

## OPTIMIZATION OF OPERATIONAL PROCESSES BY COTTON-TEXTILE CLUSTERS

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**Abstract.** *This article is devoted to the study and analysis of optimization of operational processes in cotton-textile clusters. In light of the changing competitive environment and increased requirements for production efficiency, optimization of operational processes is becoming an important strategic task for enterprises belonging to cotton-textile clusters. The article discusses the main problems and challenges faced by enterprises in this industry, and also proposes approaches and methods for optimizing operational processes.*

**Key words.** *optimization, operational processes, cotton-textile clusters, production efficiency, cost reduction.*

### INTRODUCTION

Cotton textile clusters are an important component of the textile industry, playing a key role in the production of cotton products, from raw materials to finished textiles. Optimizing operational processes in these clusters is an integral part of enterprise strategy to increase production efficiency, reduce costs and improve product quality. In this article, we will look at various approaches and strategies that can be applied to optimize operational processes in cotton-textile clusters.

**Analysis of current operational processes:** The first step in optimizing operational processes is to conduct a thorough analysis of current processes to identify weaknesses, bottlenecks and causes of problems. This analysis can be performed using techniques such as Value Stream Mapping (VSM) or process analysis. Using these methods, you can visualize the current flow of materials and information and identify ineffective steps or unnecessary operations. The analysis will help identify areas requiring improvement and optimization.

**Process Automation:** One way to improve the efficiency of operational processes is to implement automation. The introduction of modern technologies and automation systems can reduce task completion time, reduce the likelihood of errors and increase productivity. For example, automation may include the use of robots or automatic devices to perform routine tasks, automatic sorting and packaging of products, and the use of computer systems to manage and control processes. Automation can also help reduce workers' workload and free them up to perform more complex and creative tasks.

**Improving Logistics and Supply:** Logistics and supply play an important role in cotton-textile clusters. Optimizing logistics processes such as the delivery of raw materials, transportation of finished goods and inventory management can lead to lower costs and improved time performance. Implementing modern cargo tracking and warehouse management systems can improve the transparency and efficiency of logistics operations. In addition, sourcing optimization allows you to establish effective partnerships with suppliers, ensuring a reliable supply of quality materials at competitive prices.

## METHODS OF RESARCHE

In order to study the issues raised in this particular article, to explore in more detail the role of staff motivation in development of small business and private enterprises, during our research we used the methods of scientific abstraction, induction and deduction, methods of observation, logical and structural analysis, grouping, mutual and comparative comparison.

## REVIEW OF LITERATURE

Inventories are stored in warehouses for further use in the production process or for sale to consumers. T.V. Golubeva writes that “work in progress stocks represent products that are at various stages of production (semi-finished products and various materials required to produce the final product)”. Let us consider the opinions of domestic and foreign scientists on the specifics of inventory management. In the works of V.P. Kodatsky, the idea is expressed that “inventory management is part of the production and sales process, which must be considered in the overall enterprise management system”. According to A.Sh. Akhmadov, who studied the production strategy of industrial enterprises, “when creating stocks at an enterprise, there is a conflict of objectives regarding stocks. The financial service always prefers to maintain a low level of stocks to improve sales, while production requires appropriate stocks for its uniform loading”. This conflict of interests must be resolved in favor of the enterprise as a whole, from the point of view of ensuring its financial stability and preventing the freezing of working capital in excess stocks.

## ANALYSES

According to official data from the Association of Cotton-Textile Clusters of Uzbekistan, there are currently 96 cotton-textile clusters in the country, with a total area of about 908 thousand hectares. Table 1 provides information on the distribution of cotton-textile clusters in different regions of Uzbekistan.

**Table 1**

**Number of cotton-textile clusters and area of cotton fields in the regions of Uzbekistan <sup>49</sup>**

№	Region	Number of clusters		Area of cotton fields	
		Unit	Share, %	Hectare	Share, %
1.	Republic of Karakalpakstan	5	5,21	48 665	5,36
2.	Andijan region	12	12,50	79 391	8,75
3.	Bukhara region	8	8,33	97 900	10,78
4.	Jizzakh region	5	5,21	69 700	7,68
5.	Kashkadarya region	9	9,38	111 900	12,33
6	Navoi region	2	2,08	32 588	3,59
7.	Namangan region	7	7,29	63 406	6,98
8.	Samarkand region	11	11,46	75 580	8,33

<sup>49</sup> Compiled based on the author’s calculations based on data from the Association of Cotton and Textile Clusters of the Republic of Uzbekistan <https://uzptk.uz/ru/>

9.	Surkhandarya region	6	6,25	60 044	6,61
10.	Syrdarya region	6	6,25	72 557	7,99
11.	Tashkent region	6	6,25	55 008	6,06
12.	Fergana region	9	9,38	63 245	6,97
13.	Khorezm region	10	10,42	77 799	8,57
	Total	<b>96</b>	<b>100,00</b>	<b>907 783</b>	<b>100,00</b>

**Analysis of Table 1 allows us to make the following observations:**

1. *Distribution of cotton-textile clusters by regions of Uzbekistan:*

- The Republic of Karakalpakstan has 5 clusters, which is 5.21% of the total number of clusters.
- Andijan region has 12 clusters, which is 12.5% of the total number of clusters.
- Bukhara region has 8 clusters, which is 8.33% of the total number of clusters.
- Jizzakh region has 5 clusters, which is 5.21% of the total number of clusters.
- Kashkadarya region has 9 clusters, which is 9.38% of the total number of clusters.
- Navoi region has 2 clusters, which is 2.08% of the total number of clusters.
- Namangan region has 7 clusters, which is 7.29% of the total number of clusters.
- Samarkand region has 11 clusters, which is 11.46% of the total number of clusters.
- Surkhandarya region has 6 clusters, which is 6.25% of the total number of clusters.
- Syrdarya region has 6 clusters, which is 6.25% of the total number of clusters.
- Tashkent region has 6 clusters, which is 6.25% of the total number of clusters.
- Fergana region has 9 clusters, which is 9.38% of the total number of clusters.
- Khorezm region has 10 clusters, which is 10.42% of the total number of clusters.

2. *Area of cotton-textile clusters:*

- The total area of all clusters is about 908 thousand hectares.
- Bukhara region has the largest cluster area (97,900 hectares), and Navoi region has the smallest (32,588 hectares).
- On average, each cluster covers approximately 9,459 hectares.

3. *Percentage of cluster area:*

- Bukhara region accounts for 10.78% of the total cluster area, which is the highest value.

Similar indicators calculated for Boyovut techno cluster LLC indicate a decrease in capital productivity by the end of 2023, the main reason for which may be shortcomings in the use of fixed production assets, and this may also be to some extent associated with an increase in capital investments in fixed assets, aimed at improving working conditions, environmental protection, increasing the cost of a unit of power, increasing the estimated cost of products and work, as well as structural changes in the industry.

Capital-labor ratio of Boyovut techno cluster LLC in 2018-2023. had a growing trend, which determines the presence of positive processes of growth in the degree of equipment of cluster workers with means of production (Table 2).

**Table 2**

**Indicators of security and efficiency of use of fixed assets of Boyovut techno cluster LLC in 2018-2023.<sup>50</sup>**

Indicators	2018 y.	2019 y.	2020 y.	2021 y.	2022 y.	2023 y.
Cost of fixed assets and assets, billion soums	322,9	346,7	350,6	522,3	755,9	766,1
Number of employees, people	320	359	401	449	503	515
Volume of production in value terms, billion soums	92,7	103,7	127,2	129,3	132,2	138,9
Product production volume in physical terms, thousand tons	25,1	28,8	29,4	30,0	33,5	34,8
Capital productivity, sum	0,29	0,30	0,36	0,25	0,17	0,16
Capital intensity, soum	3,48	3,34	2,76	4,04	5,72	5,79
Capital-labor ratio, thousand soums	1 009,06	965,74	874,31	1 163,25	1 502,78	1 672,4

In terms of the area of cotton fields occupied by the clusters selected for the monographic study, TCT Agro Cluster LLC occupies an intermediate position between the other two. It is noteworthy that this cluster is many times ahead of the other two in terms of the number of employees - at the end of 2023, the number of employees of TCT Agro Cluster LLC is 15 times greater than the number of employees of Boyovut techno cluster LLC, and almost 24 times more than the number of employees of Alyorteks LLC. Calculations showed that the capital productivity indicators of TCT Agro Cluster LLC tended to increase, and capital intensity, respectively, to decrease. However, it is alarming that the indicators of equipment with fixed production assets - capital intensity - decreased significantly during the period under study, taking the lowest values compared to the other two clusters (Table 3).

**Table 3**

**Indicators of security and efficiency of use of fixed assets of TCT Agro Cluster LLC in 2018-2023.<sup>51</sup>**

Indicators	2018 y.	2019 y.	2020 y.	2021 y.	2022 y.	2023 y.
Cost of fixed assets and assets, billion soums	862,4	971,0	1 180,0	1 189,4	1 210,5	1 232,3
Number of employees, people	2 755	3 197	4 388	5 052	7 487	7 563
Volume of production in value terms, billion soums	274,3	317,8	475,9	455,4	564,5	573,2
Product production volume in physical terms, thousand tons	70,9	81,2	112,3	103,7	118,2	124,5

<sup>50</sup> Compiled based on the author’s calculations based on data from the Association of Cotton and Textile Clusters of the Republic of Uzbekistan <https://uzptk.uz/ru/>

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Capital productivity, sum	0,32	0,33	0,40	0,38	0,47	0,49
Capital intensity, soum	3,14	3,06	2,48	2,61	2,14	2,10
Capital-labor ratio, thousand soums	313,03	303,72	268,92	235,43	161,68	156,7

The purpose of the dissertation research is to find ways to improve the operational strategy of cotton-textile clusters of Uzbekistan in the production of export-oriented products, in connection with which we will analyze the indicators of the share of exports in each of the analyzed clusters

Thus, the analysis made it possible to identify the strengths and weaknesses of the activities of the cotton-textile clusters of Alyorteks LLC, Boyovut techno cluster LLC and TCT Agro Cluster LLC (Table 4).

**Table 4**

**Strengths and weaknesses of the activities of HTC “Alyorteks”, “Boyovut techno cluster” and “TCT Agro Cluster” in 2018-2023.<sup>52</sup>**

Strengths	Weak sides
<b>Boyovut techno cluster LLC</b>	
An increase in the capital-labor ratio, which determines the presence of positive processes of increasing the degree of equipment of cluster workers with means of production	Decrease in capital productivity, the main reason for which may be shortcomings in the use of fixed production assets
Low level of labor intensity	Significant increase in variable costs per unit of output, which may indicate an increase in product costs
<b>TST Agro Cluster LLC</b>	
Increase in capital productivity, decrease in capital intensity	High variable costs per unit of production
High share of exports in production	High level of labor intensity, which means low productivity and ineffective organization of labor in the enterprise

Results. In order to improve the activities of clusters, it is necessary to develop and implement a program of measures to increase the capital-labor ratio and capital productivity, increase export volumes, and reduce labor intensity, for which it is necessary:

- increase the number of qualified employees;
- purchase high-tech equipment and replace outdated ones;
- strengthen control over production;
- improve working conditions;
- find better quality raw materials for production;
- correctly distribute tasks and delegate authority.

<sup>52</sup> Compiled by the author.

1. *Areas of cotton fields:*

• TST Agro Cluster LLC occupies an intermediate position in terms of the area of cotton fields between two other clusters. However, specific field areas are not indicated in the data provided.

2. *Number of employees:*

• At the end of 2023, the number of employees of TCT Agro Cluster LLC exceeds the number of employees of Boyovut techno cluster LLC by 15 times and Alyorteks LLC by almost 24 times. This indicates a significant number of labor resources in TCT Agro Cluster LLC.

3. *Indicators of capital productivity and capital intensity of TST Agro Cluster LLC:*

• The capital productivity indicators of TST Agro Cluster LLC showed a growing trend in the period from 2018 to 2023. This indicates increased efficiency in the use of fixed assets and increased productivity.

• On the other hand, capital intensity indicators in the period under study decreased significantly, taking the lowest values compared to the other two clusters. This may indicate insufficient equipment with fixed production assets and inefficient use of resources.

4. *Share of exports:*

• Data on the share of exports in each of the clusters is not provided. To analyze the strengths and weaknesses of clusters in this aspect, additional information is required.

So, based on the data provided, the following preliminary conclusions can be drawn:

• TCT Agro Cluster LLC has a significant number of employees, which can be an advantage for increasing productivity.

• The capital productivity indicators of TST Agro Cluster LLC are growing, which indicates an increase in the efficiency of resource use.

• However, capital intensity indicators are declining, which requires attention and measures to improve the availability of fixed production assets.

## **DISCUSSION**

The results of the study showed that the introduction of cluster systems in the cotton and textile industry of Uzbekistan had a positive impact on the development of the industry. As a result of using the cluster approach, there was an increase in cotton production, an improvement in the quality of textile products, attraction of investments and the use of innovative technologies. This contributed to increased employment and income, as well as the integration of industry and agriculture, increasing the overall competitiveness of the country's economy.

However, some problems have been discovered that limit the development of cotton-textile clusters. In particular, there is an underdeveloped regulatory framework, as well as ineffective relationships between clusters and farms. There is also an increase in monopoly in the regions, which complicates the development of the industry.

As part of the study, two clusters were identified – “Boyovut techno cluster” and “TCT Agro Cluster”. The analysis showed their strengths and weaknesses. Among the weaknesses, there is a decrease in capital productivity, possibly caused by the ineffective use of fixed assets. An increase in variable costs per unit of production was also identified, which may be associated with an increase in production costs. High labor intensity indicates inefficient production organization.

In general, cluster systems have proven their effectiveness and feasibility in the cotton and textile industry of Uzbekistan. However, for further development it is necessary to pay attention to eliminating the identified problems and creating a favorable investment and legal environment.

In order to improve the activities of clusters, it is necessary to develop and implement a program of measures to increase the capital-labor ratio and capital productivity, increase export volumes, and reduce labor intensity, for which it is necessary:

- increase the number of qualified employees;
- purchase high-tech equipment and replace outdated ones;
- strengthen control over production;
- improve working conditions;
- find better quality raw materials for production;
- correctly distribute tasks and delegate authority.

For the further development of clusters, it is necessary to take a number of measures. First, attention should be paid to increasing capital productivity through the efficient use of fixed assets. This can be achieved by upgrading equipment, introducing new technologies and improving production process management.

Secondly, it is necessary to reduce variable costs per unit of production. This can be done by exploring opportunities to optimize production processes, improve raw material suppliers, and implement more efficient inventory management techniques.

Thirdly, possibilities for reducing the labor intensity of production should be considered. This can be achieved by automating certain production operations, introducing modern technologies and training personnel.

In addition, to improve the activities of clusters, it is necessary to improve the working conditions of employees, which helps to increase their productivity and level of satisfaction. You should also look for opportunities to find higher quality raw materials for production, which will improve the quality of the final product and increase competitiveness.

Finally, an important aspect of the development of cluster systems is the correct distribution of tasks and delegation of authority. A clear definition of roles and responsibilities within the cluster contributes to the effective organization of work and the achievement of set goals.

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