

# **Spatial distribution of the production potencial of the textile industry and its raw material base in the CMEA countries**

**Stanislaw PACZKA**

*Institut of Economic Geography and Space Organization  
University of Łódź (Poland)*

The textile industry is one of those industrial branches the spatial distribution of which does not directly depend upon the raw material base. The location of this branch is connected with the surplus of the labour force, sufficiency of water, transport network, markets, organizational factors and others.

In many countries, also in the socialist ones, the development of textile and knitting industries in the second half of XX century was connected with creation of the conditions for accelerated industrialization and activization of the undeveloped areas. No wonder then that the textile industry is one of the most important economic branches in the European socialist countries. Increasing employment is an evidence of this significance. In 1970 in the textile and knitting industries in the European CMEA countries —including the USSR— there were 4,3 million employees, and in 1983, 10 per cent more, i.e. 4,7 million workers.

Significant changes in the structure of industry of these countries were characteristic in 1970-83. The share of the textile workers in the total employment in industry was decreasing. This process was different in particular countries but it concerned almost all European socialist countries.

The employment in the textile industry was decreasing in Poland and in Hungary, while in the USSR, Romania, the GDR and Bulgaria was increasing. The decreasing share of the textile industry in the total industrial emplyment was a consequence of the development of other industrial branches in particular countries.

The share of textile and knitting industries in the total industrial output has also changed. The changes in this field are illustrated by Fig. 1. This process was the strongest in Bulgaria, Poland, and also Hungary, and the GDR. In 1983 the biggest share of textile

**TABLE 1**  
**General area, population and employment in the textile and knitting industries per cent. 1982**

| Countries      | Area   | Population | Employment in textile industry |
|----------------|--------|------------|--------------------------------|
| Bulgaria       | 0,47   | 2,3        | 2,5                            |
| Czechoslovakia | 0,55   | 4,0        | 4,3                            |
| the GDR        | 0,46   | 4,4        | 4,4                            |
| Poland         | 1,34   | 9,5        | 7,4                            |
| Romania        | 1,02   | 5,9        | 8,2                            |
| Hungary        | 0,40   | 2,8        | 2,2                            |
| the USSR       | 95,76  | 71,1       | 71,1                           |
| Total          | 100,00 | 100,0      | 100,0                          |

*Source: Statisticeskij jezegodnik stran-czelenow Sowjeta Ekonomiczeskoj Wzaimopomoszczj 1983  
 Finansy i Statistika, Moskwa 1983 pp. 121, 124 and calculations of the author.*

and knitted industries in industrial output was observed in the USSR, Romania and Poland, and the smallest in Hungary and Czechoslovakia (table 2).

The big share of textile and knitting industries in employment and global output illustrates great significance of this branch in the industry of particular countries. The importance of textile and knitting industries in the European socialist countries and the USSR will be shown with the help of a synthetic index. This index consists of nine indexes of production of basic textiles goods per 1 inhabitants. These indexes were normalised with the help of average, and next they were summed up. These sums —divided by the number of features— were adopted as a synthetic index of the potential of textile industry in different countries. It is illustrated by the calculations presented in Table 3. The lowest potential of production was in the USSR and Romania, the highest in the GDR, Czechoslovakia, and Bulgaria. The value of the synthetic index for the USSR amounted to 85,9 whereas for the GDR 236,6 points. Differences in the production potential of the textile and knitting industries between these countries was as follows: in 1970 1,00:2,75; and in 1982 1,00:2,32. In 1982 the high production potential could also be observed, besides the GDR,

**TABLE 2**  
**Share of textile and knitting industries in the employment and global output of all industrial branches in per cent**

| Countries      | Employment |      |            | Global output |      |            |
|----------------|------------|------|------------|---------------|------|------------|
|                | 1970       | 1983 | Difference | 1970          | 1983 | Difference |
| Bulgaria       | 10,3       | 9,5  | — 0,8      | 9,2           | 5,7  | — 3,5      |
| Czechoslovakia | 8,7        | 8,0  | — 0,7      | 5,4           | 5,0  | — 0,4      |
| the GDR        | 6,9        | 6,7  | — 0,2      | 6,7           | 5,6  | — 1,1      |
| Poland         | 10,9       | 8,4  | — 2,5      | 8,2           | 6,0  | — 2,2      |
| Roumania       | 10,8       | 11,4 | — 0,6      | 7,2           | 7,8  | 0,6        |
| Hungary        | 8,2        | 7,0  | — 1,2      | 5,4           | 4,1  | — 1,3      |
| the USSR       | 9,4        | 8,6  | — 0,8      | 10,0          | 9,5  | — 0,5      |

*Source: Statisticeskij jezegodnik stran-czelenow Sowjeta Ekonomiczeskoj Wzaimopomoszczj 1984.  
 Finansy i Statistika, Moskwa 1984 pp. 65, 119 and calculations of the author.*

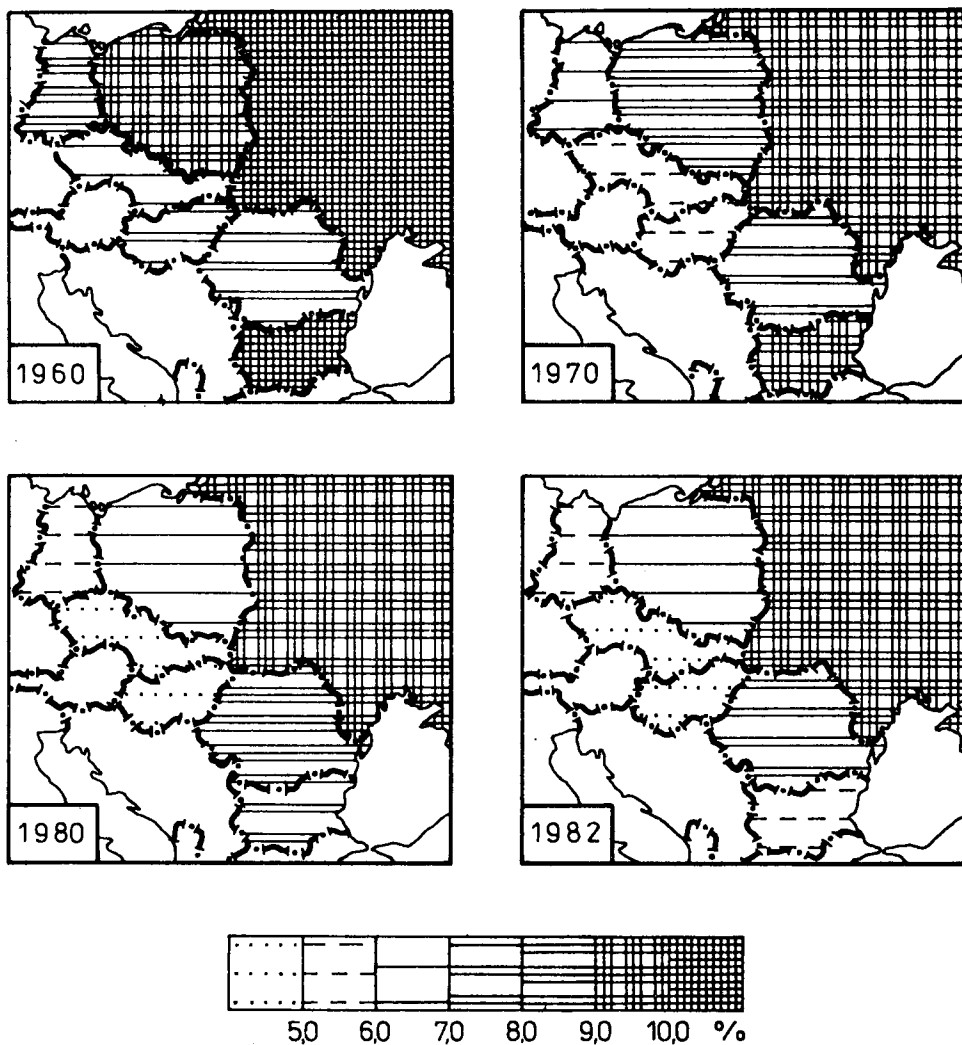


Fig1. Changes in the shares of textile and knitting industries in the global industrial output in the European CMEA countries (1960-1982)

Czechoslovakia and Bulgaria, also in Romania. In the latter countries the production potential of the textile industry was increasing. The decrease of the potential of production took place in the other countries, and it was the strongest in the GDR, Hungary, and Poland. The causes of these tendencies in particular countries are different, among others: different rate of labor efficiency hampering productive investment for the development of this branch, different birth rate and financial difficulties, foreign trade barriers, and others.

In the beginning of the seventies the textile industry of the USSR, Poland, Bulgaria, Czechoslovakia, and other European CMEA countries had the stock of machinery out of date. This was the reason of numerous employments needed in other industrial branches.

**TABLE 3**  
**Synthetic index and differentiation in the potential of production of textile and knitting industries**  
**in the European CMEA countries. 1982.**

| Countries      | Synthetic index of the potencial<br>of production |       |            | Differentiation in the<br>potencial of production* |      |
|----------------|---|-------|------------|--|------|
|                | 1970  | 1982  | Difference | 1970   | 1982 |
| Bulgaria       | 117,4   | 151,5 | + 34,1     | 1,37   | 1,83 |
| Czechoslovakia | 164,6   | 156,4 | - 8,2      | 1,92   | 1,89 |
| the GDR        | 236,6   | 197,4 | - 39,2     | 2,75   | 2,39 |
| Poland         | 96,3  | 82,6  | - 13,7     | 1,12   | 1,00 |
| Roumania       | 93,4  | 149,5 | + 56,1     | 1,09   | 1,81 |
| Hungary        | 106,9   | 88,8  | - 18,1     | 1,24   | 1,08 |
| the USSR       | 85,9  | 85,0  | - 0,9      | 1,00   | 1,03 |

\* the lowest of the potencial of production = 1,00.

*Source: Calculations of the author.*

Governments of these countries aimed at the decreasing the employment in the textile industry. This process took place early in the GDR. Many new plants were built in Poland and Romania apart from the modernization of the textile industry. Many new efficient machines were imported from western countries. In the USSR these new textile mills were located in the western republics in Siberia, and the republics of the central Asia.

Significant changes in the production of textile goods per 1 inhabitant took also place in the European CMEA countries in 1970-83. The highest increase of production was in Romania and Bulgaria. In Poland there was decrease of production. Let us take the USSR for the base of comparison of the level of production of textile goods per 1 inhabitant.

In the fiels of the cotton yarn production it is higher in Bulgaria, Czechoslovakia, Romania and the GDR. Also the production of flax in Czechoslovakia and Romania is higher than in the USSR. The production of fabrics in all the above mentioned countries is also bigger than in the USSR.

The GDR and Romania are the most important producers of socks and stockings. Romania and Bulgaria, Czechoslovakia and Poland in the field knitted clothes, the GDR, Bulgaria, Poland and Romania in the branch of knitted under-wear (Fig. 3.4). In this period the production of non-tissued goods was favoured in the European CMEA countries, as well as, the knitting industry and the production of stockings (Table 4).

Let us consider now the raw material base in these countries. In 1960-80 the production of man-made fibres was increasing rapidly whereas the increase of the natural fibres production was rather slow. The share of the man-made fibres in mill consumption of fibres amounted to 53,1 per cent in 1980.

Introducing man-made fibres to the textile production will allow the CMEA countries to decrease the import of raw materials from the highly developed countries, and will allow to develop especially the knitting industry where these fibres are widely used. Man-made fibres well complement the lack of natural fibres.

The production of fibres in the CMEA countries occupies little area, in Poland 0,3 per cent, in Hungary 0,2 per cent, in Bulgaria and Czechoslovakia 0,6 per cent. This share amounts to 2 per cent in the USSR, and 1,1 in Romania. The increase of man-made fibres production resulted in hampering the production of natural fibres production in Bulgaria, Poland, the GDR, and Hungary in 1970-82.

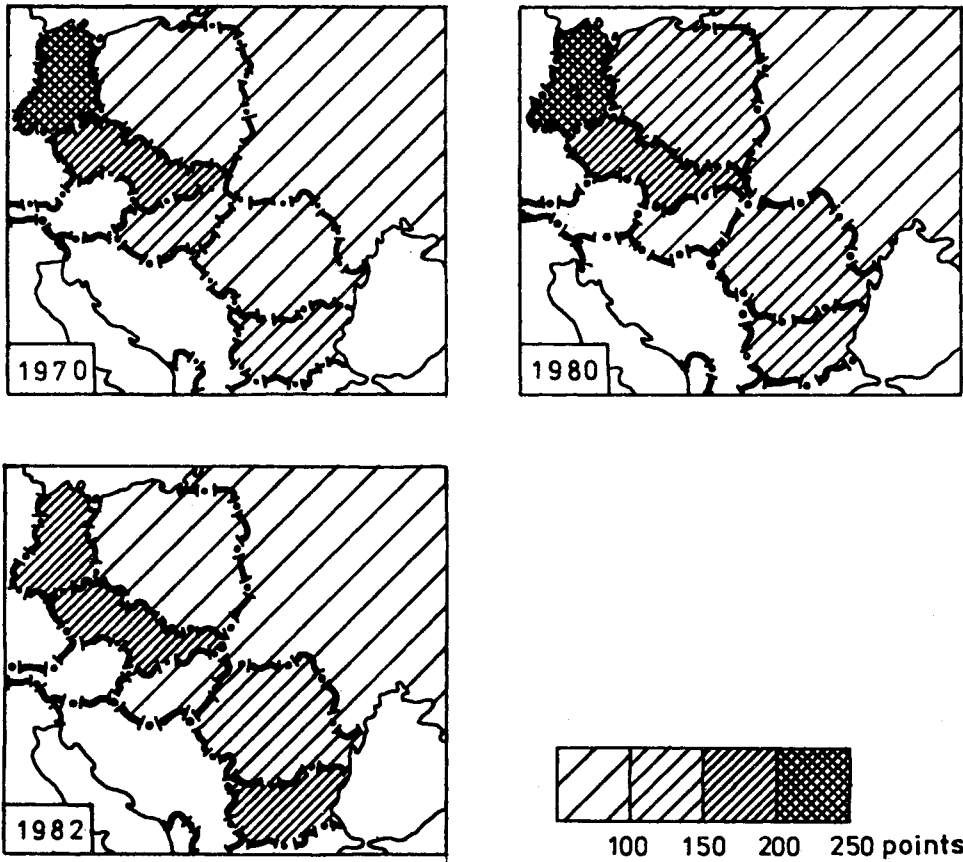


Fig 2. Changes in the potential of production of textile and knitting industries in the European CMEA countries (1970 - 1982)

### Index of the potential of production

Cotton is grown in the USSR and Bulgaria. Total area of cotton production in the USSR was 3.188.000 ha, in Bulgaria 12,7 thousand ha, and in Romania about 0,5 thousand ha. This area was much bigger in mid-seventies, but then it was limited.

In 1982 the crops of cotton amounted to 20,1 thousands tons in Bulgaria, 0,6 thousand tons in Romania, and 9,3 millions tons in the USSR. In 1983 the production of cotton fibres in the USSR amounted to 2,6 millions tons, 61,6 per cent falling to the Usbeck Republic, 27,6 per cent to Turkmen, Tadzhhik, and Kirghiz Republic, and 10 per cent to the Azerbaijan Republic.

Favourable conditions for the production of cotton were created in the USSR, which resulted in the increase of cotton growing areas and its productivity. The majority of the USSR cotton is of medium quality, Russian cotton is imported to Poland, Romania, Czechoslovakia, and the GDR. The European CMEA countries imported almost 612 thousand tons of cotton fibres in 1970, and 653 thousand tons in 1982. The USSR exported 517 thou-

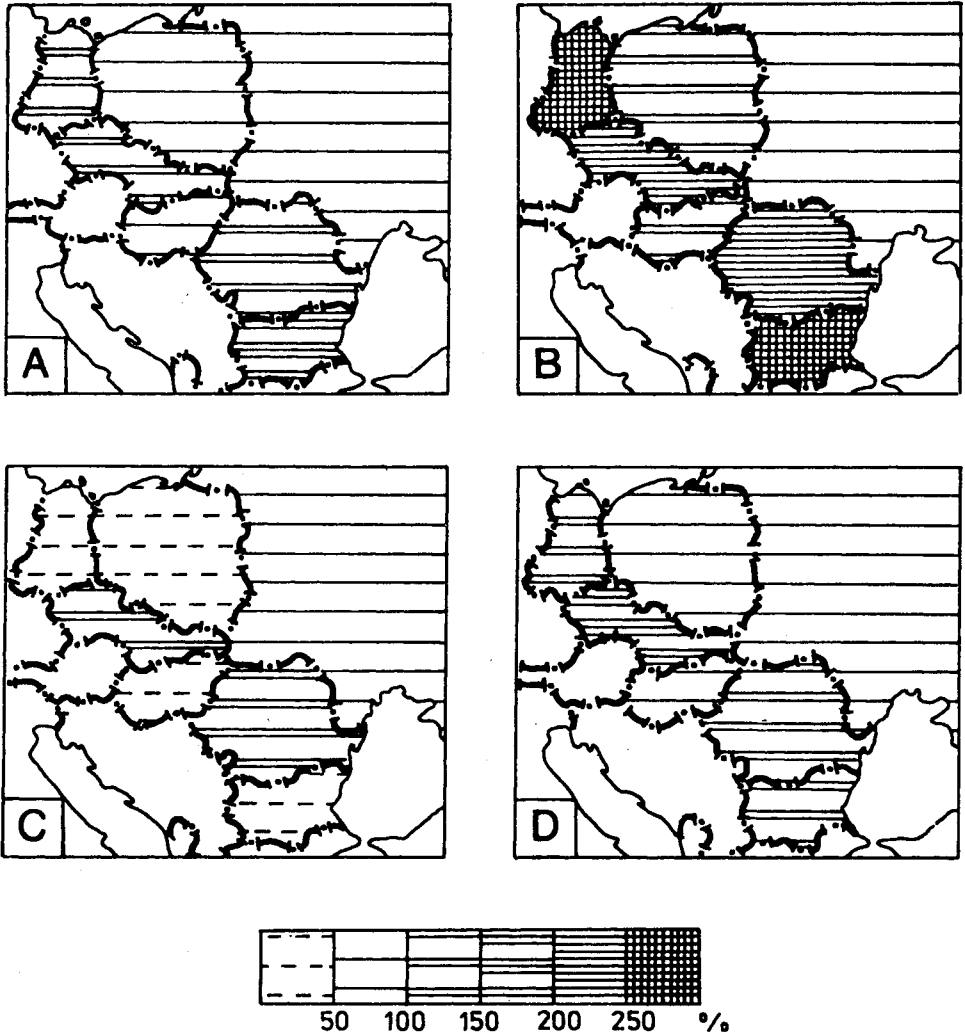


Fig 3. Level of textile output per 1 inhabitant in the European CMEA countries in comparison with the USSR in 1983 (the USSR = 100)  
 A - cotton yarn; B - woolen yarn; C - flax yarn;  
 D - fabrics (except laces)

sand tons in 1970, and 949 thousand tons in 1982, that is almost one third total production.

Flax and hemp are also important fibres in the CMES countries, although their production in the scale of the world is decreasing. Flax is grown mainly in the USSR, but also in Poland, Romania and Czechoslovakia. The share of the production of flax fibres in the USSR in the world production amounts to 51 per cent, whereas in respect to the area 79 per cent.

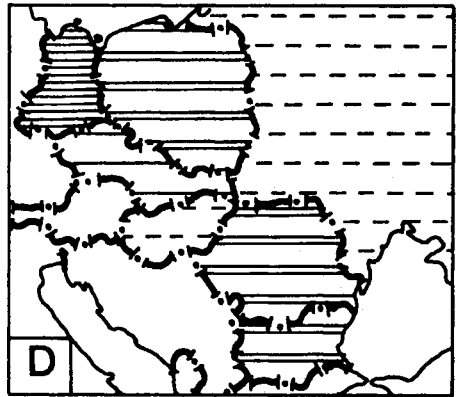
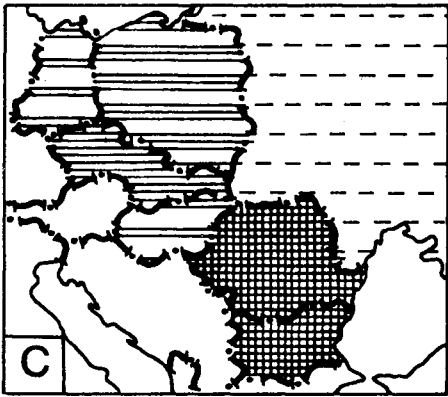
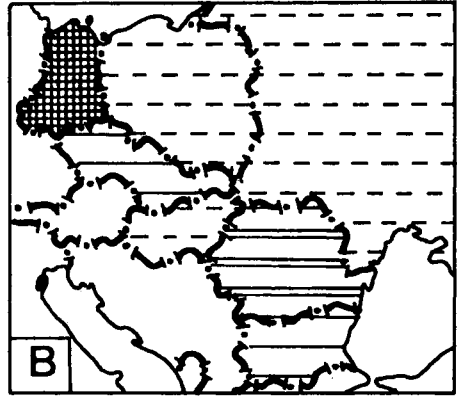
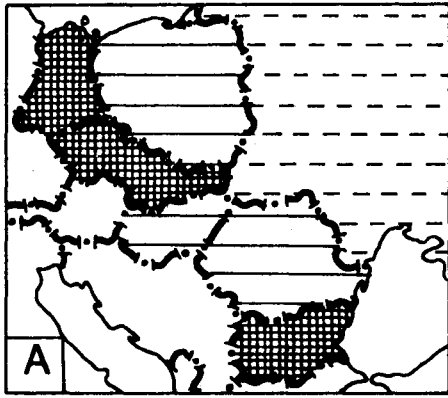


Fig4. Level of production of non-tissured fabrics and knitted goods per 1 inhabitant in the European CMEA countries in comparison with the USSR in 1983 (the USSR = 100)  
 A - non-tissured fabrics; B- socks and stockings; C- knitted clothes ; D- knitted underwear

This area in the USSR decreased from 1,3 million ha in 1970 to 1 millions ha in 1982. The production of flax is concentrated in Russian, Ukraine, and Belorussian Republics. In the above mentioned countries the production of the flax fibre and yarn is decreasing.

The area of hemp growing in these countries was also decreasing from 217,6 thousand ha to 127,6 thousand ha. This area decreased in all countries except Romania, and it was stopped in the GDR. The main production areas were in the USSR and Romania.

**TABLE 4**  
**Increase of production per 1 inhabitant in the European CMEA countries. 1970-1983.**

| Textile fabrics                                  | Increase of production per 1 inhabitant in measurement units | Countries |                |         |        |          |         |          |
|--|--|-----------|----------------|---------|--------|----------|---------|----------|
|  |  | Bulgaria  | Czechoslovakia | the GDR | Poland | Roumania | Hungary | the USSR |
| cotton and cotton-type yarn                      | kg   | 0,8       | 1,2            | 0,3     | -1,7   | 3,0      | -0,4    | 0,2      |
| woolen and woolen-type yarn                      | kg   | 1,3       | 0,6            | 0,6     | -0,6   | 1,7      | -0,4    | 0,2      |
| flax yarn  | kg   | 0,0       | -0,1           | -0,1    | -0,1   | 0,4      | -0,1    | -0,2     |
| all tissues/except laces/<br>fabrics non-tissued | m <sup>2</sup>   | 14,7      | 5,1            | 3,1     | -7,4   | 16,3     | -3,8    | 3,2      |
| stocking and socks                               | pairs  | 6,4       | 7,1            | 8,6     | 2,0    | 2,2      | 1,1     | 2,0      |
| knitted clothes                                  | pieces   | 3,4       | -0,5           | 9,7     | 0,6    | 3,6      | 2,2     | 1,2      |
| knitted underwear                                | pieces   | 3,2       | 0,6            | 1,1     | 1,4    | 4,8      | 1,3     | 0,0      |
|  |  | 2,9       | 0,2            | 2,4     | 2,0    | 2,2      | -1,6    | 1,0      |

*Source: Calculations of the author*

The production of hemp in this countries oscillated around 106,8 thousand tons in 1971-75, 90,4 thousand tons in 1976-80, and it was only 64,7 thousand tons in 1982. In 1982 Romania and the USSR participated in 74,8 per cent in this production.

The highest yields from one ha were in Hungary, 17,9 g/h, Poland and Czechoslovakia, and the lowest in the USSR, 2,9 g/h.

The European CMEA countries produce also wool and silk. In 1982 in these countries there were 180,6 million sheep, out of which 142,2 million fell to the USSR, 17,3 million to Romania, and 10,8 to Bulgaria.

The production of wool in the USSR is increasing, and it is concentrated in the Staropol and Altaj countries, Rostov District, Dapertan ASSR, and southern areas of Ukrainian Republics. The USSR and other European CMEA countries produced 343,7 thousand tons of clean wool in 1970, and 440,1 thousand tons in 1982. The most rapid increase of the wool production occurred in the USSR, Bulgaria, Romania and Czechoslovakia, while the decrease took place in the GDR, Hungary, and Poland.

All European CMEA countries are importers of wool. The most importers besides the USSR are Poland, Czechoslovakia and the GDR. 1982 Poland imported 24,3 thousand tons, and Czechoslovakia 20,2 thousand tons.

The USSR is one of the most important producers of silk. This production is concentrated in the Usbeck Republic which gave almost 1,9 thousand tons of sild in 1983. The production of silk in the USSR increased from 3000 tons in 1970 to 3,9 thousand tons in 1983. In the other socialist countries the production of silk is very small.

In the European CMEA countries the production of man-made fibres developed rapidly and increased almost 5 times in 1960-83. This production was undertaken in the USSR, the GDR, Poland and Czechoslovakia at the beginning of the sixties. During the following years the most rapid increase occurred in the USSR, Romania and Bulgaria, while the share of the GDR, Poland, and Czechoslovakia was decreasing.

In the CMEA countries, especially in the USSR there are significant reserves for the development of the production of synthetic fibres. The CMEA countries import part of these fibres, but simultaneously they are developing their own production. In all these countries this production reached 2,3 million tons in 1982.



**TABLE 5**  
**Production of more important textile fabrics in the European CMEA countries. 1970-1983.**

| Textile fabrics             | Measurement unite  |          |          |          |  | Index of change |
|-----------------------------|--------------------|----------|----------|----------|--|-----------------|
|                             |                    | 1970     | 1980     | 1983     | in production<br>1970-1983<br>(1970=100) |                 |
| cotton and cotton-type yarn | thousand tons      | 2.144,8  | 2.469,1  | 2.452,3  | 114,3                                    |                 |
| woolen and woolen-type yarn | thousand tons      | 628,7    | 832,0    | 759,8    | 126,6                                    |                 |
| flax yarn                   | thousand tons      | 298,4    | 267,3    | 258,0    | 86,5                                     |                 |
| all tissues /except laces/  | mln m <sup>2</sup> | 13.039,0 | 15.567,0 | 15.616,0 | 119,8                                    |                 |
| fabrics non-tissued         | mln m <sup>2</sup> | 286,0    | 945,4    | 1.284,7  | 449,2                                    |                 |
| stockings and socks         | mln pairs          | 1.972,6  | 2.614,8  | 2.805,4  | 142,2                                    |                 |
| knitted clothes             | mln pieces         | 671,8    | 987,7    | 980,3    | 145,9                                    |                 |
| knitted underwear           | mln pieces         | 1.375,7  | 1.949,7  | 1.947,9  | 141,6                                    |                 |

*Source: Statisticeskij jezegodnik stran-czlenow Sowjeta Ekonomiczeskoj Wzaimopomozszi 1984. Finansy i Statistika. Moskwa 1984 pp. 98-101 and calculations of the author.*

There exists considerable exchange of textile goods among the European CMEA countries. The needs of the countries are similar, but they are satisfied to a different degree. Especially the USSR has the greatest disparity between the demand and home supplies. It exports cotton but imports textile machines, knitted goods, clothes, fabrics, and some raw materials.

In the period of crisis Poland was also an importer of cotton and flax yarn, fabrics, socks, and stockings. The main exporters of textile goods are the GDR, Czechoslovakia, Romania and Bulgaria.

The USSR is the most important trade partner among the CMEA countries. The main trade partners of the USSR are the GDR, Czechoslovakia, Bulgaria, and Poland. In 1982 these countries were as important as all the remaining well developed and developing countries of the world together. This is an evidence of very strong economic relations within the CMEA.

**TABLE 6**  
**Spatial structure of production of man-made fibres in the European CMEA countries**

| Countries      | 1960  | 1970  | 1980  | 1983  | Changes of<br>the structure<br>in 1960-1983 |
|----------------|-------|-------|-------|-------|---|
| Bulgaria       | —     | 1,9   | 4,4   | 4,4   | 4,4   |
| Czechoslovakia | 12,1  | 8,4   | 7,6   | 7,8   | — 4,3                                       |
| the GDR        | 30,2  | 18,1  | 13,5  | 12,9  | — 17,3                                      |
| Poland         | 15,1  | 11,7  | 11,8  | 9,6   | — 5,5                                       |
| Roumania       | 0,8   | 6,5   | 7,0   | 7,2   | 6,4   |
| Hungary        | 0,8   | 0,8   | 1,4   | 1,2   | 0,4   |
| the USSR       | 41,0  | 52,6  | 54,3  | 56,9  | 15,9  |
| Total          | 100,0 | 100,0 | 100,0 | 100,0 | 0,0   |

The USSR is a supplier of many raw materials to other CMEA countries and an importer of textile and knitted goods. It is an important stimulus for the development of the textile industry in these countries. The European CMEA countries are importers of fibres but also exporters of textile ready-made goods.

### **La distribució del potencial productiu de la indústria tèxtil en relació a les seves matèries primeres en els països socialistes europeus**

La indústria tèxtil en els països socialistes europeus constitueix una branca important de l'economia. El 1970 ha empleat 4,3 milions de treballadors i el 1983 havien augmentat més del 10%. S'ha cercat el potencial de la indústria tèxtil d'aquests països a base de l'índex sintètic obtingut dels vuit índexs de la producció dels articles tèxtils per cada habitant. Els resultats finals d'aquests càlculs es poden veure al quadre 3. L'Alemanya de l'Est, Txecoslovàquia i Bulgària tenien els potencials més grans de producció per habitant, l'any 1977, mentre que la Unió Soviètica, Romania i Polònia tenien els més baixos.

Fins el 1982 el potencial de la indústria tèxtil ha augmentat, sobretot a Romania i Bulgària, però s'ha notat una tendència a disminuir a l'Alemanya de l'Est, a Hongria i a Polònia. Aquest procés era degut als factors següents: la diferenciació de la productivitat del treball, la reducció de les despeses dedicades al desenvolupament de la indústria tèxtil, el creixement desigual dels naixements, les dificultats financeres i la reducció del comerç internacional.

La restauració de les matèries primeres de la indústria tèxtil i l'ús de les fibres químiques decideixen una localització més lliure de la indústria tèxtil. D'altra banda l'accessibilitat de les comunicacions, l'abundància d'aigua i d'energia i els excedents de mà d'obra femenina afavoreixen la localització de la indústria tèxtil.

La Unió Soviètica i altres països socialistes europeus tenen les matèries primeres següents: cotó, lli, canem, llana, seda i també fibres químiques. El cotó és conreat a la Unió Soviètica i a Bulgària i constitueix la base fonamental de les matèries primeres d'aquests països. Els importadors principals de cotó són Polònia, Romania, Txecoslovàquia i Alemanya de l'Est.

El lli es produeix sobretot a la Unió Soviètica. Aquest país forneix el 51% de la producció mundial del lli.

Els països principals del conreu del canem són la Unió Soviètica i Romania.

En la producció de la llana, la Unió Soviètica i els altres països socialistes europeus no són autàrquics.

L'any 1982, la Unió Soviètica ha importat 125.000 tones i els altres països 41.400 tns. A més de la Unió Soviètica els països que importen més llana són Polònia, Txecoslovàquia i l'Alemanya de l'Est.

Tot i que és el productor de seda més important, la Unió Soviètica n'exporta poca.

La base de les matèries primeres de la indústria tèxtil s'ha ampliat amb les fibres químiques. Entre 1960-1983 la producció de fibres químiques en aquests països ha augmentat cinc vegades. A la Unió Soviètica i en altres països socialistes europeus hi ha reserves de matèries primeres per la producció de fibres químiques i estan creant la possibilitat de substituir les fibres naturals per les químiques.

La Unió Soviètica és l'importador principal de productes tèxtils dels altres països socialistes europeus. Però al mateix temps és l'exportador de les matèries primeres que produeixen aquests països.

## **La distribution du potentiel productif de l'industrie textile et sa base des matières premières dans les pays socialistes européens**

L'industrie textile dans les pays socialistes européens constitue une branche importante d'économie. En 1970 elle a employé 4,3 millions des travailleurs et en 1983 plus de 19%. On a déterminé le potentiel de l'industrie textile dans ces pays au vertu de l'indice synthétique qui était fait à la base des 8 indices de la production des articles textiles pour 1 habitant.

On a montré les résultats finaux des calculs au tableau 3. En 1977 les pays comme l'Allemagne de l'Est, Tchécoslovaquie et Bulgarie se sont caractérisés par les potentiels de la production par 1 habitant les plus grands, tandis que l'Union Soviétique, Roumanie, et la Pologne avaient les potentiels de la production les plus bas.

Jusqu'à 1982 le potentiel de l'industrie textile est augmenté surtout en Roumanie et Bulgarie, mais la tendance de diminution s'est signalée à l'Allemagne de l'Est, en Hongrie et en Pologne. Les éléments suivants avaient l'influence à ce processus: la différenciation de la productivité du travail, la réduction des dépenses pour le développement de l'industrie textile, l'accroissement de la natalité inégal, les difficultés financières et la réduction du commerce international.

La restauration des matières premières de l'industrie textile et l'application des fibres chimiques décident à la localisation plus libre de l'industrie textile. De l'autre côté l'accessibilité de communication, l'abondance de l'eau et de l'énergie et les excédents des mains-d'œuvres des femmes favorisent la localisation de l'industrie textile.

L'Union Soviétique et d'autres pays socialistes européens ont les matières premières suivantes: le coton, le lin et le chanvre, la laine, la soie et aussi les fibres chimiques. Le coton est cultivé à l'Union Soviétique et en Bulgarie et il constitue la base fondamentale des matières premières pour tout ces pays.

Les importateurs principales de coton sont: Pologne, Roumanie, Tchécoslovaquie et Allemagne de l'Est.

Le lin est produit surtout à l'Union Soviétique. Ce pays fournit 51% de la production du lin dans le monde.

Les régions principales de la culture du chanvre se concentrent à l'Union Soviétique et en Roumanie.

Dans la production de la laine, l'Union Soviétique et les autres pays socialistes européens ne sont pas autarciques.

En 1982 l'Union Soviétique a importé 125 milles tonnes et les autres pays —41.4 milles tonnes. Outre de l'Union Soviétique c'est la Pologne, Tchécoslovaquie et l'Allemagne de l'Est qui importent les plus de la laine.

L'Union Soviétique —c'est le plus important producteur de soie, mais il n'exporte que peu de soie.

La base de matières premières de l'industrie textile s'a élargi par les fibres chimiques. En 1960-1983 la production des fibres chimiques dans ces pays a augmenté 5 fois.

À l'Union Soviétique et aux autres pays socialistes européens existent les réserves des matières premières pour la production des fibres chimiques et ils créent les possibilités de substitution des fibres naturelles par les fibres chimiques.

L'Union Soviétique c'est l'importateur principal des produits textiles pour les autres pays socialistes européens. Il est à la fois l'exportateur des matières premières qui sont produites dans ces pays.