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COTTON TEXTILES COMMITTEE

SURVEY ON PRODUCTIVE CAPACITY IN THE WORLD COTTON TEXTILES INDUSTRY

Note by the Secretariat

1. The Cotton Textiles Committee agreed at its meeting in December 1963 that material should be collected to enable the Committee to follow structural changes and adjustments and to discuss prospects for a further expansion of international trade in cotton textiles. This material should include, *inter alia*, estimates of future trends in consumption, production, productive capacity etc. It was further agreed that the secretariat, in collecting such material, should use all available sources and take full advantage of the work being undertaken by other organizations.
2. The attached survey, giving certain information on production and productive capacity, represents information which could be included in a broader, more comprehensive study on future trends in consumption, production, productive capacity, etc. The survey has been conducted through the generous cooperation of the International Federation of Cotton and Allied Textile Industries (IFCATI).
3. The data presented are designed to trace the changes which have taken place in the capacity and production in the cotton spinning and weaving industry during the last decade and offer also some indications of future developments. The survey is essentially a statistical one and is based mainly on enquiries made by IFCATI to industry associations in the different countries.
4. Not all the countries surveyed were in a position to submit equally complete data; moreover, much of the data supplied is of a provisional nature. For some countries no information at all was currently available but might become obtainable in the near future. The information contained in this report must, therefore, be considered as incomplete and preliminary.
5. Some of the main features evident from the statistical tables are described in Part I (attached), while the tables themselves, with notes and explanations, are included in Part II (COT/W/29/Add.1). IFCATI has made available a certain number of copies of the basic material received from the submitting associations, which can be distributed (as Part III), to delegations having a particular interest in this material.¹
6. As is stated above, the information contained in this survey only represents a part of the material which the secretariat hopes to provide for the Committee. It would like to discuss with the Committee at technical level the best way to proceed and, in particular, the steps which can be taken to make available the additional information needed by the Committee.

¹ Available in English only.

SURVEY ON PRODUCTIVE CAPACITY IN THE WORLD COTTON TEXTILES INDUSTRYPART I: MAIN FEATURES

1. The term productive capacity, as used in this survey, is defined as the machinery in place and the hours during which it is worked. These factors together set the mechanical limits to output.
2. The machinery surveyed covers what is generally termed as the cotton industry, although to some extent it also uses artificial and synthetic fibres.¹
3. Utilization of machinery is calculated throughout this report on the basis of the number of hours and shifts worked per day. As will generally be recognized, a shift is the period of time during a day when one group of people work unchanged. The survey has taken into account modern working conditions and variations between countries and has defined a single shift as 2,100 hours per year, two shifts as 4,160 hours per year and three shifts as 6,200 hours. This scale takes into account the usual differences in length of the three shifts. The concept of maximum machine utilization has been introduced so that all industries may be compared against a maximum utilization of 7,488 hours.²
4. The survey shows varying patterns in the world cotton textiles industry. Some countries, for example, have a well organized industry with a high degree of machinery utilization. The majority of national cotton textile industries, however, may be classified in a second group, in which - although they are still viable - there is a need for improvement of machine productivity by all possible means. A third group of countries has a rate of productivity which is even lower.
5. A detailed study of each of the tables contained in Part II will emphasize these three groupings.³

Table A - Spinning: Machinery changes and utilization

6. The first trend which is thrown into sharp relief by this data is the separation into contracting and expanding cotton industries. The process of contraction by scrapping is dominant in Western Europe⁴, Canada, the United States and Poland, whilst the Japanese have mothballed much of their machinery instead. In South America, too, in some instances, the reduction of spindles in place is apparent. Noticeable from Table A is the correlation between machinery reduction and the increase in spindle utilization. Disregarding the effects of good or bad years, the trend for most countries which have reduced capacity is towards

¹ See Part II, General Note, paragraph 4, page 2/3.

² See Part II, General Notes, Table A, page 4.

³ The following summary of findings with reference to the various tables is not intended to be exhaustive and should be read in conjunction with the tables themselves.

⁴ The United Kingdom is outstanding for the huge contraction which has occurred since 1939.

better utilization. The exceptions are Spain and Japan where the proportion of idle but installed capacity is above average. Other countries have tended to increase their installed spinning machinery. Particularly striking examples of this expansion are perhaps Hong Kong, Pakistan, the Philippines and South Africa. These growing textile industries are also, in many cases, succeeding in raising their machinery utilization even as they raise the number of spindles installed, e.g., the United Arab Republic and South Africa. Some, however, have failed to increase machine utilization and it has stagnated or fallen as additions to machinery are made. Hong Kong is outstanding in that it exceeds even this survey's "maximum" utilization both in spinning and weaving.

Table B - Weaving: Machinery changes and utilization

7. The same division, as in spinning, into old-established contracting cotton weaving sectors and newly established expanding cotton weaving industries is clear. In South America the trend towards contraction in the weaving sector is more marked than in the spinning sector despite expansionist influences in certain of the smaller nations. This table indicates that some countries such as Hong Kong, Pakistan, Colombia and Nigeria are able at present to equal and sometimes surpass the utilization of looms in the United States as is the case in the utilization of spindles. Only Canada, among those countries with a weaving sector which has contracted significantly since 1939, can nearly compare with the United States.

Table C - Change in the proportion of automatic and semi-automatic looms in place

8. While Table B draws attention to the contraction and relatively low machinery utilization of many of the traditional centres of cotton manufacture, Table C highlights another factor of an up-to-date industry: the modernity of the weaving equipment installed. With the proviso that in some cases the automatic loom is not the best possible for the type of production envisaged, generally speaking the proportion of automatic looms installed is an indication of the degree of modernization.

9. In contrast to their contraction and their still generally low rate of machine utilization, the traditional manufacturing centres have done much in the field of modernization. The United States with 100 per cent automatic looms, is shown to have the most modern industry, but Austria, Denmark, Finland, Germany, Italy, Norway, Sweden and Switzerland have all made great strides in the introduction of automatic machinery. Other Western European countries are replacing outmoded equipment at an increasing rate. Eastern European countries, too, are similarly placed though Hungary and Poland appear to be lagging. Certain less-developed countries have a very modern industry such as Hong Kong, Pakistan, Colombia, Israel, Nigeria, Paraguay, the Philippines and South Africa, whilst some have not been able to modernize and expand at the same time. Japan should not be judged against the small percentage of automatic looms in place recorded since Japanese data record all looms belonging to independent weavers as ordinary whereas many may not be. Independent weavers moreover account for the majority of looms installed. Over the last decade some countries have made great efforts in modernization, especially the Netherlands, Austria, Denmark,

Finland, Colombia, Iran, Mexico, South Africa, Turkey, the USSR and Venezuela. It should be noted that a small percentage change in automatic looms installed in highly industrialized countries may signify a considerable change in the absolute number of these looms.

Table D - Yarn production per spindle in place and average count¹

10. Taking into account the average fineness of yarn produced by national cotton spinning sectors as shown by the columns dealing with average count, this table gives some comparative idea of the productivity per year of the various national spinning sectors. Output is further dependent upon the character and utilization of the machinery and the quality of the labour available. With the exception of Denmark and Norway, no Western European country comes near to the United States output per spindle. Certain South and Central American countries such as Bolivia, Paraguay and El Salvador equal the United States level of production but each has a low average count yarn output. Eastern Europe contains high productivity countries; Hungary and the USSR with an average count measure indicating quite fine yarn. Africa, Asia and the Middle East have high spindle productivity in some countries such as the Congo (Leopoldville), Nigeria, Republic of China, Turkey, Thailand and the United Arab Republic. The efforts to increase productivity throughout the world cotton spinning sector are clearly shown but progress in this field has in some cases been limited. This is particularly true in a number of newly established textile industries where in contrast with the machinery in place, productivity seems to have stagnated or even declined, thereby possibly indicating a less than optimum use of resources. In a few cases the production of slightly finer quality yarn as an average may be some explanation of the reduction in productivity.

Table E - Cloth production per loom in place

11. In view of the lack of any universally applicable measurement of average cloth production quality the data in Table E should be interpreted with caution. Nonetheless, it underlines the trends emphasized in Table D, especially the general increase in productivity in the traditional centres of cotton textile manufactures. By and large, textile industries established in the less-developed countries have been able to achieve only small increases in productivity due, perhaps in some cases, to an already high level of output per loom (i.e. Hong Kong, South Africa, Bolivia). Thus the trend in production per loom appears not to match the trend of machinery in place. A number of countries rival or surpass the United States level of productivity and the list is surprising (i.e. the Congo, Nigeria, Paraguay, South Africa, Turkey, Venezuela and Hong Kong) in that all the countries concerned are newly established textile producers. The explanation would seem to be that the average cloth produced is of a rather coarse quality with relatively little work per ton produced. Hong Kong and South Africa are exceptions but in their case the high productivity is probably the result of a high degree of utilization perhaps made possible by their surplus of labour.

¹ Although no average count for the United States is available it can be assumed that it is at a comparable level with that in the majority of the highly industrialized countries.

Table F - Yarn production, domestic sales, consumption and exports

12. Despite the fragmented information which was all some countries were able to supply and the lack of comparable data on imports, this table and Table G give a valuable guide to the pattern of yarn and cloth trade and supply within the world's cotton textile producing countries. A comparison of national yarn output of 1953 with 1963 shows that merely a handful of countries - Denmark, Sweden and the United Kingdom - have experienced a decrease in the volume of yarn produced. In these few cases only, the ten years of population per capita textile consumption growth have not been sufficient to counterbalance the loss of a large part of their former domestic and export markets. In the shorter term, however, as the competition from new exporting nations has increased, a decrease in the volume of yarn produced has been experienced by the majority of western textile industries. This reduction is evident in every Western European country from 1960 until 1963 except for Greece, Italy, Portugal, Spain, Switzerland and Denmark, whilst Japan, too, experienced a similar decline. All other countries covered increased their yarn production over this period. It is noticeable that Greece and Portugal, for instance, increased their production to a great extent due to export performances resulting from their positions as relatively low cost producers within Europe, while Switzerland has been able to increase by virtue of her speciality in finer yarns. The following estimated percentage changes fully illustrate how yarn output has increased with increasing productivity whilst the machinery in place has fallen.

	<u>Per cent</u>
Fall in spindles in place 1953-1963:	6
Rise in production of yarn 1953-1963:	36

13. Domestic sales to all yarn consumers including those to further processing sectors of integrated concerns have risen in all but a mere handful of countries during the last decade (i.e. Norway, Sweden, the United Kingdom), but over the last four years domestic sales have fallen in Japan and all Western European countries except Spain, Greece, Italy and Switzerland.¹ Complementary to this trend has been a reduction of weaving mill consumption of yarn over the last four years in most Western European countries and also in Ceylon, Australia, Czechoslovakia and Japan. Over the last decade, however, only the United States, Sweden and the United Kingdom show a net fall in mill consumption of yarn. It is noticeable that mill consumption has fallen less steeply in all these countries than domestic sales, which may in part be due to the increasing rôle played by imported yarns and also by the increasing use of non-spun yarns (filaments) in the domestic weaving mills. The United Kingdom domestic sales for instance fell by 19 per cent between 1960 and 1963 whilst mill consumption fell by 15 per cent. In Austria domestic sales fell by more than 4 per cent whilst mill consumption actually rose by 1.3 per cent. Furthermore, French domestic sales fell by almost 5 per cent during this period whilst mill consumption fell only by 1.4 per cent; German domestic sales fell by 12 per cent whilst mill consumption fell by less than 10 per cent.

¹No information was provided for Denmark and Portugal.

14. The data on exports confirm the familiar pattern of recent years with striking increases in the exported volume of yarn from the less-developed countries. It is interesting to note that only the United Kingdom and Italy have experienced a decline in exports throughout the period 1953-1963 whilst all the remaining Western European nations covered have managed to increase exports to some extent. Japan and the USSR have also managed to do the same although the USSR has continued to increase her exports since 1960 whilst Japan has not. France, Germany, Denmark, Finland and the Netherlands have also increased exports of yarn since 1960 with Austria, Belgium, Norway, Spain and Switzerland losing markets. Brazil's small export business is also declining and the data for Pakistan show a decline from 1960 at which time, however, yarn exports were at an abnormally high level due to exceptionally large sales to Hong Kong.

Table G - Cloth production, domestic sales and exports

15. Only a few countries experienced a decrease in their cloth production during the decade 1953-63. Those few include Denmark, Norway, Sweden, the United Kingdom and the United States, the countries which, by and large, have done the most to absorb the great increase in exports from the less-developed countries. Loss of domestic or export markets in Finland, France, Germany and the Netherlands has resulted in a reduction in cloth output in these countries. This tendency is even more marked for Japan as her export markets diminished in Asia and Africa. Ceylon and Mexico suffered a slight decline. As with yarn, it is interesting to compare the changes in installed machinery with developments in production of cloth on a world basis:

	<u>Per cent</u>
Fall in looms in place 1953-1963	13
Rise in production of cloth 1953-63	19

Such an increase in output has not even kept pace with world population which rose by about 25 per cent during the same period.

16. The movement of domestic sales by weaving mills has largely followed the pattern of production. Nearly all the new cloth producing countries expanded their domestic sales in step with their expansion of cloth output. Paraguay, however, shows an insignificant fall whilst Indian domestic sales also fell between 1960 and 1963. Domestic sales decreased in those traditional manufacturing centres which also had a declining output, whilst Czechoslovakian domestic sales decreased despite the nation's increase in output.

17. Such information as is available for the export of cloth shows a widely varied picture. Among those countries which have managed to increase their exports over the last decade are the United Arab Republic, Australia, Portugal, Spain, Japan, Ireland and Mexico, whilst the majority of these together with Colombia, Greece, Italy, India, South Korea, Pakistan, Israel and the Republic of China have increased their cloth exports since 1960. More surprisingly, however, Austria, Belgium, Finland, the Netherlands and Norway have all expanded their exports over the last decade too and indeed Austria, Finland, Norway and Sweden have continued to do so since 1960. However, France, Germany, Switzerland and the United Kingdom have suffered declining exports over the last decade and even both Italian and Indian cloth exports were lower in 1963 than in 1953 although both of these latter countries have increased exports markedly since 1960. Brazil, Denmark, the Netherlands, Spain, Japan and El Salvador show reduced cloth exports since 1960.

Table H - Forecasts: Spinning

18. Almost all those countries which attempted any kind of forecast were generally aware of an increasing market for yarn, although certain Western European countries foresaw only modest increases in their markets until 1970. Indeed, a slowing down of the rate of market expansion in the very highly industrialized countries is expected. An awareness of the need for increased productivity is general and all those countries which were able to reply to the questionnaire forecast some improvement in this direction, although improvement varied from 3 per cent by 1967 and 8 per cent in 1970 to 25 per cent in 1967 and as much as 40 per cent in 1970. Many countries intend to increase the extent of shift working, particularly in the highly developed areas, but in many cases improvement in this sphere was hampered by the trend towards shorter working hours and restrictive labour legislation and practices. In the developing countries many spinning sectors already work more than the three shift standard of 8,760 hours per year and those that do not do so have plans to develop shift working to the three shift level and beyond by 1970. Concrete plans for spinning investment show the possibility of a net addition of at least four million spindles between 1967 and 1970, quite apart from the modernization of a vast number totalling about 3 1/4 million by the same period, and envisage considerable growth in available markets. Traditional manufacturers of yarn found great difficulty in quoting any figures for investment until 1967 in view of the present **changes** in international trade in general, together with the structural developments current in the world cotton industry. The majority of these countries however foresaw the next few years in terms of modernization, replacement and scrapping rather than extensions to spindles in place. In contrast, developing countries generally plan a wealth of new installations and envisage considerable growth in available markets.

Table I - Forecasts: Weaving

19. With definite projected net extensions totalling about 82,000 looms and modernization and replacement plans envisaged for a further 23,000 looms, the picture of future trends in the weaving sector is largely similar to that for spinning. Again, in contrast to those current in the cotton textile industries in developing countries, plans for future investment in traditional producing countries are devoted almost entirely to modernization, replacement and reduction of machinery capacity. Both developed and less-developed countries have plans to increase productivity by amounts varying between 1 per cent and 30 per cent for 1967 and between 2 per cent and 45 per cent for 1970; some countries however, including Nigeria and South Africa, do not have any firm expectation that their loom productivity will rise substantially even by 1970. Nonetheless these countries have already attained a high level of loom productivity. Again the steady development of shift working is envisaged throughout the world with the reservations already expressed for spinning forecasts concerning labour and modern working hours. It is very noticeable how many developing cotton industries manage to work their weaving sector at, near, or above the three shift optimum, largely due to local abundance of labour and the lack of work and time restrictions of all kinds. Colombia, Nigeria, Pakistan, the Philippines, South Africa, Turkey and the Sudan are typical examples. All countries seem reasonably assured of the likelihood of an increasing market, although indications in highly developed areas are that market growth will be less dynamic than hitherto and certainly less than that envisaged in the less-developed areas. The increases forecast range from less than 1 per cent by 1967 and 6 per cent by 1970 to the enormous growth rates of 100 per cent by the former year and 350 per cent by the latter.

General trend

20. This survey gives an impression of the cotton textile industry in traditional centres, apart from the United States, as being still somewhat remote from the level of productivity attained by the United States' cotton textiles industry. At the same time it suggests great effort in these areas by the industry to adapt itself to the different technological and trading conditions existing today and likely to exist in the future. On the other hand the new cotton textile industries in developing countries are shown as rapidly expanding and sometimes well-equipped and well-utilized. However, many of these countries too are suffering from a low level of productivity perhaps due to under-utilization of available resources. Furthermore, some expansion plans seem to be based upon these low productivity levels as well as high estimates of the likely available markets.

21. The high machine productivity of the United States cotton industry and the progress made to reach this goal, particularly in Western Europe, over the last ten years, partly due to introduction of modern machinery, indicate that the industry is increasingly becoming capital rather than labour intensive. The attainment of high productivity and utilization rates is what is sought and the survey indicates the efforts made by national cotton industries to attain them. The available data suggests that if conditions allow the world cotton textiles industry to reach by 1970 the efficiency level at present attained by the United States, the output of yarn would rise by about 45 per cent over existing production levels and the output of cloth would rise by over 75 per cent.¹ These increases could be achieved without any additions to machinery apart from those now planned and take account of neither the additional output of those nations able to exceed the existing American level of productivity nor the probable improvements in machinery by 1970.

¹ No attempt has been made to relate the two projections which clearly are mutually inconsistent as they stand.

