			x		x							45"			2	++	
[illegible]curing m.	[illegible]onforts	1			x		x							45"			2	++	

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FACTORY: UNITED TEXTILE [illegible] LTD. - [illegible]

machine	make	number	year -50	year 50-53	year 53-63	heads or spindels	act. state good	act. state fair	act. state poor	act. state [illegible]	act. state [illegible]	technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	el. com.	air con.
[illegible] Department																				
[illegible]	[illegible] (Jap)	1			x	—	x					1½" lap		—	100% rayon	lap [illegible]	[illegible]	2	++	+
[illegible]	" "	15			x	—	x					lap	ø 1¼"					3	++	+
[illegible] frames	"	2			x	2 x 8 = 16	x					ø 1¼"	ø 1¼"		x 6			3	++	+
[illegible] frames	"	2			x	2 x 8 = 16	x					ø 1¼"	ø 1½"		x 6			3	++	+
[illegible] frames	"	2			x	248	x					ø 1½"					124 sp. each	3	++	+
[illegible] -Sp. Frames	"	8			x	3072	x						20'	8000 rpm	ø 48 mm	[illegible]	384 sp. each	3	++	+
cone winders	Kuniton "	2			x	128	x						cone				64 sp. each	3	++	+
hank winders	"	5			x		x					cone	hank							
[illegible] Department																				
[illegible] dyeing mach.	Jap	2			x		x					hanks						3	++	
" "	"	1			x		x					"					small unit		++	
Centrif. hydroextractor	"	2			x		x					"						3	++	
" "	"	1			x		x					"					small unit		++	
[illegible] machine	"	1			x		x					"						3	++	
[illegible] machine	"	1			x		x					"						3	++	
[illegible]	"	1			x		x					"						3	++	
[illegible] Department																				
[illegible]																				

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FACTORY: [illegible]

machine	make	number	year			heads or spindls	act. state				technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	cleam.	air cond.
			-59	60-62	63-68														
[illegible]	[illegible]																		
[illegible]	[illegible]	[illegible]			x	220	x			•	hank	cone					3	+	
[illegible]	"	3			x		x									colourd warp	3	+	
[illegible]	" "	[illegible]			x	12	x								overhead cleaner		3	+	
[illegible] looms	[illegible] "	[illegible]			x		x			•			145 ppm	58" reed s.	autom. colour-change dobby motion	0,6 – 0,75 efficiency	3	+	[illegible]
"		[illegible]			x		x			•				44" "			3	+	"
"		[illegible]			x		x			•				40" "			3	+	"
		[illegible]																	
finishing and [illegible]																	1		

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FACTORY: [illegible]

machine	make	number	year -59	year [illegible]	year [illegible]	heads or spindels	act. stand [illegible]	act. stand [illegible]	act. stand [illegible]	act. stand [illegible]	act. stand [illegible]	in	out	speed	charact.	spec. outfit	remarks	shifts	cleann.	aircond.
[illegible] Department																				
[illegible]	[illegible]	1			x		x						lap				rayon, cotton	2	++	
cards	Platt	10		x			x					lap	Ø12					2	++	
drawing frame	[illegible]	4		x		40	x						Ø..		6x; 5 heads			3	+	
" "	Zinser	2			x	8							Ø14		8x; 4 heads		under arr.	–		
roving frame	[illegible]	3	x			3x120	X											3	+	+
" "	"	1			x	120	X											3	+	+
[illegible] sp. frame	[illegible]	12	x			4800		X					20'	6-7000 rpm	Ø1.75"-2.75"-8" rise		400 sp. each	3	+	+
" " "	Platt	5	x			1880	X						30'	9800 "	Ø2"-3"	pneumafil	376 " "	3	+	+
						6680														
" " "	Platt	6		?		2400	x				x				Ø1.75"-2.75"		400 sp.e. - under arr.	–		
						9080														
Doubling fr.	Platt	1	x			250		x										3	+-	+
Cone winders	Platt	4		x		4x120	x											3	+-	

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FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year [illegible]	heads or spindels	act. state good	act. state fair	act. state poor	act. state [illegible]	act. state [illegible]	in	out	speed	charact.	spec.outfit	remarks	shifts	cleann.	air.cond.
[illegible] Department																				
[illegible]	[illegible]	2	x					X					lap 45'				rayon	2	+	−
[illegible]	[illegible]	2	x					X		x		lap	ø 10'					3	+−	−
[illegible]ing frame	Platt	8	x			32		x				ø 10'	ø 10'		6x			3	−	−
[illegible]ing Frame	[illegible]	7	x			3 x 140			2	2	1						no spares	3	+−	−
" "	Platt	1			x	..											under err.	−		
[illegible]ing Sp. Frame	Thr[illegible]fall	1[illegible]	x			7200		x					25'	8500 rpm	ø 2"-3"-8"	pneumafil	400 sp. each	3	+−	−
[illegible]ing fr.	Platt	2	x			800												3	+−	−
[illegible] winders	Univ. Windin.	1	x			30		X										3	+−	−
" "	[illegible]	1	x			40		X										3	+−	−
" "	[illegible]	2			x	2 x 96	x									overhead-cleaner		3	+−	−
[illegible]-winder	[illegible]	1	x			150		X										3	+−	−
[illegible]ing Department & Yarn Dyeing																				
[illegible] + warping m.		1			x		x								2000 mm	electr. contr.		2	+−	−
[illegible] app.	[illegible]	1	x					X				cheese			pressure dyeing			2	+−	−
[illegible]rif. Hydroext[illegible].		1	x					X				"						2	+−	−
[illegible]ying ch.		1	x									"			steam-heated			2		−
" "		1	x									"			electry- "			2		−
[illegible] mach.		1	x					X		x								2	−	−
[illegible]	[illegible]	[illegible]	x			4 x 12		3			1							3	−	−
"	[illegible]	[illegible]									4				automatic		no spares	−		

30

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FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-68	heads or spindls	act speed	act fair	act poor	stand.	technical datas / characteristics in	out	speed	charact.	spec.outfit	remarks	shifts	clean.	air-cond.
weaving looms	Sulzer Rüti	56	x						x	7				47" reed s.	30 looms w.dobby and 6-colour rev.ch.		3	-	-
" "	"	56	x						x	8				57" " "			3	-	-
[illegible]ecuring		2	x					x									2	+-	-
folding		1	x				x										2	+-	-

INGENIEURS CONSEIL · CONSULTING ENGINEERS · BERATENDE INGENIEURE [illegible] Inh. Dipl.-Ing. U. Metzker 8 MÜNCHEN · LEOPOLDSTRASSE 173 E · TELEFON (0811) 34635[illegible]

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year [illegible]-68	heads or spindels	act. state good	act. state fair	act. state poor	act. state [illegible]	act. state [illegible]	in	out	speed	charact.	spec. outfit	remarks	shifts	cl. cond.	air cond.
[illegible] Department																				
[illegible]er scutcher	[illegible]	2			x		x						lap			5 lattice feeders	cotton	3	++	-
[illegible]ling m.	[illegible]	1			x		x					vaste					vaste	1	++	-
[illegible]	[illegible]	[illegible]			x		x					lap	ø18"		ø18"/42" high		40 lbs p.h.	3	+	exh.
[illegible]ing frame	[illegible]	6			x	12	x								6 x			3	+	+
[illegible]ving frame	[illegible]	4			x	4 x 48	x								ø7" - 14" lift	pneumafil		3	+	+
[illegible] spinn.fr.	[illegible]	15			x	6000	x						ø15		ø2" - 3" - 9" lift	" + overh.cl.	400 sp. each	3	+	+
[illegible]ling fr.	[illegible]	1			x	300	x									overhead-cl.		3	+	
cone winder	[illegible]	1			x	60	x						cones					3	+	
[illegible] Department																				
[illegible]er	[illegible]r-Colln.	1			x	216	x					tubes	cheese		full autom.	overhead-cl.		3	+-	-
Pirn winder	[illegible]	10			x	100	x					cheese	pirn	10000 ft/m	" "			3	+-	-
[illegible] warping	Barber-Coll[illegible]	1			x		x									electr. control	504 bob.	2	+	-
[illegible]ing mach.	India	1			x		x											2	+	-
[illegible]ving looms	[illegible]	10			x		X			.				172 ppm	66" r.s.	4 dobby looms - 16 shafts		3	+-	+
"	"	12			x		X			.				210 "	54" r.s.	24 looms w.		3	+-	+
"	"	12			x		X			.				210 "	44" r.s.	drill att.		3	+-	+
"	"	27			x			X		.	9				44" r.s.		training looms			-
[illegible]																				
[illegible]					x												under err.			-
[illegible]	[illegible]				x		x								48"		for [illegible]	2		

FACTORY: [illegible] (Page 2)

machine	make	number	year -50	year 50-58	year 59-69	heads or spindels	act. state good	act. state fair	act. state poor	act. state test.	act. state [illegible]	technical datas / characteristics in	out	speed	charact.	spec.outfit	remarks	shifts	clean.	ir.cond.
[illegible] closed		3			x		x								48"			2		1
[illegible] mach.		1			x												under err.	1		
[illegible] ster		1			x												" "	1		
[illegible].fin.cal.	Ind.	1			x		x								7 rollers		occ. used only	-		-
[illegible] mark printers		2			x			x							56° + 72°		" "	-		-

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FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-61	heads or spindels	act.state good	act.state fair	act.state poor	act.state obsolete	act.state out of order	technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	clean.	air.cond.
[illegible] Departments:													no specific information obtained							
[illegible]	[illegible]fabrat	2			x															
[illegible]	"	1			x															
[illegible] winder	"	1			x															
[illegible]zing mach.	Thies	1			x															
[illegible]erry looms	Rüti	2n			x										250cm r.s.					

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-68	heads or spindles	act stage good	act stage fair	act stage poor	act stage not working	technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	cleann.	air.cond.
[illegible] Department with [illegible]																			
Dyeing m.		1	x						x		hanks						2	+-	-
Dyeing m.		1	x						x		hank	cone					2	+-	-
pirn winder		2	x			20		x			cone	pirn		autom.		not sufficient	2	+	-
pirn winder		x	x			!			x	?	•	•					2	+	-
warping		4	x					x	x							primitiv but adequate	2	+	-
sizing		1	x						x	x						not used			
warping m.		1	x						x	•						" "			
weaving looms		12	x						x	•			120 ppm	61° r.s.	6 colour-change	absolete but	2	-	-
" "		74	x						x	•			120 "	43° "	6 " "	working;	2	-	-
" "		24	x						x	•			170 "	43° "	6 " "	Soma looms	2	-	-
" "		8	x						x	• 20			170 "	40° "	6 " "	idle	2	-	-
										•						no spare part			
Terry looms		4	x						x				120 ppm	40° r.s.	terry-att.		2	-	-
		122																	

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FACTORY:

machine	make	number	year -50	year 50-58	year 59-68	heads or spindels	act.stage good	act.stage fair	act.stage poor	act.stage obsol.	act.stage work	technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	cleann.	air.cond.
Spinning Department:																				
winder	Ity.	1			x	26	x						cone					1	++	-
Pirn winder	Saurer	1			x	15	x					cone	pirn					1	++	-
" "	Schlafhorst	1			x	8	x					cone	pirn					1	++	-
twisting m.	USA	1			x		x											1	++	-
weaving looms	Ferrario	25			x		x		•					90-100 ppm		dobby-4-colour		1	++	-
inspection																	15 tables	1	+	-
Finishing Department:															will work in 1 shift only!					
milling & felting	Becherini	2			x		x											1	++	-
cloth width																				
scouring	Becherini	1			x		x											1	++	-
centrif.hydroex.	Ity.	1			x		x											1	++	-
fulard	Ity.	1			x		x											1	++	-
stenter	Monti Vannini	1			x		x								2 meters			1	++	-
sanforizing m.	Sar. Ity.	1			x		x								"			1	++	-
raising m.	Monti Vannini	2			x		x								"			1	++	-
shearing m.	" "	1			x		x								"			1	++	-
steam cal.	" "	1			x		x								"			1	++	-
finishing m.	" "	1			x		x								"			1	++	-

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-68	heads or spindles	act stage good	act stage fair	act stage poor	act stage absol. not work.	technical datas / characteristics in	out	speed	charact.	spec.outfit	remarks	shifts	clean.	air.cond.
[illegible]:											[illegible]								
[illegible]wing looms	Grosse[illegible]	2	x				x	•							[illegible]		1		
Note: [illegible]wing preparation and finishing with [illegible] sel-[illegible]wing.																			

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FACTORY: [illegible]

machine	make	number	year -59	year 59-63	year 63-	heads or spindels	act. stage good	act. stage fair	act. stage poor	act. stage obsol.	act. stage [illegible]	technical datas / characteristics: in	out	speed	charact.	spec. outfit	remarks	shifts	cleann.	aircond.
[illegible]	[illegible]	[illegible]																		
[illegible]ling mach.	Fr[illegible]i	2	x					x		•		waste	flock					1	+-	-
"	"	1	x					x		•		"	"		small unit					
[illegible]ying mach		3	x					x				flock	"				occasionally			
[illegible]trif.hydroext.		2	x					x				"	"				"			
[illegible]ying ch.		1	x					x		•		"	"				"			
[illegible]nding m.		1	x					x				"	"							
double cards	Platt	2	x						x	x	1	"						2	+-	-
" "	Ity.	1	x					x										2	+-	-
" "	"	1			x		x										under arr.	2	+-	-
[illegible]inning frame	[illegible]	4	x			4 x 144		x										2	+-	-
[illegible] Departm[illegible]																				
[illegible]rping mach.		1		x			x										yarn bought	1	+	-
[illegible]ving looms		13	x					x		•					75" r.s.	colour change		2	+-	-
" "		[illegible]	x					x		•					85" r.s.	" + dobby 4/4		2	+-	-
		138																		
[illegible]ising mach.		11	x				X								90"			2	+	-
[illegible]lander		1	x				X								90"			2	+	-
[illegible]ning m.		2	x				X								90"			2	+	-

INGENIEURS CONSEIL · CONSULTING ENGINEERS BERATENDE INGENIEURE [illegible] Inh. Dipl.-Ing. U. Metzker 8 MÜNCHEN · LEOPOLDSTRASSE 173 E · TELEFON [illegible]

FACTORY: [illegible]

machine	make	number	year -50	year [illegible]	year [illegible]	heads or spindels	act. stage good	act. stage fair	act. stage poor	act. stage [illegible]	act. stage [illegible]	in	out	speed	charact.	spec. outfit	remarks	shifts	cleann.	circond.
[illegible] Department[illegible]												warp & [illegible]ft yarn bought								
[illegible]r	[illegible]ki ([illegible])	1			x	22	x						spool				used occasionly		++	–
[illegible] winder	I[illegible] "	12			x	12 x 10	x									autom. stop		2	++	–
[illegible]l	"	1			x		x									electr. control		1	++	–
[illegible]per	[illegible] "	1			x		x											1	++	–
[illegible]ving looms	[illegible]ki "	12			x		x			•					65" r.s.			2	+	–
" "	"	1					x			•				140 -	75" r.s.			2	+	–
" "	"	5					x			•				170 ppm	75" r.s.	4 colour-ch.		2	+	–
" "	"	2					x			•					85" r.s.	dobby		2	+	–
		[illegible]																		
raising m.	Konsho-[illegible]t.	1			x		x								75"	electr. heater	number not suff.	2	++	–
" "	" "	1			x		x								85"	adapted		2	++	–
[illegible] press		1			x		x													–
[illegible]ing mach.					x		x													

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-68	heads or spindles	act stage good	act stage fair	act stage poor	act stage actual	act stage ret.work	technical datas / characteristics: in	out	speed	charact.	spec.outfit	remarks	shifts	cleann.	[illegible]
[illegible] Department:												weft: ring yarn bought								
[illegible]	"	1			x		x					cheese cops						2	+	-
[illegible] winder	"	1			x	7	x					•						2	+	-
[illegible]	"	1			x		x											2	+	-
[illegible] ring mach.	"	1			x		x								72"			2	+	-
[illegible] ving looms	"	2a			x		x		•					140 ppm and more	80" r.s.			2	+-	-
" "	"	3a			x		x		•						70" r.s.			2	+-	-
" "	"	2a	x				x		•	3					80" r.s.	4 colour ch. + dobby		2	+-	-
		7a																		
[illegible] ring m.	"	2			x		x								2 meters			2	+	-

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FACTORY: [illegible] – [illegible]

machine	make	number	year	heads or spindles	act. stage	in	out	speed	charact.	spec. outfit	remarks	shifts	cleann.	air cond.
[illegible]						weft & warp yarn bought.								
[illegible]	[illegible]rata (Jap.)	7	x	2 x 20	x	hank	cone					2	+	–
[illegible] winder	Toyo Menka K.	16	x		x	hank	cops		note: 10 ordinary size, 6 bigger size			2	+	–
[illegible]	KMS Jap.	1	x		x					electr. control		1	++	–
[illegible]ing mach.	KMS "	1	x		x				78"			1	++	–
[illegible]ing looms	[illegible] "	30	x		x •			100 ppm	75" r.s.			2	+-	–
" "	" "	10	x		x •			100 ppm	75" r.s.	2 colour-ch. + dobby		2	+-	–
		40												
[illegible]ing m.	Mac Iron Wks	4	x		x				75" r.s.			2	++	–
[illegible]r. balepress	Jap.	1	x		x							1	++	–

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-63	heads or spindels	act.stage good	act.stage fair	act.stage poor	act.stage ab.sol.	act.stage not work.	technical datas / characteristics in	out	speed	charact.	spec.outfit	remarks	shifts	cleanin.	hirund
[illegible] Department																				
[illegible] m.	[illegible]	1			x		x							600 m/min	350 cm	elcctr. contr.		1	++	-
[illegible] punches	[illegible]	1			x		x										occasionally u/		++	-
Terry loops	[illegible]	12			x		x							148 ppm	220 cm	autom. looms dobby w. punched cards		1	++	-

FACTORY: [illegible]

machine	make	number	year -50	year 50-58	year 59-63	heads or spindels	act.stage good	act.stage fair	act.stage poor	act.stage absol. not work.	technical datas / characteristics in	out	speed	charact.	spec.outfit	remarks	shifts	clean.	air.cond
[illegible]											production will start in June 1968								
[illegible]		1	x			2 x 1		x			top			inters. gill box					
[illegible]	[illegible]	1			x	1													
[illegible]	[illegible]	1			x	1													
[illegible]	[illegible]	1			x	2													
[illegible]	[illegible]	1			x	120													
[illegible]	[illegible]	2			x	2 x 400							up to 10000 rpm	ϕ 60 mm					
[illegible]	Prince-Smith	2		x		2 x 140					bob.	bob.							
[illegible]	[illegible]	1			x						bob.	cone							
[illegible]	[illegible]	1			x	40					cone	hank							
[illegible]	[illegible]	1			x						cone	balls							
[illegible]																			
[illegible]																			
[illegible]	[illegible]	1			x						balls	balls							
[illegible]		1			x														
[illegible]		1			x														
[illegible]		1			x														
[illegible]		1			x						hanks								

machinery arrangement

glazing & lighting

4. Degree of Integration
and
Ballance between the mill departments

The actual stage of integration and ballance between the mill department is shown in the graphic on page 45.

The policy of the Kenyan Government in the first stage of industrial development of the textile industry was to install fully integrated autonom mills. This policy was necessary as the industry otherwise would have started

- with weaving - as the easiest processing
- with dyeing etc. - as the most profitable processing, while
- the spinning - as a more delicate processing with high investments would have been neglected or postponed.

For the Kenyan economy however it was desirable to use the domestic cotton.
The development of the textile Industry after the 1st phase of industrialization has given the following results resp. aspects:

- most of spinning plants use imported rayon/viscose as basic material, but no cotton.
  Rayon processing is easier as cotton processing, the profit is higher.
- some mills would prefer to process imported cotton which is cheaper than Kenyan cotton.
  For the Kenyan economy it would be more desirable to export dear cotton and to import the same quantitiy of cheaper one.
- The Kenyan (and East African) textile industry grew already to such an extend, that the rules of competition became a vivid factor. But competition means for any partner to organize himself in the most economic way.
- The economic way will have (and has already) the consequence for each manufacturer to try to produce more economically.
- - Some beginning factories will however need governmental support, to enable them to work in three shifts - as one shift work turns prices prohibitively high.

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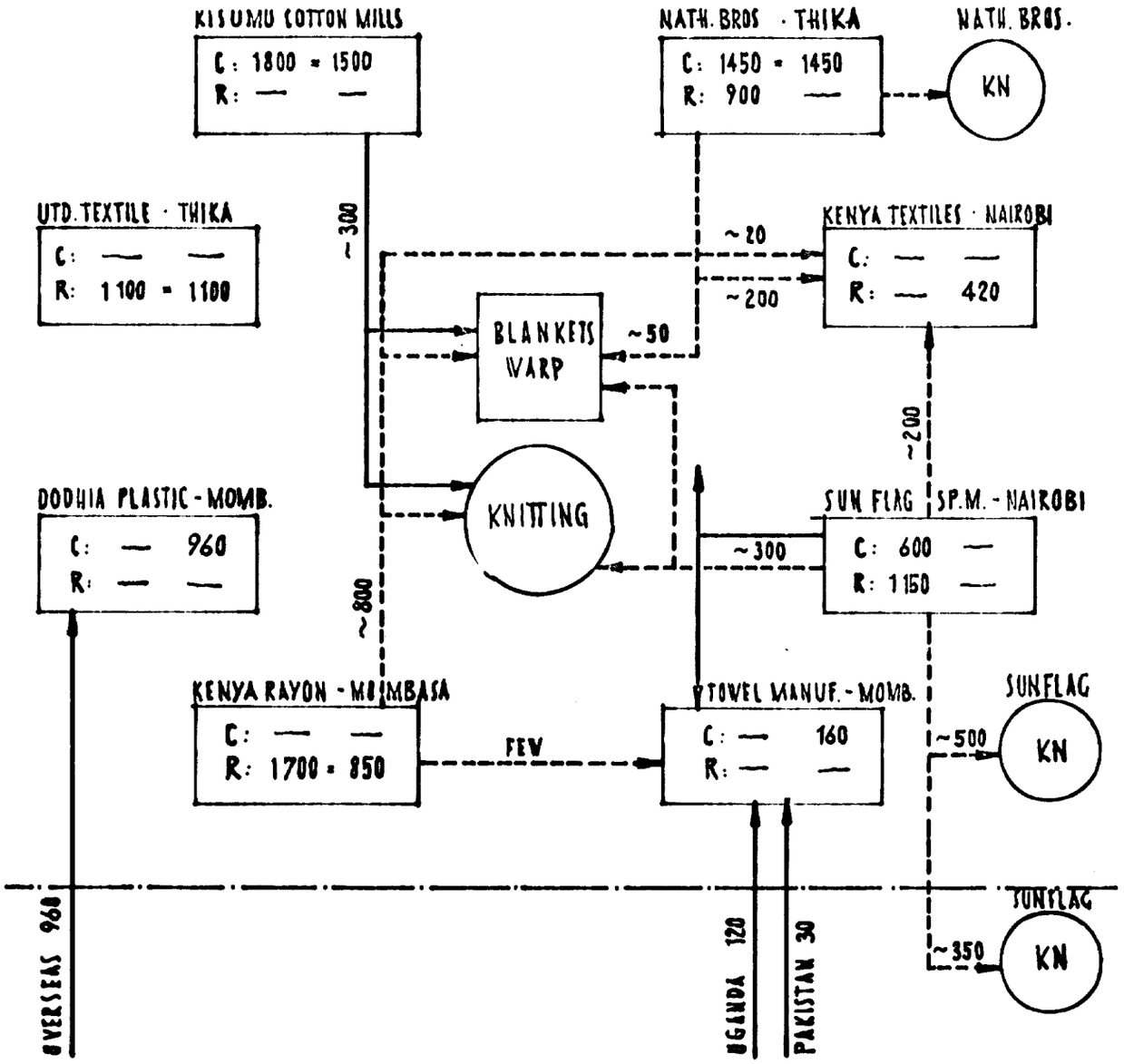
YARN ——— COTTON
--------- RAYON / VISC. IN 1000 S OF LBS P.Y.



BALLANCE BETWEEN THE MILL DEPARTMENTS

- - Other factories will force production to lower the self-cost prices.
- - The balance between the departments of the individual factories becomes less important by the time, as surplus yarn can be sold to other factories, if offered at an reasonable rate.
- - Each factory will try to diversify their production to their possibilities and to the permanently varying requirements of the market.
  (note: the licensing system as applied up to now does not follow fast enough the fluctuating textile market).
- - not only diversification but also specialisation or growth to more economic sizes of processing departments will be necessary to survive. For spinning mills it would mean to increase to sizes between 1o' - 2o'ooo spindles.
- - Production of grey cloth in coarse qualities is not profitable and will not pay in the future. Kenyan factories will not be able to compete with prices form some Asiatic countries or African countries with cotton monoculture.

5. Labour force, amount of raw materials used, and other inputs

In the following pages we shall show briefly and compact:

- a brief summary of the textile factories
- labour force in the textile industry
- amount of raw material used
- other imputs
- cost prices

We like to mention, that some of the datas had to be estimated. More exact and explicit figures can be found in the ECONOMICAL REPORT.

5.1 Brief Summary of Factories

Textile factories	Place	Spindles	yarn: cotton	yarn: rayon/visc.	yarn: Wool	yarn: PA	yarn: PE	yarn: bleach.	yarn: dyeing	Looms	piece: bleaching	piece: dyeing	piece: merc.	piece: printing	piece: finishing	remarks
Kenya Rayon Mills Ltd.	Mombasa	7200		X					X	100						
Kenya Textile Mills	Nairobi	-		X					X	122						
Kenya Toray Mills	Thika	-								-		X		X	X	
Sunflag Spinning Mills	Nairobi	9080	X	X						-						
United Textiles Ind.Ltd.	Thika	3072		X					X	108						
Nath Brothers	Thika	13080	X	X						96	X	X	X		X	
Kisumu Cotton Mills Ltd.	Kisumu	6000	X							200	X	X			X	
		38432								629						
Blanket Factories	**Place**	**weft spindles**								**Looms**						
Nakuru Industry Ltd.	Nakuru	776							X	138						
Kenwool Enterprises Ltd.	Nairobi									7						
Shah Bhagwanji Kachra	Mombasa									70						
Sameh Textile Ind.Ltd.	Mombasa									40						
Blanket Manufacturers Ltd.	Mombasa									20						
		776								275						
Towel Factories	**Place**	**Spindles**								**Looms**						
Dodhia Plastics Int.Ind.	Mombasa	-								20						
Towels Manufacturers Ltd.	Mombasa	-								12						
		-								32						
Wool	**Place**	**Spindles**								**Looms**						
Raymond Woollen Mills Ltd.	Eldoret	800							X	-						
Kenwool Enterprises Ltd.	Nairobi	-								25						
		800								25						

5.2 Labour Force

	Mill manager	Engineers	Technicians	Fitter	ass. fitter	Supervisors	Ass. Supervisors	Attendants	Total Workers	Office
Kisumu Cotton Mills	1e	4e	7e	9e	9	-	5	6o5	628	52
United Textile Ind.	1e	-	2e	3	-	1o	8	549	57o	16
Kenya Rayon Mills	1e	4e	-	1e	-	6	18	475	5oo	15 *
Nath Brothers Ltd.	1e	-	1e	3	-	9	-	448	46o	1o *
Kenya Textile Mill	2e	-	-	3e	-	-	1o*	16o	173	2
Sunflag Spinning Mill	1/2e	1/2e	2	4e	-	3		14o	147	6*
Dodhia Plastic Int.	1e									
Towel Manufacturers	1e	1e	2e	1	3	2	-	4o	46	4
Nakuru Industry Ltd.	1e	2e	3e	5		1o*		465	48o	7
Samoh Textile Ind.Ltd.	1e	2e	-			2		192	194	4
Blanket Manufacturers	1e	2e	-	1	2			96	99	5
Shah Bhagwanji Ltd.	2e	3e	-			3		233	236	2
Kenwool Enterprises	1e	2e	1e	3*	3*	3*	3*	83*	95	
Raymond Woollen Mills	1e	1e	2e							

Note: e = exterr.
* = estimated fig.

5.3 Amount of Raw Materials Used

	cotton	rayon viscose	woollen or synth.tops	cotton yarn	rayon yarn	woollen yarn	synth. yarn
Kisumu Cotton Mills	1800			1500			
United Textile Ind.		1100			1100		
Kenya Rayon Mills		1700			850		
Nath Brothers Ltd.	1450	900			1450		
Kenya Textile Mill			400*		420		
Sunflag Spinning M.	600	1150					
Dodhia Plastic Int.					960*		
Towel Manufacturers				160			
Nakuru Industry Ltd.							
Sameh Textile Ind. Ltd.						500*	
Blanket Manufacturers							
Shah Bhagwanji Ltd.				350	250		
Kenwool Enterprises						185*	265*
Raymond Woollen Mills			300*				
Ken-Knit						50*	100*
Taftex Mills				80*		15*	15*
	3850	3950	700*	2080	5030	750*	380*

* = 1969

The above table is not very complete yet. Datas concerning the consupntion of hosieries should be entered to obtain the real demand on yarn. For the blanket industry the demand was calculated as follows :

yearly demand of blankets in Kenya	3,5 mios.
average weft per blanket	0,18 lbs.
Total demand of weft per year appr.	600'000 lbs.
Cotton	350'000 lbs.
Rayon	250'000 lbs.

Note: For developing factories the demand of material has been estimated. Figures with asteric (*) give presumed consumption for the year 1969.

5.4 Woollen tops and Woollen Yarn

Requirements of Wcollen tops for 1969

Raymond Woollen Mills	3oo'ooo lbs
Kenya Textile Mill	4oo'ooo lbs
	7oo'ooo lbs

Requirement of Woollen and synthetic yarn

Sameh Textile Industry Ltd. (12o'ooo blankets x 3 lbs)	36o ooo	max. 7oo'ooo
Ken-Knit Ltd.	25'ooo	max. 15o'ooo
Kenwool Enterprises Ltd.	2o'ooo	max. 185'ooo
Tuftex Mills Ltd.	-	15'ooo
	4oo'ooo	max.1.o5o.ooo
Retail	12o'ooo	15o.ooo
	52o'ooo	max.1.2oo'ooo

5.5 Other inputs

Other materials as chemicals and dyestuff used for the textile industry will depend on the permanently varying programme of manufacturing, but will certainly increase in the next years. An important figure of "input" are the spare parts. These have been shown to be extreemely low in new factories and on the other hand extreemely high in older ones. The low figures given by the factory management did not consider the parts taken from the stock. We estimate that the demand of spares for the six spinning/weaving plants will amount to 2 million shillings per year. Some of the factories who have absolete machinery will replace those, consequently the demand of spares will be reduced slightly. It would be a help for the whole Kenyan Industry if a small, but well equipped workshop with small iron or brass foundry and adequate cutting metal-working machines could produce and deliver all kinds of torthed weels, shafts and screws on order bases.

5.6 Costprices

It was not possible to give costprices for the individual articles produced, without the special consentment of the concerned factories, which was refused to us.

6. Brief summary to the possibilities of diversification

Since the Kenyan textile Industry has reached a certain degree of maturity and to fight a rather hard competition because of the difficulties met in the EA community, diversification will be necessary to cover a wider (more profitable) palette of the market.

6.1 Yarn

6.11 Yarn for weaving of americani and drills

Any spinning plant in Kenya can produce yarns up to 30'.
Some of the factories however are limited to proceed rayon/viscose as the scutchers are not fit, to clean and open the cotton-flock.

For many products most probably Indian cotton would do.
For competitive reasons - americani can be imported below self-cost prices of the Kenyan mills - the own production will decrease in the next years.

6.12 Yarn for hosieries (underwear)

Actually there is no (or only little) demand for cotton yarn; rayon yarn is used. The quality of yarn is superior to the above (6.11). The yarn for knitting is produced by 3 Kenyan factories and imported from Asia.
To increase production, either the number of spindles should be increased, or - in case the production of americani would decrease - the existing spinning plants could deliver the yarn.

6.13 Yarn for weft of Blankets

can be produced by any Kenyan spinning mill. For cotton yarn see remark (6.11).

6.14 Yarn for poplins

For poplins - yarn up to 50' - Kenyan cotton is nearly ideal. None of the existing spinning plants could spin finer counts.
Yarn for poplins further will need combing.

6.15 Yarn for sewing thread

There is no Kenyan factory fit to produce yarn for sewing thread. The only factory with a moderate combing plant is Nath Brothers. Their spinning preparation however is not yet fit enough to supply top quality yarns.

6.2 Woven Fabrics

6.21 Grey baft (Americani)

Fabrics could be produced by any weaver; there is a relatively high demand in Kenya (higher than the actual production) but weaving is not profitable.

6.22 Grey drills/twills

Fabrics could be produced by any weaver who has looms with drill -attachment. Further remark as above.

6.23 Cotton Linnen

bleached or/and dyed.

In the end of 1968 there will be two factories in Kenya, the Kisumu Cotton mills and Nath Brothers, to bleach and dye piece goods. The capacity of the two plants is high enough to bleach and dye any piece-goods of the country. Both plants have space for extensions. To save foreign currency, for a limited period treatment of imported goods could be allowed.

6.24 Drills & Twills

bleached and/or dyed, as above

6.25 Popline

Bleached and/or dyed, as above

6.26 Printed Fabrics

There is only one printing plant in Kenya, but printing nylon fabrics only.

The taste of consumers is influenced by the progressive urbanisation, therefore the demand of printed linnen and poplins is permanently increasing.

The technical probleme of printing are relatively easy to solve with the aid of experts. The major difficulty will be to hit the taste of the conaumere, ae there are no skilled deeigners in Kenya.

6.27 Bed eheets and bed covers

There are two factories in Kenya to produce to a very emell ecale rayon colour-woven bed-sheets.
For a bigger production there are no adequate looms, (with wide readsize).
Bleaching and finiehing would be no problem in the two factories with bleaching plant.

6.28 Color woven febrice

There are two factories epecialized in colour-weaving, The Kenya Textile Mills and the United Textile Industry.
Both factories had to suffer the restrictione in sales to EA countries

6.29 Towele

In the end of 1968 thers will be two factories at Mombasa to produce terry-towels of any size. Both factories have installed very few looms yet in order to increase their plant according to the requirement of the market.

6.3 Woollen woven febrice

6.31 Suiting

The Kenyan Kenwool-Enterprises will have the capacity to produce all heavy suitings for the EA community ranging from woollen and manmade fibre baeee.

6.32 Wash - and - wear

The cheap tropicals, meanly the different types of wash- and - wear euitinge, will find an open market in the future. (and will replace to a certain degree dyed drille.)
There ie no factory yet in Kenya epecialized in tropical euiting weaving and finiehing.

6.33 Upholstery

The program of Kenwool-Enterprises will cover also weaving of upholstery. There is no possibility to cover the domestic market because of the wide-spread qualities and designs, which use to be imported in relatively small quantities. An experienced designer however could have good success.

7. Reorganisation in the Industry

Efficiency and profit are the characteristics of modern industry. The Kenyan textile industry suffers form a serious set-back caused by the development within the EA-market. Thus there are some branches nowadays which are working without any profit.

The comparison cotton - rayon gives a clear idea:

	cotton: sh.p.lb.	rayon: sh.p.lb.
Raw Material	2/35	1/6o
Yarn 2o'	3/5o	3/1o
Cloth grey	4/8o	....
Bleached and Dyed cloth	7/3o	7/5o

Cotton fabrics are subjected to a higher price-cutting and have therefore a lower margin of profit.

A reorganisation of the industry is neceseary but difficult to be executed. It consists in:

- increase of productivity of the different departments, by
- increase of the workers efficiency (selection, reward)
- increase of the output of machines (better servicing, use of modern machines)
- find out by a cost-control which products are profitable and which are not.
- Diversification of production according to the requirements of the market (the actual licencing system will have to be reviewed).
- Specialisation of production in order to create more profitable working units (and lower overhead/management cost).

A healthy industry is autonomical and doesn't need governmental interference. It will be difficult in Kenya to find the right way, as the market is relatively small and without the guidance of a central authority the great danger of vain investments would occur. However there are certain ideas:

- the existing industry must have the possibility to modernize their plants.
- to adjust their machines according to the changing requirements. (i.e. more spindles when changing to finer counts.)
- to take more advantage of their capacities (for example: dyeing of purchased fabrics, i.e. installation of a printing plant in order to exploit the existing bleaching plant and the finishing plant.)

Today a vertical integration of the factories is not necessary any more. Thus a weaving plant in Nairobi today practically works with no overhead expenses. If the factory would spin their own yarn, it is to be supposed that this would be more expensive than the one the plant is buying. - From the existing vertical factories only, the United Textile Industry is ballanced. All the other spinning plants sell yarn.
As there is a great demand for yarn, an extension of the spinning plants would be desirable.
It is to mention here that the countries in Asia, actually exporting grey fabrics at dumping prices sell yarn at relatively high market prices.

8. Economic and Technical Feasibility of proposed projects

New industrial projects can be realised only after having received a licence. To obtain this, an

Application

for the grant of an industrial licence

must be submitted to the East African Industrial Licensing Ordinance

Registrar
P.O.Box 30462
N a i r o b i/Kenya

The licence will be granted only if no justified objections will be brought forward by the members of the EA-community industries.

There are with the Ministry the following pending applications:

1. B.L. Dowling
   "Plied Yarn and Sewing Thread"
2. W. Plöger
   "Threads"
3. Kenya Cotton Mill
   "Bed covers, Bed sheets"
4. Simba Textile Mills
   "Bed spreads, Towels"
5. Maurer Textiles SA
   "14,5 Mio.sq.yds. Spinning, weaving, finishing."
6. Flamingo Textiles (i.f.) Ltd.
   "15 Mio. sq.yds. Spinning, weaving, finishing."

8.1 Dowling - Thika

a) Factory Scope

Plied Yarn and Sewing Thread
960'000 lbs. p. annum initial capacity
3 mio. lbs. p. annum final capacity

b) Market

- there is a demand for about 400 - 500 tons of Sewing Thread in the EA countries, but only half of it in Kenya.

  Plied yarn requirement.....

- The above initial capacity is too high for the Kenyan market.

c) Feasibility

There is no doubt, that the plant in mind could work very profitable and would help to save some million shillings in foreign currency every year.

The plant would encourage local spinners to extend their plants to spin Galole Cotton.

d) Difficulties

According to the actual principles of the EA government only fully integrated plants should be considered and licensed. But it is to mention that the spinning capacity in both neighbouring countries is showing already a certain degree of oversaturation and still new mills are built. In Uganda there are already idle spindles.

Only one of the factories can be realized, either 8.1 of 8.2.

8.2 Wilhelm Plöger

EA Fine Spinner Ltd.

a) Factory Scope

Spinning of fine yarns

Manufacture of threads 400 tons/year

b) Market

There is a demand of about 400 - 500 tons of sewing thread in the EA countries, but only half of it in Kenya.

in the EA countries, but only half of it in Kenya.

c) Feasibility

The study made by Mr. W. Plöger is very reasoneble. The plant in mind could work with a reasonable profit.
The number of African workers (1o8) seems to be very low in relation to the total investment of 98o'ooo £ i.e. 9.ooo £ per working place. Either Mr. Plöger has installed too highly automationized machines for a developing country or the number of workers to be employed has been fixed too low.
The latter would have a certain influence on the profit and lose calculation.

d) Difficulites

A too big unit has been chosen for the reletively small market.

8.3 Kenya Cotton Mill - Nairobi

a) Factory Scope

Weaving of bed covers, bed spreads and bed sheets
15o'ooo pcs. per annum initial capacity
45o'ooo pcs. per annum final capacity

b) Market

According to the information given by the Kenya Cotton mill in their application the total demand of bed covers, spreads and - sheets for the 3 EA countries tops in about 18o'ooo pcs. per year, while the Kenyan market absorbs only 7o'ooo pcs.
The Kenyan import of bedsheets, bedspreads, chadders, and similar bed covers amounted to:

1966: 4224 ooo sq.yds. (i.e. 1 mio. pcs.)
1967: 2143 ooo sq.yds. (i.e. o,5 mio. pcs)

The chosen capacity seems to be reasonable.

c) Feasibility

There is no difficulty in producing the above described articles. The capital of £ 75'ooo propoeed for the mill will essure proper installation. There will be employed some 7o African workers, i.e. an investment of less than 1'ooo £ per working place.

d) Difficulties

Concerning integration same remark as under (8.1)

8.4 Simba Textile Mills

a) Factory Scope

Weaving of bed spreads, terry and jacquard towels.

b) Market

Concerning bed spreads as (8.3)

For towels there would be a certain market, but the only factory operating (March 1968) makes no profit because of the competition from overseas. In 1969 there will open another factory in Mombasa.

c) Feasibility

No details were available

d) Difficulites

Competition

8.5 Maurer Textiles SA

Textile Mill - Eldoret

a) Factory Scope

Spinning, weaving and finishing incl. printing of drills and finer clothes.

14.5oo'ooo yards per annum

b) Market

The study of Maurer has been made in 1966, the application submitted in January 1967. The production scope was based on an EA-market, while in the meantime the situation had changed by import restrictions, and by new factories in Tanzania and Uganda. The total import of textile fabrics to Kenya amounted in 1966 to 34 mio. squ.yds. (cotton) while the total production of woven cotton fabrics for 1968 will reach 15 mio. squ.yds. only.

There is an increasing demand for shirtings and poplins in Kenya, but the printing plant with a presumed production of 8.5 mio.squ.yds. can be absorbed by the EA-market only. The consumption of printed fabrics inside Kenya is still relatively modest.

c) Feasibility

The techn.feasibility of the project is 1oo% secured.

The economical part has to be revised, as in the meantime the excise duty and the transport tax (for exports to Tanzania and Uganda) has been introduced. Both, the duty and the tax, will have an influence on the rentability of the factory.
The prices for the investments are too high.

a) Difficulties

Technically no difficulties. For the rentability of the plant, the new conditions on the market have to be considered.

8.6 Flamingo Textiles (i.f.) Ltd.

Textile Mill-Nakuru

a) Factory Scope

Spinning, weaving and finishing
10.000'000 yards p.a. printed
5.000'000 yards p.a. polyester-cotton blends

15.000'000 yards p.a.

b) Market

The basic study has been made by Frauenlob-Wippermann in 1967, but revised by more profound studies in February 1968. Special attention has been paid to the polyester-cotton blends of which Kenya had imported 6 mio. yards, the three EA-countries together 10 mio. yards in 1967 (acc. to Frauenlob-Wippermann). It is generally recognized that the consumption of finer clothes and poplins has been considerably increased, since the shirt- and garment-making industry has been widened to such an extend, to feed the greatest part of the market.
The figures concerning the actual and future situation of the market, i.e.

1967 consumption 86 mio.yds. of textiles
1970 consumption 109 mio.yds. of textiles

differ from other sources and will have to be confirmed by the economist. The 10 million equ.yds. of printed cotton goods are more than the market of Kenya will be able to absorb.

c) Feasibility

The technical feasibility of the project is 100% secured.

The economic part has to be revised, as neither investments for the thermo-setting equipment (for polyester finishing) nor the exise duty had been entered. Both will have an influence on the rentability of the factory.

d) Difficulties

Technically no difficulties. Applicant should correct his figures concerning production cost, turnover and probably reduce the enviseged output.

8.7 Summary

There is a demand on

bed sheets etc.
sewing thread
cotton and rayon fabrics

and factories whould be built to produce these goods, if the Kenyan Government can give a protection to the new factories against the growing competition from the EA countires.
Two companies have applied for a licence for spinning, weaving, printing and finishing, i.e. "Maurer Textiles S.A." and "Flamingo Textiles (i.f.) Ltd.". The combined capacity of both is about 29,5 mio. sq.yds.

We feal a substancial overlapping in the production scheme of the two factories and an overrating of the actual demand of prints.

Maurer would produce	3,5 mio. sq.yds. of shirting and poplins,
Flamingo furter	5,o mio. sq.yds. of PE-cotton blend
together	8,5 mio. sq. yds.

while the total market has been estimated (by Flamingo) to be 6,o mio. sq.yds. only - in 1967.

Actually there is no place for both factories at the time.

The total investment of Flamingo Textile are much lower and more reasonable than Maurer ones. The capacity could be reduced to the actual demand.

9. The weaving capacities of EA in brief

The following table is an extract from Mr. U.Rundins report on the East African Textile Industry.

Expected Production 1967 and 1968 ;

Cotton fabrics, woven

a) grey	EA	28.220.000	sq. yds.	
	K	4.800.000	" "	= 17%
b) bleached	EA	8.100.000	" "	
	K	2.580.000	" "	= 31%
c) coloured	EA	2.000.000	" "	
	K	nil	" "	= o %
d) dyed Khaki	EA	7.500.000	" "	
	K	640.000	" "	= 8,5%
e) dyed trills and twills	EA	4.100.000	" "	
	K	nil	" "	= o %
f) other	EA	52.170.000	" "	
	K	2.540.000	" "	= 5 %
g) printed	EA	19.400.000	" "	
	K	nil	" "	= o%
	Total EA	121.490'000	"	
	Total Kenya	10.500'000	"	

In the items (c) and (d) a little disarrangement occured in favour of KENYA, not having however any influence on the total sum.

According to Mr. Rundine calculations the consumption of woven cottons in 1966 for the three EA-countries amounted to 174 mio. squ.yds. (Thereof 48 mio. squ.yds. in Kenya). The capacity having built up presently in Tanzania and Uganda is not known to us. But it is sure that this will lead to a temporary crisis in the countries evolved and this crisis will have an influence on Kenya, too. On all forthcoming projects the renbability must be a priority;for the factories already exieting there will be a necessity to reorganise and, if expedient, to extend themselvee.

Munich, April 1968

Dipl.Ing.U.Metzker

PART B : Technical recommendations

PART B - Technical Recommendations

1. LICENSING SYSTEM

The actual licensing system does not encourage entertainment any more. But licensing has been agreed as a principle between the East African countries.

1.1 Licensing for Industrial Enterprises (Factories)

The licenses given to the industrial enterprises do neither correspond to the actual nor to the theoretical production of the license holders. The Industrial Licensing Ordinance has given three times as much licenses for the blanket manufacturing industry than the market can absorb.

Name of factory	output in 1000's of sq. yds. p.a. actual	theor.	licensed
Kenya Rayon Mills Ltd.	2 500	3 300	15 000
Kenya Textile Mills	1 250	3 000	3 000
United Textile Ind.Ltd.	3 000	3 500	10 000
Nath Brothers Ltd.	4 500	5 000	7 500
Kisumu Cotton Mills Ltd.	7 000	8 500	20 000 *

* incl. towels and blankets

Name of factory	output in 1000 s of sq.yds p.a. actual	theor.	licensed
Towel Manufacturers Ltd.	200	600	1 000
Dodhia Plastic Int. Ltd.	-	400	1 200
Kisumu Cotton Mills Ltd.	-	-	?

	output in 1000 s of blankets p.a. actual	theor.	licensed
Nakuru Industry Ltd.	1 700	3 350	3 500
Kenwool Enterprises Ltd.	-	150	.....
Shah Bhagwanji Kachra Ltd.	700	1 560	1 200
Samah Textile Industry Ltd.	480	720	1 000
Blanket Manufacturers Ltd.	336	528	1 000
Kisumu Cotton Mills Ltd.	-	-	1 500

- Licenses should be given more easily and within a shorter period.
- Licenses should be given to carry out a certain activity, with not too bound limitations.
- Licenses should be given to install certain machines.
- Applicant shall prove
  - - the actual demand of articles (he intends to manufacture)
  - - the priceworthyness of his production which will have to compete with worlds markets
  - - the know-how
  - - how he will train the staff
  - - inform the chamber of commerce on the number and quelification of skilled and instructed personal he will need,
    the licence shall expire after two years if the machinery was not ordered or delivered.

The above conditions will garantee that no protective measure - or only temporary ones - will be demanded from the goverment.

For minor changes in production a registration (extension of licence) should do.
If a successful enterprise will ask for extension, this should be easily granted.

1.2 Licensing and Integration

The actual trend in E.A.textile licensing goes towards vertical integration (as in the times of Mahagna Ghandi who had to break a monopoly). As Kenya is developping, any industrial activity should be attracted. Note that finishing is not only the most profitable branch of the textile industry, but on the same time the most currency - saving one.
Any industrial activity requires a certain special skill and know-how. For a relatively small industrial unit - and most of Kenyan factories are relatively small in comparison with modern plants in highly industrialized countries - the factory has to have for any branch of activity a number of foremen, technicians and engineers. This might be quite a burden and certainly affect the costprices and finally result in request for governemental protection.

- We recommend that licences to be granted for any activity which might improve the rentability of the existing plants.

1.3 Licensing for Transport

Any larger industrial enterprise will need at least one lorry of their

own. The C-licence should be automatically granted.

Remark: Spareparts and tools often arrive by air.
The clerk who clears those out from customs should have the possibility to carry them at once to the mill (sometimes in his personal car.)

2. FIBRE - YARN PROCESSING (cotton, rayon, viscose)

Kenyan spinning mills will have to improve their rentability. The governing factors for a plant are:

- choice of machinery
- minimum size of a workable unit
- labour
- airconditionning
- layout
- maintenance
- sales and markets

2.1 Choice of Machinery

The textile industry is often regarded as traditional and static rather than as dynamic, and as labour intensive rather than as capital intensive. This image of the industry was correct up until some fifteen years ago when, after over half a century of technological stagnation, dynamic changes began to alter the situation. Since then production capacity of machinery has increased dramatically.

UNIDO had called in October 1967 for a expert meeting to deal with the problem of the selection of machinery in the cotton industry because of the importance of this sector to the developing countries. The report of the group consists of two major parts:

a) Specification and comparison of different levels of technology..
.....

b) Establishing of criteria for the selection of equipment for these levels.

The different levels of technology (and machinery) are:

a) Conventional Equipment;

b) An intermediate level;

c) A high level of automation.

According to this criteria it can be stated that most of fibre-yarn processing machinery in Kenya - with few exceptions - falls below the criteria of the conventional equipment and is to be considered as absolete or partly absolete. A systematic renewal will have to take place.

According to the recommandation of the meeting, developing countries will not show a tendency to automation for fibre-yarn processing, as high level automized equipment is too high in investment per employee and is contrary to a diversified production.

- We would recommend to encourage the textile industry to modernize their equipment, in order to reduce production cost.

- With the existing spinning plants no experiments towards a diversification of production should be made, as the plants are giving the best productivity in the counts they have been designed for. (Note: the demand of 2o'counts is higher than the actual production)

- To lower the production cost (and of course the investment) we see no disadvantage to purchase second-handmachinery with high output, if in first-class stage and of very recent make.

- No further investments for absolete machinery, even if new.

- Spinning preparation, i.e. opening up to carding should be bought from one manufacturer with regard to a future adaption to a continous process line.

2.2 Minimum Size of a Spinning Plant

No spinning plant can operate reasonably with less than 5 ooo spindles while the profitable unit should consist of at least 12 - 2o ooo spindles.

2.3 Labour

With skill and education we shall deal in chapter 6 of this report. Here we'll describe labour as an (costy) input and give comparitive figures.

A good spinning mill in Kenya has employed:

147 workers
3 technicians/engineers
6 Office-employees

for about 9 ooo spindles with an average production of about 16o kg/h (36o lbs.p.h.).

This factory should work with 38 workers - if number of spindles were compared with " optimal conservativ standard plant" or 33 workers only - when comparing the output of the plants. (UNIDO - figures).

Still labour is "cheap" in Africa, but 3 to 4 men cost as much as a skilled European or Asiatic worker.

If we

compare	147	:	33
we get	4,3	:	1

and consequently labour cost becomes higher than in Europe or Asia.

If we consider, that this special factory has purchased their machinery at favorable conditions, they might be just competitiv with imported yarn.
There are more modern and more absolete plants in Kenya than the one we picked out.

2.4 Air conditioning and Roof Insolation

In any spinning plant ere should be maintained a constant temperature with a certain percentage of humidity. The air should be free of dust and lints.
In the coastal area of Kenya with its excessive humidity above condition can't be obtained by economic airconditioning plants.

- No fine spinning plants should be built in Kenyas coastal area.
- New factories should have adequate airconditioning systems, roof insolation * and dust extruction.

* not in any areas.

2.5 Layout

The layout of the equipment should be planned to make the most economical use of space, to give an efficient material flow and to allow for expansion.

- New factories, or any extension of existing ones, should submit their layout.

2.6 Maintenance

Equipment maintenance must be organised and directed in a strict and methodical manner, regard of the level of the equipment.

In giving due emphasis to a well organized maintenance control program, the mill control laboratory should work with the maintenance departement, especially in organizing the scouring of machinery.
A well equipped machine shop is especially important in the context of developing countries where the mills may be isolated and there may be more difficulties in obtaining spare parts than in developed countries.
We refer further to chapter 7) of this report.

2.7 Sales and Markets / Diversification

A spinning plant of a certain minimum capacity (we mentioned 12 - 2o'ooo spindles) can work profitable whether a part of an integrated plant or selling yarn to others.

Most of the plants will be integrated, but there will be a demand of yarn for hosieries and some weavers.
Any plant who will sell yarn must be aware that they will have to satisfy their clients with specific yarn according to order. Such factories will require a more competent overhead and management.

3. WEAVING PLANTS (COTTON, RAYON,VISCOSE)

The output per worker of Kenyas weaving plants is far behind any statistics. A complete modernization will have to take place to improve the productivity.

3.1 Choice of machinery

According to UNIDO-experts meeting "the conventional level of equipment sophistication" is considered the most suitable current level for developing nations. Taking into consideration the cost and problems of complex machines, the UNIDO-experts group strongly recommends that developing nations should not install advanced or automated equipment (except for winding and sizing where some sophistication is considered justified).

The orderly fuction of the weaving preparation department will have a decisive influence on the efficiency and quality obtained from the weaving department.

- modern and(partly) automized winders should be installed wherever possible. This will reduce complaints to a minimum.
- electrically controlled sizing machines should be applied for bigger plants. To avoid a breakdown of production, there should be always 2 machines.
  For very small weaving plants one older sizing machine will do.

Only 15% of the waeving looms installed in Kenya are automatic ones. The rest are manually operated. The UNIDO-expert group considers automatic looms as the conservativ type; manual looms are considered to be absolete.

- Accordingly Kenyan weaving plants should be modernized as soon as possible, otherwise they will not be able to produce at competitiv cost prices.
- There is still a possibility to attach rotary batteries etc. to the more recent built weaving looms.
- In future no looms than excellent automatic ones should be installed (Whether new or second hand).
  Experts should accept any machine prior to shipment !

3.2 Minimum Size of Weaving Plants

In fact there is no minimum size of weaving plants, although bigger plants will most probably work better.

For a modern weaving preparation, the number of 3oo looms would be ideal. There is no need to have a own spinning plant, as long as one can buy good yarn at reasonable conditions.

3.3 Labour

The quality of woven fabrics depends to a high degree on the skill and willingness of the attendant. This applies specially to the primitiv looms, but to a certain extend to automatic looms, too.
With absolete weaving looms, labour becomes a very costy factor.

A factory in Kenya with new machinery from Japan who has started production few years ago only employs in their weaving section about 42o workers for 1o8 looms, (including weaving preparation, inspection, etc.) with an average production of 45o sq.yds. p.h.
This factory should work with 5o workers - if the number of looms were compared with the "optimal conservativ standard plant" or 3o workers only while comparing the output of the plant. (UNIDO-figures.)
Above figures are very ideal, but a correction would not affect whole picture.

If we compare 42o : 5o
we get 8,5 : 1

which makes production prohibitiv, even if we consider the lower investment of the simple machinery. The above plant was still under training but it represents the actual situation of weaving plants in Kenya very well.

3.4 Airconditioning

For weaving plants a proper airconditioning installation would be desirable but humidification respectively humidity control will be the minimum we should ask for. As the demanded percentage of humidity lays relatively high, most weaving plants should have roof insolation in order to keep the heat (which dries the air) away.

- New plants should be equipped with an adequate airconditioning and /or humidification system.

3.5 Layout

as (2.5), but note the distance between the looms should allow easy transport of warp/loom beams.

3.6 Maintenance

as (2.6)

3.7 Sales and Markets / Diversification

The pallete of products of a weaving plant is usually bigger than this of the spinning plant, as there are many articles to be produced to satisfy the (permanently) varying merket.

The only articles which can be produced in big quantities are grey baft (americani) and some drills; for any other articles the weavers have to follow the trend of the markets. To produce more articles needs a better organisation and a better approach to the market, i.e. marketing.

There are only few articles which can be sold in loom stage (mostly grey baft and other cheap articles for which production does not pay.) Finishing plants however are expensiv and their capacity correspond to at least 3oo looms.

(Further remarks on finishing in chapter 4).

4. FINISHING PLANTS FOR COTTON FABRICS.

Finishing means just pressing, plaiting, cutting and wrapping, but we use it as a synonymous for the final treatment of goods (desizing, bleaching, mercerising, dyeing, printing, washing, stenting, shearing etc.).

Each article needs a special treatment and has to pass through the specific machines of the line.

Nowadays only modern plants are in use and give satisfactory results. The capacities of modern plants are relatively high, as the investments are. To run these modern plants a special skill is required.

Only bigger weavers will have the possibility to run their own finishing plants. For smaller weavers the investment will never pay. In Kenya actually two factories run their own finishing plants - both to be considered as small ones in comparison to their finishing capacity.

- We would recommend to investigate whether the two factories who have already a finishing plant of their own would be interested to finish imported goods in order to raise their efficiency, and
- whether the factories would be ready to finish fabrics for local weavers on order bases.

There is no printing plant in Kenya yet, except the one of Kenya

Torray Mills Ltd. in Thika, printing on nylon fabrics only.
There is an increasing demand of fashionable and fancy African prints. Most of the designs are due to fashions and can be sold in relatively small quantities only.

- Before starting with printing in a bigger scale a thorough analysis will be due. The choice of the equipment will depend mostly from this study.

5. Blanket Manufacturing

There are in Kenya factories with relatively modern and other ones with absolete machines. The licensed capacity for blankets is about 3 times, the practical capacity 2 times the actual consumption.
There are factories who make very good blankets and other ones do not even keep an average standard. There are dozens of sizes and qualities on the market, which make a selective comparison for the consumers nearly impossible.
It is quite sure that there is no hope that all the factories will survive the crisis. The relatively small mills (in Mombasa) have practically the same overhead as the bigger ones.
In order to protect the consumer and to give him the possibility to compare the manyfold blankets, a certain standardisation of sizes and qualities (except for de luxe qualities) would be faire. This system would eliminate the lower production first.
No specific recommandation can be given.

6. Labour and Skill

In part A of this report, workers and their skill have been subject to very hard criticism. But not only the workers, but the whole staff does not correspond to what they should be.
Quality and efficiency of a factory depend to a very high degree to the capability, willingness and efficiency of the labour.
There is a fatal lack of education and training.
The manpower in the production line should consist of:

- attendants (trained, unskilled workers)
- supervisors* (as above but with better ability or KJSE)
- foremen * (either KJSE or craft examination)
- technicians (certificate of polytechnic)
- engineers - in major factories only, acting as general managers, mill managers, or chiefs of department.

- office boys (KPE or CSC)
- clerks (CSC or HSC)
- typists (CSC and special courses)
- accountants (HSC and special courses)
- chief accountant (HSC or 1st University degree)
  - in major factories only
- commercial director -
  - in major factories only

In the past years there was not paid enough attention to training and instruction of the mills staff.
The Kenya educational program can and will help the industry ot give the adequate skill to a justified number of personel.

- We recommend that the Chambre of Commerce and Industry will inform the Kenyan industry about the educational program of Kenyan schools.

- The Chambre of Commerce and Industry should - with the assistance of the Kenya Polytechnic and other institutions - provide questionnaires to the industry asking for:
  demanded skill or degree
  number of male or female
  year of intended first employment.

  The same questionnaire should be filled by any applicant for an industrial licence.

<u>* Skill of Supervisors and Formen</u> (*footnote to above)
There could be in future an other way to give the required skill to the workers.
We had mentioned in Part A of the report, that manual ability of workers who touch at the age of 18 years for the first time in their life technical equipment can not be the same, as of younger workers. The manual ability gets lost or spoiled.

For those boys who are not gifted for theoretical training - or who have not the possibility to visit a techn. secondary school - there could still be given an opportunity to learn a profession, to develop their manual ability or technical sense (for which they might be more gifted than for theory) and to become skilled workers, craftmen or even technicians.

The training program of those boys - apprentices - should be:

. primary school
. enter a workshop/factory as an apprentice for four years
  9 - 1o months p.a. work and 2-3 months p.a. practical and theoretical training at a Training Center.
. Craftsman examination with certificate after 4 years.

The Textile Training Center could train mechanicians, electricians, spinners, weavers, dyers, etc. The salary of an apprentice should be low in order not to attract those, who intend to visit the secondary school.

7. Maintenance and Spare Parts

The Kenyan textile factories have in general too small and not adequate workshops. With few exceptions only there is a general certain lack of maintenance. But lack of maintenance will cost very dear on the long hand. The more complicated the machines will be - and to compete with worlds markets there will be more complicated machines - the better skill will be necessary to the maintenance staff.

- Specially new factories will have to prove how they will solve the maintenance work,
- any new factory should have an adequatly furnished maintenance shop (whether new or secondhand machines will be installed does not matter).

It is essential for any factory to have a stock of spare parts and accessories (UNIDO recommends a 2 years stock for new factories), but even in the best spare part store there will be sometimes important spares missing, specially for those machines of which only one kind has been installed.
It would be a great advantage fot the Kenyan industries if spare parts on order bases could be obtained at reasonable prices from Kenyan workshops. Such a workshop could be attached to the Industrial Training Center, to the "Nairobi Industrial Estates" or work as a private enterprise.

- We recommend that the Chamberof Commerce and Industry will investigate the possibility to establish such a workshop.

8. Management and Organisation

There is no or very recent industrial tradition within Kenya.
To several textile industries the technical know-how was given by suppliers of the machinery or by foreign partners. The interior organisation of the different factories vary very much, from smalest to inflated body.
Factories who make just few articles and who have not to bother about

sales have very often an engineer as their general manager. The administration is kept to a minimum.

In factories with a very diversified production or a production of fashionable articles (most of textile industry will have to concentrate on fashions) special attention will have to be paid to the sales department. Beside a firstclass technical management and to produce many top quality articles they will need a really good technical management, factories will have to force selling and in many cases the sales department will outnumber the technical staff.

Note: actually factories have to sell what has been produced.
It will be more profitable to produce that had been ordered. As most of the dealers are or have been importers, it should be easy for them to place orders in advance.
Only if orders can not be placed with the domestic industry, orders for imports will have to be placed.

- New industries will have to follow most modern marketing ideas.
- Any existing mill will have to reorganize and to modernize. This certainly will need the help of experts.
- The best management will fail if their activity will be set back by a non-elastic licensing system.
- It must be the aim of the management to produce at competitive prices.

9. THE ROLE OF TECHN. CONSULTATION FOR THE TEXTILE INDUSTRY

In order to protect the already established domestic textile industry a certain guidance will be required for some years. The task will be manifold and can be solved by a team of consultants only.

Consultants can offer:

- Checking of forth-coming projects (applications)
- - feasibility studies
- - composition of equipment
- - analysis of prices
- - specifications and tendering (calling for offers)
- - accept machinery prior to shipment
- - studies on the layout
- - planning of new plants and extensions.

- Reorganisation of existing mills

- - detailed survey of machines and the plant
- - studies of actual production scheme and material flow, processing labour force,
- - tables of inputs, outputs and losses
- - description of the actual organisation
- - direct recommandations, where necessary
- - report towards a reorganisation scheme

- Technical Assistance

- - giving the know-how, whenever required
- - recrutment of additional technical staff, selection and training
- - training of the actual technical staff in European factories.
- - information on new technical methods and techniques,
- - periodical visits to the factories
- - purchase of accessories (and spare parts) through a European non-profit organisation.

We know that the services of a consultant will cost dear. The consultant however will raise the productivity and will - in some cases - save a part of actual management cost. Purchase of accessories (and spare parts) can save a good percentage and will diminuish correspondancy to a minimum.

10. FINAL CONCLUSIONS

The future development of the textile industry will raise many problems and will be in some cases even painful to owners and workers.

The productivity in the rich countries has been increased year by year but not yet in most of the developing countries. The rift in the productivity between Kenyan textile industry and the industrialized countries has been widened in the last few years irspite the excellent development in other fields. If the textile industry will not accept modern processing, this industry will never be able to compete with foreign markets and will depend on the mercy of the government or undergo. New, modern factories will dictate prices and those, who cannot follow will fail.

African labour is cheap in relation to earnings in rich countries, but only to a certain extend cheap. Wherever labour assignment increased to more than 3 to 4 African workers for the product made in the rich countries by one man, the competitivity will become dubious.

With absolete plants the ratio can mount to 1o:1 or higher.

The industrial way of enterprise demands a high utilisation of invested capital, while Kenyan new finishing plants are at 7o% (seventy!) percent idle.
While everybody in Kenya is keen to get optimum education no attempt has been made yet towards special courses for textile workers.
The Kenyan textile industry should organise (with the aid of the Chambre of Commerce and Industry) in order to solve their commun problems.
For the technical and economic development of the country it does not much difference, whether textile mills are fully integrated or not. Even if the development would concentrate - for a certain time - on some (more profitable) branches, the final trend will - as soon as the preferred branches will be saturized - fill "the holes" in order to satisfy the major part of the market. After few years nobody will ask any more which branches of the textile industry have been built first.

As regard to the modernization of the factories, for many years highly automized machines will be excluded. For the supply of modern machinery with a high output it makes no difference whether the enterprise will prefer new or nearly new machines.
Investments for new but absolete machines should be stopped at once.

In giving the textile industry a guidance, technical assistance and more liberty in their production scheme, the industry will certainly modernize within few years and overcome the actual crisis.

Nairobi, October 1968

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documents

- " A Guide to Industrial Investment "
  by Ministry of Commerce and Industry
  Nairobi 1967
  on page.....employment

- " Licensed Textile Manufacturers" (July 1967)
  a confidential report on the Textile Industries of the
  3 East African countries by East African Common Services
  Organisation
  Economic advisory unit
  P.O.B. 30462 - Nairobi

- " Follow-up Study of the 1965 Textile Report"
  by the Associate Economic Advisors. (By Mr. Ulf Rundin)

- Textile Industry - Outline; by the UNDP

- UN Centre for Industrial Development
  Regional Survey on the Cotton Industry, Wool Textil Industry
  Jute Textile Industry

- Working Tables "Textile Production 1966 - 1970"
  by
  Economic Advisory Unit (Mr. U. Rundin)

- Application for the grant of an industrial licence for a
  Textile Mill by
  Maurer Textiles S.A.

- The East African Textile Industry
  Part 1, Trade, production and consumption of textiles,
  by Mr. U.Rundin (March 1968).

- UNIDO - Vienna
  Report of Export Group meeting on the Selection of Textile
  Machinery in the Cotton Industry (1967).

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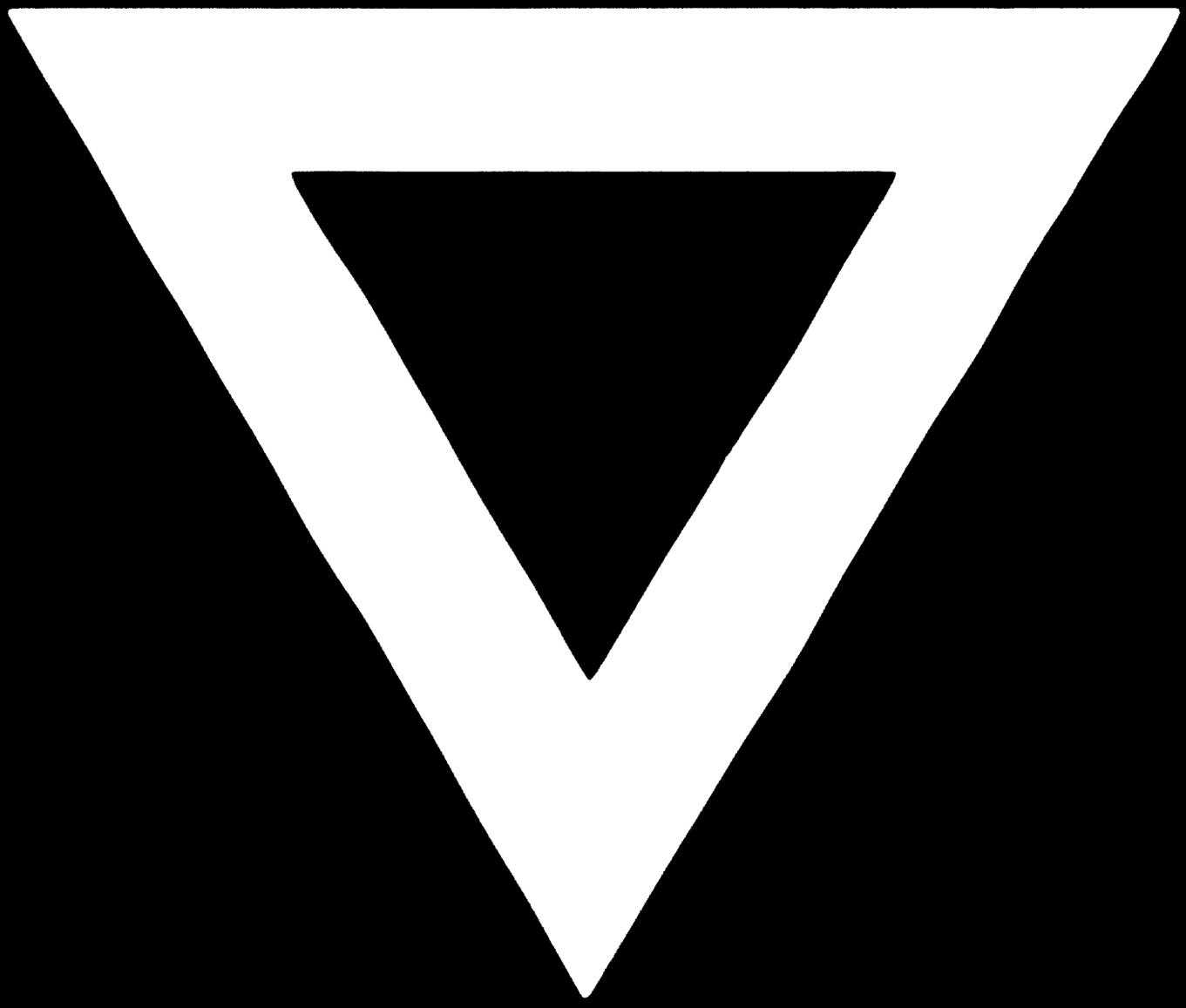

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