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# **The Research Journal of Business in Emerging Economics**

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# Climate Adaptation Strategies or The Agricultural Sector in Transition Economies

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## Abstract

This article examines the processes of climate adaptation in the agricultural sphere of countries with transition economies, with particular reference to Ukraine, in the context of the growing risk of climate change and the need to develop alternative models of more sustainable development. It shows that the processes of soil degradation, growing aridity, and the scarcity of water resources are increasingly affecting food security and the competitiveness of agricultural production. The purpose of the research is to assess the adaptive potential of the agricultural sector of Ukraine and identify the areas for its enhancement based on the experience of other countries with transition economies, such as Georgia, Azerbaijan, and Kazakhstan. The methodology of the research is based on the principles of the systemic and comparative analysis of the subject matter. The results obtained demonstrate that the impact of climate change on the agriculture sector in Ukraine is quite significant, making it extremely vulnerable and exposed. On the basis of the experience accumulated in the countries with developing economies, it can be stated that the problems identified can be overcome with the joint application of biotechnologies, digital technologies, and institutional measures. On the basis of the results obtained, it is suggested that an integrated model for adapting the agriculture sector in Ukraine to the effects of climate change be implemented, which would unite digital technologies, scientific potential, and joint efforts of the government and business organizations. This approach can be used as the basis for enhancing the climate resilience of the agriculture sector and developing new mechanisms for controlling the processes of adaptation, which can be implemented up to 2030.

**Keywords:** adaptation; strategy; climate change; agricultural sector; countries with economies in transition; digitalization; biotechnology; sustainable development

## 1. Introduction

One of the main challenges to agricultural production is climate change. Climate change affects crop yields, soil composition, and water balance, thus triggering a wide range of environmental and socioeconomic consequences. The impact of these changes is particularly negative on the socioeconomic stability of rural areas. The results of the study by the Intergovernmental Panel on Climate Change (2022) show that these trends are of great importance on a global and regional scale. Countries with emerging economies, such as Ukraine, Azerbaijan, Kazakhstan, and Georgia, are faced with a double-edged sword: on the one hand, the increase in risks associated with climate changes requires urgent adaptation; on the other hand, economic constraints, a lack of investment opportunities, and the failure to apply scientific approaches to economic policies hinder this adaptation process. Low- and middle-income countries are particularly vulnerable to the consequences of climate changes. The situation is particularly acute in Ukraine. According to estimates by the European Commission's Joint Research Centre (2025), more than 40% of arable land is already eroded, and water shortages are being exacerbated by rising temperatures and reduced precipitation. These conditions call for the formulation of climate adaptation strategies that incorporate analysis tools, digital monitoring tools, and effective management systems that can effectively

support proactive strategies. Consistent with the latest trends and recommendations from international environmental agreements, such as the European Green Deal, the UN's Sustainable Development Goals, and the Climate Agreement, Ukraine's agricultural policies should incorporate climate-resilient and innovative digital solutions not just for increasing productivity but also for making the agricultural industry less vulnerable to climate risks. In this regard, the formulation of a new climate-smart transformation of the agricultural industry based on the principles of sustainable development, innovation, and cooperation between science, government, and business is particularly significant. Adaptation strategies are not just for coping with climate risks but also for modernizing the socio-economic structure of the country while adhering to global environmental standards.

## 2. Objectives and tasks of the study

This study aims to assess the adaptive capacity of Ukraine's agricultural sector in the face of climate change and ensure its resilience through a comparative analysis with countries with economies in transition, such as Azerbaijan, Kazakhstan, and Georgia. Accordingly, the main objectives of the study are as follows:

- Analysis of global and regional climate risks associated with agricultural production, based on the FAO (2024); IPCC (2022); OECD-FAO (2024); OCR (2025);
- analysis of the situation and adaptation of the Ukrainian agricultural sector to climate change based on statistics provided by the State Statistics of Ukraine (2023), the Ukrainian Hydrometeorological Center (2023), the National Strategy for Adaptation to Climate Change until 2030 (Ministry of Environment, 2021);
- conducting a comparative analysis of adaptation models in transition economies (Georgia, Azerbaijan, Kazakhstan) in order to identify similarities and differences in political, technological and institutional adaptation models that can be adopted;
- creation of a comprehensive, unified integrated climate adaptation model for Ukraine's agricultural sector using new development models that are ready for climate change, combining digital technologies, scientific understanding, and institutional risk management models.

## 3. Materials and methods

The study uses methodological and comparative analytical approaches to analyze the adaptive potential of Ukraine's agricultural sector in the face of climate change and identify opportunities for strengthening it. The analysis draws on the experience of countries with transition economies—Azerbaijan, Kazakhstan, and Georgia.

### 3.1. Data sources

The study is based on the integration of information from key international and national institutions:

- FAO (2024) data on weather-related agricultural losses caused by natural disasters and models for climate-resilient agriculture;
- IPCC (2022) – climate change scenarios and their impact on crop yields and food security (RCP 4.5, RCP 8.5);
- OECD–FAO (2024) – forecasts for the development of the agricultural sector in transition economies;
- Joint Research Centre (JRC, 2025) – regional assessment of climate risks and land degradation in Ukraine;
  - State Statistical Service of Ukraine (2023) – official data on the state of agricultural production;
- Ministry of Environmental Protection and Natural Resources of Ukraine (2021) National Strategy for Adaptation to Climate Change until 2030;
- Ukrainian Hydrometeorological Center (2023) Meteorological and Climate Indicators for Ukraine.



### 3.2. Research methods

*A comparative analysis is used to compare climate risks, as well as political and technological approaches to adaptation in countries with economies in transition (Ukraine, Georgia, Azerbaijan and Kazakhstan).*

*Statistical analysis used to assess trends in crop yields, agricultural production structure and the extent of land degradation based on data from the State Statistics of Ukraine (2023), FAO (2024) and OECD-FAO (2024).*

*A content analysis of policy documents based on the National Strategy for Adaptation of Ukraine to Climate Change until 2030 (2021), as well as reports from the FAO, OECD, and OCR, was conducted to identify key areas of adaptation policy.*

*A SWOT analysis is used to systematize the strengths and weaknesses of Ukraine's adaptation policy, as well as external opportunities (investments, international projects) and threats (droughts, soil degradation, infrastructure damage).*

### 3.3. Validity and limitations.

The methodological integration of international and national data ensured the objectivity of the assessment and allowed for the alignment of global scenarios (FAO, IPCC, OECD-FAO) with the regional characteristics of Ukraine (RCC, Ukrainian Hydrometeorological Center, State Statistics of Ukraine). The main limitation of the study is limited access to field observations in the southern regions of Ukraine due to ongoing military operations, which was partially offset by the use of satellite and statistical data from international sources.

## 4. Research Results

### 4.1. Global Trends in Climate Risks for the Agricultural Sector

FAO data for 2024 show that from 2007 to 2022, agriculture accounted for a whopping 23% of all global economic losses from natural disasters, 65% of which were from droughts. This creates a pressing need for science-based adaptation models that integrate economic instruments, digital technologies, and institutional relationships. In the context of the contemporary scientific discourse on adaptation, this phenomenon is viewed as a deep organizational and institutional transformation of agribusiness rather than a short-term reaction to climate risks. This suggests that water scarcity is still the dominant destabilizing factor of agricultural production. The organization states that the agricultural and food sectors are facing an "increasing threat of loss and damage" due to climate change, and more than a third of the world's countries have already recognized this risk in their Nationally Determined Contributions (NDCs). Thus, the phenomenon of climate shocks is perceived as a systemic component of the world economic process rather than a random event. In its Sixth Assessment Report (2022), the Intergovernmental Panel on Climate Change reports that agriculture is approaching the limits of adaptation in various parts of the world. This suggests that, despite the achievements of science and technology, there are areas where losses cannot be fully compensated for.

This has significant impacts, particularly on low- and middle-income countries, which may lose up to a quarter of their grain crops in the event of a 2°C increase in average temperatures, thus posing a direct threat to food security. According to the OECD/FAO joint forecast (2024) for 2033, the global agricultural and fishery products are expected to increase by approximately 14% due to technological advances in emerging economies; however, in the absence of a timely introduction of climate-neutral technologies, greenhouse gas emissions are expected to increase by 5-6%. This is a clear paradox in terms of economic growth and environmental sustainability, as economic growth continues to gain momentum, so do environmental pressures.

According to JRC (2025) estimates from the PESETA III project under the RCP 8.5 scenario, grain yields in Southern Europe could decline by 10–22% by the middle of the 21st century, while in Eastern

Europe, including Ukraine, climate risks are exacerbated by anthropogenic factors such as soil degradation, soil pollution and the destruction of irrigation infrastructure as a result of war. Climate risks are thus complex and interrelated, simultaneously affecting natural resources, economic productivity, and social stability in rural areas.

For countries with transition economies such as Ukraine, Kazakhstan, Azerbaijan and Georgia, the situation is exacerbated by insufficient investment, weak policy coordination and limited integration of scientific knowledge into decision-making processes. This reinforces the urgent need for science-based adaptation strategies that integrate economic instruments, digital technologies, and strong institutional ties. Today, researchers perceive adaptation not as a quick fix to climate change, but rather as a rethinking of the organization and management of agribusiness. Spikuluk and Shelenko (2024) emphasize that the transition to a European green transition framework cannot be limited to technical solutions alone. They argue that ensuring circularity, decarbonization, and digitalization of production requires effective collaboration between government, business, and science. Kifyak and Dubinsky (2024) support this position. In their work, they emphasize the importance of developing a flexible institutional architecture that promotes the harmonization of economic, environmental and social development goals.

These issues are also relevant at the international level. Kimo et al. (2025) demonstrate how the CCAFS Climate Analogue tool enables both forecasting future agroclimatic conditions and enabling local farmers to adapt to these changes. However, Sanz and Perea Blazquez (2025) note that AFOLU sectors lack effective global governance mechanisms, hindering the implementation of adaptation policies in developing countries. In our view, the findings verify that technology tools alone do not suffice to achieve systemic resilience. Even with methodologically sound climate analogs and forecast models, their effectiveness will not go very far without institutional coordination, financially viable models, and the inclusion of scientific data within national-level management decisions. Hence, the adaptation of the AFOLU sector should not only be considered from a technological perspective but, above all, from a managerial and institutional perspective that facilitates the transfer of scientific progress to real agricultural production systems.

**Based on the scientific achievements achieved, three types of adaptation can be distinguished:**

- 1. Institutional** – creation of regulatory and political frameworks for the application of sustainable development principles;
- 2. Organizational and economic** “use of technologies and digital management systems”;
- 3. Social development of human** potential capable of disseminating climate-friendly practices at the local level.

In the case of Ukraine, adapting to climate change represents a double challenge, both ecological and economic. It appears that the synergy between scientific prediction, digital modeling of risks, and the development of human capital represents the essential base of a new management paradigm where the resilience to climate change represents a new indicator of the effectiveness of policies.

#### **4.2. Climate risks and consequences for the agricultural sector of Ukraine**

The analysis confirmed that Ukraine represents one of the countries which face the highest risks of climate change. The JRC report on the 2025 scenarios underlines that “in the last three decades, the average temperature rose by 1.3–1.5°C. Steppe areas receive 15–25% less precipitation. Looking to the future under the RCP 4.5–8.5 scenarios, we expect that by 2030, the shortage of moisture might affect over 40% of the southern steppe.”

The ICOSG NAAS field observations (Shabatura et al., 2025) underlined that “yields losses in the southern regions exceed 20% for wheat and even 25% for maize, with over 13.5 million ha of arable land deteriorating.” Irrigation area has been reduced by nearly 40%, leading to a significant loss of adaptive resources in the region following the destruction of the Kakhovka Hydroelectric Power Plant. Economic



calculations using the OECD–FAO (2024) methodology show that without modernization of water infrastructure, annual losses to the agricultural sector could reach US\$3.5 billion due to drought.

**4.3. Responses to adaptation models in Georgia, Azerbaijan and Kazakhstan: regional findings**

In Georgia, biotechnologies coexist with traditional approaches to land management. Geladze (2024) points out that FAO programs to revive local wheat varieties play an essential role in maintaining genetic diversity and improving the protection of crops against drought and heat. The modernization of breeding and the use of precision agriculture have helped to increase yields by 12-15 percent and reduce the use of fertilizers (Ujmaguridze, 2025). The FAO-EU working group in Georgia (2025) supports the use of biotechnology and financial incentives. Agrarian reform is directly related to economic growth, as indicated by Tsopurashvili (2023), where agricultural GDP growth has reached 5 percent.

In Azerbaijan, the emphasis is on the improvement of the genetics of plants for better adaptation, as well as digital management systems. Walieva and Huseynova (2024) show the role of molecular genetic technologies in the development of drought-tolerant wheat varieties. The State Strategy (2025) of the Ministry of Agriculture of Azerbaijan ranks the adaptation of the farm sector in the liberated lands by 2030 at the top. According to the State Strategy (2025) of the Ministry of Agriculture of Azerbaijan, the adaptation of the farm sector in the liberated lands by 2030 ranks first. Salaev (2023) states that digitalization really drives the agricultural economy, and Alvarez (2025) confirms this, stating that the application of climate technologies reduces crop losses by 10-12%.

For example, in Kazakhstan, as demonstrated by the research of Karabasov et al. (2022), the Organic Agriculture and Digital Irrigation 2030 program was gradually developed based on the increasing challenges faced by the agricultural sector regarding water supply and sustainability of agricultural production. Today, this program already covers more than 25% of irrigated land, which not only speaks of the scale of the program's implementation but also of the agricultural sector's interest in the implementation of digital technologies. The implementation of this program has already led to a decline in water losses by a fifth of the total volume and has resulted in an increase in crop yields on average by 14%, thus demonstrating the effectiveness of this program. This is a great example of how a digital program can offer not only economic benefits but also environmental ones, thus demonstrating that digitalization is not only a way to increase crop yields but also a way to make agriculture more resistant to changes in the climate. Summarizing regional experience allows us to systematize the main climate challenges and adaptation strategies in transition economies. For clarity, comparative results are presented in Table 1.

*Table 1. Key climate challenges and adaptation strategies in transition economies*

| Country    | Main climate risks                            | Key adaptation directions                           | Examples of initiatives                   |
|------------|---|---|---|
| Ukraine    | Droughts, soil degradation, water scarcity    | Digital modeling, smart irrigation, biotechnology   | DigitalAgro, Copernicus, Climate Hub NAAS |
| Georgia    | Changing precipitation patterns, soil erosion | Conservation of local crop varieties, biotechnology | FAO Local Wheat Programme                 |
| Azerbaijan | Aridity, declining soil fertility             | Molecular breeding, digital                         | Azerbaijan Climate Data Platform          |

|                   |   |  |   | monitoring<br>platforms |
|-------------------|---|--|---|-------------------------|
| Country           | Main climate risks                          | Key areas of adaptation.                             | Examples of initiatives.                      |                         |
| <b>Ukraine</b>    | Droughts, soil degradation, water scarcity. | Digital modeling, smart irrigation, biotechnology.   | DigitalAgro, Copernicus, NAAS Climate Center. |                         |
| <b>Georgia</b>    | Changes in precipitation, soil erosion.     | Preservation of local crop varieties, biotechnology. | FAO local wheat program.                      |                         |
| <b>Azerbaijan</b> | Aridity, decline in soil fertility.         | Molecular selection, digital monitoring platforms.   | Azerbaijan Climate Data Platform.             |                         |
| <b>Kazakhstan</b> | Aridization, water deficit.                 | Digital irrigation 2030, organic farming.            | Smart Farming Kazakhstan                      |                         |

**Sources:** Compiled by the author based on FAO (2024); OECD-FAO (2024); JRC (2025); Kimo et al. (2025); Dzeladze (2024); FAO-EU Task Force Georgia (2025); Valiyeva & Huseynova (2024); Salayev (2023).

#### 4.4. Comparative analysis and the role of Ukraine

A comparative analysis with Georgia, Azerbaijan and Kazakhstan shows that Ukraine has the most developed scientific and institutional base (the Institute of Climate-Oriented Agriculture of the National Academy of Sciences of Ukraine, the Ukrainian Hydrometeorological Center, the Institute of Soil Science), but it suffered the greatest environmental losses as a result of the war (Shabaturova et al., 2025). The Ukrainian agricultural model is characterized by a consistent and integrated approach: climate modeling (Euro CORDEX, RCP 4.5–8.5), data analysis and phytoremediation technologies complement each other and together form the basis of climate-smart agriculture.

The use of digital risk management platforms – AI models, satellite imagery, and IoT sensors – enables the development of a unified adaptive monitoring system that can be applied at the regional level across Eastern Europe.

#### 4.5. Synthesis of Results: Integrated Adaptation Model

This paves the way for Ukraine to establish regional climate expertise centers. A comparative analysis shows that successful adaptation to climate change in the agricultural sector requires the integration of technological, institutional, and scientific solutions into a unified risk management model. Based on the results of this study, we consider an integrated adaptation model that combines three key elements – biotechnology, digital technology, and the institutional-organizational side. Their synergy can support the development of mechanisms for enhancing the climate resilience of agricultural systems in countries with



transition economies. The structure of an integrated climate adaptation model for the agricultural sector is presented in Table 2, which includes the main components, objectives, implementation tools, and expected results.

*Table 2. Integrated model of climate adaptation for Ukraine's agricultural sector*

| Model component                     | Objective   | Implementation tools  | Expected outcomes  |
|-------------------------------------|---|---|--|
| <b>Biotechnological</b>             | Enhance crop resilience and soil fertility                  | Drought-resistant varieties, phytotechnologies, modernized seed systems | Reduced yield losses, increased biodiversity and productivity      |
| <b>Digital-technological</b>        | Improve forecasting and climate-risk management             | IoT sensors, satellite monitoring, AI-based analytics                   | Efficient water management and climate-resilient planning          |
| <b>Institutional-organizational</b> | Strengthen coordination among science, policy, and business | Strategic partnerships, state programs, educational initiatives         | More effective adaptation policy and increased investment capacity |

**Sources:** Author's generalization based on FAO (2024); JRC (2025); OECD-FAO (2024); Ministry of Environmental Protection of Ukraine (2021); Shabaturova (2024); Shabaturova, Stepanova & Yakovenko (2025).

**Biotechnology Dimension (Georgia, Azerbaijan).** Research by the FAO-EU working group in Georgia (2025), combined with the work of Valieva and Huseynova (2024), shows that the incorporation of local genetic resources helps increase crop resilience to drought, pests, and diseases, while protecting and conserving biodiversity. These practices are of particular importance to the agricultural industries of Azerbaijan and Georgia, in which low water resources and aridification are a threat to stability. The biotechnological component of the model provides a basis for the creation of a stable agroecosystem, capable of independently reacting to changes in the climate.

**Digital-technological dimension (Ukraine, Kazakhstan).** Today, this approach is viewed as a key component of efficient adaptation to the current environment. In practice, this involves the use of digital technology to make on-the-spot decisions, as opposed to reacting to a situation after it has occurred. This is similar to the Kazakh Digital Irrigation 2030 program, in which water efficiency is to be improved, water loss reduced by 20%, and grain yield increase by 14%.

**Institutional and organizational dimension (all countries).** This institutional dimension describes the state's ability to support collaboration between science, business, and government in implementing climate policy. Adaptation in the agricultural sector is not limited to the implementation of technological solutions and largely depends on institutional synergies created through the coordinated interaction of government regulatory mechanisms, financial support instruments, and scientific expertise (Shpykuliak and Shelenko, 2024). In transition economies, institutional weaknesses often limit innovation. Therefore, this component of the integrated model calls for the creation of a coordinated climate adaptation governance system based on open data, stakeholder engagement, and sustainable financing. This, in turn, facilitates the convergence of adaptation processes in the political and technological spheres.

**Integrated model of Ukraine for the region.** The study shows that the Ukrainian climate adaptation model incorporates elements from three complementary perspectives, allowing it to contribute to the development of a regional benchmark in Eastern Europe and the Caucasus. The model is characterized as follows:

- climate risk monitoring and land use management using digital tools (AI, satellite mapping and Copernicus programming systems);
- a solid scientific basis for data validation and development of adaptation strategies;
- institutional cohesion, including the public policy framework and the participation of key government institutions, such as the Institute of Climate-Smart Agriculture of the National Academy of

Agricultural Sciences and the Ukrainian Hydrometeorological Centre, as well as research institutions and local communities.

This brings us to the creation of the conditions under which Ukraine might become a “regional hub” for climate knowledge, bringing together scientific research, technological solutions, and practical experience to help agricultural adaptation to climate change. In this context, the proposed integrated adaptation model consists of three levels that interact with each other: biotechnology, digital technology, and institutionally. It is evident that the proposed integrated adaptation model possesses a flexible structure that responds to climate risks, thus enhancing agricultural productivity and the socio-economic resilience of agriculture.

The experience of Ukraine indicates that the key to agricultural adaptation to climate change lies not in the application of individual technical solutions, but rather in the combined application of technology, scientific knowledge, and management culture.

## 5. Discussion

Data from the transition countries suggests that there is little room for neutral interpretation. While these countries are subject to broadly similar climatic pressures—water scarcity, soil degradation, and increased temperature—all are experiencing different agricultural responses. These are not only the result of the availability of resources and technology, but also the level at which adaptation is considered strategically necessary, as opposed to being formally necessary.

Georgia is an example of an approach in which adaptation is based on the respect for local agricultural traditions. The FAO programs re-introducing drought- and disease-resistant wheat strains are not taken lightly but are considered a serious approach to maintaining genetic strength and putting food on the table (Dzeladze, 2024). The use of biotechnology, precision agriculture, and tracking technologies are all critical elements in maintaining the foundation (Ujmaguridze, 2025).

On the other hand, the experience of the FAO-EU Working Group (2025) proves at least one thing: the answer lies not only in the technological field. Tsopausashvili (2023) is absolutely right to stress that these changes should be compatible with the goals of a climate-neutral development. Otherwise, the adaptation process might become disjointed and temporary.

Azerbaijan’s policy is slightly different. In this country, the emphasis is placed on the development of genetic technologies to create more drought-resistant wheat. Such a policy might be seen as a reasonable answer to the growing climate aridity (Walieva & Huseynova, 2024). Making the agriculture of the occupied territories more adaptable by 2030 is not only a matter of environmental protection but a purely national concern. The National Climate Data Platform unites satellite, hydrometeorological, and economic data, making it possible to consider all these elements together.

In this regard, the role of digitalization cannot be overstated. According to Saeva (2023), better data management results in better natural resource efficiency and economic resilience. While Azerbaijan is still in the process of building up the institutional framework for adaptation, it has already achieved rapid development in the public digital sphere. In turn, Ukraine has a good scientific basis for its activities, especially with the contribution of the Risk Management Institute of the National Academy of Sciences of Ukraine (Shabatura et al., 2025). This creates the opportunity for a learning experience between the two countries, with the methodological contribution from Ukraine and the experience from Azerbaijan.

Kazakhstan, however, has chosen another route, focusing on organic agriculture as a means of building resilience to climate change. Cutting back on the use of mineral fertilizers, focusing more on biotechnology, and implementing eco-certification form the basis of this strategy (Karabasov et al., 2022). Consider, for example, the Digital Irrigation 2030 program, which demonstrates how digital technologies can pay for themselves with less water waste and better grain yields, "proving that you do not have to choose between going green and going profitable" (Kimo et al., 2025).



In this respect, Ukraine is an exemplary case. Ukraine possesses an impressive scientific potential, extensive agricultural areas, and opportunities to use advanced digital technologies. The previous studies carried out by Shabatura et al. (2025) have indicated that Ukraine's main strength is found in the integration of these opportunities. Satellite monitoring with the use of Copernicus and Sentinel, as well as AI technologies and climate risk management, increasingly integrate into one adaptive system. Such an integrated system allows connecting local observations with global data, which helps to better understand real climate risks.

However, Ukraine is different from Georgia and Azerbaijan not in the absence of local initiatives but in the development of the national scientific and technological system. Such a system is the basis not only for national but also for regional cooperation. All these cases lead us to one very simple conclusion: adaptation does not work not due to the absence of technologies but due to the parallel work of institutions, science, and economic incentives.

This is why the institutional aspect is truly important. This is where adaptation strategies are translated into real policies, regulations are properly designed, and everyone—government, business, and society—shares the burden of climate risks (Shpykuliak & Shelenko, 2024; Tsopausashvili, 2023). In the scientific and technical sphere, everything comes down to the implementation of digital platforms, the study of genetic research, and the improvement of water resource management systems (Valiyeva and Huseynova, 2024; Shabatura et al., 2025). This, as an economic component, includes financial support for farmers, investments in green technologies, and incentives for innovation (FAO-EU Task Force Georgia, 2025; Alvarez, 2025). Ukraine has all the necessary conditions to become a regional hub for climate expertise, capable of integrating the experience of the Caucasus and Central Asia into its own climate-smart governance model. The methodologies developed by ICOSG NAAS for climate modelling, risk assessment and digital monitoring could serve as a basis for the creation of an Eastern European Climate Databank under the auspices of FAO or the European Union.

Summarizing the results of the comparative analysis allows us to identify priority areas for improving the climate resilience of Ukraine's agricultural sector by 2030. These areas encompass technological, organizational, and educational measures that form the foundation of national adaptation policy. The structure of these areas is presented in Table 3.

*Table 3. Main directions for strengthening climate resilience of Ukraine's agricultural sector by 2030*

| Direction                        | Priority actions  | Expected effect   |
|----------------------------------|---|---|
| <b>Digitalization</b>            | Expansion of climate-monitoring systems and risk-management platforms               | Reduced uncertainty, improved decision-making efficiency      |
| <b>Biotechnology</b>             | Introduction of adapted varieties, bioengineering methods, and soil restoration     | Increased yields and food security                            |
| <b>Institutional integration</b> | Science-policy-business partnerships, development of climate programs               | Policy coherence and stable agricultural growth               |
| <b>Educational component</b>     | Climate education for farmers, training in precision agriculture and sustainability | Formation of adaptive management culture and local resilience |

**Sources:** Author's generalization based on FAO (2024); JRC (2025); OECD-FAO (2024); Ministry of Environmental Protection of Ukraine (2021); Shabatura (2024); Shabatura, Stepanova & Yakovenko (2025).

Ukraine's transition to adaptive agriculture is not an isolated phenomenon; Ukraine is, in fact, a part of a larger geostrategic context in which agricultural policies are closely interrelated to regional and global climate challenges. Climate change, depletion of water resources, and soil salinization are threats to almost all countries, irrespective of their level of economic development. But it is precisely in these conditions that new opportunities emerge, and it is in this context that it is possible to pass from local actions

to a coordinated approach, which may become a basis for developing a regional model of climate resilience, in which Ukraine can play a prominent role of a leader.

## 6. Conclusion

Climate change is no longer an abstract external factor for Ukrainian agriculture. It is seen in the form of crop loss, changes in the level of income received by farmers, and the level of risk associated with agricultural production. Weather instability is not only affecting the efficiency of agricultural development but is also affecting the ability of farms to stay in the market for some years to come. These conclusions are not based on any particular publications, but rather on the similarities of these assessments made by different international organizations. The analytical materials published by the FAO, IPCC, OECD-Fao, and the Joint Research Centre, although differing in their methodology and scope, show one common trend. Agriculture is one of the most vulnerable areas of the economy. Increasing aridity, temperature variability, and soil degradation are direct threats to food security, particularly in those areas where the level of economic and environmental resilience is already compromised.

At the same time, Ukraine has considerable potential for developing climate-resilient agriculture. Yet, much of it remains underestimated. Water scarcity, the extent of degraded land that exceeds 13.5 million hectares, and the persistent knowledge-action gap continue to hinder the process. In such conditions, coping with climate-related shocks only after the fact can bring only limited relief. A new model of action, which focuses on anticipating risks and mitigating them before losses become inevitable, appears increasingly imperative.

Examining the experiences of Georgia, Azerbaijan, and Kazakhstan helps to clarify this shift. These countries differ in institutional capacity, policy priorities, and resource availability, but their adaptation paths reveal several common themes. Where progress is achieved, it is rarely the result of a single intervention, but rather the result of a combination of technological innovation, sustained public support, and active local engagement. In Georgia, adaptation efforts are closely linked to biotech solutions. Azerbaijan places particular emphasis on digital climate platforms and data-driven decision support. Kazakhstan's "Digital Irrigation 2030" program illustrates how water resource management can be coordinated system-wide. Taken together, these examples demonstrate that effective adaptation requires a solid scientific and technological foundation.

In this context, the current research introduces an integrated adaptation framework specifically for Ukrainian farms. While adaptation is often considered an individual process, the proposed framework integrates these elements into three interrelated areas. The first area is biotechnology, including the use of biotechnology for the improvement of the state of the soil and the introduction of crop varieties resistant to drought. The potential of digital technologies is not seen in the direct observation of climate change processes. Their real potential is the transformation of complex information into decisions. However, adaptation is impossible without coordination. Only through the harmonious work of government agencies, researchers, and businesses can the policy on climate change become not only declarative but also executable.

The integrated climate change adaptation model for the agricultural industry of Ukraine is based on digital technology, science, and collaboration between government and business entities. The proposed approach will lay the foundation for increasing the resilience of agricultural production to climate change and developing new mechanisms for managing adaptation processes until 2030.

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# Sustainable Tourism: Features and Factors of Development in Risk Conditions

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## Abstract

The article examines global risks associated with negative impact on the environment and their influence on sustainable economic development, identifies features and substantiates factors, principles and priority areas for the development of sustainable tourism. The tourism sector is an important part of the modern world economy. In the era of globalization, tourism contributes not only to the economic development of individual states, but is also the cause of geographical diversification, due to which the structure of international tourist flows undergoes changes. The above necessitates special attention to this topic and the identification of the formation of possible new promising tourist destinations. In addition, tourism as a component of the general economic system is sensitive to various types of risk in the political, economic, social and environmental spheres. Thus, the topic is becoming even more relevant for scientific research.

**Keywords.** Global risks, environment, sustainable development, global goals of sustainable development, sustainable tourism.

## 1. Introduction

The current state of the global economic system is largely characterized by the presence of a number of risks and threats. Environmental risks refer to potential risks to the natural environment, ecosystems and human health. These risks can come from various sources, including environmental pollution, climate change, natural disasters and industrial activities. As a rule, they often consist of a combination of complex economic, social and environmental phenomena that closely interact with each other.

The global importance of tourism is increasing due to its increasing influence on the economy. In many countries, it is the most important area of economic activity, making a significant contribution to the gross domestic product (GDP), creating new jobs and stimulating the development of infrastructure at various levels - national, regional and local. This underlines the fact that sustainable growth of tourism is becoming a key factor in economic prosperity in many countries of the world. International tourism plays an important role in the global economy, as:

- it provides foreign exchange and stimulates employment in the service sector and related types of business;
- optimizes macroeconomic indicators and promotes the intensification of socio-economic

processes in the regions;

- supports the diversification of the economy of the country's subjects and rural areas, influencing demand in industries related to tourism.

Sustainable tourism is a type of tourism that considers long-term economic, social, and environmental impacts, meeting the needs of all stakeholders: tourists, industry, the environment, and local communities. Key factors in its development include nature and climate, infrastructure, cultural values, and tourism opportunities. However, in risky environments, managing these factors, taking into account potential threats such as natural disasters, economic instability, or social conflict, becomes essential. Characteristics of Sustainable Tourism.

**Economic Sustainability:** Creating jobs, supporting local businesses, and ensuring economic growth without harming the environment and society.

**Environmental Sustainability:** Minimizing negative impacts on the environment, preserving biodiversity and natural resources, and managing waste and energy consumption.

**Socio-Cultural Sustainability:** Respecting local culture, traditions, and heritage, ensuring the participation of local residents in tourism activities, and respecting their rights.

**Factors for Development in a Risky Environment Geographic and Climate:** Assessing risks associated with natural disasters (earthquakes, floods, hurricanes) and developing mitigation plans.

**Economic:** Implementing sustainable business models, diversifying tourism offerings, and creating a resilient financial infrastructure to reduce dependence on a single source of income.

**Social and Cultural:** Developing local communities, ensuring their participation in planning and decision-making, preserving cultural identity, and preventing the negative impact of tourism on local populations.

**Political Will and Governance:** Developing clear policies, strategies, and regulations aimed at ensuring tourism sustainability and risk management.

**Infrastructure and Technology:**

Creating resilient infrastructure that meets safety and environmental requirements, as well as using technology to improve management and communication.

The rapid development of international tourism is facilitated by the process of globalization, the establishment of diplomatic, economic, trade and intercultural ties between states. Tourism is a particularly relevant and potentially attractive area of development for developing countries, since it is a kind of investment injection into the economy of national and foreign investors interested in increasing their own capital

The anthropogenic impact on the environment exceeds permissible limits and is due to a number of interrelated processes. It is characteristic that economic growth is accompanied by population growth (mostly in developing countries) and a decrease in population (in some developed countries and regions), an increase in resource consumption, environmental degradation, global climate change, a decrease in biodiversity, and desertification of a significant part of the territory in certain regions of the world. Understanding the characteristics of environmental risks and threats is critical to the sustainable development of the tourism industry and the development of a set of measures to prevent, reduce and eliminate existing problems.

The work uses the methods of the logical method, classification and systematization, abstracting, review and analysis of scientific publications of scientists and specialists based on databases of peer-reviewed scientific literature.

## **2. Research Results**



As environmental conflicts intensify, economic development becomes more unstable as a result of disruption to the ecosystem. In these conditions, the concept of sustainable development has become relevant and was reflected in the work of the World High-Level Summit held in Copenhagen in 1995 (World Economic Forum, 2023). This document adopted a set of measures aimed at creating conditions for sustainable development. It provides for the broad participation of civil society in the development and implementation of solutions that determine the well-being of society.

The growth of online booking, the emergence of new travel formats, and changes in consumer preferences towards more environmentally friendly and sustainable tourism have led to the emergence of new trends and required the development of innovative solutions (UN DESA, 2024). In the new conditions, the tourism industry is faced with the need to use digital technologies not only to improve efficiency and optimize processes, but also to create a more personalized and comfortable travel experience. There are three possible paths for sustainable development of tourism as a strategic sector of the economy.

First, the extensive development path is associated with the expansion of the area of tourist territories and clusters, the attraction of additional workers, and an increase in the volume of tourism products and services in conditions where the tourism services market is not saturated and there is no strong competition.

In January 2023, the World Economic Forum published the Global Risks Report. The report highlights the challenges of addressing immediate and long-term risks. According to the report, "failure to mitigate climate change" and failure to adapt to climate change are the most serious risks projected for 2033. The report also notes that social and political polarization could further reduce the ability of collective problem-solving to address these global risks (IMF, 2022). For example, a cost of living crisis was identified as the number one risk over the next two years, while the biggest risk over a 10-year period was failure to mitigate climate change.

Digital transformation has become not just the introduction of new tools, but a comprehensive rethinking of how value is created for consumers. Regions with intensive tourism development are characterized by significant income from international tourism and a significant contribution of tourism to their GDP (Figure. 1).

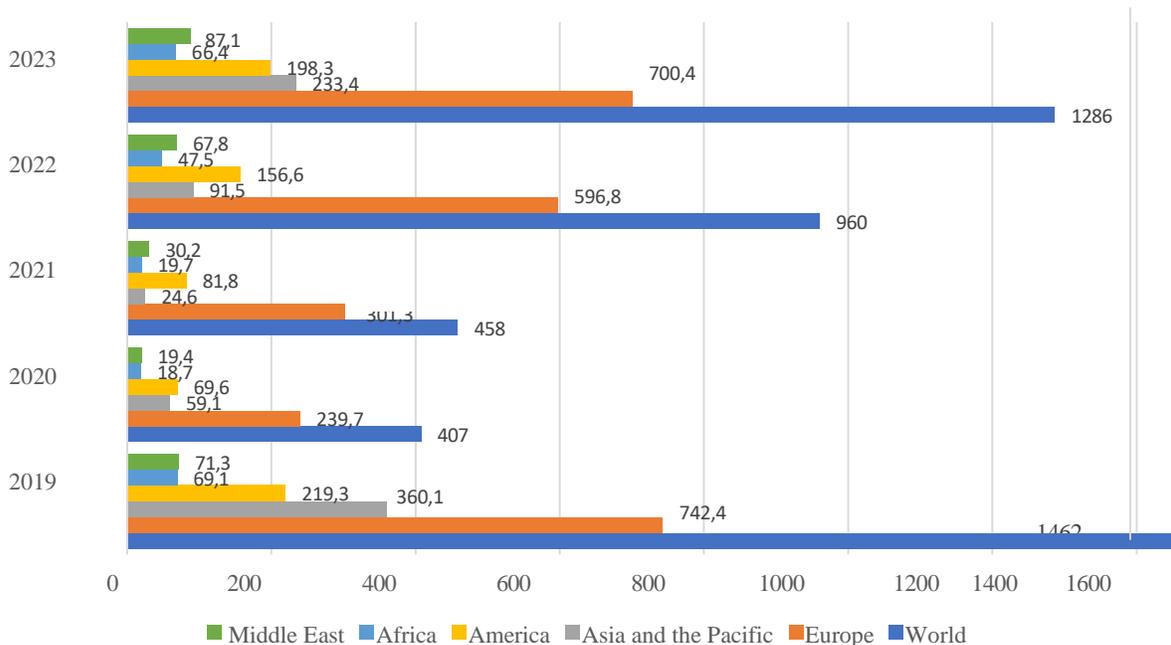
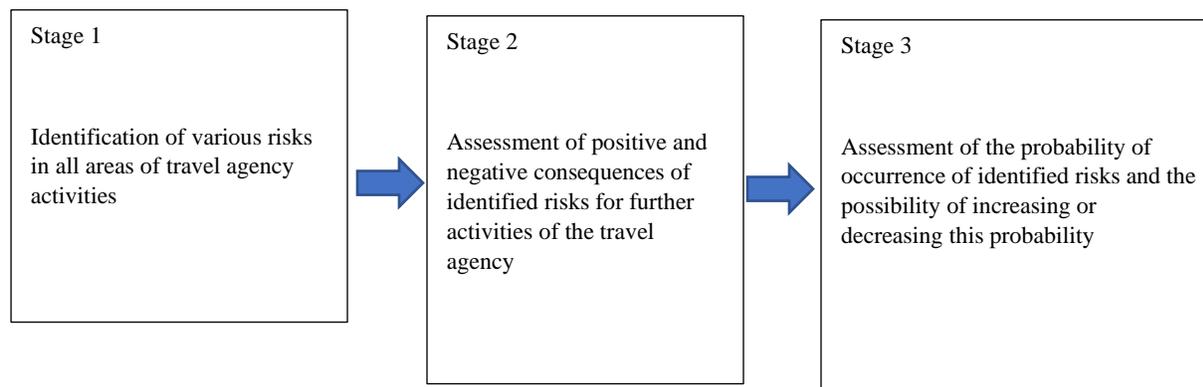


Figure. 1. International tourist arrivals by world regions, million people [World Tourism Organization, 2024]

The Global Risks 2023 report warned of emerging risks of rising inflation, debt and interest rates. According to the latest forecasts of the International Monetary Fund (IMF), global inflation in developed countries is expected to decline sharply from almost 9 percent in 2022 to 6.5 percent in 2023 and 4.1 percent in 2024 (United Nations, 2015).

The standard algorithm for assessing risks in the activities of travel agencies includes three stages (Figure. 2)



*Figure. 2. Standard algorithm for risk assessment in the activities of travel agencies.*

On September 25, 2015, at the UN Development Summit held at the UN headquarters, UN member states adopted the Sustainable Development Goals 2030, which consists of 17 Sustainable Development Goals (UN DESA, 2024).

This program provides for the implementation of specific measures to combat poverty, inequality, injustice and climate change. The new global goals and comprehensive development program, unlike in 2000, provide for the implementation of deeper reforms aimed at eliminating the root causes of poverty and ensuring a common development process for the masses and everyone.

The next UN Sustainable Development Report 2024 identifies 2024 as a critical period for global development (Khoshnevis Yazdi, 2012).

It is known that the Republic of Uzbekistan supports the sustainable development program of 17 goals and 169 targets developed by the UN until 2030 and carries out systematic work in the field of sustainable development (UNEP & UNWTO, 2005).

Sustainable tourism development is also the implementation of mechanisms for the formation of appropriate production models and a culture of consumption with sustainable economic development of tourist areas and the preservation of social and environmental balance.

In this case, sustainable tourism development can be implemented based on the following principles: implementation of the concept of sustainable tourism development in harmony with supply and demand; implementation of sustainable tourism development on a 7M scale (mono, mini, micro, meta, meso, macro and mega). Before moving on to a description of risk management technologies, let us consider the main characteristics of risk (Table 1).

Tourism is one of the largest and fastest growing industries in the world and is becoming an increasingly important source of income, employment and wealth in many countries. Currently, tourism accounts for a larger share of foreign exchange earnings and export revenues than any other industry in the world. Although tourism brings significant economic benefits to many countries, regions and communities, as practice shows, its rapid expansion has serious environmental and socio-economic consequences.

There is a reduction in natural resources and environmental degradation associated with tourism.



Long-distance travel leads to the combustion of large amounts of fuel and contributes to climate change due to CO<sub>2</sub> emissions. As a result, tourism development can have both positive and negative impacts on destinations. Sustainable tourism development attempts to find a balance between these effects (World Travel & Tourism Council [WTTC], 2023).

The UN Environment Programme and the World Tourism Organization (UNWTO) defined sustainable tourism as "tourism that takes full account of its current and future economic, social and environmental impacts and meets the needs of visitors, industry, the environment and host communities" (Statista Research Department, 2025).

*Table 1. Main characteristics of risk and their description*

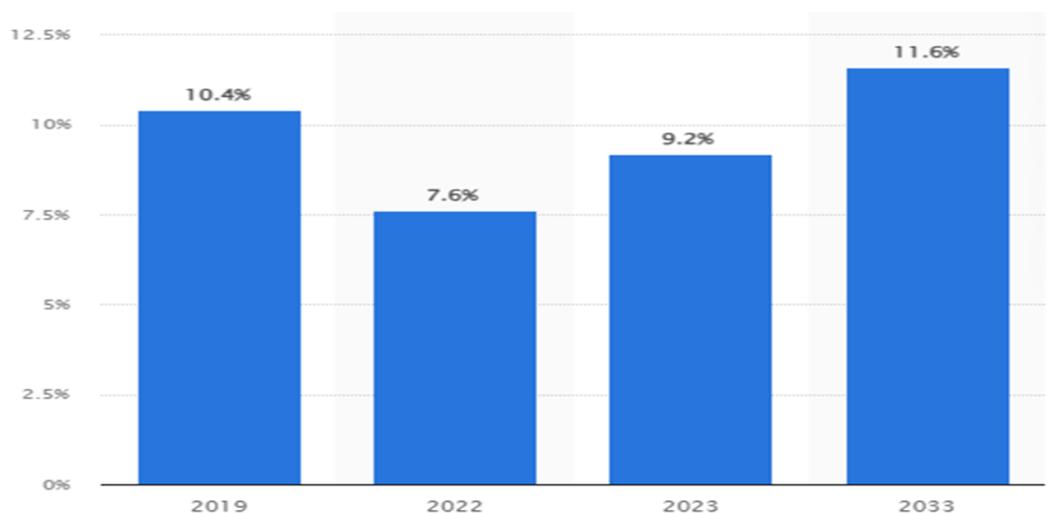
| Key risk characteristics        | Description of risk characteristics   |
|---------------------------------|---|
| Risk event and its consequences | Consequences of events that may negatively affect the achievement of the goals set by the management of the travel agency                           |
| Probability of risk             | The possibility of events occurring that may negatively impact the achievement of the goals set by the management of the travel agency              |
| Amount at risk                  | Potential, numerically measurable possibility of loss (most often this refers to the cost estimate of losses as a result of the occurrence of risk) |

Secondly, according to a study conducted by the World Travel and Tourism Council (WTTC) in collaboration with Oxford Economics, the global tourism sector is projected to contribute to increased employment (World Travel & Tourism Council [WTTC], 2023).

Through sustainable tourism development: firstly, it is possible to increase public awareness of environmental protection; secondly, it is possible to develop a sense of identification with local traditional culture and help the population increase their income by creating local jobs; thirdly, since the tourism chain includes several industries, it is possible to transform various industries in the region into green and low-carbon industries.

In recent years, despite economic and geopolitical challenges, the recovery of the travel and tourism sector has continued at a rapid pace.

International tourism is characterized by an uneven distribution of tourist flows around the world. Countries can be clearly divided into tourist exporters and tourist importers. The leaders in the field of outbound tourism are traditionally highly developed countries such as Germany, Great Britain, Belgium, Denmark, the Netherlands, the USA, Canada and Japan. This trend is due to many factors. The fundamental one is the level of income of the population, which determines the possibility of traveling not only within the country, but also abroad. The total share of the travel and tourism sector in GDP is expected to be 11.6 percent in 2033 (Figure 3) (Koroleva, 2022).



*Figure 3. Share of travel and tourism sector in gross domestic product*

Over the past six decades, tourism has not only grown, but also evolved, transforming from a highly specialized form of recreation into one of the key sectors of the global economy. Its influence extends to all spheres of life, from infrastructure and transport communications to culture and education. The transnationalization of the international tourism business is best seen in the hospitality industry, where large hotel chains operate, which contributes to the effective development of the service sector.

Studying international experience in applying measures to combat crisis phenomena in the tourism sector is of great importance, since the analysis of these approaches allows them to be adapted and integrated into national systems of regulation and support of the tourism industry, which contributes to its more effective development (Table 2). Table 2 shows the role of the travel and tourism sector in the national economy of the largest countries in the world economy.

*Table 2 - the role of the travel and tourism sector in the national economy of the largest countries in the world economy.*

| Countries | Share of tourism sector in GDP, billion USD | Share of tourism sector in GDP, % ,2024 | Change in the share of the tourism sector in GDP (%) 2024 | Total share of tourism sector in 2024 |               | Tourism Sector Change, 2024 (%) |               |
|-----------|---|---|---|---------------------------------------|---------------|---------------------------------|---------------|
|           |   |   |   | Inside                                | International | Inside                          | International |
| USA       | 1,271.2                                     | 5.5%                                    | 22.0%   | 94.8%                                 | 5.2%          | 28.0%                           | 1.4%          |
| Germany   | 251.0                                       | 6.4%                                    | 5.0%  | 89.6%                                 | 10.4%         | 5.8%                            | 11.8%         |
| Japan     | 206.3                                       | 4.2%                                    | 22.9%   | 99.3%                                 | 0.7%          | 40.5%                           | -90.8%        |
| Italy     | 179.0                                       | 9.1%                                    | 58.5%   | 83.8%                                 | 16.2%         | 76.4%                           | 19.8%         |
| India     | 178.0                                       | 5.8%                                    | 43.6%   | 94.5%                                 | 5.5%          | 55.7%                           | -39.1%        |



|                |       |       |       |       |       |       |        |
|----------------|-------|-------|-------|-------|-------|-------|--------|
| France         | 177.9 | 6.5%  | 40.6% | 70.0% | 30.0% | 51.5% | 33.2%  |
| Mexico         | 168.8 | 13.1% | 23.6% | 86.4% | 13.6% | 20.7% | 58.6%  |
| United Kingdom | 157.5 | 5.7%  | 40.3% | 96.2% | 3.8%  | 57.5% | -48.8% |
| Spain          | 113.1 | 8.5%  | 52.5% | 59.5% | 40.5% | 52.3% | 70.1%  |
| Brazil         | 103.5 | 6.4%  | 21.7% | 96.0% | 4.0%  | 29.9% | -10.6% |
| Canada         | 88.0  | 4.4%  | 24.4% | 85.5% | 14.5% | 3.3%  | 4.2%   |
| Australia      | 76.5  | 4.7%  | -6.8% | 98.0% | 2.0%  | 1.8%  | -82.2% |
| Russia         | 66.0  | 3.7%  | 32.8% | 86.9% | 13.1% | 8.3%  | 12.6%  |
| Turkey         | 59.3  | 7.3%  | 60.6% | 38.0% | 62.0% | 7.4%  | 104.4% |
| Saudi Arabia   | 51.5  | 6.5%  | 1.4%  | 72.8% | 27.2% | 6.7%  | -7.0%  |

Since the tourism chain includes several interconnected industries, sustainable tourism can help transform various industries in the region into a green and low-carbon industry.

The rapid spread of new trends in the tourism sector has become possible due to continuous scientific and technological progress and is primarily associated with the introduction of digital technologies. Digitalization has played a vital role in the recovery of tourism. During the pandemic, many travel companies and platforms have increased their operational efficiency and user convenience with the help of digital technologies. For example, artificial intelligence and big data analysis help travel companies optimize routes and personalize services, and contactless technologies, such as electronic payment and e-tickets, have become widespread during the pandemic.

The use of contactless payment systems, applications, artificial intelligence technologies and virtual or augmented reality, the use of blockchain technology are already shaping the usual environment of human life, therefore, their direct impact on the field of international tourism is manifested through the expansion of opportunities for the provision of tourism services. With the advent of forums, blogs, Facebook, Twitter, YouTube and other social media, tourists themselves have begun to create an image and influence the brand of a company through their messages. E-commerce has also played a huge role in the globalization of tourism. As technology is increasingly applied in tourism, digital transformation will continue to drive the recovery and growth of the tourism industry in the coming years, especially in the areas of virtual tourism and augmented reality.

Another tourism trend in recent years is that, in addition to traditional tourist destinations, emerging tourism markets such as Southeast Asia, Latin America and some African countries are becoming new choices for international tourists [UNCTAD, 2024]. These markets attract large numbers of tourists due to their unique culture, natural landscape and relatively low travel costs. The Asian market, mainly represented by China, is expected to make a significant contribution to global tourism growth in the coming years with the gradual recovery of outbound tourism.

### 3. Conclusion

The tourism industry is actively developing at the macroeconomic and regional levels. The problems faced by the industry have led to the introduction of new products and technologies to meet the changed consumer demand. An important trend is the cooperation of government agencies and private companies to regulate the industry and solve urgent problems. At the same time, the diversification of tourism forms has also given impetus to recovery. A feature of the post-COVID recovery growth has been the growing popularity of new forms of tourism. These include ecotourism, health tourism, "sustainable" tourism, etc. Of particular interest among these new forms is the so-called "labor" tourism. The widespread use of such a form of employment as remote work has contributed to the fact that for many people it has become possible to combine tourism and work. This, in turn, has led to the emergence of demand for long-term travel, when, for example, people travel to warm countries for the winter, combining travel and work. It is necessary to take into account the totality of various factors and conditions influencing the transformation processes in the industry. Sustainable tourism development is an integrated and systematic approach that combines social, environmental and economic values. Currently, there are various models of sustainable tourism development, but they do not fully cover the factors and indicators that ensure the sustainability of tourism. In this regard, it is necessary to develop and implement a number of strategic directions for the development of sustainable tourism. It is important that tourism development is carried out in accordance with sustainable development strategies, considering tourism activities as part of sustainable development along with other activities and the impact on other sectors. It is necessary to develop social cooperation by developing mechanisms to increase the willingness of people involved in sustainable tourism to cooperate. The issue of sustainable development affects the quantity and quality of services consumed by the consumer of tourism products, thereby forming consumption patterns that lead to sustainable tourism development.

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# Strategies for Enhancing Foreign Direct Investment in Uzbekistan

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## Abstract

Recently, the role of foreign direct investment in economic development in emerging countries has been emphasized. Therefore, competition for FDIs among countries has been on the rise. Since Uzbekistan is an emerging country, it is vital to develop effective strategies for attracting FDIs from other countries. This paper seeks to conduct an evaluation on the efforts made by Uzbekistan in enhancing its competitiveness in the global environment for attracting FDIs. In analyzing the investment environment and formulating effective strategies for attracting FDIs, Global RPM and QSPM methods have been used in combination with expert interview techniques. In this research, Global RPM analysis is used for evaluating globalization, rationality, professionalism, and morality for FDIs in Uzbekistan. Moreover, by using these strategies for attracting FDIs in Uzbekistan, economic development could be promoted, and new employment opportunities could be created for its citizens.

**Keywords:** FDI, Development Strategies, Global RPM analysis, Uzbekistan

## 1. Introduction

This paper attempts to present a comprehensive view of the role of foreign direct investment (FDI) in the socio-economic and technological modernisation of Uzbekistan. Besides the strategies, other success factors include a better macroeconomic environment, the availability of a highly-skilled labor force, and modern infrastructure. Since FDI enhances these factors by giving them more importance and efficiency, it is important for nations to exploit the benefits of FDI. Developing a consistent developmental environment depends not only on local factors but also on the political will to support foreign direct investment. Having a favorable political environment makes a country more attractive to international investors. Several policy issues have to be addressed in such a situation: foreign investors should not be subjected to legislative and administrative obstacles; there should be transparency in FDI regulations; and the legal system's capacity should be strengthened to safeguard the rights of investors (Kang, 2019).

According to statistics, the pattern of FDI inflows into developing countries is continuously increasing. Research in the literature shows that most parts of the developing countries of the Central Asia region have really become very FDI-friendly mostly on account of the natural resources and the big population which together offer a very large and potential market (Kasimov & Saydaliev, 2022). FDI is the main engine of growth of developing countries as it contributes to the reduction of dependency, the elimination of poverty, and the increase of global integration.

To illustrate, the country has moved up the ranking in the World Bank's Doing Business from 166 in 2012 to 69 in 2020. One of the most significant changes that the country has gone through is the loosening of financial policies in September 2017. Basically, this means that the government is not only trying to attract new investments through its policies but also to have investors reinvesting their returns.

For the purpose of recognizing the possible ways of development, this research will apply a comprehensive methodology and will thus derive the Global RPM analysis and Quantitative Strategic Planning Matrix (QSPM). It becomes possible through this combined methodology to single out the most efficient development approaches and policy actions. This work's findings will focus on the key problems of the FDI environment and will be accompanied by suggestions to increase Uzbekistan's international competitiveness. Importantly, the outcomes will provide a holistic approach to changing economic policies and systems, as will be clear to government officials and traders. Through the use of the Global RPM and QSPM analyses, the present research innovates by providing a thorough and structured method to decide on the best development strategies. The Global RPM method allows one to focus on the essential aspects and sub-elements, instead of just secondary data and expert opinions. Therefore, the suggested method will deliver a full answer to the problems of FDI planning and policy creation. The paper is structured as follows: Section 2 reviews the literature on FDI, Section 3 covers the data and methodology, Section 4 presents and discusses the results, and the final section presents the key conclusions.

## **2. Literature Review**

The business environment in Uzbekistan continues to evolve positively. For example, between 2012 and 2020, the country has made considerable progress in the World Bank's Doing Business ranking, leaping from 166 to 69. Among the various changes, the most important one that the country has made is the easing of financial policies which were implemented in September 2017. Essentially, by means of such a step, the government not only intends to attract new investments through its policies but also to have investors reinvesting their profits.

In order to identify the development opportunities, this research will utilize different techniques applied in a single manner and hence it will derive the Global RPM analysis and Quantitative Strategic Planning Matrix (QSPM). Combining these two approaches allows isolating the most effective development paths and policy measures. Results of this study will be directed at the main issues of the FDI environment and will be accompanied with proposals for improving international competitiveness of Uzbekistan. What is more, the results will be able to provide government officials and traders with an overall depiction of the changing economic policies and systems. By employing the Global RPM and QSPM analyses, this paper goes beyond the existing body of literature by presenting a comprehensive, systematic approach to selecting the most appropriate development strategies. The Global RPM methodology enables the selection of the focal components and sub-components, rather than simply relying on secondary data and expert opinions. Thus, the proposed method will provide a comprehensive response to the issues of FDI planning and policy formulation.

To get a clearer picture of the economic consequences of FDI, one should, among other things, comprehend what kind of forces are at work in investors' and hosts' countries' decisions to undertake investments. Based on the literature, there are three major types of FDI motivations, and these are resource-seeking, market-seeking, and efficiency-seeking FDI (Dunning, 1993). Among other things, resource-seeking FDI is influenced by the presence of natural resources, cheap labor, and well-developed infrastructure in the host country (Morck et al., 2008). Market-seeking FDI is an attempt to gain new markets in foreign countries, sometimes in industries inspiring the strongest protection. When a firm globally distributes the integrated resource-seeking and market-seeking strategies, locally-driven and efficiency-seeking FDI may be the result (Ismail, 2019). The major factor behind Central Asia's FDI is natural resources such as oil, gas, and metals, and the fact that half of the investments are targeted at the oil production and processing sector Yasar & Paul, (2007). The increase in the world price of natural resources has, therefore, seemed Central Asia's main permanent factor to attract FDI (Spechler et al., 2009). Certain labor-intensive industries tend to receive less FDI. Textile is a pretty significant FDI sector in Uzbekistan mainly because the local cotton supply powers it rather than labor. There are, however, many other factors that affect FDI inflows significantly.



On the contrary, developing countries, for years, have perceived FDI as a tool of foreign countries to make profits from them through the operations of MNEs (Hill & McKaig, 2015). According to Chen et al. (2010), FDI adversely affects the local economy in numerous ways, including but not limited to overreliance on foreign capital, irregularities in FDI inflows, prominence of low-tech industries, as well as threat to the survival of local businesses. Other factors such as growth potential, political stability, the level of democracy, membership of trade agreements, and the level of liberalization are several variables that have shown to be positively related to FDI inflows (Büthe & Milner, 2008). Developing countries are expected to benefit more from the existence of international organizations such as the WTO suggested by (Büthe & Milner, 2008).

The same government policies that are capable of helping a country meet the minimum international standards could also be instrumental in increasing the inflow of FDI (Sinanagic et al., 2012). A good reputation as a favorable destination cannot be built by one stakeholder only. Media campaigns, exhibitions, and telemarketing should be backed by monitoring mechanisms.

Developing countries' FDI has become one of the main sources of capital inflows and it continues to play a significant role in economic growth as well as macroeconomic stability. The focus here will be on Uzbekistan, a Central Asian country that has historically and consistently received relatively low amounts of FDI compared to other CIS countries. This paper will discuss the investment climate in Uzbekistan, the methods foreign capital attraction, and the extent to which government reforms play a role. To assess the strategies for development, this investigation will rely on a combined framework of Globalization, Rationality, Professionalism, and Morality analysis (Global RPM) and the QSPM technique. Firstly, this research will determine the pertinent Global RPM factors through obtaining expert opinions, after which it will rate these factors using the attractiveness scores. Finally, the combination of these scores to decide the most feasible approach to FDI in Uzbekistan will be done through the QSPM method.

### **3. Methodology**

By the decree of the Statistical Committee of Uzbekistan, the population of the country is 32,981,716 people, and the total geographical area is 449,000 square kilometers. Uzbekistan is located in what is generally known as Central Asia and it has land borders with Kazakhstan at the north, Turkmenistan at the southwest, Kyrgyzstan and Tajikistan at the east and Afghanistan at the south.

Uzbekistan is endowed with both natural resources and human capital, and its large population serves as a great base for Uzbekistan to attract Foreign Direct Investment (FDI) more than before. However, most of these strengths are common to all countries in this region. Nevertheless, due to the country size and strategic location in the region, Uzbekistan has a unique advantage to become a major recipient of FDI in Central Asia.

The present research relies on the Global RPM tool to reveal strategic elements, the Likert scale to evaluate and classify them, and finally, the QSPM approach is applied to generate strategies. The objective of this paper is to formulate a vision for the region and incorporate it with the development strategies so that Uzbekistan would be an attractive destination for FDI.

#### **3.1. Data collection and analysis**

The main purpose of this study is to conduct a Global RPM analysis of the FDI factors in Uzbekistan (figure 1) and point out the development strategies for the region, as it is a suitable instrument for strategic planning. Global RPM is recognized as a suitable method for grasping the globalization, rationality, professionalism, and morality dimensions of FDI in a region. As there are numerous factors in this analysis, the outcomes from each tool may complement each other, thus bringing about a more thorough analysis. In fact, by applying both methods, we can gain a deeper insight into the extent to which the above-mentioned factors may enable Uzbekistan to be more successful on a global, rational, professional, and moral level.

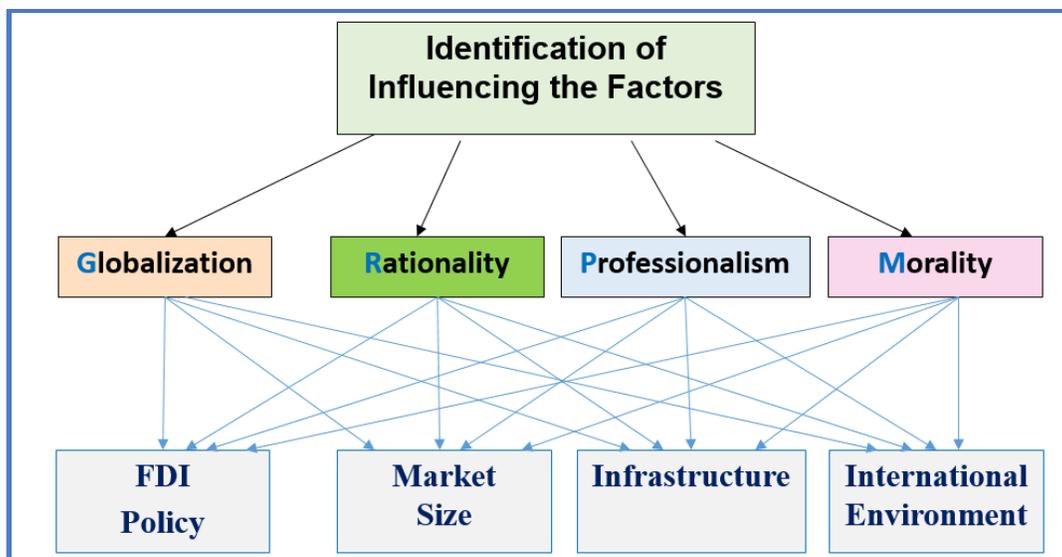


Figure 1 Combining FDI Criteria with Global RPM analysis

The first part of this research basically employed a case study and expert interviews to figure out the most crucial factors and strategies. The decision to use this combination of methods was based on the fact that this research question is related to research methods that are typically very effective when used for research questions that require detailed, contextual, but at the same time non-manipulative descriptions of a phenomenon, including the recognition of the importance of contextual factors in the formulation of the research question (Baxter & Jack, 2008; Yin, 2003). Interviews as a main data-gathering instrument were selected to conduct this research, because it was recognized that interviews are the most effective method to get the deepest participants' perspectives (Creswell & Creswell, 2017; Kebete & Wondirad, 2019). 24 face-to-face interviews were conducted in Uzbekistan from four categories of respondents: policymakers, 8; scientists, 7; small business owners, and investors, 9. Subsequently, Global RPM and QSPM were used for the strategizing purposes.

The interview process was created to distinguish the four groups of respondents: policymakers, scientists, small business owners, and investors in the region. The interview procedure was composed of the following main tasks: (a) understanding the key factors that influence FDI in Uzbekistan, (b) choosing and examining proper development strategies through literature analysis and best practice analysis of successful cases, and (c) assessing the relative attractiveness of the selected strategies with regard to the key factors based on the QSPM analysis. Through expert interviews and literature analysis, the study recognized four components of the Global RPM framework. Each of the 4 dimensions contains 4 factors, so together they make up a total of 16 factors. Besides, the factors were used to measure the affective dimension of Global RPM. The list of factors is presented in Table 1.

Table 1. Influencing Factors of Global RPM and FDI Dimensions

|             | Globalization             | Rationality                   | Professionalism                                 | Morality                   |
|-------------|---------------------------|-------------------------------|---|----------------------------|
| FDI Policy  | Political Stability       | Level of transparency for FDI | Ease of receiving license for FDI               | Investment Promotion       |
| Market Size | Availability of Resources | Wages rates                   | Knowledge of staffs in efficient doing business | Literacy rate of residents |



|                                  |                              |                                       |   |                               |
|----------------------------------|------------------------------|---------------------------------------|---|-------------------------------|
| <b>Infrastructure</b>            | Transport Infrastructure     | Openness to foreign investment        | Ease of receiving visas and employing foreign personnel | Green practices and attitudes |
| <b>International Environment</b> | Friendly investment climates | Inflation and Exchange rate stability | Qualified Staff   | Corruption Rate               |

Source: Constructed by the research participants

As already discussed, the first set of factors of evaluation is evaluated appropriately. Then, demographic variables are added to the survey. A small cover letter is also added, which gives a small introduction about the research topic and objectives and also ensures the respondents that their information will be kept confidential. Then, the survey is pre-tested among professionals from industry and academia. Some minor changes are made based on their suggestions, and then the survey is ready for implementation.

### 3.2. Global RPM Analysis

The ultimate goal of this framework is to boost business competitiveness, as well as offer a different perspective on global and local business strategies (Jeong et al., 2021).

**Globalization Dimension:** This dimension measures the extent of globalizing a business from different perspectives such as how to venture into global markets, meeting global market standards, and deepening the understanding of the impact of globalization on the business.

**Rationality Dimension:** Rationality Dimension refers to the development of strategies and decision-making based on reason, data, and evidence. It involves evaluating the reasonableness, legitimacy, and reasoning of the strategies that the business has implemented.

**Professionalism Dimension:** The Professionalism Dimension looks at the development of professionalism in the business. It covers aspects such as the insight of the management, industry professionalism, and employee professionalism. It includes assessing the level to which the business decisions align with the values of the society and the moral standards of the society.

The Global RPM analysis can be used to maximize the resources by analyzing how to create global brands, how to enter the global market, how to create rational strategies, how to enhance professionalism, and how to align the businesses, all under the dimension of globalization, rationality, professionalism, and alignment, respectively. Since the business environment is different for all, the impact of these factors may vary from industry to industry and organization to organization.

### 3.3. QSPM analysis

Quantitative Strategic Planning Matrix (QSPM) is a device that should be capable of gauging the relative attractiveness of different strategies by considering the main internal and external factors (David et al., 2017). The simplicity level of the technique makes QSPM a very handy tool, as it permits an unbiased decision on strategies that are more practical when compared to other management strategies (Chandra & Sharma, 2018). David et al. (2017) believed that in the QSPM analysis there are 6 steps to be done which are: 1. The identifying key business factors 2. Judging/marketing these factors by how important each factor is. In the case of Global RPM dimensions, the total of the weights has to be 1.0. 3. Recognizing possible strategies based on the strategic position of the identified factors. 4. Each factor should be assigned an attractiveness score from 1 to 10 for each strategy.

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1. The identifying key business factors
2. Judging/marketing these factors by how important each factor is. In the case of Global RPM dimensions, the total of the weights has to be 1.0.

3. Recognizing possible strategies based on the strategic position of the identified factors.
4. Each factor should be assigned an attractiveness score from 1 to 10 for each strategy.
5. Computation of total attractiveness scores for each Global RPM dimension by multiplying the factor weights with the attractiveness scores.
6. Calculate the final total attractiveness scores based on the combined effect of all factors and the most appropriate strategies to be implemented.

Finally, QSPM also works as a matrix, which evaluates and compares the attractiveness of the viable strategic options based on the criteria developed through both internal and external analysis of the organization or project. In the context of the research, the strategies were identified for improving the inflows of FDI and for maximizing the benefits of FDI for Uzbekistan. By applying QSPM, the identified strategies are evaluated and compared based on the attractiveness of the strategies. In addition, six strategies were identified for improving FDI in Uzbekistan through the successful international practices, after a careful evaluation of the factors and their relationships. The strategies selected for evaluation through QSPM are:

**FDI-driven Growth Strategy:** The focal point of this strategy is foreign direct investment as the key growth engine for the economy of Uzbekistan. The strategy centers on facilitating a conducive environment for foreign investors through the implementation of necessary reforms in the country.

**Organizing Anti-monopoly Laws:** The main objective of this strategy is to foster healthy competition in Uzbekistan by limiting monopoly practices. It is based on the idea of deepening anti-monopoly laws in Uzbekistan to give the investors a signal that they can do business in a fair environment.

**Human Resources Development:** The country is well aware of the fact that its human resources need to be developed. This focus is on mobilizing investments into education and training as a means of creating highly qualified human resources in Uzbekistan. Human resources development is a key factor for foreign investors during their decision-making process about Uzbekistan as an investment destination.

**Export-oriented Growth Strategy:** This strategy intends to position Uzbekistan as a serious player in international trading markets. The strategy proposes the diversification of Uzbekistan's exports, upgrading of products' quality, and leveraging international trade agreements to facilitate the expansion of Uzbekistan's exports.

**Development of Transport Infrastructure:** Transport infrastructure plays a vital role in any country's overall logistics management. Thus, it is a fact that investment in transport infrastructure will work wonders in making Uzbekistan more appealing to foreign investors.

**Investing in High Technology:** The implementation of this strategy will see resources being channeled into the development of high technology sectors. It mainly lays emphasis on research and development incentives, nurturing high technology startups, and setting up agreements for technology transfers as the ways through which these goals will be achieved.

This assessment sharply focuses on the identification of the strategies that are most likely to work in enhancing the country's ability to attract foreign direct investment and achieve economic growth.

## **4. Results and Discussion**

### **4.1. Results of Expert Interviews Using Global RPM Dimensions**

In analyzing the factors of FDI in Uzbekistan, 4 factors were assigned to each of the Global RPM categories—globalization, rationality, professionalism, and morality (table 2) using expert satisfaction ratings ranging from 1 point (highly unsatisfied) to 10 points (highly satisfied). The findings indicate that on average, the satisfaction score is 6.42 out of a possible 10 for all factors. In general, this represents a moderate level of satisfaction. Morality is found to be the factor that received the highest average



satisfaction rating of 7.24, reflecting how well FDI is in harmony with and satisfies the values and interests of the different stakeholders such as employees, customers, partners, society, and the environment. In contrast, the lowest average satisfaction rating of 5.79 was received by globalization, which shows the degree to which FDI responds to various external global forces such as market forces, consumers, competitors, government regulations, and technology. From the results of the analysis, there is a clear indication of the need to improve the policies and practices of Uzbekistan with regard to globalization and professionalism in order to attract more high-quality FDI into the country. The challenges that still need to be addressed include infrastructure, export competitiveness and diversification, lack of human capital and innovation, lack of anti-monopoly practices, and high risks of corruption and bureaucracy. Generally speaking, the results obtained in the Global RPM analysis highlight the need for Uzbekistan to improve its globalization factor and its integration and FDI policies. Professionalism and morality are generally seen in a positive light, however, further improvements are necessary if Uzbekistan is to become a more attractive destination for foreign investors. Hence, such an assessment serves as a foundation for policy changes which will help improve the FDI climate in Uzbekistan.

Table 2. Descriptive results of Global RPM Dimensions

|                           | Globalization | Rationality | Professionalism | Morality | Mean: |
|---------------------------|---------------|-------------|-----------------|----------|-------|
| FDI Policy                | 5.19          | 7.09        | 5.68            | 7.92     | 6.48  |
| Market Size               | 7.69          | 6.95        | 4.87            | 8.97     | 7.12  |
| Infrastructure            | 4.17          | 7.67        | 7.43            | 6.88     | 6.54  |
| International Environment | 6.16          | 4.78        | 6.17            | 5.22     | 5.59  |
| Mean:                     | 5.77          | 6.63        | 6.02            | 7.23     | 6.43  |

Note: All items were measured based on a 10-point scale, where 1 means strongly disagree and 10 means strongly agree.

One of the biggest infrastructure problems is the interruption of the power supply that results in production shutdowns due to power cuts. Corruption also affects almost all public sectors, such as the military and food subsidies, as well as power generation and distribution.

It is even more difficult to sustain economic growth because Uzbekistan is highly dependent on natural resources and because of the nature of resource markets, which are volatile. In order to reduce the risks associated with global price changes in commodities and to provide more economic opportunities for its citizens, Uzbekistan has to diversify its economy and shift away from the natural resource sector. At present, other sectors that are not the oil and mineral sectors are not very attractive to foreign investors.

#### 4.2. The Assignment of Weights for the Interview’s Results

The results of the survey highlight the relative importance of the factors determined. The use of weights for the factors is also important for the evaluation of each development strategy individually. Table 3 indicates the allocated weights for the Global RPM factors. In this study, the factors rated lower in the survey were allocated higher weights ranging from 0.09 to 0.43.

Table 3. The assignment of weights for Global RPM Dimensions

|                           | Globalization | Rationality | Professionalism | Morality |
|---------------------------|---------------|-------------|-----------------|----------|
| FDI Policy                | 0.28          | 0.21        | 0.26            | 0.18     |
| Market Size               | 0.15          | 0.24        | 0.33            | 0.08     |
| Infrastructure            | 0.33          | 0.18        | 0.17            | 0.27     |
| International Environment | 0.22          | 0.38        | 0.25            | 0.44     |
| Total:                    | 1.0           | 1.0         | 1.0             | 1.0      |

Note: Each of these factors will have a coefficient ranging from 0 to 1, representing the relative importance of that factor in determining the actual barriers. The coefficient represents the relative importance of the factor.

### 4.3. Final Rankings of Strategies Using QSPM Method

Based on the Global RPM approach, six development strategies were developed through the use of the benchmarking cases and learning from the past literature, following the evaluation of the factors and the identification of the interrelationships between the factors. The six strategies were the basis for the evaluation and comparison of Uzbekistan's performance. To identify the level of attractiveness for the developed strategies, the QSPM analysis was carried out (Table 4). The results of the QSPM analysis show that the most preferable strategy for improving FDI in Uzbekistan is the "FDI-driven Growth Strategy." Furthermore, the strategies for Organizing Anti-monopoly Laws and Human Resources Development, which received the highest total attractiveness scores, have a high potential for resolving the inconsistencies and challenges in the FDI environment.

The study suggests an FDI-led growth approach for Uzbekistan, learning from the experiences of other countries that have effectively attracted FDI and recorded rapid economic growth. Uzbekistan, unlike other countries in Asia, which opened their markets and experienced fast economic growth, has remained relatively isolated and has not been successful in attracting FDI.

Table 4. Final Rankings of Strategies using QSPM method

|   | Global | R    | P    | M    | Mean | Rank |
|---|--------|------|------|------|------|------|
| Development of Transport Infrastructure | 1.87   | 1.47 | 2.78 | 1.96 | 2.03 | 6    |
| Export-oriented Growth Strategy         | 2.63   | 2.43 | 3.17 | 1.95 | 2.54 | 4    |
| Human Resources Development             | 2.75   | 2.72 | 2.74 | 3.36 | 2.89 | 3    |
| FDI-driven Growth Strategy              | 3.64   | 3.28 | 3.98 | 2.89 | 3.46 | 1    |
| Organizing Anti-monopoly Laws           | 3.26   | 3.25 | 2.99 | 3.94 | 3.34 | 2    |
| Investing to High Technology            | 2.64   | 1.8  | 3.55 | 1.96 | 2.48 | 5    |

Note: The attractiveness scores are categorized on a scale where 1 = not attractive, 2 = slightly attractive, 3 = attractive, 4 = fairly attractive, and 5 = highly attractive.

The enforcement of Anti-monopoly Laws is of critical importance in order to ensure that competition is fair.

Regardless of the fact that globalization was ranked the lowest in the survey, it is a clear sign that FDI is reacting to globalization factors such as market trends, consumers, competitors, regulations, and technology. An FDI-led Growth Strategy is capable of helping Uzbekistan to become more part of the world economy through investments in the focal sectors like energy, telecommunication, finance, and manufacturing. This can assist Uzbekistan in improving its market share, customer base, globalization footprint, and technology. Strengthening Anti-monopoly Laws can assist globalization in that it can provide a clear and fair business environment, avoid market distortions, control market power, and protect the interests of foreign investors, local investors, consumers, and small businesses.



Another pressing matter for Uzbekistan is diversification of exports, not only in terms of product choice, but also in terms of countries. Showing the ability to produce exportable industries is a key demand, and the textile industry is a practical place to begin. Access to Asian markets for the production and distribution of the textile industry can be a major milestone toward the path of industrialization. The implementation of the Anti-monopoly Laws is a critical factor for fair competition. The monopoly control authority in Uzbekistan should work in collaboration with the Overseas Investors Chamber of Commerce and Industry to establish the right boundaries.

Globalization received the lowest score in the survey. However, it also shows a foreign direct investment (FDI) pattern that responds to global factors such as market trends, consumers, competitors, and regulations, and technology. Capital injection through FDI can be highly instrumental for Uzbekistan to achieve a Growth Strategy that is aligned with the global economy and to attract quality investment that is in line with the needs of the strategic sectors such as energy, telecommunication, finance, and manufacturing. This, in turn, Uzbekistan must look to develop its markets in the regions of China, India, and Korea, while still having a close relationship with its markets in the US and EU. One of the main considerations that affect the inflow of investments and productivity remains to be market access. The administration has started to implement fresh policies aimed at making the country more appealing; however, more funds are needed to tackle these problems.

#### 4. Conclusion

Foreign direct investment (FDI) is a key engine for the world economic integration process, as it helps the flow of capital and the most advanced technology to the developing countries. Uzbekistan, a country with a huge development potential, definitely needs FDI to lift its economy to a higher level.

This research uses the result of the overall position of the country on the Global RPM and QSPM to assess the state of FDI in Uzbekistan and propose development strategies. The findings show that the country is holding the bottom position of the sequence in the globalization process, which means it is largely isolated from the rest of the world. The reasons for this are visa restrictions, language issues, lack of proper facilities, and poor advertising internationally.

The three most significant strategies were singled out as: FDI Growth Strategy (upgrading of policy, provision of incentives, and simplification of procedures), Anti-monopoly Laws (ensuring fairness and transparency), and Human Resource Development (creating a skilled labor force). Although the above, problems such as currency convertibility, transport, corruption, and judicial systems are still the main hurdles.

In short, the FDI strategy for Uzbekistan is to turn the country into a regional hub and a commercial gateway between Europe, the Asia-Pacific region, and South Asia. To be able to reach a higher level of global integration, it is vital to upgrade transport and service infrastructure.

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# The Role of Digital Solutions in Implementation of Safe City Project

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## Abstract

The article, which discusses the implementation of the "Safe City" project in Uzbekistan, mainly focuses on surprising role of digitization in public safety. According to the research, the success on project execution relies heavily on using latest management methods and extensive human resource policies. The methodology is based on an analysis of national strategies, legal regulations, and international experiences in creating smart city projects. The results indicate the necessity of effective inter-departmental collaboration in government, the increasing significance of young ICT professionals, and the organizational issues due to centralized management systems. The article points to the fact that solid human resource management, innovative governance methods, and suitable elements of the legal framework go a long way in enhancing project performance and ensuring sustainability of the initiative over time. Generally, article covers three following key ideas, as Safe City Project (as a national strategic and technological initiative), Digital project management (as the methodological and managerial framework), and Human resources and institutional capacity (as key success factors).

**Keywords:** Safe City, digitalization, management, human resources, ICT, strategy, legislation, public safety, characteristics, mobile terminals, implementation, emergency, calls, components, information communication technologies, effectiveness, investment, economics

## 1.Introduction

There is no question that the Safe City initiative has great importance for Uzbekistan since it means in a very direct way raising the level of public safety and social stability together with the continuation of modernization of the urban infrastructure. If one analyses its significance in terms of social, economic, technological, and governance factors, then primarily it is proper to analyze this issue from the perspective of a community safety and security improvement. In fact, the main goal of the Safe City project is to lower crime rates, speed up emergency services, and make citizens feel safer in cities. Applying smart video surveillance equipment, automated traffic monitoring, and facial recognition technologies, allow police to prevent crimes in advance, identify criminals systematically obtaining evidences, as well as to have faster and better responses to emergencies. Digital systems are, thus, a very important tool not only to keep things neat and tidy in a fast-growing city like Tashkent, but also to help people feel safe and secured in their daily lives. As far as economy is concerned, security is undoubtedly one of the key factors to sustainable development, since a safer and stable environment quite naturally attracts foreign investors, and additionally, by security measures, the area is protected against losses due to theft, vandalism or damage of the property; thus, the business confidence is raised and it is encouraged the local entrepreneurship.

Moreover, the implementation of advanced technology security infrastructure enhances innovation, accelerates the development of the ICT sector, and generates new job opportunities in the digital economy of Uzbekistan. For example, the Safe City initiative helps the digital transformation of urban areas in Uzbekistan in terms of city planning and management. Thus, it is included in the e-government and

Smart City frameworks of the country, offering integrated platforms that connect law enforcement, traffic control and public transport systems, emergency medical and rescue services. With the support of automated traffic cameras, license plate recognition networks, and real-time data evaluation, law enforcers can identify traffic offenders at once, decrease the number of accidents and enhance the flow of traffic and the urban mobility in general. This point is already crucial for the biggest cities of Uzbekistan where traffic jams and accident statistics still remain a big issue. Besides cities, Safe City systems contribute to national security by continuously observing the public spaces, transport terminals and borders, thus preventing the acts of terrorism, drug trafficking, and organized crimes, facilitating the work of the rescue team and the restoration of public order. The state is then able to use these data to anticipate security threats and to strengthen the country's resistance to any potential risks.

Safe City technologies when implemented responsibly and with due regard for people's privacy, can substantially increase the feeling of security among citizens and thus become a factor that enables the public to trust their government institutions even more. Besides that, they make the activities of the police more transparent. By providing a noticeable change in public safety and the quality of services, the project impacts the quality of life in the cities of Uzbekistan positively.

Regarding the alignment with the National development plans, the Safe City project is consistent with the long-term objectives of Uzbekistan that also entail the Digital Uzbekistan 2030 strategy (Decree of the President of the Republic of Uzbekistan, 2023). Also, the 17 UN Sustainable Development Goals (SDGs), in particular, SDG 11 (Sustainable Cities and Communities) and SDG 16 (Peace, Justice, and Strong Institutions), emphasize the tech-oriented approach that the country is taking for safety, sustainability, and efficiency (Bobokhonov & Bekturganov, 2025). The Safe City program is indeed a wise step forward for Uzbekistan. Apart from making the society safer and more secure, it is also facilitating quicker digital transformation, stimulating economic growth, and enhancing the effectiveness of governance. By ensuring safety and intelligence in cities, Uzbekistan is strengthening its position on the world map as a contemporary, technologically advanced, and citizen-focused nation (Dentons, 2019).

Some countries, including Uzbekistan, consider the introduction of the "Safe City" scheme to be a key strategic priority. The main goal of the "Safe City" concept is to realize the digitalization of public safety utilizing the opportunities of the following ICT instruments: monitoring, prevention, and reaction. The "Safe City" concept is an integral component of the smart city concept, which incorporates the following technologies: video analytics, artificial intelligence (AI), and big data. National development agenda of Uzbekistan, particularly the Uzbekistan–2030 Strategy includes key issues, such as public order, protection measures, and improving preventive systems, emergency response promotion, including ethnic integration and international security. However, the project does not merely serve as a technological innovation but also a management challenge. The partnership among different stakeholders, including law enforcement agencies, emergency services, and local municipal administrations, require efficient digital project management tools and methodologies.

International best practices prove that successful digital project management consists of adaptable planning, a strong inter-departmental cooperation, and data-driven decision-making. Accordingly, initiating robust methodological strategies to administering digital projects under the Safe City notion can eliminate efficiency, decrease duplication of work, and make public institutions more responsible. This article aims to explore the methodical, managerial, and staff aspects of the Safe City project in Uzbekistan and recommend how to improve this concept by applying contemporary digital project management practices.

In simpler terms, dominance of young people in the ICT sector, the increasing role of human resource management, and the need for cross-department collaboration made the Safe City project relevant to study interactions regarding Uzbekistan's development strategies, such as Uzbekistan-2030 Strategy. Besides, considering ICT innovations and human resource policies upgrades as the main preconditions of effective public administration via up-to-date management methods. The Safe City project does not only involve applying of cutting-edge technology but is also a challenge to the governance and institutional



structures. The study aims to explore the methodological, managerial, and HR aspects of the Safe City project in Uzbekistan and define how it can develop the execution of the program through contemporary management practices.

## 2. Methods

Methodologically, this research relies on qualitative and analytical methods combined with a review of documents, a comparative study of international Safe City models, and an evaluation of the implementation framework of Uzbekistan. Apart from that, it uses project management theory, stakeholder analysis, and human resource assessment to highlight the contributing factors for the success and sustainability of the Safe City project. The study is compliant with the following methodological approaches:

Document and policy analysis – review of the legislative framework of Uzbekistan, including the “Uzbekistan – 2030” Strategy, the Law “On Normative Legal Acts,” and government resolutions regulating ICT and public safety (Law of the Republic of Uzbekistan, 2000).

Comparative analysis – the research of international top performing strategies in the Safe City and Smart City project implementations globally, particularly focusing on the aspect of ICT and HR policy integration. Management analysis - a research paper focused on a comparison of classical and modern management styles, discussing how they can be applied to public safety projects and what implications this might have for HR management. Case Study - a comprehensive organizational study of the Uzbek Safe City Center, its granting the Ministry of Internal Affairs authority, and the operation of its cybersecurity. The complete use of these methodologies unveils. The entire scale of the technological and managerial dimensions of the project are exposed by the complete use of these systems of methods.

## 3. Results

The findings of the research can be summarized as:

Technological side: The Safe City initiative is a comprehensive ICT platform, which aims to increase public safety via real-time monitoring, data analysis, and preemptive measures.

Situation Center is one of the main elements, which controls getting and handling of emergency calls, CCTV data, communication with other ministries, etc.,

Human resources: The contribution of youth ICT professionals cannot be underestimated in the implementation of the project, thus at the same time emphasizing the important role of young people in the digital transformation journey. In this case, human resource policy is gradually shifting from a traditional personnel administration towards strategic human resource management that primarily focuses on professional development, training and employee motivation.

Institutional challenges: The project initially was carried out by the Safe City Center under the Ministry of Digital Technologies but then the responsibility was transferred to the Ministry of Internal Affairs for the purpose of merging public safety and cybersecurity functions. However, while a centralized management system enables better coordination at an overall level, it also leads to bottlenecks in decision-making and limits the possibilities of interdepartmental collaboration.

Management practices: Old-fashioned management (administrative, bureaucratic) still have their place but are not sufficient for modern ICT projects.

Modern management approaches, which focus on flexibility, decentralization, and interdepartmental cooperation, are very important for the success of the projects.

## 4. Discussion

When we talk about what is done to a high-standard in the area of Safe city projects, one can hardly overlook the number and the quality of cameras (CCTV). For instance, the world’s biggest CCTV

network was constructed in China by about 200 million cameras, which system is a combination of AI-powered video analytics, facial recognition, and real-time data processing (TASS, 2023).

This kind of gigantic infrastructure is indicative of China's digital governance approach, which shows just how far digitalization can go. The notion of a "Safe City" is closely related to the projects of "Smart City" and "Digital China," which shows just how far digital project management can go. The above example shows that decision-making through AI can greatly contribute to the capabilities of a system for preventive safety and forecasting of crimes.

*Table 1. Number of CCTV by countries*

| Country       | Approximate Number of Cameras / Road Cameras   | Notes / Source  |
|---------------|--|---|
| China         | ~200 million CCTV cameras nationwide   | Includes both public and private cameras; considered the largest surveillance network globally                                  |
| United States | ~50 million CCTV cameras   | Estimate includes road, private, and commercial surveillance systems  |
| Russia        | >23 million total surveillance cameras and about 28,000 traffic enforcement cameras                                    | Data includes both general surveillance and specialized road monitoring systems.  |
| Uzbekistan    | Around 1,800 road enforcement camera locations + 3,356 "smart video cameras" + 763 stationary radars (as of 2021–2022) | Includes smart cameras and radar systems installed under the Safe City project. Official nationwide totals not fully published. |

The United States, being a decentralized and market-driven system, adopts a decentralized surveillance system with 50 million cameras owned by the private sector. Unlike the previous system that emphasized a centralized system, the United States surveillance system mainly emphasizes the local governments and the private sector. This system of management begins at the local levels. The use of digital technology in the management of projects provides a way to ensure compatibility, data privacy, and security without the need to involve the state. The United States system proves that it is possible to balance the need for digital management with the need for data privacy and ethical standards, a balance that developing countries need to learn from (Expert Market Research, 2024).

Russia has a hybrid public sector management system that controls a camera network of more than 23 million devices; out of those, 28,000 are specialized cameras intended for law enforcement and road safety. The hybrid management system is a combination of federal and local programs. The projects undertaken by Russia under Safe City are mainly related to AI-enabled recognition systems and integrated control centers. These projects are mainly defined by the collaboration of different ministries like the Interior Ministry, Emergency Ministry, and Transportation Ministry. The countries planning to upgrade their surveillance system can use this system while ensuring proper government intervention.

Safe City project is actively conducted in Uzbekistan with about 1,800 locations for road enforcement cameras, 3,356 smart cameras, and 763 fixed radars. While its scale is modes compared to global leaders, the project is a good demonstration of the rapid progress observed in digital public safety infrastructure, underlying 'smart' technologies is indicative of the shift towards smart data processing and enforcement automation. However, integration and coordination are still remain difficult, revealing the need for strong digital project management structures and an increase in the capacity of public institutions.



Table 2. Comparative Summary

| Aspect                  | China                     | USA                             | Russia                        | Uzbekistan                       |
|-------------------------|---------------------------|---------------------------------|-------------------------------|----------------------------------|
| Scale                   | Very large                | Large                           | Medium-large                  | Small but growing                |
| Governance Model        | Centralized               | Decentralized                   | Hybrid                        | Developing                       |
| Technology Focus        | AI, data integration      | Privacy, interoperability       | Facial recognition, analytics | Smart cameras, automation        |
| Project Management Type | State-led digital program | Market-driven local initiatives | Mixed public programs         | Government modernization project |

From a project management point of view, the case of Uzbekistan shows that it is possible to advance from a pilot project to a whole country system where success is mainly dependent upon planning, interdepartmental cooperation, and human resource development (Meduza, 2023).

Some of the issues that still need to be addressed while at the same time realizing that from the analysis above, Uzbekistan has made tremendous progress in implementing the Safe City project are as follows:

The chain of command must be honest and transparent. A centralized unified strategy is extremely attractive; however, it is a two-edge sword that could result in a decrease in operational efficiency, lack of initiative, and decision-making delays. According to literature, a compromise must be found by using a hybrid approach that allows the central government to retain power over major decisions while at the same time empowering the lower government to make operational decisions. The table below shows a comparison of the major advantages and disadvantages of each approach (Tashkent Times, 2025).

Table 3. Project management’s centralization vs. decentralization methods

| Aspect                         | Centralized management     | Decentralized / Horizontal management  |
|--------------------------------|----------------------------|--|
| Decision-making speed          | slower                     | faster                                 |
| Employee initiative            | low                        | high                                   |
| Flexibility                    | low                        | high                                   |
| Interdepartmental coordination | may be complicated         | easier with horizontal links           |
| Control and supervision        | strong centralized control | distributed control and responsibility |

In other words, the importance of a management structure is that it plays a crucial role in the development of large-scale projects such as the Safe City. For instance, the introduction of a management structure for the Safe City project leads to a unique strategic direction, the application of a uniform policy, and the imposition of tight control over the entire process. The centralized management structure means that all the participating institutions are working under a single strategic vision and are guided by a set of rules. However, the introduction of a management structure is not without a number of disadvantages. For instance, the process may be delayed when decisions are being made on the operations of the system. The creativity of the specialists may be stifled, and the communication process may become bureaucratic. These disadvantages are particularly pronounced in IT projects.

On the other hand, decentralized/horizontal management is that kind of management which distributes power to various levels and departments of an organization. If it is a project of decentralization like the Safe City project, various operational departments like Situation Centers, law enforcement bodies, or ICT departments can be empowered to take independent decisions during emergency situations. This kind of management is more adaptive, encourages more innovative activities, and is a sign of trust and thus a motivational factor for employees as more independence is granted to the employees. However, it is important to note that while implementing decentralization, it is important to refrain from expanding workload by incorporating coordination mechanisms to ensure that decisions are aligned at the national strategic level.

In order to thoroughly comprehend the benefits of each kind of management approach, it is important to reach a conclusion from a comparative viewpoint. This kind of centralized management offers a lot of benefits like strategic management, standardization, as well as efficient utilization of government resources; however, it takes a long time to implement projects due to a rapidly changing environment (Khalilov, 2023).

Decentralized management, on one hand, gives more freedom to local agencies to make decisions, allows them to adapt to the local conditions and thus respond to emergencies more effectively. However, it definitely needs a proper legal framework and good interdepartmental cooperation to avoid fitness of fragmented authorities.

First and foremost, the major objectives of the project are:

- To enhance the preparedness of various government agencies, forces and resources in the prevention and mitigation of emergencies and incidents;
- To increase the efficiency of the monitoring of situations at potentially hazardous and critically important facilities, life-supporting infrastructure, educational and healthcare institutions, transportation infrastructure facilities, markets, large shopping centers, sports, cultural, and recreational establishments, and other places of mass gatherings;
- To digitize the collection, analysis, and accumulation of the reliable information in the sphere of population protection and the safeguarding of facilities of the highest social value;
- To perform monitoring, forecasting, risk-reduction, incident response, investigations, and other stages of a cycle of activities based on information support;
- To Facilitate interagency cooperation in the field of life safety via;
- To maximize the effectiveness of interaction between citizens and the state on issues related to life safety;
- To improve traffic flow along the urban road network and at the same time reduce number and severity of road traffic accidents.

Tasks “Safe City” complex as system are:

- To form a unified information space for the purpose of improving the exchange of information in the areas of monitoring, forecasting, prevention, and elimination of threats to life safety;
- To design and provide control, management, and decision-making support tools along with the development of coordination and resource management systems, as well as systems for situational analysis and forecasting;
- To provide a framework for manual or automatic systems
- To establish a national pool of information systems for security and civil protection, and a framework for a network of sensors to provide data for security systems at public places and in transport;
- To equip the population with the ability to get information and raise awareness on the issues of public safety, law and order, and environmental security;
- To put in place measures for information protection in the “Safe City” system;
- To implement a unified information and communication platform for interaction between the population and agencies responsible for life safety.

One might therefore draw the line that in reality, the majority of successful Safe City or Smart City components are a hybrid model. However, the burden of overall planning, law-making, and financial allocations will still be taken care of by the center, while the decentralization of the operational decisions,



day-to-day monitoring, and technical troubleshooting is the concern of decentralization. For instance, if Uzbekistan is planning to adopt such a hybrid system, it may allow the Safe City project to function properly in the initial phase while being consistent with the national security strategies. The Safe City project in the first instance capable and at the same time be consistent with the national security strategies (Altamimi et al., 2023). Interdepartmental cooperation: The success of this project is largely dependent on the productive cooperation of the ministries and agencies. However, the legal status of the Safe City Center limits it from cooperating with other structures horizontally, and changing it to that of an agency or an independent body might be the best solution.

**Human resources:** The demand for highly skilled ICT professionals is still increasing. It is crucial to strengthen human resources policy, continue professional development, and apply modern motivational means for a successful project.

**Legal reforms:** Implementation of the Law on Civil Service, bringing in a Code of Ethics, and upgrading dispute resolution mechanisms will institutionalize good governance practices in Safe City implementation.

**Investment and governance:** The joint ventures with foreign direct investors bring along a whole range of benefits including the possibilities for financing and technology transfer. A decentralized management system may help speed up project execution and increase financial efficiency (Kun.uz, 2024).

One of the significant focuses of this research work is to increase the contribution of digital solutions to Digital radio communication service. This communication service is used to give radio communication facilities to the staff who are always on the move.

High-quality voice transmission through advanced digital signal processing, thus operation in a highly noisy acoustic environment is no problem; Rapid call setup (up to 300 ms); Capability for individual calls (radio-to-radio); Multi-level priorities, duplex and semi-duplex call modes; Telephone calls (radio-to-external telephone networks); Group connections (radio-to-group of radios), including group calls (subscriber-to-group of subscribers), broadcast calls (subscriber-to-all subscribers), group scanning, dynamic regrouping (combining subscribers into groups without reprogramming subscriber terminals), call zone management (initiating group calls only within authorized zones), late entry (allowing a subscriber to join an ongoing group call); Emergency calls (highest-priority calls); Direct Mode Operation (DMO).

The service is made up of:

Base stations and switches located throughout the city of Tashkent; Mobile (handheld) radios for 5,000 staff in emergency and operational services Vehicle-mounted terminals for 1,000 vehicles Centralized server and computing systems

Deployment these technical tools are essential to the success of the Safe City project. Reliable digital communications, extensive monitoring systems, and confidential information-sharing networks are the key components of an advanced urban safety infrastructure, which facilitate a quicker emergency response, better coordination between local authorities and emergency services, and ultimately an enhanced level of security for the public in diverse urban settings. By leveraging the power of state-of-the-art digital radio communications together with integrated data management platforms, the Safe City initiative is not merely boosting the operational readiness and situational awareness but also playing a role in creating a safer, more resilient, and well-organized urban environment for the citizens.

Besides that, the Safe City initiative is a public safety-oriented and ICT-based strategic program of Uzbekistan. Nevertheless, the project's achievement is largely dependent on the usage of contemporary management and efficient HR policies. Thus, decentralized decision-making and horizontal management models are necessary to eliminate barriers, and increase operational efficiency and interdepartmental coordination. Human capital, particularly young ICT specialists, is the most crucial resource for the project's continuation, which is why HR policy reforms are especially stressed. Besides, legal reforms, e.g., the

enactment of the Civil Service Law, will help to provide efficient governance and improve the institutional framework.

The comparison, which is based on the number of CCTVs, suggests that the level of digital project management maturity matches quite closely the size and effectiveness of the Safe City initiatives. A centralized digital governance system in China brings a great example of its benefits whereas the U.S. represents ethical, decentralized innovation. Russia embodies a well-balanced coordination model, while Uzbekistan is just embarking on the journey of public safety digital transformation.

In the case of Uzbekistan, the adaptation of project management styles, upskilling of human resources, and adapting the development of information and communication technologies with institutional reforms are the main areas of focus for the Safe City project in order to ensure sustainability (Government of Uzbekistan, 2025).

Here is the sentence rewritten in a neat and polished form:

To spur the launch of the project quickly and make a lasting contribution towards its sustainability, both foreign direct investments and joint ventures need to be encouraged. From the research of the management styles of the Safe City project, it is evident that a completely centralized or a completely decentralized system would not be able to ensure the sustainability of the project by itself. Centralized systems ensure strategic coherence, a common legal framework, and a most efficient allocation of national resources, while decentralization ensures the flexibility, efficiency, and rapid response of the people in adapting to the changing circumstances, which include emergency and innovation.

The result shows that for Uzbekistan, a mix of management model is recommended to be used. This management model recommends that activities such as strategic planning, setting standards, and distribution of resources are under the control of central authorities. On the other hand, operational units are empowered in their respective areas to be able to react quickly and creatively. The management model is useful in reducing the probability of being stuck in bureaucratic red tape while keeping national coordination and accountability intact. Additionally, the Safe City plan needs structural changes to be implemented along with running activities in human resources, digital infrastructure, and interdepartmental cooperation frameworks. Ultimately, organizations that are able to keep transparency, control, and flexibility while keeping public trust will be able to achieve this goal.

To sum up, the use of a hybrid model is a step in the right direction in the achievement of the Safe City project's objectives, such as improved security, smart city initiatives, and taking the digital transformation strategy in Uzbekistan to a broader level. It is recommended that further research be carried out on the practical application of the hybrid model, comparisons with global best practices, and the creation of a system for measuring the socio-economic impact of Safe City projects in the region.

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# The Importance of Risk and Crisis Management in International Tourism Destinations

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## Abstract

Risk and crisis management has a significant role to play in international tourism with the aim of providing safety for tourists and the sustainability of the tourism system. There are many areas in which tourism risks are addressed, including crime, terrorism, natural hazards, pandemics, political and economic instability, and food and infrastructure security. If not properly managed, a crisis may arise, which will affect tourism, economic revenues, and the image of a particular country. Crisis management is carried out at macro, meso and micro levels: at the macro level, national and regional policies and strategies are formulated, at the meso level, specific tourism zones and sectors are adapted, and at the micro level, local businesses and workers are supported with recovery measures. Modern approaches combine proactive and reactive strategies, location-based management, and systematic risk analysis. Digital technologies, GIS-based models, big data analytics, and the concept of smart spaces increase the agility of the tourism sector. Post-crisis recovery strategies include digital adaptation, green policies, brand rebranding and community-based models. Place-based, systemic and innovative approaches ensure the transition of tourism to a sustainable management model, ensuring the sector is flexible and resilient to future crises. These approaches strengthen economic, social and environmental sustainability and ensure the long-term development of tourism.

**Keywords:** Tourism risks, Crisis management, Security, Place-based management, Sustainable tourism

## 1. Introduction

Today, “safety” is perhaps the most sought-after factor in the tourism sector, right after price and quality. In other words, “safety is a prerequisite for tourists’ peaceful recreation” (George, 2003, p. 576). Safety has always been a priority for travel and tourism (Kovari & Zimanyi, 2011). Therefore, “tourism security has become an increasingly important area for gaining competitive advantage in tourism. In fact, security is one of the most critical factors determining a country's competitiveness in the travel and tourism industry.” (Payam & Selçuk, 2017, p. 886). In this context, the success or failure of any destination depends on providing a safe environment for tourists. However, tourism is a sector that is very sensitive to security and risk perception. Lack of confidence in tourism threatens the tourism sector. It is also a fact that safety, safety management and safety perceptions deeply affect destinations. (Aksu, 2013). Therefore, tourists have recently paid more attention to travel safety and tourism risks. Since risk and tourism are inherently related, more and more studies have focused on travel risks (Yang et al., 2016). Especially after the September 11 attacks, research on risk in tourism has become increasingly relevant.

## 2. Main Part

To prevent potential security risks in tourism from turning into crises and to effectively manage risk and security in tourism, every stakeholder in the tourism sector must consider security risks and security management. In other words, since “tourists’ perceptions of insecurity and high risk are directly related to their level of anxiety about the destination” (Reisinger & Mavondo, 2005), potential tourist risks surrounding tourism areas should be identified. Yang (2004) states that unexpected crises in the tourism

sector highlight the need to reconsider existing risk assessments in the tourism literature. “Risk perception is a powerful factor in tourist decisions and potentially distorts routine decision-making.” (Sönmez & Graefe, 1998b, p. 120). It is therefore necessary to identify the potential security risks that the tourism sector and tourists may face. This is because “both tourists and tourism destinations are deeply affected by negative security perceptions and failures in risk management.” (Hall et al., 2003, p. 2).

Risk and tourism are interrelated because the decision to travel involves risk and uncertainty as it involves traveling to unfamiliar places (Chang, 2009). Furthermore, risks for tourists are considered an integral part of tourism (Kekovic & Markovic, 2009; Kovari & Zimanyi, 2011). Tourism risk refers to the potential negative consequences that tourists are likely to experience from their travel experiences. In the context of tourism security, hazards are potential threats in the environments in which tourism activities are carried out. Risk can be defined as the probability that a tourist will suffer harm as a result of these threats (Kekovic & Markovic, 2009). In the tourism sector, uncertainties or threats constitute hazards, hazards constitute risks, and risks constitute crises. In short, risks, when poorly managed, can turn into tourism crises. Following these explanations, risk in the context of tourism can be defined as any event or situation that may prevent the tourism sector from achieving its strategic objectives, providing safe tourism services to tourists, or causing unexpected harm.

Crime, terrorism, food safety, health problems and natural disasters are seen as major areas of concern as major risk factors in tourism (Breda & Costa, 2006). In summary, Yang et al. (2016) grouped research on different types of risks in the tourism literature as follows:

Health risks (safe sex, excessive alcohol consumption, substance use, HIV risk, food risk, disease, sun exposure, injury, suicide), physical risks (personal safety, violence, sexual harassment and assault), financial risks (purchase risk, theft risk), functional/equipment, satisfaction, transportation, weather), social risks, psychological risks, political/terror risks, cultural risks, natural disaster risks (avalanches, volcanic eruptions, floods, hurricanes), adventure risk taking, temporal risks, privacy and data security risks, and legal risks (Yang et al, 2016, p. 291).

In recent years, people have paid more and more attention to travel safety and travel risks. Tourism risk perception is a quantitative assessment of tourism safety. Tourists' perception of destination risks directly affects their purchase intention. The asymmetry between the availability of objective information on tourist safety and tourists' subjective perceptions makes tourists extremely sensitive to travel risks. The inevitability of tourism risks requires tourists to have a certain level of knowledge about the destination environment.

### **3.Crisis and security management in tourism**

A crisis is an unexpected situation that negatively affects tourism activity, causing the suspension or sharp reduction of planned activities. Tourism crises are classified according to internal and external factors. The internal crises include management problems, service quality decline, and financial problems. The external crises include natural disasters, political problems, epidemics/pandemics, terrorism, economic sanctions, etc. These crises can cause significant disruption in tourism flows, tour operations, and the sustainability of the hospitality industry.

Security management in tourism is a set of systematic activities aimed at ensuring the physical and information security of tourists, workers and tourism infrastructure (Paraskevas & Arendell, 2007). The main goals are to reduce risks, respond quickly in crisis situations, establish reliable communication channels and maintain tourist trust. For tourism organizations, security means not only physical protection, but also psychological safety (tourists' sense of comfort) and social security, an environment of public trust.

Modern tourism management systems employ proactive (preventive) and reactive (responsive) strategies for crisis management (Ritchie, 2004). Proactive management involves the prior analysis of potential risks, the establishment of insurance systems, the preparation of personnel for emergencies, and the development of communication plans. A reactive strategy focuses on damage reduction and post-crisis



recovery plans after a crisis occurs. For example, during the COVID-19 pandemic, many countries adapted the tourism sector by implementing health protocols, remote service forms, and digital management systems. (UNWTO, 2021).

Risk management is one of the main stages of crisis management. During the analysis of risks, the sources of danger, the level of damage and the degree of probability are determined (Glaesser, 2006). Among the most serious risks for tourism enterprises are security incidents, financial losses, loss of customer confidence and disruption of operational stability. Insurance mechanisms, information security systems and recovery plans should be developed against these risks.

In the 21st century, digital technologies have become the main guarantor of tourism security. Smart monitoring systems, GPS tracking technologies, electronic ticketing and access management systems help reduce risks in the tourism sector (Sigala, 2018). At the same time, crisis communication platforms, social media analytics, and digital alert systems enable operational decision-making during a crisis (World Travel & Tourism Council, 2022).

The main goal after the crisis is to restore the tourism market, reshape the brand image, and restore customer trust (Avraham, 2016). Coordination between government agencies, the private sector, and international organizations plays an important role in this phase. Corporate social responsibility programs, safe tourism certifications, and sustainable tourism strategies are considered tools to accelerate the recovery process (UNWTO, 2021).

Crisis and security management in tourism is not just a response to emergencies, but also a philosophy of sustainable management. This approach determines the flexibility, resilience and competitiveness of the tourism sector. Global experience shows that tourism systems that are prepared for crises recover faster and gain long-term credibility. Therefore, the introduction of risk analysis, a safety culture and innovative management methods in tourism policy is the main guarantee of future development.

There is a significant link between tourism security and tourism crises. A review of tourism crises in recent years shows that many tourism crises are a direct result of gaps and deficiencies in security and safety.

Terrorism is a global phenomenon that involves multiple targets. Between 2015 and 2017, terrorist attacks targeting tourists and tourism infrastructure occurred in countries as diverse as Tunisia, Belgium, Burkina Faso, France, Germany, the United Kingdom, the United States, Spain, the Philippines, Egypt, Thailand, and Turkey. Some of these attacks directly targeted tourists.

Terrorism remains a serious security concern for tourism. However, even direct targeting of tourists by terrorists or criminals is not a prerequisite for negative perceptions of tourist safety. Tourism safety can also be threatened by factors such as natural disasters, pandemics, political instability, forest fires, high crime rates, or poor management of buildings, food, water, transportation systems, and other infrastructure.

For example, in January 2016, an attack on a group of tourists in Istanbul killed 11 German tourists. Another example was the suicide attack at Ataturk International Airport in June of that year. Following these events, the number of international tourists visiting Turkey dropped sharply.

The link between security and crisis is particularly evident in the case of Turkey. Between 2000 and 2014, the number of international tourists visiting Turkey increased from 8 million to 41.26 million, placing Turkey among the top ten in terms of tourism revenue and visitor numbers worldwide. However, since 2015, this growth has been interrupted by security crises.

Tourism crises are important events that affect the development of tourism destinations. However, the scientific community's knowledge of the classification features, spatial (geographic) distribution, and impact structure of tourism crises from the accumulated literature is still insufficient.

This study analyzed 302 scientific articles selected from the Social Science Citation Index (SSCI) database between 1991 and 2020. The study conducted bibliometric and content analysis to identify the event types, regional distribution, impact structure, and synergistic (interacting) factors of tourism crises.

The results show that existing research on tourism crises is largely event-oriented. The types of crises are multifaceted and divided into several subcategories. Tourism crises studied in the scientific literature mainly cover events affecting Asia, Europe, and North America — which is consistent with their geographical distribution in reality.

The impact of tourism crises on places has been identified at three levels:

1. Macro level (impacts at the scale of an entire country or region),
2. Meso level (impacts at the scale of a sector or region),
3. Micro level (impacts at the level of local enterprises and individuals).

Tourism activity acts as one of the main directions of economic, social and cultural integration on a global scale. However, this dynamic sector is highly vulnerable to crises. Natural disasters, pandemics, political instability, economic crises and security problems affect all structural elements of the tourism system (Ritchie, 2004). The impact of tourism crises is not only felt at the individual enterprise level, but also at the national and regional scale. For this reason, the scientific literature usually analyses the impact of crises on places at three levels: macro, meso and micro (Faulkner, 2001; Pforr, 2009).

The macro level encompasses the consequences of tourism crises on a country or regional scale. At this level, crises are observed in the form of declining economic indicators, loss of government revenues, weakening of the tourism brand, and loss of international image (Avraham, 2016).

For example, during the COVID-19 pandemic, tourism revenues in many countries fell by up to 70%, and employment levels fell significantly (UNWTO, 2021). Crises directly affect the reshaping of public policies at the macro level, the development of sustainable tourism strategies, and national security concepts.

Macro-level crisis management typically requires coordination between government agencies, international organizations, and regional tourism alliances. Recovery programs, tourism diplomacy, and economic stimulus are important measures in this stage (Glaesser, 2006).

Meso level: This level concerns the effects of crises on particular industries or particular tourism regions. At this level, crises are noticed in the closure of resort areas, in the restriction of the activities of air carriers, and in the change in the route of tourist flows (Pforr, 2009).

For example, political tensions in the Mediterranean region have led to a shift in tourist flows to alternative destinations such as Spain and Greece. This has meant increased demand for some countries, while reduced tourism revenues for others (Hall, 2010).

At the meso level, regional tourism management, local recovery plans and public-private partnerships play an important role in crisis management (Ritchie, 2004). Also at this level, innovative product diversification and digital marketing approaches increase the adaptive capacity of tourism (Sigala, 2018).

The micro level encompasses the impact of crises on local tourism businesses, employees, and individual entrepreneurs. This impact typically manifests itself in the form of financial difficulties, staff layoffs, customer disruptions, and psychological stress (Paraskevas & Arendell, 2007). Hotels, restaurants, and tour operators operating at the micro level face liquidity problems during a crisis and often need government subsidies or local community support. During the COVID-19 era, many small tourism businesses were able to partially resume their activities through digitalization, online reservation systems, and domestic market-focused services (WTTC, 2022).



At this level, protecting human capital, improving personnel's crisis skills, and forming a culture of individual risk management are of particular importance (Faulkner, 2001).

The impact of tourism crises on places is multidimensional and gradual. The main points of impact of this process are the national economy and international image at the macro level, sectors and regions at the meso level, and enterprises and individuals at the micro level. Global experience shows that an integrated crisis management model can only be effective if these three levels are interconnected (Ritchie, 2004; Glaesser, 2006). Therefore, place-based crisis management, systematic risk analysis, and the implementation of innovative recovery strategies should be one of the main directions in tourism policy.

| Impact of Tourism Crises by Levels |   |  |  |
|------------------------------------|---|--|--|
| Level                              | Impact Areas  | Examples   | Management Methods   |
| Macro                              | National economy, international image, government revenues    | 70% decrease in tourism revenues due to the COVID-19 pandemic                  | Government policies, national recovery plans, international cooperation    |
| Mezo                               | Sectors, regions, resorts                                     | Changes in tourist flows due to political tensions in the Mediterranean region | Regional tourism governance, public-private partnership, digital marketing |
| Mikro                              | Local enterprises, small businesses, individual entrepreneurs | Restaurants and cafes during the COVID-19 period                               | Liquidity support, staff training, online reservation                      |

The concept of place-based crisis management involves measuring the impact of a crisis not only in terms of economic indicators, but also in terms of geographical, social and structural factors. This ensures the transition of the tourism system to a more flexible and sustainable management model (Glaesser, 2006).

Spatially-oriented crisis management considers tourism destinations as functional, geographical, and institutional units, creating a management model based on the specific risk profile of each region (Beirman, 2018). This approach integrates techniques like spatial analysis, hazard mapping, and resource localization.

For instance, in tourist destinations like the Mediterranean and the Caucasus, natural hazards like earthquakes and forest fires, political instabilities, and infrastructure vulnerabilities demand different approaches to management at different levels.

The model of place-based management is also founded on the principle of participation by the local communities. This helps in enhancing the application of local knowledge in decision-making processes during crises, resource mobilization by the communities, and social sustainability of the tourism system (Hall, 2010).

One of the significant steps in the effective management of tourism crises is the application of systematic risk analysis. In this approach, risks are not viewed as random events. Rather, they are seen as the combination of dynamically interacting social, economic, and environmental factors (Glaesser, 2006).

1. Systematic risk analysis can include the following stages:
2. Identification of risks;
3. Assessment of probability and impact;

4. Prioritization of risks;
5. Mapping of the most sensitive areas.

This approach results in more real-time decision support, particularly in the form of GIS risk models and big data analysis (UNWTO, 2021). Thus, for instance, in the course of the pandemic, some states had a plan for a staged revival of the industry using approaches such as geographic simulation of tourism movement and mapping of infection risk areas.

In the post-crisis period, innovative recovery approaches are critical to the change in the tourism system. These approaches are aimed not only at restoring losses but also at restructuring the industry for sustainable development (Avraham, 2016).

The most widely adopted innovative recovery approaches are:

- Digital adaptation - The migration of the tourism industry to online platforms and AI-driven booking systems;
- Green and environmentally friendly approaches - The promotion of ecotourism and energy efficiency (Daly & Farley, 2011);
- Tourism diplomacy and rebranding - Communication approaches that help rebuild the image of the destination (Avraham, 2016);
- Community-based recovery models - Active engagement of local communities in economic and social processes.

Moreover, innovative approaches, together with the idea of smart destinations, help improve the resistance of the tourism industry to crises and optimize resource use efficiency (Sigala, 2018).

Spatially oriented crisis management, risk analysis, and the application of innovative recovery strategies are key concepts that can facilitate the transition of the tourism sector to sustainable management. The application of this concept requires an understanding of the crisis not only in economic terms but also in terms of changes in spatial and structural dynamics.

Future research in this area could be placed in the following areas: place-based risk models, digital recovery tools, and mechanisms for participation in the community. The success of crisis management in the tourism sector is not only dependent on international strategies but also on the ability to cope with the uniqueness of each place in the community (Ritchie, 2004; Pforr, 2009).

The study found that there is an opportunity for deeper research in the area of tourism crises in the future. The study provides a scientific direction for future research in this area.

#### **4. Conclusion**

The management of crisis situations and security issues in tourism should be considered a philosophy of sustainable management and not just crisis management. The tourism sector, although one of the most dynamic sectors of the global economy, is subject to a wide range of factors such as natural disasters, pandemics, political instability, economic crisis, terrorism, and technological risk. It is not enough to evaluate the effects of tourism risk only in relation to a business or tourism organization; its effects are also felt on a national and regional scale. Therefore, it is essential that the effects of tourism crisis situations are considered on three different levels: macro, meso, and micro levels. The effects of tourism crisis situations are felt on a macro level throughout a country or region, and this is expressed in a decrease in economic indicators, a decrease in government revenues, a weakening of the tourism brand, a decrease in employment levels, and a negative effect on international images. At this level, crises also result in the restructuring of national tourism strategies, public policies, and the elaboration of concepts related to sustainable development in the field of tourism. This demonstrates that tourism is a field of activity that is both economic and strategic.

At the meso level, the effects of a crisis can be noted in the following areas related to the tourism sector: the closure of resort areas, the restriction of the activity of air carriers, the evolution of tourism



flows, the suspension of activities, and the uneven distribution of resources in the sector. It is worth noting that regional tourism governance plays a significant role in the management of a crisis at this level. Strategies implemented at the regional level also provide key opportunities for the creation of alternative tourism opportunities and the efficient channeling of tourism flows.

At the micro level, the impacts are felt by tourism businesses, small and medium-sized businesses, employees and individual entrepreneurs. These impacts manifest themselves in the form of financial difficulties, staff reductions, customer flow disruptions, operational disruptions and psychological stress. Hotels, restaurants, tour operators and other tourism businesses operating at the micro level face liquidity problems during the crisis and often seek to recover through government support, local community support or innovative solutions. At this level, protecting human capital, improving personnel's crisis skills, and forming a culture of individual risk management are of particular importance for the sustainability of the tourism system.

A place-based approach plays a key role in tourism crisis management. Place-based crisis management assesses tourism destinations not only in terms of economic indicators, but also in terms of geographical, social and structural factors. This approach increases the flexibility and adaptability of the tourism system. Each tourism destination has its own specific risk profile and management strategies should be developed accordingly. In this approach, tourist destinations are evaluated as functional, geographical, and institutional entities, and measures are designed based on the needs and risks of each destination. The place-based management approach also includes the engagement of local communities, which enhances the role of local knowledge in decision-making processes during crises, the engagement of local community resources, and the social sustainability of the tourism system.

Systematic risk analysis is a significant step in the management of tourism crises. In this analysis, risks are evaluated not as random events, but as the combination of social, economic, and environmental factors. Systematic risk analysis involves the steps of risk identification, evaluation of probability and impact, risk prioritization, and mapping of vulnerable areas. This method gives a holistic perspective of the tourism system, enables a more precise analysis of the causes and consequences of crises, and also enables the design of preventive strategies.

This approach also enables more precise and up-to-date decision-making through the application of new technologies - digital analytics, geographic information systems, and big data analysis. This enhances the flexibility of the tourism industry and its ability to respond to crises.

The strategies of post-crisis recovery are very important for the sustainability of the tourism industry. The recovery of lost tourist flows, the restoration of brand image, and the recovery of customer trust can be achieved not only through the application of financial aid, but also through the application of innovative strategies. Among these strategies, digital adaptation, the development of online services and artificial intelligence-based booking systems, the promotion of ecological and green tourism, the enhancement of energy efficiency, tourism diplomacy and brand reconstruction, the application of community-based recovery models, and the implementation of the smart place concept are very important. These strategies not only help the tourism industry to recover from the crisis, but also ensure the sustainable development of the industry.

In addition to this, integrated actions are necessary for tourism crisis management on the global and local levels. The coordination of government and international organizations on the macro-level, regional and sectoral actions on the meso-level, and the synchronization of the actions of local enterprises and communities on the micro-level are necessary for tourism crisis management. The interrelations between these levels are the basis of the integrated tourism crisis management model. Without this model, it would be impossible to deal with crises and recover from them.

Among the important aspects of tourism crisis management, place management, systematic analysis of risks, and the implementation of innovative strategies of recovery are of particular interest. With

these methods, it would be possible to get a complete picture of the tourism system and consider the impact of tourism crises on the global and local levels. Moreover, these methods would not only help to protect the tourism sector from the existing risks but would also make it more flexible and competitive. The application of these principles of tourism policy in the modern world would be considered the main condition for its development. Through the use of a coherent approach to place-based crisis management, risk analysis, and innovative recovery strategies, it is possible to move towards a sustainable model of management for the tourism sector.

It is no longer sufficient to see crises simply as economic and financial phenomena. It is necessary to analyze them also as variations in the social, spatial, and structural dynamics. This allows us to have a more general view of the tourism system, enhancing its potential for adaptation and quick recovery. In the future, some of the main issues to be addressed in the management of crises in the tourism sector will be the development of location-based risk models, the use of digital recovery strategies, and the strengthening of local participatory models. It is necessary to understand that the effectiveness of crisis management in the tourism sector is not only due to global strategies but also to the ability to adapt to the specificities of the places. This approach not only makes the tourism sector resilient to crises but also allows it to be a sustainable system for its development.

Therefore, the management of tourism crises has transcended the boundaries of a mere reaction to a crisis situation, but has become a systematic, strategic, and proactive process. The factors that play a crucial role in ensuring the sustainability of tourism at various levels, such as national, regional, and local levels, include place-based management, risk analysis, and innovative recovery practices.

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