International Journal Of Management And Economics Fundamental

VOLUME Vol.05 Issue 12 2025
PAGE NO. 63-69
DOI 10.37547/ijmef/Volume05Issue12-14

# Forecasting Demand and Supply For Products In Cotton-Textile Clusters

Bakhtiyor Nasimov

Doctor of Economic Sciences (DSc), Associate Professor, First Vice-Rector of Tashkent Institute of Textile and Light Industry, Uzbekistan

**Received:** 22 November 2025; **Accepted:** 12 December 2025; **Published:** 29 December 2025

**Abstract:** This article analyzes methods for forecasting demand and supply for products in cotton-textile clusters in Uzbekistan. The study examines the application of predictive models based on cluster production processes, cotton yield, output volume, and export indicators. In addition, development prospects of cotton-textile clusters by 2030 are assessed using both innovative and inertia development scenarios. The findings provide practical recommendations for planning production, raw material supply, and improving operational efficiency.

**Keywords:** Cotton-textile clusters, demand and supply, forecasting, production, export, innovative development, Uzbekistan

**Introduction:** The textile industry is one of the largest sectors in the world, providing millions of jobs. The development of the textile industry contributes significantly to the gross domestic product (GDP) of many countries and supports the growth of international trade. In recent years, the market size of the textile industry has grown substantially. According to World Bank forecasts, it is expected to grow from USD 640.43 billion in 2024 to USD 696.16 billion in 2025, with an average annual growth rate of 8.7% [1].

The textile industry is becoming increasingly globalized, which requires companies in different countries to consider logistics chains, delivery times, and political risks, directly affecting inventory management.

In Uzbekistan, significant economic reforms are currently being implemented to develop industrial sectors. In particular, the following regulatory documents and presidential decrees play an important role in supporting the textile industry and cotton-textile clusters:

PF-2 dated January 10, 2023, “On measures to support the activities of cotton-textile clusters, fundamentally reform the textile and sewing-knitting industry, and further increase the export potential of the sector”;

PF-6079 dated October 5, 2020, “On approval of the ‘Digital Uzbekistan-2030’ Strategy and measures for its effective implementation”;

PF-23 dated January 26, 2023, “On additional measures to further support cotton raw material producers”.

The effective implementation of these tasks contributes to the improvement of the evaluation and development of industrial sectors in Uzbekistan, particularly the textile industry.

Analysis of Literature Related to the Topic

We consider the opinions of some local and foreign scholars regarding the peculiarities of inventory management. In the works of V.P. Kodatsky, it is stated that “inventory management should be considered as part of the general management system of an enterprise and is an integral part of the production and sales process” [3].

According to A.Sh. Akhmadov, who studied the production strategies of industrial enterprises, “there is a conflict of objectives regarding inventories when creating stocks at an enterprise. The financial department always prefers to maintain low inventory levels to improve sales, while production requires sufficient stocks to ensure a smooth workload” [4]. This conflict of interests should generally be resolved in favor of the enterprise, ensuring financial stability and preventing excessive working capital from being frozen in surplus inventories.

The costs of purchasing and maintaining inventories are often comparable to the value of the inventories themselves, and this should be avoided, as it prolongs the inventory turnover period. This issue should remain the focus of managers seeking to minimize the funds invested in inventory while maintaining the continuity of the production process.

Planning the procurement and consumption of raw materials and supplies relies on the rational planning and control of financial, informational, and material flows to ensure maximum effective use of enterprise resources.

N.A. Khromikh emphasizes that "effective management of material and technical resources cannot be implemented without careful analysis and optimization of their use. All production enterprises must pay attention to the state of working capital, including material stocks, work-in-progress, and finished products" [5].

Discussing the diversity of inventories, N.M. Mominova notes that "different types of inventories arising in various situations due to different reasons are united by a common problem. This problem involves optimizing order quantities and time intervals between related supplies and determining the economic parameters of inventory management models" [6]. From this, it can be concluded that the most important parameters of inventory management models are determined by the intensity of demand for the materials and resources constituting the inventory.

Currently, there is a trend toward transitioning from managing inventories separately to managing business processes as a whole. O.N. Zueva describes a logistics business process as "an interconnected set of operations and functions transforming company resources to achieve results determined by the firm's logistics strategy or consumer demand through the management of goods and related flows" [7].

The main goal of a logistics business process is to ensure timely and efficient delivery of goods from the producer to the final consumer. It starts with supply planning and includes procurement of raw materials and supplies, placement in the enterprise warehouse, internal transport between production units, monitoring of production and warehouse stocks, and calculation of necessary replenishment levels.

V.I. Malyuk writes that "cost optimization is the main objective in designing production sites, supply chains, and logistics infrastructure. For manufacturing, this often means concentrating capacities in one or a few low-cost countries in large enterprises, which is characteristic of the textile industry, where excess stocks and capacities are equivalent to losses" [8].

Analyzing foreign experience in managing production inventories in cotton-textile clusters is considered appropriate. The main elements of this experience, based on scholars' views, are examined in the main part of this article.

Analysis and Results. The textile industry is one of the major branches of light industry, primarily engaged in the production of fabrics, knitwear, and various other products based on agricultural raw materials. Therefore, special attention to raw materials and consumers is essential in the textile industry. At the same time, when developing and implementing production programs, it is necessary to establish a complete production cycle from raw materials to finished products. This requires organizing the deep processing of cotton fiber based on modern technologies, including innovative approaches such as the cluster model, in order to produce environmentally friendly finished textile and light industry products that are in high demand in both domestic and foreign markets.

Forecasting demand and supply is an important tool for business processes that contribute to the formation of an efficient, responsible, and sustainable industry within cotton–textile clusters. Forecasting raw material requirements enables more accurate planning of the procurement of raw materials and supplies, reducing warehousing costs and minimizing production losses. Forecasting production needs also makes it possible to organize logistics processes more efficiently, which has a positive impact on overall business performance.

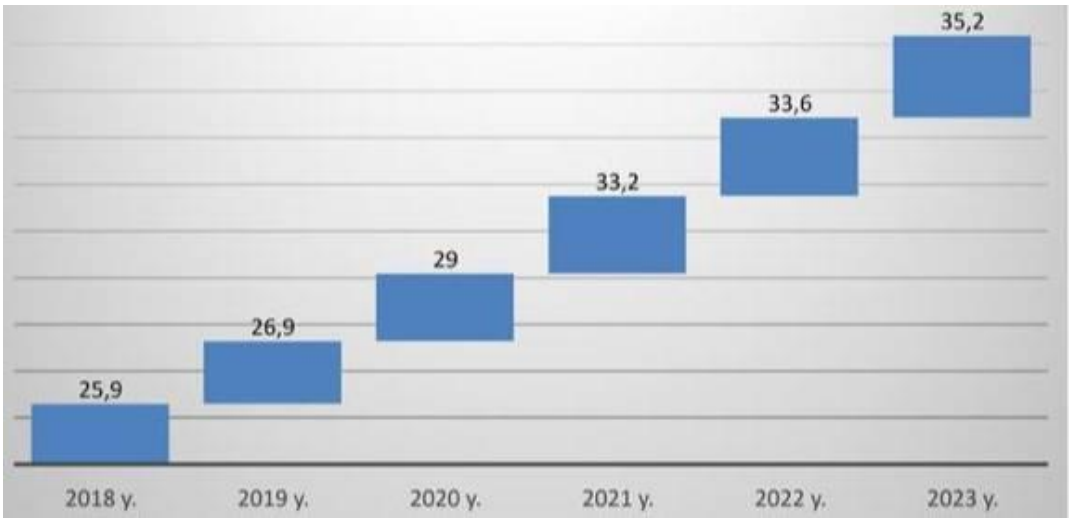


**Figure 1 . Dynamics of Cotton Yield in Cotton–Textile Clusters (CTCs), c/ha**

The key performance indicators of cotton–textile clusters (CTCs) in Uzbekistan are analyzed, on the basis of which forecast econometric models are developed. The first parameter considered is cotton yield within cotton–textile clusters. According to BusinesStat estimates, during 2019–2023 the gross output of raw cotton in Uzbekistan increased by 30.4%, reaching 3.51 million tons. In terms of raw cotton production, the country ranks among the world's top ten producers.

The increase in gross cotton harvest was driven by higher yields resulting from improved efficiency of land cultivation. In recent years, the growth of cotton yields in Uzbekistan has largely been associated with the transition to a cluster system implemented within the framework of the "Strategy for the Development of Agriculture of the Republic of Uzbekistan for 2020–2030," which enhanced the economic incentives and motivation of agricultural producers. The dynamics of cotton yields in Uzbekistan's CTCs are presented in Figure 1.

Within the production processes of CTCs, yarns of various thicknesses and compositions are manufactured, some of which are exported, while the remaining portion is further used in fabric production. Currently, Uzbekistan's textile export strategy is aimed at increasing the share of highly processed products in total exports. Modern technologies are actively being introduced in CTCs for cotton and fabric processing and for the development of new product types, thereby enhancing product competitiveness in global markets.

The textile industry is one of the key sectors contributing to national economic growth. Uzbekistan is rich in cotton resources, and processing cotton into textile products generates added value. Therefore, the export volume of products produced within CTCs is considered a key indicator in forecasting models. Growth in textile exports contributes to increased foreign currency inflows, facilitates the attraction of foreign investment, and promotes the development of new technologies, ultimately improving the quality of production processes.

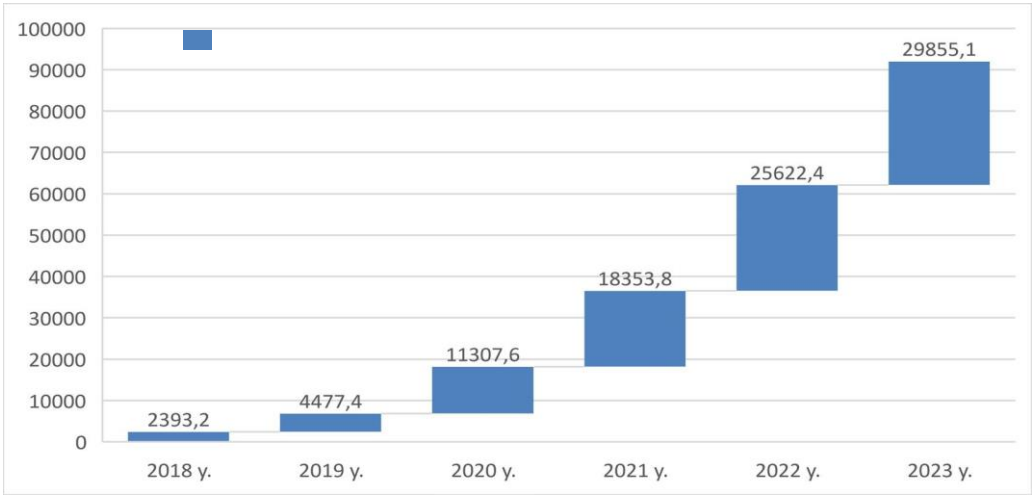


**Figure 2. Dynamics of Production Volume in Cotton–Textile Clusters (CTCs), billion UZS**

Furthermore, by developing its textile product exports, Uzbekistan strengthens its international relations and partnerships, which contributes to the country's integration into the global economy.

It is evident that the high efficiency of CTC operations is not possible without motivated and skilled personnel. Employees working in CTCs must be knowledgeable about modern innovative technologies and equipment used in textile production and be prepared to learn new methods and technologies to operate effectively in a rapidly changing production environment.

With the increase in production capacity, it becomes necessary to expand the workforce in CTCs (Figure 3).

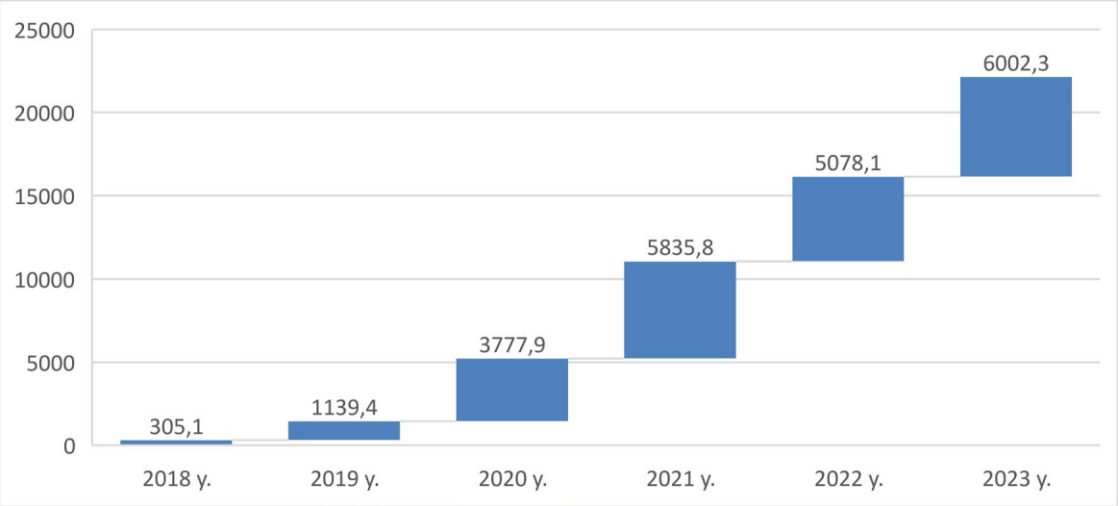


**Figure 3.. Trends in Exports of Products from Cotton–Textile Clusters, billion UZS**

As shown in Figure 3.13, the number of employees in Uzbekistan's CTCs exhibits an increasing trend, with the workforce more than eightfold higher in 2023. Correspondingly, due to both the growth in employee numbers and the improvement in their qualifications, wages in CTCs have also shown an upward trend (Figure 3).

The dynamics of wage growth indicate a particularly significant increase in salaries between 2021 and 2023. In 2023, the wage level of employees in CTCs exceeded the 2018 level by more than 100 times.

Forecasting the development of Uzbekistan's CTCs enables the identification of potential opportunities for growth and innovation. When selecting development strategies for CTCs, two scenarios were considered: the inersion (passive)scenario and the innovative (active) scenario. Using correlation-regression analysis, calculations were carried out to project the sector's development up to 2030 (Table 3.10).

The inersion scenario assumes that current trends and factors affecting the textile sector remain unchanged, envisioning a gradual and predictable evolution of Uzbekistan's CTCs. Under this scenario, changes in the sector occur slowly, and new factors have minimal impact, with technological innovations and updates being introduced gradually.

Under the innovative scenario, by 2030, cotton yield is projected to reach 53 c/ha, compared to 47.2 c/ha under the inersion scenario, representing a 1.5-fold increase over the 2023 yield (Figure 3.15). Increasing cotton yield is a key task for agronomists working in Uzbekistan's CTCs. Implementing innovations in cotton cultivation is supported financially through subsidies and tax incentives for farms adopting innovative practices, as outlined in the Decree of the President of the Republic of Uzbekistan No. PQ-17 dated March 25, 2022, "On Measures to Support the Improvement of Soil Fertility and Cotton Yields and the Introduction of New Irrigation Technologies in Cotton Fields."

To increase cotton yield, the following measures are recommended:

Using innovations in irrigation systems, ensuring more efficient use of water resources, and providing plants with an optimal level of moisture;

Using monitoring systems to determine the nutrient requirements of plants, applying modern fertilizers and biostimulants;

Monitoring the condition of fields, assessing plant health, and using remote sensing technologies to optimize the irrigation process.

The combination of these methods has a positive effect on cotton yield.

According to the innovative scenario, by 2030, the volume of produced goods is projected to reach

65,200.0 billion UZS, while under the inersion scenario it will amount to 42,996.3 billion UZS. The innovative scenario implies a 2.3-fold increase in the volume of produced goods compared to 2023, whereas the inersion scenario predicts a 1.6-fold increase relative to 2023.

**Table1.**

**Forecast of CTC Development in Uzbekistan under Different Development Scenarios**

| Indicators | Actual | | | | | | Forecast | | | | | | Trend equation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2018 y | 2019 y | 2020 y | 2021 y | 2022 y | 2023 y | 2025 y | 2026 y | 2027 y | 2028 y | 2029 y | 2030 y | |
| **Inersion ssenariy** | | | | | | | | | | | | | |
| **Cotton yield in CTCs, c/ha** | 25,9 | 26,9 | 29,0 | 33,2 | 33,6 | 35,2 | 37,1 | 38,9 | 40 | 42,5 | 45,1 | 47,2 | U=2,023x+ 23,55 $R^2$ = 0,9516 |
| **Volume of products produced, billion UZS** | 2393,2 | 4477,4 | 11307,6 | 18353,8 | 25622,4 | 27855,1 | 29699,7 | 31550,9 | 33663,1 | 35885,4 | 40805,2 | 42996,3 | U=6033,5x-5669 $R^2$ = 0,9724 |
| **Volume of exported products from CTCs, billion UZS** | 305,1 | 1139,4 | 3777,9 | 5835,8 | 5078,1 | 6002,3 | 6259,8 | 6799,5 | 7055,6 | 7255,8 | 7588,4 | 7985,7 | U=3561ln(x)-182,9 $R^2$ = 0,9424 |
| **Number of employees in CTCs, people** | 8584 | 37209 | 46572 | 61672 | 63403 | 69874 | 70365 | 74550 | 78952 | 82699 | 86447 | 90154 | U=34848 ln(x) $R^2$ = 0,9836 |
| **Salaries of CTC employees, billion UZS** | 14,59 | 70,70 | 843,92 | 1134,26 | 1506,55 | 1542,1 | 1654 | 1687,3 | 1705,4 | 1723,1 | 1877,4 | 2098,1 | U=962,54ln(x)- 207,63 $R^2$ = 0,9768 |
| **Innovatsion ssenariy** | | | | | | | | | | | | | |
| **Cotton yield in CTCs, c/ha** | 25,9 | 26,9 | 29,0 | 33,2 | 33,6 | 35,2 | 41,1 | 43,3 | 47,9 | 49,1 | 51,2 | 53,0 | U=24,086 $e^{0,067}$ $R^2$ = 0,9612 |
| **Volume of products produced, billion UZS** | 2393,2 | 4477,4 | 11307,6 | 18353,8 | 25622,4 | 27855,1 | 32774,6 | 35779,4 | 38554,8 | 40553,1 | 56441,2 | 65200 | U=1411y $e^{0,62x}$ $R^2$ = 0,9715 |
| **Volume of exported products from CTCs, billion UZS** | 305,1 | 1139,4 | 3777,9 | 5835,8 | 5078,1 | 6002,3 | 11205,8 | 12993,2 | 14665,7 | 16899,5 | 18401,3 | 20544,1 | U=330, $1x^{1,92}$ $R^2$ = 0,9531 |
| **Number of employees in CTCs, people** | 8584 | 37209 | 46572 | 61672 | 63403 | 69874 | 71596 | 85611 | 102478 | 114668 | 123544 | 139985 | Y=13410x+3257,7 $R^2$ = 0,9616 |
| **Salaries of CTC employees, billion UZS** | 14,59 | 70,70 | 843,92 | 1134,26 | 1506,55 | 1542,1 | 1977,6 | 24844,5 | 2994,4 | 3374,1 | 3778,5 | 4001,2 | U=10,68x2+340,7x- 425,5 $R^2$ = 0,9508 |

Measures to increase the volume of textile industry products are outlined in the Decree of the President of the Republic of Uzbekistan No. PF-71 dated May 24, 2024, “On measures to bring the textile and garment-knitting industry to a new level of development.” The document provides for increased investments in the textile industry by both state and private investors, customs and tax incentives for textile producers, reduction of customs barriers for importing equipment, and expansion of the product range, including new fabrics and goods that allow entry into international markets.

Thus, the author has calculated two development forecast options for the development of CTCs in Uzbekistan – inersion and innovative development. The inersion scenario assumes that the existing trends in the development of CTCs in Uzbekistan will be maintained, whereas the innovative scenario represents a fundamentally new approach. The calculated forecast indicators confirm the possibility of severalfold increases in cotton yield, textile production volume, and export volume.

The calculation of the optimal development model of CTCs in Uzbekistan shows that implementing the innovative scenario provides the most optimal set of parameters describing the development of CTCs in Uzbekistan by 2030: cotton yield – 53 c/ha, volume of produced textile products – 65,200.0 billion UZS, export volume of CTC products – 20,544.1 billion UZS, number of employees – 139,985 people, and annual harmful emissions – 605 thousand tons.

**References**


1. World Bank Group - International Development, Poverty, & Sustainability https://www.worldbank.org/
2. 2022-2026 yillarga mo'ljallangan yangi O'zbekistonning taraqqiyot strategiyasi https://www.norma.uz/qonunchilikda_yangi/2022 2026_yillarga_muljallangan_yangi_uzbekistonning _taraqqiet_strategiyasi_tasdiqlandi
3. Кодацкий В.П. Прибыль., М., Финансы и статистика, 2021, с.85
4. Ахмадов А.Ш. Повышение эффективности управления производственной стратегией в промышленных предприятиях // Экономика и предпринимательство. 2019. № 10 (111). с. 11505.
5. Хромых, Н.А. Экономический анализ оборотных активов предприятия / Н.А. Хромых. - М.: Русайнс, 2018, с.102
6. Муминова, Н. М. Сегментарный анализ рыночного потенциала текстильной промышленности Узбекистана / Н. М. Муминова. — Текст : непосредственный // Молодой ученый. — 2015. — № 12 (92).
7. Зуева О. Н. Реверсивная логистика в управлении запасами / О. Н. Зуева // Известия Иркутской государственной экономической академии. - 2009. - № 1(63). - с. 107
8. Малюк В. И. Производственный менеджмент. — М.: Юрайт. 2024, с.148
9. Madrakhimova G.R Improving The Use of Investment in Improving The Efficiency of Light Industry Enterprises in Uzbekistan. // International Journal of Research in Management & Business Studies ( IJRMBS 2019) ISSN:2348-6503. Volume 6, Issue 2 (April-June 2019). Impact Factor (5) GIF – 0.70. 32-35-p. http://ijrmbs.com/vol6issue2/madrahimova.pdf
10. Nasimov, B. (2024). SCIENTIFIC-METHODOLOGICAL BASES OF PRODUCTION RESOURCE MANAGEMENT IN COTTON-TEXTILE CLUSTERS. Академические исследования в современной науке, 3(52), 66-71.
11. Waller M.A., Fawcett S.E. Data Science, Predictive Analytics, and Big Data: A Revolution That Will Transform Supply Chain Design and Management // Journal of Business Logistics. 2023. Vol. 34 (2). p. 77.
12. 12.Schmitt A.J., Singh M. Quantifying supply chain disruption risk using monte carlo and discrete-event simulation // Rossetti M.D., Hill R.R., Johansson B. et al. (eds). Proceedings of the 2019 Winter Simulation Conference. P. 1237Madraximova G.R. Mamlakatimiz iqtisodiyotida sanoatning o'rni, ahamiyati va rivojlanish yo'nalishlari. // Biznes-Ekspert. – Toshkent, 2020. 2-son. 104-109-b. (08.00.00 №3).
13. Nasimov, B. (2025). Strengthening and enhancing the export potential of industrial enterprises for sustainable growth. MUHANDISLIK VA IQTISODIYOT, 3(4).
14. Nasimov, B. (2024). IMPROVEMENT OF PRODUCTION RESERVE MANAGEMENT MODELS IN COTTON-TEXTILE CLUSTERS: ERP-systems. Решение социальных проблем в управлении и экономике, 3(12), 131-134.
15. Manigandan, P., Kanagajothi, D., Jeena, R., & Madrakhimova, G. (2025). RISK MODELING WITH THE NEW LOGARITHMIC TANGENT WEIBULL DISTRIBUTION: APPLICATIONS IN INSURANCE AND NET OFFICIAL DEVELOPMENT ASSISTANCE. Reliability: Theory & Applications, 20(4 (89)), 1083-1093.
16. Nasimov, B. (2024). SCIENTIFIC-METHODOLOGICAL BASES OF PRODUCTION RESOURCE MANAGEMENT IN COTTON-TEXTILE CLUSTERS. Академические исследования в современной науке, 3(52), 66-71.
17. Насимов, Б. (2021). Эффективность стратегического управления предприятиями. Экономика И Образование, (4), 311-317.
18. Насимов, Б. (2021). КОРХОНАЛАР ФАОЛИЯТИНИНГ СТРАТЕГИК БОШҚАРИШ САМАРАДОРЛИГИ. Iqtisodiyot va ta’lim, (4), 311-

317.