

ORGANIZATIONAL AND ECONOMIC MECHANISMS FOR CREATING AN INNOVATIVE ECOSYSTEM OF TEXTILE INDUSTRY CLUSTERS

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Abstract. The paper analyzes cluster governance, public–private partnership, cooperation between enterprises and universities, innovation infrastructure, digital platforms, financing instruments, circular economy principles, responsible supply chains and institutional regulation. Special attention is paid to the relevance of these mechanisms for countries where textile clusters are becoming a tool of industrial modernization, including Uzbekistan.

Keywords: textile industry, textile cluster, innovation ecosystem, organizational mechanisms, economic mechanisms, sustainable development.

INTRODUCTION

The textile industry is one of the sectors in which cluster-based development can produce significant economic effects. Textile production is structurally connected with agriculture, fibre processing, spinning, weaving, dyeing, garment manufacturing, packaging, logistics, marketing and export operations. If these stages function separately, enterprises face high transaction costs, unstable raw material quality, weak technological coordination and limited innovation capacity. A cluster model reduces these barriers by creating a territorial and institutional environment in which enterprises, suppliers, service organizations, financial institutions, research centres and public authorities interact within a common value chain. Porter’s classical concept explains clusters as geographically proximate groups of interconnected companies and institutions that increase productivity, stimulate innovation and create conditions for new business formation [1]. In the textile sector, this interpretation is especially relevant because competitiveness depends not only on the individual factory, but also on the quality of the entire production and innovation environment.

MAIN PART

The first organizational mechanism is cluster governance. In many textile-producing countries, enterprises operate within a fragmented institutional environment: farmers,

spinning mills, garment factories, logistics companies and exporters often make decisions independently, without a unified development strategy. Cluster governance should solve this problem by establishing a coordination body or cluster management organization. Its functions may include strategic planning, monitoring of investment projects, supplier coordination, export promotion, technological modernization, cooperation with universities and dispute resolution among participants. Effective governance does not mean excessive administrative control. It means transparent rules, contractual discipline, equal access to infrastructure and coordination of long-term interests. Without such governance, the cluster may turn into a vertical monopoly or a loose group of unrelated enterprises.

The second mechanism is the formation of stable value-chain integration. Textile clusters should connect the full cycle from raw material to finished product. In cotton-based economies, this includes cultivation, ginning, spinning, weaving, dyeing, sewing and export logistics. Uzbekistan's experience is illustrative because cotton-textile clusters were introduced as a mechanism for moving from raw cotton production toward deeper industrial processing. The World Bank noted that Uzbekistan's cluster model expanded rapidly after 2017 and became a major institutional instrument for agricultural modernization and textile value-chain integration [3]. The 2020 reform on the broad introduction of market principles in the cotton sector abolished state procurement prices and created conditions for more market-oriented relations between farmers and cluster organizers [4].

The third organizational mechanism is contractual coordination between cluster participants. Textile clusters often include actors with unequal economic power: large processing enterprises, small farmers, medium-sized sewing factories, service providers and exporters. If contractual relations are unclear, conflicts may arise over prices, payment periods, quality standards, input supply and delivery obligations. Therefore, a cluster ecosystem needs standardized contracts, transparent pricing formulas, arbitration procedures and digital monitoring of obligations. Contracts should protect both the cluster organizer and smaller participants. This is especially important in cotton-textile clusters, where farmers may become dependent on one buyer. An innovative ecosystem cannot develop under conditions of coercive dependence; it requires trust, predictability and mutual economic benefit.

The fourth mechanism is the creation of innovation infrastructure. Textile clusters need laboratories, design centres, testing facilities, certification services, pilot production lines, business incubators and technology transfer offices. These institutions help enterprises test new fibres, improve fabric quality, reduce chemical use, develop

technical textiles and comply with international standards. Innovation infrastructure is particularly important for small and medium-sized firms, which often cannot finance advanced research or laboratory testing independently. A shared innovation centre inside the cluster can reduce costs and accelerate modernization. In practical terms, such a centre may provide fabric testing, colour fastness analysis, eco-design consulting, digital pattern-making, product prototyping and training in international certification requirements.

The fifth mechanism is cooperation between industry, universities and vocational education institutions. Textile innovation is impossible without qualified engineers, technologists, designers, machine operators, environmental specialists, logistics managers and digital analysts. Educational institutions should not remain outside the cluster. They should participate in curriculum development, applied research, internships, dual education programmes and joint laboratories. A university connected with a textile cluster can study local technological problems: water-saving dyeing, fibre waste recycling, quality defects, energy efficiency and labour productivity. Enterprises receive scientific and methodological support, while students gain practical competence. Such cooperation transforms human capital into a direct factor of cluster competitiveness.

The fourteenth mechanism is cluster performance evaluation. An innovative ecosystem needs measurable indicators. These may include the share of processed raw material, export value added, productivity per worker, number of new products, number of certified enterprises, energy consumption per unit of output, water use, share of recycled materials, number of university-industry projects, training hours, patents, digitalization level and supplier integration. Without such indicators, cluster policy becomes descriptive and difficult to evaluate. Performance monitoring should be public, regular and connected with policy decisions. Enterprises receiving support should demonstrate measurable progress.

CONCLUSION

The creation of an innovative ecosystem of textile industry clusters requires a complex combination of organizational and economic mechanisms. Organizational mechanisms include cluster governance, value-chain coordination, transparent contracts, innovation infrastructure, university-industry cooperation, digital platforms, responsible supply-chain management and institutional regulation. Economic mechanisms include preferential financing, innovation funds, tax incentives, export support, supplier development, performance-based subsidies and investment in shared infrastructure.

These mechanisms should not function separately. Their effectiveness appears only when they are integrated into a coherent cluster development strategy.

The textile cluster should be understood not as a simple administrative association of enterprises, but as an ecosystem of production, knowledge, finance, technology, labour and markets. Its innovative capacity depends on the ability to connect farmers, manufacturers, research institutions, designers, logistics providers, banks and public agencies around common economic goals. In this sense, the cluster becomes a platform for technological modernization, sustainable production and export competitiveness.

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