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**TEXTILE INDUSTRY IN THE CONTEXT OF ACHIEVING
THE SUSTAINABLE DEVELOPMENT GOALS: WORLD EXPERIENCE
AND IMPLEMENTATION IN KAZAKHSTAN**

**ТЕКСТИЛЬНАЯ ПРОМЫШЛЕННОСТЬ
В КОНТЕКСТЕ ДОСТИЖЕНИЯ ЦЕЛЕЙ УСТОЙЧИВОГО РАЗВИТИЯ:
МИРОВОЙ ОПЫТ И РЕАЛИЗАЦИЯ В КАЗАХСТАНЕ**

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Развитие казахстанской экономики в последние годы связано как с преодолением кризисных явлений, так и с программой реформ, предпринимаемых с учетом резолюции ООН «Повестка дня в области устойчивого развития на период до 2030 года», принятой в 2015 году, в рамках которой утверждены 17 целей в области устойчивого развития. На пороге 2023 года текстильная промышленность претерпела значительные изменения с точки зрения инноваций и устойчивого развития. Достижения в области технологий и растущее внимание к экологической и социальной ответственности вывели отрасль на новый путь роста и прогресса.

Цель исследования заключается в формировании основных направлений развития текстильной промышленности, разработке предложений по обеспечению достижения целей устойчивого развития (ЦУР), позволяющих повысить надежность текстильной промышленности в целом. Для достижения поставленной цели проанализированы показатели текстильной промышленности в соответствии с индикаторами ЦУР, исследован опыт зарубежных стран.

Авторами проведен детальный анализ показателей текстильной промышленности Республики Казахстан в контексте индикаторов ЦУР, который позволил определить направления дальнейшего развития в условиях концепции ЦУР. Представлен анализ влияния концепции устойчивого развития на сферу текстильной промышленности и на основе применения фактологического подхода определены принципы альтернативного и устойчивого производства.

The development of Kazakhstan's economy in recent years is connected both with overcoming the crisis phenomena and with the reform program undertaken according to the UN resolution "Agenda for Sustainable Development for the period up to 2030", adopted in 2015, within which 17 Sustainable Development Goals were approved. On the threshold of 2023, the textile industry has undergone significant changes in terms of innovation and sustainable development. Advances in technology and a growing focus on environmental and social responsibility have put the industry on a new path of growth and progress.

The purpose of the study is to form the main directions of development of the textile industry, to develop proposals to ensure the achievement of the sustainable development goals (SDGs), allowing to increase the reliability of the textile industry as a whole. To achieve this goal, the indicators of the textile industry are analyzed in accordance with the indicators of the SDGs, the experience of foreign countries is studied.

The authors conducted a detailed analysis of the indicators of the textile industry of the Republic of Kazakhstan, in the context of the SDG indicators, which allowed to determine the directions of further development in the context of the SDG concept. An analysis of the impact of the concept of sustainable development on the textile industry is presented and, based on the application of a factual approach, the principles of alternative and sustainable production are determined.

Ключевые слова: текстильная промышленность, устойчивое развитие, циркулярная экономика, устойчивое производство, зарубежный опыт.

Keywords: textile industry, sustainable development, circular economy, sustainable production, foreign experience.

The Industrial Revolution of the 18th and 19th centuries served as the basis for the development of the modern economic system, it led to an increase in the variety of goods and services and a significant increase in consumption. It seemed that natural resources are inexhaustible, and the land area for waste disposal will never end.

Today, humanity uses more natural resources than our planet is capable of reproducing, and development under this scenario leads to a deterioration in the quality of life and the destruction of society. Environmentalists claim that at the moment people need the equivalent of one and a half planets to support their livelihoods, and by the middle of the century they will need the equivalent of two planets [1].

The current situation was characterized by the development of modern global trends, such as the emergence of new technologies, the significant growth of the middle class, new types of relations between society and the state, acute awareness of environmental

problems, which contributed to the rapid development of an alternative economic model – the circular economy and its support from many developed and developing countries.

The circular economy is a completely new economic system based on the example of the functioning of ecosystems. Its ultimate goal is to separate economic growth from the consumption of natural resources by creating new types of products, services, business models and public policies. Circular economy eliminates the use of toxic chemicals that prevent reuse.

Thus, it allows to significantly reduce the use of natural resources by developing a longer product life cycle and changing the logic of consumption (from owning an item to using it). Waste simply does not exist – products are initially designed and optimized so that they can be disassembled and reused at the end of their service life.

The fashion industry, which is one of the most harmful industries on the planet, has a huge impact on environmental processes. It

accounts for 10% of global carbon dioxide emissions annually. In addition, a quarter of all chemicals on the planet are used in this area. And in terms of water consumption, the textile industry is second after agriculture.

The formation of the concept of sustainable development was a logical consequence of the process of active greening of science and economics, characteristic of the late sixties – early seventies. The aggravation of the problems of environmental pollution, overpopulation and limited natural resources could not but actualize questions about the prospects for development and the inevitability of a global crisis while maintaining the current consumption model characteristic of a number of Western countries. As a result, as a natural reaction to unrestrained consumption, the idea of an imminent global crisis arose: overpopulation, overproduction, environmental catastrophe.

The concept of sustainable development is currently recognized by all UN member countries as one of the priorities of humanity, the transition to which should take place at the national and global levels.

In the late 1980s and early 1990s, the concept of "sustainable fashion" entered public life, thanks to companies such as Patagonia and ESPRIT, whose owners, having witnessed environmental degradation, brought "sustainability" to their business.

From the point of view of materials, sustainable textile production takes into account the renewable resources of raw materials, the production process from raw materials, the working conditions of people in the factory, as well as the carbon footprint that will leave the production itself, transportation and warehousing of goods.

The main factors when choosing a material are: renewability, the source of fiber, the process of converting raw materials into textiles, the working conditions of the people who produce them and the carbon footprint of the material.

However, only eco-fabrics are not enough for industrial production, it is also important to use alternative energy sources, competently adjust logistics (to reduce emissions from air transportation), optimize water consumption,

reduce the use of harmful substances and dyes, take care of decent working conditions and, of course, inform buyers about the amount of waste and the measures taken.

The textile industry is one of the key areas of economic activity in many countries. It not only contributes to the formation of a significant part of the budget of a number of major states, but also occupies a significant share in the total volume of industrial production. Thus, in China, the share of the textile industry in the total GDP exceeds 11%, and the amount of tax deductions to the budget is about 15-20% of its total volume. Many economically developed countries, such as Germany, France, the USA and Italy, do not lag behind China, where the volume of tax deductions ranges from 6 to 12 % [2, 3].

In Kazakhstan, textile production accounts for more than 60% of light industry output. At the same time, in general, light industry occupies only 1% of the output of the manufacturing industry of the Republic of Kazakhstan.

In the production of textiles, there was an increase in the segment of cotton fabrics (by 3.5%, up to 8.1 million sq. m. in January–April 2023) and finished textiles for the household (by 5.7% to 7.4 million pieces, of which bed linen – 2.5 million pieces, +22.1% for the year). The output of nonwovens and products made of them in January–April 2023 amounted to 1.9 million sq. m.

The production of carded and combed cotton decreased by 5.8%, to 35 thousand tons; also in the red is the production of felt and felt (by 13.3%, to 158.2 million tenge), including felted and felt shoes (by 19%, to 20.1 thousand pairs).

Fabric production is concentrated in three regions: Pavlodar (14.4 million sq. m.) and Kostanay (0.4 million sq. m. regions, as well as Shymkent (8.6 million square meters). Felted and felt shoes were produced in Akmola (15.5 thousand pairs) and East Kazakhstan (4.6 thousand pairs) regions. The entire output of cotton falls entirely on the Turkestan region.

In value terms, the volume of textile production in January–April 2023 amounted to 23.4 billion tenge - 20.5% more than last year (industrial production index - 113.4%). The share of textiles from the total volume of light

industry production increased from 55.5% to 60.1%.

Today, domestic textile enterprises have a full opportunity to increase their competitiveness, using all the possibilities. This is due to the fact that the textile industry of Kazakhstan has great potential for the development of the industry, given the low production costs, the fact that most of the necessary raw materials are produced in the

country and there are potential markets for the products, the attractiveness of the investment climate in the country, the availability of developed transport infrastructure.

According to statistics, the number of permanent textile manufacturing enterprises in Kazakhstan in 2016 amounted to 171 enterprises, in 2023 their number reached 308, of which the share of small enterprises is a priority in terms of enterprise size (Fig.1).

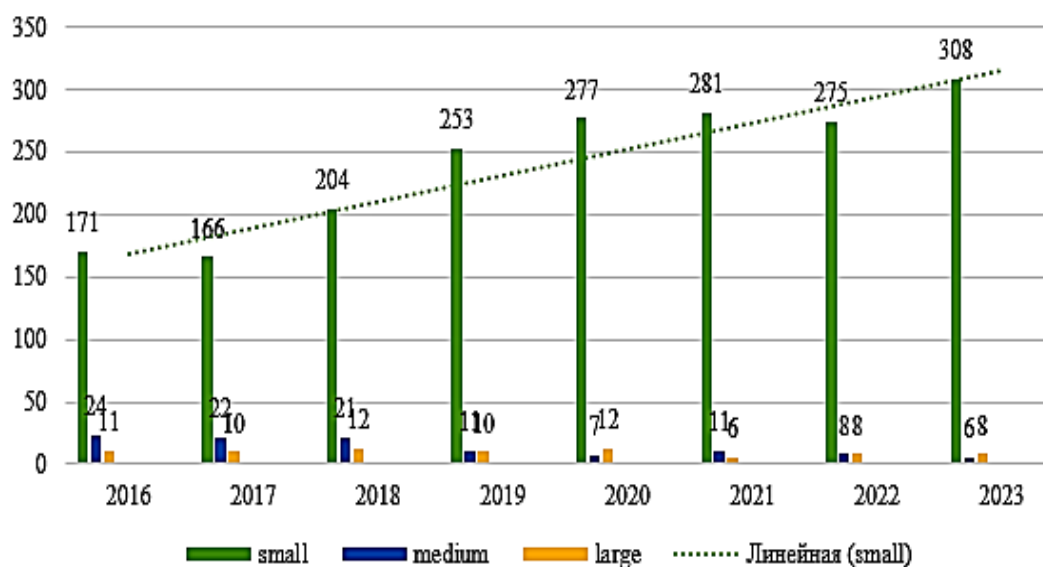


Fig. 1

According to Figure 1, although the number of small enterprises among the existing textile manufacturing enterprises has increased, the number of medium and large enterprises has changed and decreased somewhat. In 2016, the number of medium-sized enterprises was 24, in 2023 their number decreased by 4 times, 6 enterprises remained, in 2014-11, in 2023-8 enterprises. Currently, all textile enterprises operating in the country belong to the private sector.

Currently, the innovative activity of enterprises of the domestic textile industry is at a very low level. As a result of research conducted by the National Bureau of Statistics of the Agency of the Republic of Kazakhstan for Strategic Planning and Reforms in the period from 2015 to 2022, the level of innovation activity of textile industry enterprises on product and process innovations is considered in Table 1.

According to Table 1, textile enterprises in 2015 only 8 out of 79 enterprises were aware of the presence of product and process innovations, that is, the indicator of innovation activity was 10.1%, in 2016 this indicator was 13.3%, in 2017 it decreased slightly-9.6%, in 2018 and 2020-9.9%, in 2017-7.5%, in 2021 – a sharp decrease – 3.3%, in 2022 – a slight improvement it is observed – 4.3%.

According to the Oslo manual, all innovations must, by definition, contain some proportion of novelty. In practice, three concepts of innovation in innovation are considered: new or significantly improved goods (services), which are new "for the organization", "for the market of goods (services)" and "for the whole world [5].

Most of the innovative products (goods, services) produced by domestic textile enterprises are new or improved goods (services) that are new to the organization (Table 2).

Table 1

Years	Number of enterprises, units	Including		Level of activity in the field of innovation, %	The level of passivity in the field of innovation, %
		There is innovation	No innovation		
2015	79	8	71	10,1	89,9
2016	60	8	52	13,3	86,7
2017	83	8	75	9,6	90,4
2018	91	9	82	9,9	90,1
2019	91	9	82	9,9	90,1
2020	93	7	86	7,5	92,5
2021	92	3	89	3,3	96,7
2022	92	4	88	4,3	95,7

Note-Compiled by the authors based on the source [4]

Table 2

Name of indicators	2017	2018	2019	2020	2021	2022
New or significantly improved goods (services) that are new to the organization	-	1 810,7	1 465,3	1 582,0	6,0	6,2
New or significantly improved goods (services) that are new to the commodity (service) market	-	1 292,6	2 218,8	14,3	-	-
New or significantly improved goods (services) that are new to the worldwide (service) market	-	-	-	-	-	-
Total	2 019,9	3 103,4	3 684,2	1 596,3	6,0	6,2

Note-Compiled by the authors based on the source [4]

In general, from the data of the tables 1 and 2, it is clear that the decline in innovative activity of domestic textile enterprises directly affects the volume of innovative products produced by them, respectively. This indicates the weakness of the management of innovation activity at domestic textile enterprises. Textile enterprises need to continue their innovative activities continuously and improve it over time.

The textile industry is growing rapidly in developing countries. About 70% of fabric production is in Asian countries. China is the leader in global textile production, followed by Turkey, India, and Korea. For a long time, the structure of the world textile industry has been dominated by the production of natural fabrics from cotton, wool, and linen. Currently, the share of production of chemical fibers, as well as mixed fabrics from chemical and natural raw materials has increased significantly. The production of linen fabrics has declined sharply in recent years. The leaders in the creation of natural fur today are countries such as China, Germany, the USA and Russia. Artificial fur and inexpensive prod-

ucts from it are made in many countries of the world.

The center of sewing production has also gradually moved to Asian countries. China and Turkey currently hold the primacy in the production of clothing and ready-made garments of mass demand. Developed countries (especially France, Italy, USA) still specialize in creating fashionable, designer, elite, individual products.

Today, China and Taiwan dominate in the global export of shoes, being manufacturers of inexpensive and relatively high-quality shoes. And the production of expensive leather and footwear products is still concentrated in developed countries - the USA and Italy [6].

The Chinese economy is a vivid example of the development of the textile and clothing industry, which can become an effective basis for building an industrial society. In China, achieving competitiveness in this area has become a platform for the development of other industries, including the production of industrial equipment, machinery and equipment. Today, China's light industry is at the forefront and accounts for 21% of total produc-

tion. In terms of competition, China has gradually overtaken its main rivals – Turkey and Mexico, which are the most important suppliers of textiles to the United States. Currently, China occupies 26% of the global textile market and 34% of the clothing market.

The leading factor in achieving the competitive advantage of Chinese products is their low cost. Chinese textile exports are increasing by an average of 6% annually. Only in 2008, due to the global financial crisis, textile exports from China fell by 9% (in other countries, the drop reached 16%). As the economy recovered, exports of Chinese textiles increased by 23.6%, and clothing by 21% [6]. The success of the Chinese light industry was facilitated by the creation of many regional clusters that focused on specific market segments. The synergy from the activities of these clusters made them extremely competitive, and high efficiency and low costs made it possible to fulfill orders from a growing number of domestic and foreign firms [7]. Thanks to the competitive advantages obtained, China's light industry has been dominating the global market for many years.

Light industry is one of the most dynamically developing industries in Uzbekistan. Currently, the textile and clothing industry of this country creates 20% of GDP, they employ a third of the working-age population. A significant part of the light industry enterprises of the republic is part of the state joint-stock company "Uzbeklegprom", which unites enterprises of cotton, knitting, silk-spinning, sewing and other sub-sectors [8]. Favorable conditions have been created in the country for foreign companies to work together with enterprises of Uzbekistan. At the same time, many sewing and textile enterprises fulfill orders from European firms. About 75% of textile products produced in the country are produced by joint ventures and foreign enterprises. Stable inflow of foreign investments is an important indicator of the vigorous development of light industry. More than 100 enterprises with the participation of foreign investors from Europe, Japan, South Korea, Turkey, India, and the USA operate in Uzbekistan. At the same time, the light industry of the republic works mainly for export,

while inexpensive imported products are mostly sold on the domestic market. To stimulate exports in the country, a number of benefits are provided to enterprises exporting more than 80% of their products, provided that the cost of finished products exceeds material costs by at least 4 times. Thanks to active cooperation with foreign companies, Uzbek enterprises have been equipped with the most modern equipment from the world's leading manufacturers of textile machinery. The country's light industry enterprises produce a wide range of products that meet international standards.

Kyrgyzstan's light industry has grown rapidly over the past decade and a half. Industry accounts for more than 10% of the country's GDP, its share in the total volume of industrial production is more than 16%, which employs 30% of the able-bodied population [9]. The garment industry is developing most successfully. Other small industries – textile and footwear – lag behind. Ready-made clothing produced in Kyrgyzstan is successfully sold in the CIS countries, especially in Russia and Kazakhstan, which can compete with similar products of Chinese and Turkish origin due to the low price and favorable quality.

The textile industry of Turkmenistan generates 12% of the country's GDP and occupies the second position in terms of production after the oil and gas sector. Cotton growing is the leading sphere of agriculture in the country. The grown cotton is of high quality and is exported to China, Iran, Indonesia, Singapore, South Korea, Ukraine, Turkey, Great Britain. The state provides substantial benefits to private cotton producers, controls its quality and sales in the domestic and foreign markets.

For South Korea, light industry is a traditional branch of the economy. The largest role belongs to the textile sub-sector. However, in recent years, there has been a decrease in such indicators of the industry's activity as the volume of production, the volume of exports, the number of industrial personnel. The main direction of regulation of the country's light industry is the development of a new plan for the development of national human resources of the Korean Textile Federation. It is based on a change in the competitiveness paradigm:

if material resources were the most important factor before, now and in the future – human resources and education. Education is valued as an important productive resource, displacing capital and labor [10].

The development of the light industry of the Republic of Lithuania is connected with the country's accession to the EU. European organizations began to actively place their orders at Lithuanian sewing enterprises due to lower labor costs. However, many Lithuanian citizens began to seek higher-paying jobs in Western European countries. This led to a shortage of labor and an increase in the average age of employees of enterprises. The Lithuanian light industry is dominated by the garment industry, which is based on small enterprises and workshops, as well as family enterprises. Lithuania's light industry is working for export: 75% of the manufactured products are exported to Western Europe [11].

For a long time, the US light industry has been the largest and most diversified segment of production. However, over the past decades, the industry has been losing its competitiveness due to a significant influx of inexpensive imported products from Asian countries and Latin America [12]. The idea of the North American Free Trade Agreement (NAFTA) was based on the premise that the elimination of customs barriers between the United States, Canada and Mexico would create economic conditions under which each country would use its competitive advantages. It was expected that this agreement would integrate the textile production of the United States and the garment production of Mexico to fight Asian competitors. Contrary to this forecast, the growth of clothing production in Mexico did not lead to a strengthening of the American textile industry. On the contrary, the US light industry began to lose its competitive position. Textile manufacturers have moved their production facilities to Mexico, where production is more profitable due to the low cost of labor. Government measures aimed at supporting the US light industry involve investing capital in research and development, the use of new technologies in the production of high-quality products.

Light industry is a traditional industry for many countries of the European continent, its history dates back to the Middle Ages. However, these days these countries are increasingly importing mass-demand products from countries with low labor costs. Over the past two decades, there has been a decrease in production volumes in the light industry by an average of 10%. There is a tendency for European companies to transfer production facilities to Asian countries in order to use cheap labor. At the same time, developed countries retain the creation of models, the development of goods of specific demand, expensive and high-quality products.

The Italian light industry occupies the second position after mechanical engineering in terms of the number of employees in the industry. The greatest importance belongs to the production of knitwear, yarn, silk fabrics, wool, chemical fibers. Most textile industry enterprises are concentrated in the north of the country, where they are provided with inexpensive electricity from Alpine hydroelectric power plants. This country remains a recognized leader in the world in the production of high-quality and very expensive shoes. Italian silk is also known for its high quality.

France is still the center of haute couture. This is the recognized niche that remains for France. French products are distinguished by quality, elegance, elegance, originality. France produces 24% of all European textiles (more only in Germany). However, since 2005, along with the abolition of import quotas, there has been a decrease in production volumes. This is caused by a strong influx of Chinese imports.

Germany is traditionally considered the European leader in the production of textiles and clothing. Various public and state structures contribute to the development of the textile and clothing industry in Germany. The success of the light industry in this country is promoted by active cooperation of market participants, exchange of information and consolidation of efforts in competitive competition [6]. The German light industry was one of the first to enter into the processes of industrial internationalization – the relocation of

production facilities to countries with inexpensive labor. The reorientation to a more capital-intensive and innovative sector of this industry allowed it to withstand the competition of Asian manufacturers.

The transition to rational economic models of environmental management and the return of waste to economic circulation is one of the 17 Sustainable Development Goals (Goal 12: Ensuring the transition to rational consumption and production models), which Kazakhstan has adopted and undertakes to achieve by 2030, including in the textile industry.

The reduction of natural resources necessary for the production of fabrics from natural fibers, as well as the increase in the burden of the textile industry on the environment raise the question of its adaptation to the principles of a closed-cycle economy, in which waste from the use of textile products is not sent to burial, but selectively collected and disposed of in new goods and products, relevant.

According to recent studies of the morphological composition of municipal solid waste (MSW), in Kazakhstan, the mass fraction of textile waste, depending on the climatic zone, is 3-6% [11]. According to official data, about 70 million tons of MSW are generated annually in the country, of which about 4.2–8.4 million tons are waste from the use of textile products, which consist, including imported textiles.

Textile waste of consumption mainly belongs to hazard class V (practically non-hazardous waste)³, but with the mixed collection of municipal waste, textiles are polluted with organic waste, hazardous household and medical waste, and as a result, the hazard class increases. The danger of dumping such waste increases with the increasing use of synthetic fabrics, which extend the decomposition period of such waste to hundreds of years. In such a situation, land pollution by dumping consumer waste, including textile, hinders the achievement of goals and objectives, and also does not correspond to the system of global indicators of sustainable development in the field of environmental protection (Goal 15: Protection and restoration of terrestrial ecosystems).

At the same time, the Government of the Republic of Kazakhstan recognizes that textile waste has resource value as raw materials for the production of low-grade yarn, various non-woven, mixed materials, sewing technical and upholstery wool, as well as in the production of shoes, insulation materials, etc.. However, due to the lack of infrastructure for the selective accumulation of consumer waste (separate collection), textiles after mixing with municipal waste either become unsuitable for reuse and recycling, or unprofitable due to the need to process such waste.

Thus, the problem of textile waste consumption in Kazakhstan has a bright socio-ecological and economic character and corresponds to the goals of sustainable development.

International experience shows that the introduction of a closed-loop economy contributes to solving this problem. The closed-cycle economy model is based on the "5R" principle, which determines priorities in descending order with respect to the consumption of goods (Refuse; Reduce; Reuse; R; Rot - compost) [12].

In many European countries, the closed-cycle economy model for textiles is already being actively implemented. In Germany, there is a package collection, where people buy packages, wash and put clothes in these packages and on a certain day they can take these packages outside, where a special service takes them for recycling. There is also a container collection in the country – containers are placed in cities, people put unnecessary clothes in them, and then these containers go for disposal. In addition, in Germany there are so-called rooms with clothes (germ. - Kleiderkammern), in which the German population carries their already unnecessary things. Over the past few decades, the demand for "second-hand" clothes has decreased in the country, as state authorities are trying to minimize the social disparity, but, nevertheless, there are still people who cannot afford to buy clothes and have to rely on worn-out, but still of good quality, things. Cooperation between designers and textile waste manufacturing

companies has been established in the country, you can order the right amount of textile waste fabric from them at a favorable price [13].

In the Netherlands, Mud Jeans is actively working with used jeans, the old fabric of which is crushed to the state of cotton wool and new fabrics are made from this material for new products. They also came up with the concept of "jeans rental", thanks to which a person can either buy jeans or rent them and then hand them over for recycling again. There are companies with a similar concept in Denmark, Finland, Taiwan and China.

The introduction of a closed-cycle economy model into Kazakhstan's production is impossible without measures to support socio-ecological projects from the state and incentive measures for the disposal of textile waste.

The countries with the highest rates of waste disposal of textile products have reached a high level of recycling due to the introduction of such an economic mechanism as extended producer responsibility (EOR), which implies assigning responsibility to the manufacturer for the further disposal of their goods after the loss of their consumer properties, which corresponds to the international principle "the polluter pays" [12]. Responsibility for the further disposal of their goods encourages manufacturers to make products from more environmentally friendly materials, better quality and durable. The EOR mechanism effectively encourages producing companies to actively involve waste in recycling. The implementation of state support is expressed in tax preferences and financial assistance to social projects for the collection and distribution of unnecessary clothing to the poor, which stimulates the development of infrastructure for the collection of textile waste and their transportation, including to recycling facilities [14]. State incentives for producers are provided by compensating processors for the collection, transportation, processing and disposal of waste.

It is worth noting that in Kazakhstan, since 2016, the EOR system has been legislated, but for a number of reasons it is

not effective, including with regard to textile waste.

Firstly, the method of calculating the environmental fee has a number of drawbacks:

- the rates of the environmental fee do not correspond to the real costs of collecting, processing and disposal of textile waste;

- the availability of recycling standards reduces liability and makes it possible to evade responsibility;

- the list of groups of goods and packaging to be disposed of within the framework of the ROP does not take into account many types of materials, as well as their multicomponentness.

Secondly, the lack of an effective mechanism for the supervisory authorities to control producers of goods by the volume of products they produce, as well as the formation of waste, leads to a low collection of payments for environmental collection, which are necessary for the development of infrastructure for the management of textile waste and to support socio-environmental projects [15].

Thirdly, an important stage of the transition is also informing the population about the key aspects of the collection, processing and disposal of textile waste. To implement this, it is necessary at the state level to establish a system of notifying the population about the high degree of importance of the secondary use of textile products and, as a result, reducing the burden on the natural environment and reducing social imbalance. This event should be taken into account when setting goals, objectives and targets of the system of national projects of the Republic of Kazakhstan [16].

The study of the problem of textile waste management carried out in the work allows us to conclude that currently in Kazakhstan there are basic prerequisites for the transition of the textile industry to a closed-cycle economy.

In the course of further developments in the field under consideration, systematic work should be carried out aimed at solving certain tasks, including:

- adjust the legislative consolidation of the EOR system;

- strengthen measures to support socio-environmental projects in the field of textile waste management;
- provide benefits and tax breaks for participants in the textile waste management industry;
- strengthen state supervision in the field of waste management;
- to increase the ecological culture of the population.

Reducing excessive consumption of textile products and the return of textile waste to economic circulation will not only save natural resources, prevent environmental damage and help the poor, but also reduce the share of textile imports, reduce the cost of raw materials, and give advantages to Kazakhstani textile products on the domestic and international market [17].

One of the main trends that have emerged in recent years is the use of advanced materials and eco-friendly fibers. Companies are shifting their focus to eco-friendly options such as organic cotton, bamboo and recycled polyester. This shift not only satisfies the growing consumer demand for environmentally friendly products, but also helps to reduce the negative impact of textile production on the environment [18].

Another important event was the spread of 3D printing in the textile industry. This technology allows you to create intricate and complex designs that were previously impossible using traditional production methods.

In addition to eco-friendly materials and 3D printing, the textile industry is increasingly focusing on automation and robotics.

The future of the textile industry is also linked to social and environmental responsibility. Companies are aware of the serious social and ethical problems associated with textile production, from child labor to poor working conditions and the need for fair wages. Brands cooperate with suppliers to improve working conditions and ensure that their products are manufactured in compliance with ethical standards. As we move forward, sustainability and innovation will continue to shape the textile industry. Companies that prioritize these values are best equipped to succeed in an increasingly competitive and

rapidly changing market. New technologies and materials will appear, and companies that adapt to these changing times will be able to create a more sustainable and fair future for everyone [19].

The use of advanced materials, robotics, automation, 3D printing and artificial intelligence is revolutionizing the industry and creating new opportunities for growth. Companies are also increasingly focusing on ethnic and social responsibility, ensuring that their products are produced in a more sustainable and responsible manner. Although challenges remain, this new era of innovation and sustainable development offers great prospects for the textile industry and its stakeholders.

The level of awareness of sustainability and circularity is higher than ever today, and the need for changes in the textile industry is especially urgent. A number of initiatives have made progress in addressing the most pressing social and environmental problems, including through the development of transparency standards, the preparation of recommendations on cotton cultivation and the compilation of lists of regulated substances. However, it is obvious that much remains to be done and that the implementation of improvements in the environmental and social spheres should become one of the main, not secondary, areas of activity among leading brands and large companies. The need to change the very essence of the textile industry is also becoming more and more obvious: it requires a transition from the production of a large number of mainly disposable products to the production of valuable products that can be used for a long time before they are adapted for other applications or recycled. Circularity will require completely new ways of doing business, but will allow the sector to bring commercial, social and environmental benefits [20].

The transition to sustainability and circularity in the textile industry will require an integrated approach and changes at every stage of the value chain involving market participants at all levels and from all segments. It is necessary to ensure the large-scale application of new business models, to stop the use of hazardous substances in textile production,

to increase the efficiency of resource use, to abandon fossil fuels in favor of renewable energy sources and materials. But first of all, it is necessary to ensure more optimal use of textile products, including increasing the service life (use stage) and expanding the possibilities of use after the end of the service life (restoration/alteration), as well as significant improvements in the processing of materials at the end of their life cycle.

In order to reduce the consumption of large amounts of energy, chemicals and water in the textile production process, technical solutions such as anhydrous dyeing continue to be developed. New types of business activities, for example, the provision of clothing rental services, are becoming increasingly popular and, along with the development of new processing technologies, can contribute to increasing the service life of products and expanding the possibilities of their use after the end of their service life. Standards and recommendations, especially with regard to cotton cultivation, are gradually being introduced into policies aimed at solving a number of the most acute social problems in the textile industry. However, all these efforts need to be increased and expanded. In particular, it is necessary to create an appropriate institutional environment for the successful development and expansion of innovation activities [21].

The implementation of systemic changes will require coordinated actions of all stakeholders and regions. Priorities should include improving governance and policy effectiveness to drive change, collaboration and funding to promote industry-wide action, and changing consumer habits. Transparency and traceability of value chains in the textile industry are also crucial in order to ensure accountability and informed decision-making by consumers.

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