



## Article

# The Importance of Considering Risk Factors in Organizing and Implementing Construction Activities in Regions (A Case Study of Pakhtaobod District, Andijan Region)

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**Abstract:** This scientific article deeply analyzes the relevance and practical importance of taking into account risk factors in the process of organizing and implementing construction activities in the regions. The study is conducted on the example of the Pakhtaobod district of Andijan region, identifying the main types of risks that arise at the stages of planning, financing and implementation of regional construction projects and assessing their impact on the efficiency of construction processes. In particular, financial risks, organizational and managerial risks, technical and technological risks, legal and regulatory risks, as well as risks associated with socio-economic and natural-climatic factors are systematically considered. The article analyzes modern methods of identifying, assessing and managing risks, in particular, the issues of classifying risks, determining their probability and impact, compiling risk maps and introducing monitoring mechanisms from a scientific, theoretical and practical perspective. The research process used methods of statistical analysis, comparison, expert assessment and a systematic approach, through which problems encountered in construction projects implemented in the Pakhtaobod district and their causes were identified. The results of the study show that insufficient consideration of risk factors in the organization of construction activities leads to project delays, increased construction costs, inefficient use of financial resources, and a decrease in the quality of construction work. On the contrary, the introduction of effective mechanisms for early identification and management of risks has a positive impact on ensuring the sustainability of construction projects, increasing investment attractiveness, and the socio-economic development of regions.

**Keywords:** Centralized Resources, Budget, Risk Management, Construction Efficiency, Risks, Region

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## 1. Introduction

Risk management is a comprehensive system of measures aimed at identifying, assessing, and mitigating financial, technical, organizational, and legal risks that may arise during the construction process. In this context, effective risk management ensures the accuracy and reliability of construction activities, supports compliance with project timelines and budget discipline, while quality control of construction works enhances technical safety and helps prevent emergency situations. The importance of considering risk factors in organizing and implementing construction activities, using the example of Pakhtaobod district of Andijan region, is explained by the fact that large-scale infrastructure and social facilities are being developed in this area within the framework of state investment programs. Therefore, improving risk management is a decisive factor

not only in increasing economic efficiency but also in creating comfortable living conditions for the population, ensuring social stability, and maintaining environmental safety[1].

The relevance of the topic is determined by the fact that in Uzbekistan the construction of major infrastructure and social facilities is mainly financed through the state budget and loans from international financial institutions. This requires improving mechanisms for identifying, assessing, and mitigating risks, ensuring targeted and efficient use of financial resources, and preventing corruption-related practices in the construction process. The introduction of modern management approaches based on international standards and digital technologies can significantly enhance the effectiveness of risk management. In particular, the use of Building Information Modeling (BIM) technologies, digital monitoring platforms, and automated technical supervision tools in project management enables early identification of risks at initial stages of construction[2].

In addition, in order to strengthen technical supervision over construction projects financed from the state budget, government resolutions have been adopted to involve private business entities on an outsourcing basis in providing technical supervision services [3]. This mechanism ensures independent and objective control during the construction process, strengthens compliance with design and cost-estimate documentation, and helps maintain a balance of interests between the client and the contractor. As a result, construction quality improves, and risks associated with financial losses and technical defects are significantly reduced.

## 2. Methodology

The Budget Code of the Republic of Uzbekistan defines the State Budget of the Republic of Uzbekistan as “a centralized monetary fund intended to financially support the execution of state functions and responsibilities” [4]. The Code also takes into account expenditures related to financing centralized investments where republican ministries and agencies act as customers [5]. The Urban Planning Code of the Republic of Uzbekistan stipulates that “mandatory insurance of construction risks shall be implemented for construction projects financed from the State Budget of the Republic of Uzbekistan and loans provided under government guarantees”. Moreover, the Code provides that the financing of urban development activities may also be carried out using funds from the budgets of the budgetary system [6].

The Decree of the President of the Republic of Uzbekistan dated November 27, 2020, No. PF-6119 “On Approval of the Strategy for Modernization, Accelerated and Innovative Development of the Construction Sector of the Republic of Uzbekistan for 2021–2025” emphasizes the introduction of risk insurance principles in design, survey, and construction activities based on the study of international best practices, with the aim of improving the quality and safety of urban development activities [7].

Official data from the National Statistics Committee of the Republic of Uzbekistan provide information on the volume of construction works at the national, regional, district, and city levels, which serves as an important empirical basis for analyzing construction development trends.

## 3. Result and Discussion

The Table 1 population of Pakhtaobod district amounts to 212.7 thousand people (as of March 26, 2025). The total land area of the district is 26,033 hectares. A large share of the population is engaged in agricultural activities, primarily cotton growing, grain production, rice cultivation, vegetable farming, and fruit growing. At the same time, industrial production, construction, and service sectors have been developing steadily in recent years [8].

**Table 1.** Total Permanent Population of Pakhtaobod District (thousand people)*Based on data from stat.uz.*

Year	2021	2022	2023	2024	As of March 26, 2025
Population	195.5	199.9	204.2	208.7	212.7

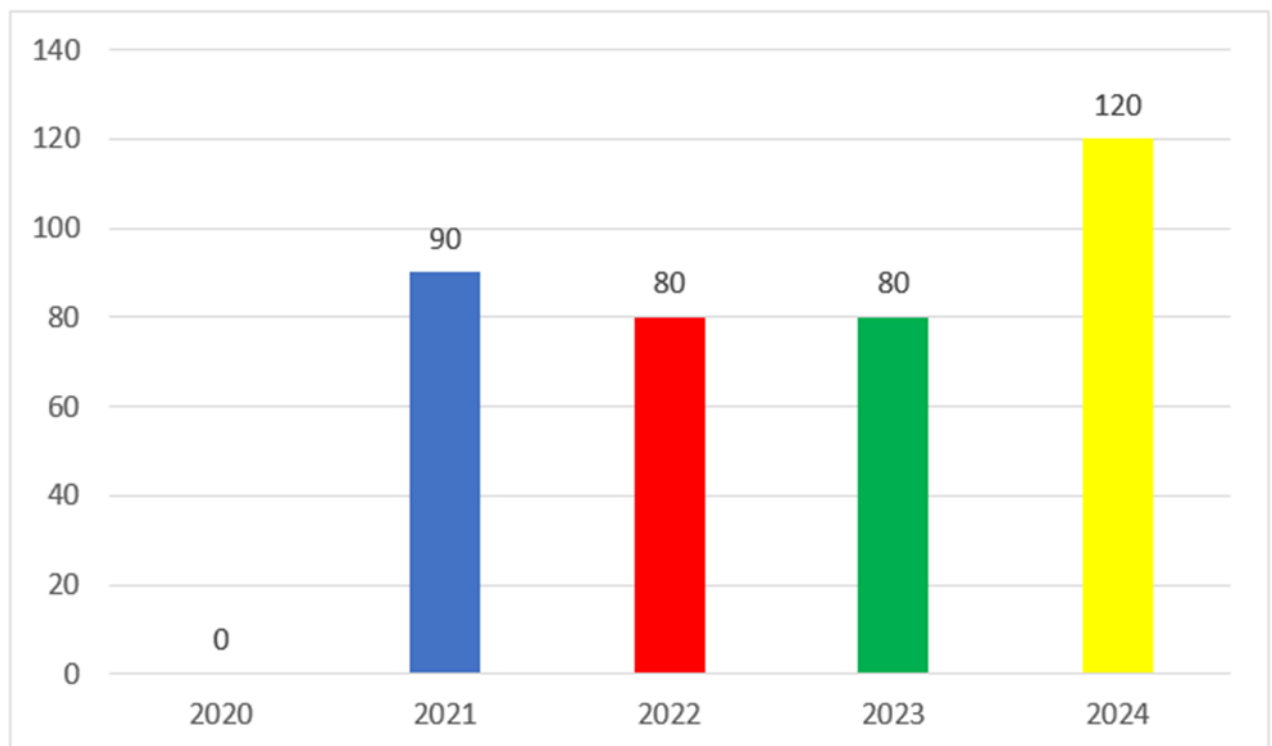
Pakhtaobod district borders the Jalal-Abad region of the Kyrgyz Republic to the north and northeast, Izboskan district to the west, Andijan district to the south, and the Kyrgyz Republic and Jalolquduq district to the east (at a distance of 58 km). One of the distinctive features of the district is its direct border with the Kyrgyz Republic. The climate is continental, characterized by very hot and dry summers and mild to relatively cold winters [9].

The Table 2 steady growth of the district's population has led to an increasing demand for housing. This trend can be observed from the data presented in the following table and diagrams[10].

**Table 2.** Construction of Multi-Storey Residential Buildings (number of housing units).

Indicators	Total (2020–2024)	2020	2021	2022	2023	2024
Pakhtaobod district	370	–	90	80	80	120

The data indicate a growing pace of multi-storey housing construction in recent years, which reflects both the rising housing demand and the intensification of urban development processes in the district. This trend underscores the necessity of effective risk management in construction activities, particularly in terms of financial planning, infrastructure provision, and ensuring construction quality and safety under conditions of rapid demographic growth[11].

**Figure 1.** Multi-Storey Housing Construction in Pakhtaobod District (2020–2024).

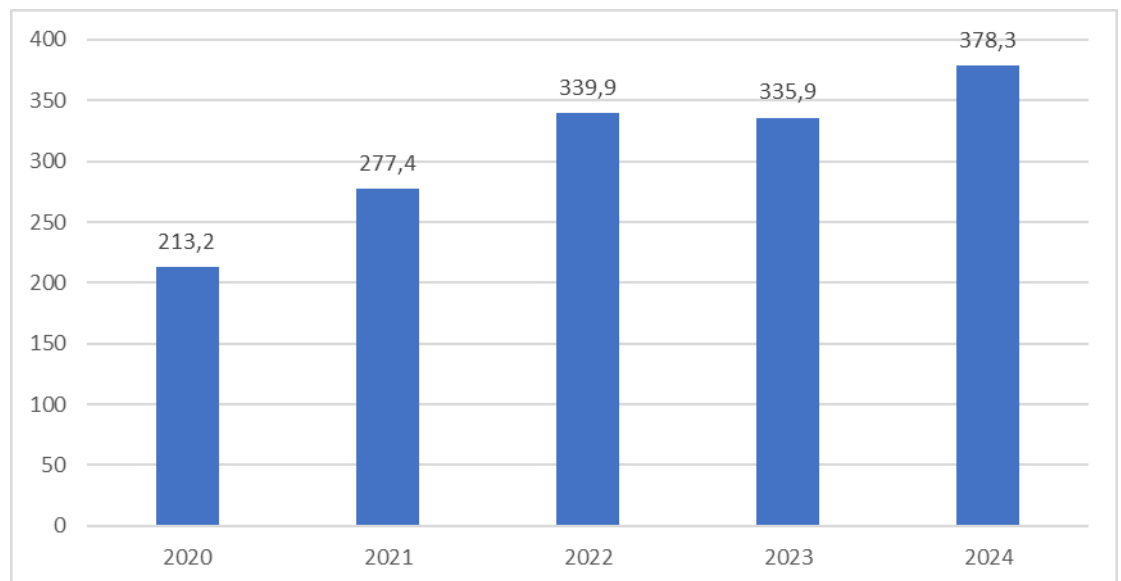
The Table 4. volume of construction works in the district shows an increasing trend. Construction activities are carried out using funds from the state budget, extra-budgetary funds, as well as private funds of business entities[12].

**Table 3.** Annual Volume of Construction Works in Pakhtaobod District (billion UZS)

*Based on data from stat.uz.*

Year	2020	2021	2022	2023	2024
Volume of Construction Works	213.2	277.4	339.9	335.9	378.3

The Table 5. volume of construction works in the district, especially the construction of multi-storey residential buildings, shows an upward trend year by year. Land plots for housing construction are mainly selected from areas not used for agriculture[13].



**Figure 2.** Diagram of Changes in the Volume of Construction Works in Pakhtaobod District.

The annual average population growth rate is 102.2%, the annual average growth of construction works is 116%, and the annual average growth rate of housing construction is 110%. Based on statistical analysis, the population is expected to reach approximately 240 thousand within the next five years (an increase of 111.5%), the volume of construction works is projected to grow by 210%, and housing construction is expected to increase by 161% [14].

These growth trends, along with the processes of urbanization, necessitate the careful and comprehensive development of the district master plan and local master plans, including rural settlements, for both the near-term (5-year) and long-term (25-year) periods, taking into account the socio-economic development prospects of Pakhtaobod district. During this planning process, it is essential to analyze demographic growth, migration flows, transport loads, ecological conditions, and the current capacities of engineering infrastructure. Such an approach ensures sustainable regional development, rational use of land resources, and prevents potential infrastructural and social problems in the future.

When developing master plans, it is appropriate to construct multi-storey residential buildings in blocks, mainly 7–9 floors, rather than as standalone houses in neighborhoods.

This enables efficient use of land, compact placement of engineering and utility networks, and improves the quality of social services provided to residents. Furthermore, consolidating administrative offices with related activities into single 7-story administrative buildings can enhance management efficiency, while allocating conveniently located land plots to business entities facilitates the development of small and medium-sized enterprises. Locating industrial enterprises farther from residential areas ensures environmental safety and protects public health.

In addition, providing heating for multi-storey residential buildings via centralized heating plants promotes efficient use of energy resources and reduces environmental impact. Engineering utilities, including electrical networks and facilities, drinking water supply and sewerage systems, as well as telecommunications networks, should be gradually modernized, reconstructed, or newly built in accordance with a 25-year perspective to ensure uninterrupted regional development. Modernizing this infrastructure also lays a strong foundation for the implementation of digital technologies and “smart city” elements.

Given the high potential of the fruit and vegetable sector in Pakhtaobod district, it is advisable to establish at least 10 modern enterprises annually by 2030 for storage and processing of fruits and vegetables. This not only increases the added value of agricultural products but also creates new jobs, expands export potential, and raises household incomes. Integrating these enterprises with logistics centers and cold storage facilities will help form an agro-cluster system in the district and support sustainable economic growth[15].

#### 4. Conclusion

According to the regulatory document QMQ 2.01.03-19 “Construction in Seismic Zones,” Pakhtaobod district is located in a seismic area with a rating above 9 on the seismic scale. The probability of earthquake recurrence is 8 points once in 200 years and 9 points once in 1000 years. It is advisable to conduct a high-precision re-evaluation of the seismicity of the region using modern advanced technologies.

For multi-storey residential buildings, it is recommended to develop and implement a pilot project for a single smart residential building that is earthquake-resistant, energy-efficient, and provides high economic performance. In these apartments, introducing an online electricity consumption monitoring and control system allows saving 5–10% of electricity consumption. This also prevents illegal or excessive connections to the grid. The development and implementation of the pilot smart residential building, as well as the electricity monitoring and control system, can be carried out by the professors and lecturers of Andijan State Technical Institute. Additionally, it is necessary to plan the construction of a new sewerage system for the district center using tunnel technology by 2030.

Financial risks affect the targeted use of state funds, technical risks determine material quality and construction timelines, organizational risks depend on the efficiency of cooperation between project participants, and environmental risks highlight the need to minimize impacts on the environment.

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