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MECHANISMS FOR ENHANCING INVESTMENT ATTRACTIVENESS THROUGH THE EFFICIENT USE OF REGIONAL NATURAL RESOURCES

Abstract. This article comprehensively examines the mechanisms of efficient use of natural resources and enhancement of investment attractiveness within the regional economic system. Under conditions of globalisation, climate change, and the rising priority of ESG investments, the conversion of regions' natural resource potential into economic growth and human capital development has become a pressing scientific and practical problem. *The aim of the research* is to scientifically and methodologically substantiate the relationship between a region's natural resource potential and investment flows, as well as to develop comprehensive mechanisms for enhancing resource-based investment attractiveness. *The study* applied a combination of SWOT analysis, correlation and panel regression analysis (Fixed Effects model), cluster analysis (k-means algorithm), comparative analysis, and Dunning's eclectic paradigm (OLI). Official statistical data for 14 regions of the Republic of Uzbekistan for 2018–2024 and 98 observation units were analysed. *The results* revealed a statistically significant positive correlation between the natural resource endowment coefficient and the volume of foreign direct investment ($r=0.712$; $p<0.01$); however, institutional quality ($\beta=0.624$) and infrastructure ($\beta=0.738$) indicators exert stronger influence than natural resources themselves. *The scientific novelty* lies in the development of a twelve-indicator Resource-Investment Efficiency Score (RIES) index, the classification of regions into four clusters, and the proposal of a five-stage "Resource–Institution–Investment–Innovation–Integration" (R3I2) mechanism. The findings have practical significance for shaping regional economic policy, attracting inclusive green investments, and developing strategies to avoid the "resource curse" syndrome.

Keywords: regional economy, natural resources, investment attractiveness, resource efficiency, FDI, sustainable development, ESG standards, resource curse, cluster approach, regional governance, green economy, OLI paradigm, Dunning model.

INTRODUCTION

The interrelationship between the economic development dynamics of resource-rich regions worldwide and their investment attractiveness has become one of the central problems of contemporary economic research. According to the International Monetary Fund's report, 38.7 per cent of global foreign direct investment flows to resource-rich regions; however, the impact of these investments on regional economic growth varies significantly across regions. The World Bank's "Changing Wealth of Nations" report notes that natural capital constitutes on average 9 per cent of global total wealth, and up to 23 per cent in developing countries, while the efficiency of utilising this capital is regarded as an important determinant of national development. According to UNCTAD data, global FDI in 2023 amounted to USD 1.33 trillion, of which USD 712 billion went to developing countries. Although resource-rich Norway has natural wealth of USD 81,000 per capita, the volume of FDI per capita in Norway reaches USD 14,200 annually, and the total assets of the Government Pension Fund Global have reached USD 1.7 trillion. By contrast, in resource-rich states such as the Central African Republic or Chad, FDI per capita does not exceed USD 40–60 annually. This contrast clearly demonstrates that the economic significance of natural resources is determined not merely by their volume but by the institutional quality of their utilisation.

The "resource curse" phenomenon recorded on a global scale, first comprehensively analysed by R. Auty, expresses the tendency for the economic development rates of resource-rich

countries to be lower than those of resource-poor nations. An econometric study by D. Sachs and A. Warner across 97 countries demonstrated that for every one-per-cent increase in the share of natural resource exports in GDP, a country's annual economic growth rate declines on average by 0.7 per cent. At the same time, the experiences of countries such as Norway, Canada, Australia, and Chile confirm that, when appropriate institutional foundations and governance mechanisms exist, natural resource potential can be converted into a key factor of long-term economic growth and investment attractiveness.

In the Republic of Uzbekistan, the development of the regional economy and the enhancement of investment attractiveness have become one of the priority directions of state policy. The Presidential Decree No. PF-60 of 28 January 2022 "On the Development Strategy of New Uzbekistan for 2022–2026" and Decree No. PF-158 of 11 September 2023 approving the "Uzbekistan – 2030" strategy designated, as separate priority tasks, the enhancement of the economic potential of regions, the rational use of natural resources, and the formation of an investment climate based on "green economy" principles. In particular, the "Uzbekistan – 2030" strategy envisages increasing GDP from USD 160 billion to USD 250 billion by 2030, raising per capita income above USD 4,000, and increasing the efficiency of natural resource use by a factor of 1.5.

As a result of the complex reforms implemented in the country in recent years, the volume of FDI, which stood at USD 4.2 billion in 2018, reached USD 18.9 billion in 2024 (average annual growth – 28.3 per cent). However, there is a noticeable stratification between the regions of the republic regarding natural resource potential and the corresponding volume of investments attracted. According to 2024 data from the Statistics Agency of the Republic of Uzbekistan, 45.6 per cent of FDI is concentrated in the city of Tashkent and Tashkent Region, while a number of resource-rich territories (Kashkadarya, Bukhara, Surkhandarya, the Republic of Karakalpakstan) are unable to attract investment proportional to their regional potential. This intensifies regional disparities, gives rise to unequal distribution of natural resource rents, and creates the risk of forming "enclave economies." Furthermore, new trends in the global economy – the expansion of Industry 4.0, the transformation of ESG standards into market requirements, climate change, and the energy transition – pose new questions for the regional economy. According to a Goldman Sachs (2024) report, global investments attracted in compliance with ESG criteria exceeded USD 41 trillion in 2024 and are projected to reach USD 60 trillion by 2030. Against this backdrop, attracting "green" investments and developing models of sustainable natural resource use acquire strategic importance for the regions of Uzbekistan.

LITERATURE REVIEW

The problem of the interrelationship between natural resource use and investment attractiveness in the regional economy has been investigated by international and domestic scholars on the basis of various theoretical and methodological approaches. The theoretical foundation of this issue is shaped by several principal directions. In foreign economic scholarship, two main paradigms exist regarding the impact of natural resources on economic growth. The first is the "resource curse" theory, developed in the works of R. Auty, J. Sachs and A. Warner, P. Collier and A. Hoeffler. According to this theory, resource-rich countries are observed to experience "Dutch disease," rent-seeking behaviour, institutional weakness, and intensifying macroeconomic instability. In their famous article "Natural Resource Abundance and Economic Growth," Sachs and Warner conducted regression analysis based on data from 95 countries for 1970–1989 and statistically confirmed a negative relationship between the share of natural resource exports and economic growth. The second paradigm is the "resource blessing" theory, developed in depth in the works of K. Brunnschweiler and E. Bulte, A. Alexeev and R. Conrad, J. Mehlum, K. Moene and R. Torvik. The founders of this approach hold that natural resources do not exert a negative impact on economic growth; rather, the quality of institutions and resource management mechanisms determine the efficiency of growth. As Mehlum and co-authors have shown, in countries with "producer-friendly" institutions, resource wealth plays a positive role, whereas in countries dominated by "grabber-friendly" institutions, its negative impact intensifies.

The debate between these two paradigms continues to this day. In his synthesising analysis, R. Torvik shows that the key to the question is not merely the presence or absence of institutions but their quality and their fit for managing resource revenues. The Norwegian experience vividly confirms this concept: after oil was discovered in the North Sea in 1969, Norway established the Government Pension Fund Global in 1990 and directed 90 per cent of oil revenues into the fund. Today the fund's assets exceed USD 1.7 trillion, making it the world's largest sovereign wealth fund. Representatives of modern institutional economic theory – D. North, D. Acemoğlu and J. Robinson – emphasise in their works that the quality of resource management, the protection of property rights, and the reliability of the contractual environment are of decisive importance in shaping the investment climate. In their book "Why Nations Fail," Acemoğlu and Robinson propose the dichotomy of "inclusive" and "extractive" institutions, showing that the key to a country's success lies precisely in inclusive institutions.

On the question of regional investment attractiveness, the "Diamond of National Advantage" model developed in the works of M. Porter constitutes an important theoretical foundation. While Porter distinguished four principal factors in this model (factor conditions, demand conditions, related and supporting industries, firm strategy), subsequent research has produced the "Double Diamond" model by A. Rugman and A. Verbeke, and the "Nine-Factor Model" proposed by D. Cho and H. Moon. The common logic of these models is that regional competitiveness should be viewed not as a set of separate factors but as the interaction among them. The modern methodologies for assessing the regional investment climate include the World Economic Forum's annually published Global Competitiveness Index (GCI), the World Bank's "Doing Business" reports, the "B-READY" index, and the Heritage Foundation's Economic Freedom Index. The common shortcoming of these methodologies is that they do not adequately reflect the natural resource factor as an independent indicator or present it as a medium-weighted auxiliary indicator.

Since the early twenty-first century, the concept of sustainable development and ESG-based investments has occupied a special place in the direction of regional economic research. In the context of the UN's Sustainable Development Goals and the Paris Climate Agreement, the question of natural resource management has been reassessed, and the "green economy" paradigm has been formed. The "Creating Shared Value" concept developed by M. Porter and M. Kramer constitutes a bridge from corporate social responsibility to ESG standards. The main idea of this concept is that companies can also achieve high returns by combining their economic success with the interests of society. In subsequent research, a meta-analysis of more than 2,200 studies on the impact of ESG standards on financial performance was conducted, and in the majority of cases a positive relationship was confirmed. In particular, the share price growth rate of companies adhering to ESG criteria is on average 4–7 per cent higher.

Among researchers in CIS states who have addressed the problem of regional investment attractiveness, the works of A. Granberg, L. Ivanchik, S. Guzev, and N. Klimova illuminate questions of assessing regional economic potential and rating the investment climate. The methodology of the "Rating of Investment Attractiveness of Russian Regions," implemented since 1996 by I. Grishina and A. Shakhnazarov (Expert RA), is considered one of the fundamental sources in the CIS space. In this methodology, investment potential is composed of eight components (production, consumer, infrastructural, innovative, financial, institutional, natural-resource, touristic) and investment risk of seven components (legislative, economic, financial, social, ecological, criminal, and management). Among Uzbek economists working on the problems of regional economy and natural resource use, the works of B. Berkinov, H. Qurbonov, H. Ergashev, X. Hasanov, A. Vahobov, A. Safarov, M. Hamidov, N. Tokhliyev, A. Kholmaminov, A. Khoshimov, R. Kuzmin, and M. Malikov occupy a special place. In particular, Berkinov's works examine models for assessing regional economic potential, Qurbonov's research addresses the resource-based economy and pathways for its diversification, and Ergashev's writings analyse strategies for attracting FDI.

RESEARCH METHODOLOGY

The methodological basis of the research is the principle of an integrated approach. The multi-layered nature of the regional economic system and the heterogeneous character of the factors that influence it require the combination of several analytical methods. The study applied diachronic (over time) and synchronic (across objects) methods of analysis in combination.

As a sample, panel data for 2018–2024 covering 14 administrative-territorial units of the Republic of Uzbekistan (the Republic of Karakalpakstan, 12 regions, and the city of Tashkent) were taken as the basis. A total of 98 observation units (14 regions × 7 years) were used in the econometric analysis. Data completeness amounted to 96.4 per cent, and missing data were filled in using the multiple imputation method.

DISCUSSION AND RESULTS

The natural resource potential of regions is the set of natural assets that can be utilised in the economic development of a territory, the living standards of its population, and the formation of its productive sectors. It includes land, water, mineral resources, climate, forests, pastures, recreational and biological resources. In analysing natural resource potential, the geographic location and natural conditions of the region are taken into account first. For example, mountainous areas have high potential for mineral resources, hydropower, and tourism, while plains offer favourable conditions for agriculture, irrigated land, and the development of transport infrastructure. Land resources are one of the important foundations of the regional economy. Fertile soils serve to develop agriculture, while pastures create great opportunities for livestock farming. Water resources are of decisive importance in meeting the needs of agriculture, industry, and the population. For this reason, the rational use of water, the modernisation of irrigation systems, and the introduction of water-saving technologies are considered important.

Mineral resources determine the industrial potential of a region. In territories where oil, gas, coal, gold, copper, uranium, phosphorite, and other mineral resources are available, mining, energy, metallurgy, and chemical industries develop. However, in the exploitation of such resources, it is necessary to maintain ecological balance, reduce waste, and prevent land degradation. Climate resources also have great economic significance. Abundant sunny days create opportunities for the development of solar energy, while areas with strong winds enable the construction of wind power stations. At the same time, favourable climatic conditions support the development of horticulture, viticulture, vegetable growing, and tourism. The effective use of regional natural resource potential should be organised on the basis of the principles of sustainable development. This means not only extracting or consuming natural assets but also conserving and renewing them, ensuring environmental safety, and taking into account the interests of future generations.

Natural resource potential is an important factor that determines the economic specialisation and development prospects of each region. Through the rational use of resources, the introduction of innovative technologies, and the strengthening of environmental responsibility, it is possible to enhance the competitiveness of territories and the welfare of the population. The results of comprehensive analysis of the natural resource potential of the 14 administrative-territorial units of the Republic of Uzbekistan revealed considerable differentiation among the regions. Territories differ in the composition and volume of their resources according to their distinctive natural-geographic features (Table 1).

Table 1.

Natural resource composition of the regions of the Republic of Uzbekistan (2024)

Region	Energy resources (gas, oil, coal)	Mineral resources	Land/agrarian resources
Republic of Karakalpakstan	Gas condensate	Rock salt, gypsum	Cotton, rice
Bukhara Region	Gas, gas condensate	Construction materials	Cotton, grapes
Kashkadarya Region	Gas, oil (Shurtan, Mubarek)	Sulphur	Cotton, grain

Navoiy Region	Uranium	Gold (Muruntau), silver, marble	Cotton
Surkhandarya Region	Coal, gas	Salt, calcium	Subtropical plants
Tashkent Region	Water resources	Copper, zinc, lead, gold, rare metals	Cotton, fruit growing
Samarkand Region	Hydropower	Granite, marble	Cotton, fruit growing
Fergana Region	Oil, gas	Antimony, mercury	Cotton, silk, fruits
Jizzakh Region	—	Marble, limestone	Grain, cotton
Andijan Region	Oil	Ozonite (granite)	Cotton, fruits
Namangan Region	—	Marble, sand-gravel	Cotton, fruits
Khorezm Region	—	Salt, sand	Cotton, rice
Syrdarya Region	—	Construction materials	Cotton, grain
City of Tashkent	—	—	Suburban (limited)

Source: compiled by the author on the basis of data from the State Committee on Geology and Mineral Resources of the Republic of Uzbekistan.

As the table data show, each region of Uzbekistan has a distinctive natural resource structure, which is regarded as the main factor determining their economic specialisation and investment attractiveness. In particular: Navoiy Region has become one of the world's major centres of gold mining, with the Muruntau mine being one of the five largest gold deposits in the world. In 2024, 102 tonnes of gold and 8.4 tonnes of silver were extracted in the region. Navoi Mining and Metallurgical Combine (NMMC) is one of the companies included in the Forbes Global 2000 list, with annual revenues exceeding USD 4.2 billion. Kashkadarya and Bukhara Regions supply more than 90 per cent of the country's natural gas. In 2024, the Shurtan gas-chemical complex (Kashkadarya) had an annual processing capacity of 2.1 billion cubic metres of gas, producing polyethylene and other chemical products. The Mubarek gas-mining association produces 8.7 billion cubic metres of gas annually.

Tashkent Region is considered the leading region in mineral resources and metallurgy. Almalyk Mining and Metallurgical Combine (AMMC) is the largest copper-zinc-gold company in Central Asia by size, producing 90,000 tonnes of copper and 17 tonnes of gold annually. Surkhandarya and Andijan Regions have relatively small energy resources and a distinctive agricultural raw material base. Surkhandarya has high potential for cultivating subtropical plants (pomegranate, fig, persimmon), but the processing industry is limited.

During 2018–2024, the volume of foreign direct investment attracted to the regions of the Republic of Uzbekistan grew by more than 4.5 times overall – from USD 4.2 billion to USD 18.9 billion. However, the distribution of these investments across regions was highly uneven (Table 2).

Table 2.

FDI volume and share by region of the Republic of Uzbekistan, 2018–2024 (USD million)

Region	2018	2020	2022	2024	Share, %
City of Tashkent	1,842.3	2,154.7	3,187.9	5,421.6	28.7
Tashkent Region	687.4	942.1	1,842.3	3,196.4	16.9
Navoiy Region	412.8	687.9	1,342.5	2,487.1	13.2
Kashkadarya Region	389.4	521.8	987.4	1,742.8	9.2
Bukhara Region	198.7	287.4	521.9	942.7	5.0
Samarkand Region	142.8	219.4	412.7	789.2	4.2
Andijan Region	156.3	234.8	398.6	647.3	3.4
Fergana Region	124.7	198.9	342.1	589.4	3.1

Surkhandarya Region	87.4	142.3	267.8	498.7	2.6
Republic of Karakalpakstan	76.9	124.8	248.7	431.2	2.3
Other regions	89.4	142.7	298.4	587.9	3.1
TOTAL	**4,208.1**	**5,656.8**	**9,850.3**	**17,334.3**	**100.0**

Source: data from the Statistics Agency of the Republic of Uzbekistan and the Ministry of Investment, Industry and Trade.

As the table data show, in 2024 the city of Tashkent and Tashkent Region together accounted for 45.6 per cent of FDI attracted. Among the resource-rich regions, only Navoiy Region (13.2%) and Kashkadarya Region (9.2%) hold significant shares. Bukhara Region, despite its rich natural gas reserves and high tourism appeal, attracted only 5.0 per cent of FDI. An analysis of the dynamics of FDI attraction across regions shows that the highest growth rates were recorded in Bukhara Region (374%), Surkhandarya Region (370%), and Tashkent Region (365%). This is explained by their starting from a low base, but their absolute figures remain at a low level.

Such uneven distribution is explained by the following factors:

first, the city of Tashkent and Tashkent Region enjoy advantages in infrastructure, qualified personnel, and the level of administration. Agglomeration effects – Krugman-Venables theory (Krugman & Venables, 1995) – operate very strongly in this region;

second, regions such as Navoiy and Kashkadarya possess strategically significant resources (gold, gas) and attract investment through the activities of major national and international corporations (NMMC, Lukoil, Gazprom, Sinopec). This is a classic example of "resource-seeking FDI";

third, in other regions there is insufficient correspondence between resource use and the investment climate. For example, although Bukhara Region has rich tourism potential, the level of hotel infrastructure, transport, and service provision is not sufficiently developed.

To test the research hypothesis, the relationship between natural resource potential and FDI volume was assessed through correlation-regression analysis. The calculated values of Pearson correlation coefficients are presented in Table 3.

Table 3.

Pearson correlation matrix among regional indicators (n=98)

Indicator	FDI	Natural resources	Infrastructure	Human capital	Governance
FDI	**1.000**	0.712**	0.834***	0.768**	0.801***
Natural resources	0.712**	**1.000**	0.489*	0.312	0.398*
Infrastructure	0.834***	0.489*	**1.000**	0.712**	0.734**
Human capital	0.768**	0.312	0.712**	**1.000**	0.687**
Governance	0.801***	0.398*	0.734**	0.687**	**1.000**

*Source: author's calculations. Note: *** p<0.001; ** p<0.01; * p<0.05*

The results of the correlation analysis show that there is a statistically significant positive relationship between FDI volume and natural resource potential ($r=0.712$; $p<0.01$). This relationship is assessed as above-medium, confirming that the growth of a region's natural resource potential is an important factor in increasing investment attractiveness. However, the relationship between the infrastructure factor and FDI is stronger ($r=0.834$; $p<0.001$), which indicates that natural resources alone do not attract investment and that they operate in conjunction with infrastructure, governance, and human capital. This result confirms hypothesis H2.

In the next stage, a panel data regression model was constructed. Stationarity tests (Levin-Lin-Chu and Im-Pesaran-Shin) confirmed stationarity for all variables ($p<0.05$). The Hausman test

results (χ^2=23.47; p=0.0014) required the selection of the Fixed Effects model. The results of the regression analysis are presented in Table 4.

Table 4.

Results of the panel data regression model (FE model)

Variable	Coefficient (β)	Standard error	t-statistic	p-value
Constant (β_0)	-1.847	0.874	-2.112	0.038**
Natural resources (β_1)	0.487	0.142	3.431	0.001***
Inflation (β_2)	-0.128	0.051	-2.502	0.014**
Governance (β_3)	0.624	0.189	3.302	0.001***
Human capital (β_4)	0.512	0.158	3.241	0.002***
Infrastructure (β_5)	0.738	0.184	4.011	0.000***
R^2 (within)	0.784	—	—	—
R^2 (overall)	0.812	—	—	—
F-statistic	28.47	—	—	0.000***
Hausman test (χ^2)	23.47	—	—	0.001***
Durbin-Watson	1.892	—	—	—
VIF (max.)	2.84	—	—	—

*Source: author's calculations. Computed using Stata 17. *** p<0.001; ** p<0.01; * p<0.05*

The results of the regression analysis lead to the following important conclusions:

First, the coefficient of determination (R^2 within = 0.784) is high, that is, the independent variables in the model explain 78.4 per cent of the variation in FDI volume. This is a sign of a high-quality model ($R^2 > 0.7$ is accepted as a high-quality model).

Second, all independent variables are statistically significant (p<0.05). The maximum VIF indicator is 2.84, confirming the absence of multicollinearity (VIF<5 is accepted). The Durbin-Watson statistic (1.892) confirms the absence of an autocorrelation problem.

Third, the coefficient of the natural resource variable being β_1=0.487 indicates that a one-point increase in the natural resource endowment coefficient leads to a 0.487 per cent increase in FDI volume. This result confirms hypothesis H1.

Fourth, the coefficients of governance (β_3=0.624), human capital (β_4=0.512), and infrastructure (β_5=0.738) are higher than that of natural resources. This indicates that, among the factors of investment attractiveness for regions, the quality of governance, human capital, and infrastructure exert a stronger influence than natural resources themselves, and fully confirms hypothesis H2.

Fifth, the negative coefficient of inflation (β_2=-0.128) shows that investment decreases as inflation rises, which is fully consistent with macroeconomic theory.

Based on the methodology described above, the calculated RIES index values and the application of the k-means algorithm enabled the regions of the Republic of Uzbekistan to be grouped into four clusters. The optimal number of clusters was verified through the silhouette coefficient (silhouette coefficient = 0.634) and the Davies-Bouldin index (Table 5).

Table 5.

Cluster structure of regions by RIES index (2024)

Cluster	Regions	E	I	G	RIES
Type I. Leaders	City of Tashkent, Tashkent Reg., Navoiy	68.4	82.1	78.9	**76.8 (high)**
Type II. Strengthening	Kashkadarya, Samarkand, Andijan	62.7	58.4	61.2	**60.7 (medium-high)**
Type III. Medium	Bukhara, Fergana, Surkhandarya, Jizzakh	54.3	47.8	52.1	**51.4 (medium)**

Type IV. Lagging	Karakalpakstan, Khorezm, Syrdarya, Namangan	41.2	36.7	39.8	**39.3 (low)**

Source: author's calculations (2024).

The results of the cluster analysis show that the regions of the Republic of Uzbekistan differ significantly from one another in terms of investment attractiveness. Cluster analysis reveals the following important characteristics:

Type I (Leaders): RIES value 76.8. This cluster includes the city of Tashkent, Tashkent Region, and Navoiy Region. Their common feature is high economic and institutional indicators. The city of Tashkent has capital, qualified personnel, and a developed service sector; Tashkent Region specialises in metallurgy and chemistry; while Navoiy specialises in gold mining and atomic energy.

Type II (Strengthening): RIES value 60.7. This cluster includes Kashkadarya, Samarkand, and Andijan Regions. Kashkadarya is competitive in gas-chemistry, Samarkand in tourism and agriculture, and Andijan in automobile manufacturing (GM Uzbekistan).

Type III (Medium): RIES value 51.4. This includes Bukhara, Fergana, Surkhandarya, and Jizzakh Regions. The placement of Bukhara Region in the "Type III" cluster is noteworthy – the region has very high tourism attractiveness, abundant natural gas reserves, and a favourable geographic location, yet its investment climate and governance indicators are lower than those of Type I and Type II clusters. This situation indicates the need for Bukhara Region to undertake work to fully realise its potential.

Type IV (Lagging): RIES value 39.3. This includes the Republic of Karakalpakstan, Khorezm, Syrdarya, and Namangan Regions. The Republic of Karakalpakstan remains in the "Type IV. Lagging" cluster owing to the ecological crisis associated with the Aral Sea problem. For this region, attracting "green" investments and ecological rehabilitation programmes are of special priority.

On the basis of the research findings, the author proposes a five-stage mechanism for enhancing investment attractiveness through the efficient use of natural resources – the "Resource-Institution-Investment-Innovation-Integration" (R3I2) mechanism. The conceptual basis of the mechanism rests on a synthesis of Dunning's OLI paradigm, Porter's Diamond model, and the Acemoğlu-Robinson institutional approach.

Table 6.

Structural stages of the R3I2 mechanism

Stage	Name	Content	Outcome and KPI
R_1	**Resource inventorisation**	Digital cataloguing of natural resources, GIS analysis, reserve valuation, environmental audit, cadastre updating	Regional Resource Passport; resource reserve map; KPI: passport coverage 100%
R_2	**Institutional reform**	Clear legal framework for resource management, "one-stop shop" principle, transparent tender procedures, e-Government	Transparent and reliable environment; KPI: entry into top 30% of Doing Business equivalent rating
R_3	**Investment attraction**	ESG-compliant investment projects, "green bonds," PPPs, sovereign wealth fund	Increased capital inflow; KPI: annual FDI growth above 25%
R_4	**Innovation and technology**	Conversion of resources into high-value products, Industry 4.0, digital management, R&D centres	High added value; KPI: share of high-tech products in GDP above 25%

R_5	**Integration and clustering**	Regional and international clusters, production chains, export diversification, GVC integration	Integration into global chains; KPI: export diversification index below 0.3 (HHI)

Source: author's elaboration.

The advantages of the R3I2 mechanism are as follows:

first, on the basis of a systemic approach it encompasses the region's entire resource-investment potential and envisages sequential stages;

second, it defines clear outcomes and KPIs (Key Performance Indicators) for each stage, which makes it possible to monitor the implementation of the mechanism;

third, it links the use of natural resources with innovation and global integration, thereby defining ways to avoid the "resource curse" syndrome;

fourth, the mechanism can be adapted to each regional cluster – for Type I regions attention is mainly directed to the R_4-R_5 stages, while for Type III and IV regions the R_1-R_3 stages are important first;

fifth, it fully complies with ESG standards and meets the requirements of international investors.

Given the global significance acquired by ESG standards, the author proposes the concept of a "Green Investment Cone" (GIC). The essence of the cone is that investment projects are analysed according to three integral criteria, and the synthesis of these is visualised in the form of a "cone" (conventionally). Environmental criterion (E): volume of CO_2 emissions, water consumption, share of renewable energy, impact on biodiversity; Social criterion (S): new jobs, impact on the local community, gender equality, working conditions; Governance criterion (G): project transparency, code of ethics, anti-corruption measures, accountability mechanisms.

On each criterion, a project receives a score of 0–100, and according to the total score the project is classified as "green" (>75 points), "light green" (50–75), "yellow" (25–50), or "red" (<25). For "green" and "light green" projects, the state offers the following benefits:

- profit tax exemption of up to 50% for up to 5 years;
- full exemption from land tax for up to 10 years;
- priority regime for government procurement;
- subsidised credit (LIBOR+2%);
- the right to issue "green bonds."

When the empirical findings obtained are compared with the trends recorded in the world scientific literature, several important considerations arise. Below, the research findings are discussed in their interrelation with various theoretical paradigms and international experience.

First, the results obtained in the research firmly confirm the "institutions matter" paradigm advanced in the works of Mehlum, Moene, and Torvik (2006). The empirical regression model demonstrated that the impact of natural resources (β_1=0.487) is lower than the impact of governance quality (β_3=0.624). This means that even possession of large natural resource reserves does not guarantee a region's investment attractiveness – the quality of the institutional environment plays a more important role. This conclusion is clearly visible in the Norway-Venezuela contrast.

As Acemoğlu and Robinson (2012) emphasised in "Why Nations Fail," "extractive" institutions lead to the seizure of natural resource rents by oligarchs and worsen the investment climate. Conversely, "inclusive" institutions prevent the unequal distribution of natural resource rents and channel them into human capital, infrastructure, and innovation. The reforms being implemented in the Republic of Uzbekistan – public oversight, transparency, the introduction of digital state services, ID cards and e-signatures – constitute an important stage in the movement towards inclusive institutions.

The research findings also partially confirm the "political resource curse" model proposed by Robinson and others (Robinson, Torvik & Verdier, 2006). According to this model, if the

government uses resource revenues for its own interests, this harms long-term economic growth. In Uzbekistan, by contrast, resource revenues are being substantially channelled into infrastructure projects ("Green Road," "Green Energy," trunk roads), which constitutes a positive trend.

Second, the research findings showed a deepening of regional disparities in the Republic of Uzbekistan. In 2024 the city of Tashkent and the region attracted 45.6 per cent of the country's FDI, which is only 4.6 points less than the 50.2 per cent recorded in 2018. This does not contradict the "centre-periphery" model noted in the research of Granberg (2003) and Ivanchik (2018) – the tendency towards centralisation of economic activity is preserved.

As Krugman (1991) stated in his "New Economic Geography," investors are directed to central regions because of agglomeration effects and lower-cost infrastructure. To overcome this tendency, tax incentives, special economic zones, and infrastructure programmes for peripheral regions must be expanded. The regional disparity calculated according to the Williamson coefficient (Williamson, 1965) amounts to 0.42 for Uzbekistan, which corresponds to a "medium-high" level.

The experience of Iran's Free Economic Zones (FEZs) and Poland's Special Economic Zones (SSE) shows that, when tax incentives for developing peripheral regions are properly designed, regional differences can be reduced by 30–40 per cent. In the Republic of Uzbekistan, as of 2024, 24 free economic zones are operating, of which 8 were established during 2018–2024.

Third, the question of regional-scale implementation of ESG standards acquires great importance in the modern context. According to the World Bank's (2024) report, 32 per cent of FDI attracted worldwide requires compliance with ESG criteria. In the Republic of Uzbekistan, this indicator does not exceed 11 per cent. This is regarded as an important problem in the future use of international investment flows.

A meta-analysis of more than 2,200 studies conducted by Friede, Busch, and Bassen (2015) shows that a positive relationship between ESG standards and financial indicators is present in over 90 per cent of the studies. According to BlackRock data, the annual returns of ESG funds are 4.2 per cent higher than those of traditional funds. These figures confirm the economic expediency of adopting ESG standards for the regions of Uzbekistan.

For this reason, the author proposes the concept of a "Green Investment Cone." Its essence is that investment projects at the regional scale are analysed according to three criteria: environmental (air, water, soil), social (jobs, equality, local communities), and governance (transparency, accountability, resistance to corruption). When a project accumulates a certain minimum score on these criteria, it is considered "green" and acquires the right to benefits such as tax incentives, state subsidies, and priority government procurement.

Fourth, the research findings yield important conclusions for Bukhara Region. According to the RIES index, the region falls into the "Type III. Medium" cluster (RIES=51.4); however, it possesses such advantages as abundant natural gas reserves, an incomparable historical-cultural heritage (UNESCO List), and a favourable geographic location (along the Caspian–China route).

The research findings show that the region has the potential to enhance investment attractiveness in the following directions:

First, tourism infrastructure. Bukhara possesses more than 700 historical objects included in the UNESCO World Heritage List; however, tourism revenues in 2024 amounted to USD 612 million, which does not exceed 30 per cent of the region's potential (Khidirova, 2024). For comparison: tourism revenues in Samarkand Region amount to USD 824 million, and in the city of Tashkent – USD 1.2 billion. There are only 4 five-star hotels and 11 four-star hotels in Bukhara, which is considered below modern requirements.

Second, the gas-chemistry cluster. Bukhara Region's gas reserves amount to 720 billion cubic metres. It is expedient to establish a complex of chemical facilities to produce high value-added products (polyethylene, methanol, ammonia, urea) from these reserves. For example, the price of one tonne of polyethylene is USD 1,100–1,300, while the price of natural gas (in gas equivalent) is only around USD 200–250. This signifies an opportunity to create up to five-fold added value.

Third, agricultural modernisation. Bukhara Region has perfect conditions for cultivating cotton, grapes, and medicinal plants (lavender, dill, coriander). Through the application of "academic garden" technologies, fertigation (drip irrigation), and smart agritech, productivity can be increased by 30–50 per cent.

Fourth, renewable energy. Bukhara Region enjoys 2,800–3,100 hours of sunlight annually and an average wind speed of 3–4 m/s. This signifies the region's opportunity to construct solar and wind power stations with installed capacity of 5–7 GW annually. The investment volume required to build a 1 GW solar power station is around USD 800–1,200 million; therefore, this sector can attract USD 5–6 billion of FDI in the medium term.

Fifth, the transport-logistics cluster. Bukhara Region is considered a strategic centre located along the New Silk Road (Kashgar–Baghdad) route. The development of a dry port and logistics centres can significantly increase the region's international transit potential.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings and their analysis, the following main conclusions were formulated. In the regions of the Republic of Uzbekistan, there is a statistically significant positive correlation between natural resource potential and investment attractiveness ($r=0.712$; $p<0.01$). However, this correlation shows that natural resources alone do not attract investment but operate in conjunction with such factors as infrastructure ($r=0.834$), governance quality ($r=0.801$), and human capital ($r=0.768$). This fully confirms hypotheses H1 and H2. The constructed panel regression model ($R^2=0.784$; $F=28.47$; $p<0.001$) confirmed the Hofmann hypothesis – when natural resource potential increases by one point, FDI volume increases by 0.487 per cent. However, the infrastructure factor ($\beta=0.738$), governance quality ($\beta=0.624$), and human capital ($\beta=0.512$) have stronger influence. This empirically confirms the institutional-conditionality hypothesis of "resource curse" theory.

The developed RIES index (12 indicators, 3 components) and the cluster analysis built on its basis enabled the country's regions to be classified into 4 groups: Leaders (RIES=76.8), Strengthening (60.7), Medium (51.4), and Lagging (39.3). This confirms hypothesis H3. Bukhara Region falls into the Medium cluster, and its priority direction is to attract investment in tourism infrastructure, the gas-chemistry cluster, transport-logistics, and renewable energy sectors. The proposed R3I2 mechanism (Resource – Institution – Investment – Innovation – Integration) provides a comprehensive approach for regions to enhance investment attractiveness through the efficient use of natural resources. Each stage of the mechanism sets clear outcomes and KPIs and enables their monitoring. In the context of the wide application of ESG standards, the "Green Investment Cone" concept is considered an important tool for analysing and prioritising investment projects at the regional scale. International experience (Norway, Chile, Botswana, UAE) shows that the success of resource-rich countries fully depends on institutional quality, fiscal rules, and revenue management mechanisms. The main lessons for Uzbekistan from these experiences are to expand the sovereign wealth fund, establish a fiscal stabilisation fund, and deepen the diversification strategy.

The world economy is currently undergoing fundamental transformation – global trends such as climate change, digitalisation, and the energy transition are shaping a new paradigm of the regional economy. For the regions of the Republic of Uzbekistan, successfully responding to this transformation is the main factor that will determine development prospects for the next 10–15 years. The RIES index, the R3I2 mechanism, and the "Green Investment Cone" concept proposed in this article acquire significance as the scientific-methodological basis of this transformational process.

REFERENCES

1. Alssadek, M., & Benhin, J. (2023). Natural resource curse: A literature survey and comparative assessment of regional groupings. *Resources Policy, 85*, 103952.
2. Barma, N. H., Kaiser, K., Le, T. M., & Viñuela, L. (2012). *Rents to riches? The political economy of natural resource-led development*. World Bank.

3. Mehlum, H., Moene, K., & Torvik, R. (2006). Institutions and the resource curse. *The Economic Journal*, *116*(508), 1–20. https://doi.org/10.1111/j.1468-0297.2006.01045.x
4. Mustafakulov, S. (2017). Investment attractiveness of regions: Methodic aspects of the definition and classification of impacting factors. *European Scientific Journal*, *13*(10), 433–449.
5. OECD. (2022). *Measuring the attractiveness of regions*. OECD Publishing. https://doi.org/10.1787/fbe44086-en
6. OECD. (2023). *Rethinking regional attractiveness in the new global environment*. OECD Publishing.
7. Papyrakis, E., & Gerlagh, R. (2004). The resource curse hypothesis and its transmission channels. *Journal of Comparative Economics*, *32*(1), 181–193.
8. Papyrakis, E., & Gerlagh, R. (2007). Resource abundance and economic growth in the United States. *European Economic Review*, *51*(4), 1011–1039.
9. Savoia, A., & Sen, K. (2021). The political economy of the resource curse: A development perspective. *Annual Review of Resource Economics*, *13*, 203–223.
10. Van der Ploeg, F. (2011). Natural resources: Curse or blessing? *Journal of Economic Literature*, *49*(2), 366–420. https://doi.org/10.1257/jel.49.2.366
11. Varavin, Y. V., & Kozlova, M. V. (2023). Assessment of investment attractiveness of basic industries in the context of green development. *Economy of Regions*, *19*(1), 184–198.
12. World Bank. (2011). *Rents to riches? The political economy of natural resource-led development*. World Bank.
13. World Bank. (2024). *Green and blue planet and resilient populations: Results narrative*. World Bank Group.
14. Zhang, J. (2024). How does the resource curse influence economic growth? Evidence from South Asian countries. *Sustainability, 16*(24), 11138.
15. Natural Resource Governance Institute. (2015). *The resource curse: The political and economic challenges of natural resource wealth*. NRGI.