

Smart Contract as an Institutional Basis for Sustainable Development of the Region's Economy

Tamila S. Tasueva ¹*[ORCID 0000-0002-7716-8341],
Vera V. Borisova ²[ORCID 0000-0002-4419-8990]

¹ *Kh. Ibragimov Complex Institute of the Russian Academy of Sciences, Grozny, Russia; Grozny State Oil Technical University, Grozny, Russia*

² *Saint Petersburg State University of Economics, Saint Petersburg, Russia*
tamila7575@mail.ru

ABSTRACT

The issues of sustainable development of territories are increasingly coming into the field of vision of scientists and practitioners. The institutional framework of the region's infrastructure implements the principles of sustainability and adaptability. The use of smart contracts can facilitate strengthening of the communication stability between subsystems and elements of the region's economy. The practice of using smart contracts in various spheres of activity (banking sector, insurance, transportation, delivery of goods, government services, etc.) demonstrates their ability to maintain the intended development trajectory, despite the influence of external factors. The possibilities of using smart contracts in the regional economy include holding a vote of citizens on a particular vital issue; organization of cadastral registers and standard electronic documents. Also they include carrying out initiatives to register companies and support small and medium-sized businesses; introduction of a mechanism for tracking shares and their financial support; management of communication between business entities and individuals in terms of compliance with environmental standards, including the provision of regulatory and reference documentation. We are not talking about the formalization of the entire economic system with smart contracts and the creation of a "digital region". The formulation of the research problem is associated with the use of smart contracts as a connecting link in the institutional framework of the regional economy, contributing to overcoming the state of instability of infrastructure in the digital economy. In recent years, support for the sustainable development of the territory has become an urgent agenda for the development of many institutions. The principles of sustainable development, or ESG – Environmental, Social, Governance, are formulated, implying a responsible approach to environmental issues, social and corporate cooperation. Obviously, in order to work according to ESG principles, Russian regions need institutional transformation. Digital tools (smart contracts, block chain, cloud technologies and artificial intelligence) create additional opportunities for the implementation of the ESG agenda. The sequence of actions is the following: analysis of the goals achieved in this direction on the basis of digital technology tools; development of a regional ESG policy (a concept for the development of a territory based on ESG principles) and informing the public (publication of the concept in the public domain) about the directions and priorities of its implementation. Then it is as follows creation of an institutional basis for the implementation of regional ESG-policy; defining the objectives of institutional support; formation of measures for the implementation of regional ESG-policy, including time limits and responsibility for their implementation.

Keywords: *sustainable development, development of the territory on the principles of ESG, digitalization, smart contracts, ecosystem, public-private partnership*

1. INTRODUCTION

It was proposed to include ESG principles in the development strategies of companies back in the

early 2000s due to the worsening climatic conditions on the planet [1, 2]. A unified approach to assigning an ESG rating to companies has not yet been developed. Companies focus on one or another

rating criterion, depending on the industry and the specifics of their activities. Thus, energy companies give priority to environmental parameters, in the banking sector a special role is assigned to management criteria, and in the service sector – to social responsibility.

Regions that implement and promote responsible social, environmental and management standards within the framework of the socio-economic development of the territory can also apply for a good score in the ESG rating. It is important to strike a balance between the ESG criteria. Attention is drawn to this circumstance in the provisions of the national project “Ecology”. Until 2030, it is envisaged to transfer 100% of all waste for sorting and to cut waste disposal in half [3].

The circle of agencies that carry out ESG-assessment and certify companies according to ESG-standards has expanded (*Figure 1*) [4]. As a rule, companies are divided into leaders, mid-level and laggards.

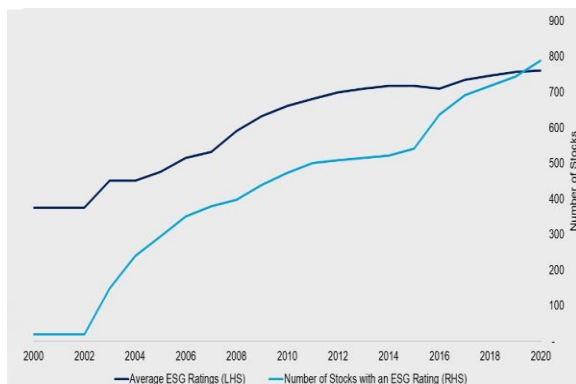


Figure 1. Dynamics of ESG-rated companies from 2000-2020

Source: [5]

The data in *Figure 1* shows that in the early 2000s the number of companies with ESG rating did not exceed two dozen. Over twenty years, the average ESG rating has doubled, and the number of companies has reached more than 800. The independent rating agency RAEX-Europe annually publishes a rating of Russian companies operating on ESG principles. According to RAEX, for the first half of 2021, the five Russian leaders focused on ESG principles included Polymetal, Sibur, Lukoil, Enel Russia, and Russian Railways. Competition requires not only the introduction of innovations and breakthrough technologies, but also responsible investment in new promising projects. One third of Russian banks have fixed in the credit policy the assessment of borrowers according to ESG criteria [5]. The Russian banking sector has developed

guidelines for launching the principles of responsible investment and created investment units and funds focused on ESG principles.

In the context of sustainable development of Russian territories, we will single out environmental issues, waste recycling, care for specially protected areas, the formation of environmental consciousness and skills for the rational use of all types of resources [6-8].

2. MATERIALS AND METHODS

The aim of the study is to develop scientific and methodological tools aimed at introducing smart contracts into the economic practice of the regions.

This goal required the solution of the following research tasks: theoretically substantiate the feasibility of using smart contracts in the regional economy; identify and systematize the determinants of institutional support for the smart contract toolkit; analyze the parameters of institutional support for regional ESG policy using the smart contract toolkit.

The methodological basis of the study was a method of cognizing the socio-economic reality of the development of the region. It makes it possible to analyze the possibilities of positioning smart contracts as an institutional basis for the sustainable development of the regional economy and formulate recommendations reflecting the view of the team of authors on the prospects for introducing smart contracts into economic practice.

Research ideas about the sustainable development of the region's economy are formed on the basis of the application of universal scientific methods: structural and functional analysis and synthesis of environmental, social, economic regulatory and monographic materials; used a comparative method for the development of institutions in the digital environment of the regional economy. Taken together, these scientific methods made it possible to substantiate the theoretical and methodological provisions of the problem under study.

3. RESULTS

The problem of the formation of institutional support for the development of the economy predetermines the need for a large-scale digital transformation of the entire economic complex of the region. The expected vector of digitalization, according to experts, should be coordinated with the ESG agenda. In this context, the issues of

introducing smart contracts, artificial intelligence, digital twins, network-centric management methods in the business processes of business entities undergo a critical rethinking. [9].

Understanding the role of digital technologies in increasing the sustainability of the regional economy, there is a need for a conceptual justification of the development of the institutional environment for the implementation of smart contracts in business practice [10]. This provision determines the purpose of writing this article and the logic of the presentation of the material.

In economics, the concept of “smart contract” has received many interpretations [11]. The practical implementation of blockchain technologies has contributed to the automation of a number of transactions in digital ecosystems [7] (including regional ecosystems). The consequence of this was the formation of a new digital environment for smart contracts on the blockchain.

Objectively, the need arose for a regulatory assessment of the positioning of smart contracts in the new digital field. Scientists' discussions on this issue are focused on whether “smart contracts work like ordinary civil legal contracts, or whether their use characterizes” the beginning of a technical, social and economic revolution, which must be supported with law [11].

It is known that “the state of instability of the system during the design of new organizational forms intensifies at the points of bifurcation, when it is necessary to make a choice or correct the path of development. In the context of the digital transformation of the region's economy, the importance of taking into account bifurcation points is that they allow the possibility of influencing the choice of the system's behavior, on its further development, not by force, informational methods, by weak influences” [12].

Studying the problem of sustainable development, the authors focus on the prospects for the use of smart contracts as a driving force and an important element of institutional support for regional ESG policy.

Smart contracts offer significant advantages over paper transactions. A classic example of the execution of smart contracts is the work of the carrier companies – Yandex-taxi and Uber. Automatic execution of a smart contract in real time protects participants from unauthorized third-party interference and changes. The transparency of transactions enables the parties to track the

execution of a smart contract in real time. The confidentiality of the transaction is respected; its high speed and self-fulfillment are maintained.

The definition of the term “smart contract” can be found in the legislation “On digital financial assets”. It notes that “a smart contract is a computer algorithm that allows participants in a distributed register to exchange assets, is a technology and can be recognized as a type of civil contract” [13]. It is fair to say that the practice of using smart contracts is ahead of theory. Scientists pay attention to various options for using smart contracts: the issuance of digital securities and the turnover of financial assets, the formation of supply chains, the creation of real estate registers, etc.

The dynamic implementation and responsible use of smart contracts in the digital environment makes it possible to talk about the expediency of their application in the formation of the institutional framework of the regional infrastructure in the coordinates of the ESG agenda.

Smart contracts include applications such as financial management systems, human resources, logistics, cadastral services, etc.

The current wave of smart contract use is focused on supporting sustainable development programs. This is due to the development and use of algorithms for finding patterns in the processing of complex tasks of ranking ESG values.

Smart contracts work successfully with large datasets in terms of transparency, speed, flexibility, and predictability. The success of using smart contracts depends on well-designed legal support, principles and practices for proper and responsible execution.

Using the example of the Chechen Republic, we examined the possibility of using smart contracts in the context of ESG systematization and analysis, including their institutional support and ESG ranking¹.

The leadership of the Chechen Republic shares ESG values and designated them as a priority goal –

¹ A ranking is a list of any objects (companies, countries, people, etc.) that can be ordered with any of the available ranking indicators; in our case, it is the systematization and analysis of ESG data of companies and territories. The agency RAEX-Europe updates the ESG ranking every month: it reevaluates companies based on their annual reports, and also includes new ones that have not yet been evaluated. The ranking has already covered 135 Russian companies from 24 different industries.

“building an economically sustainable and technologically progressive region” [14].

The Strategy for the Socio-Economic Development of the Republic formulates the thesis that: “a new level of public administration can become possible in the Chechen Republic due to: increasing the availability and quality of public services through digitalization, increasing the efficiency of the government, development institutions and budget policy, attracting talent to public administration. The republic has an extensive sustainable development program in all three areas of ESG – Environmental, Social, Governance: ecology, social policy and corporate governance in the context of the implementation of the public-private partnership mechanism.

In terms of ecology, projects have been launched that allow enterprises of the agro-industrial sector of the republic to apply modern resource-saving technologies and reduce the negative impact on the environment. The Republic has a significant land bank of agricultural territories (61.9%) in the total land fund of the Chechen Republic. The issue of soil and water protection and the fight against land degradation is a key element of the environmental policy of the republic's leadership. The principle of alternation of sowing crops in agricultural areas, the rational use of fertilizers and chemical means of crop protection are applied. Work is underway to monitor carbon dioxide emissions into the atmosphere and introduce measures to replace obsolete agricultural equipment with modern, more environmentally friendly [14].

An important part of the practice of promoting ESG values in the Chechen Republic is related to the social sphere. The social policy of the republic is aimed at creating favorable working conditions for workers, material support for the population, providing citizens with affordable modern medical care, training and retraining of personnel to work in modern innovative conditions of the digital economy. For the republic, the emphasis on social policy determines its future development.

In the context of the implementation of the ESG principle related to corporate cooperation in the Chechen Republic, the development of a public-private partnership mechanism is envisaged in the following areas. They are “efficient and technological production of agricultural products based on leading companies and developed cooperation of households to ensure sustainable sales in the Russian Federation and presence in export markets” [15].

The implementation of the measures presented in the Strategy is carried out in three stages, up to 2035. They are aimed at improving the quality of life in the Chechen Republic, building a new economic model and a high level of public administration.

In the Chechen Republic, many companies began to restore their business after the crisis caused by the COVID-19 pandemic, on the principles of environmental, social and corporate cooperation ESG, Environmental, Social, Governance. Among them there are Chechen regional branches of “Rosselkhozbank” JSC, “Sberbank” PJSC, “Grozneftegaz” JSC, “Chechencement” JSC, NJSC “IST Kazbek” and “GrozStroyKeram” LLC, “Chechen Mineral Waters” LLC, “Leader-R” LLC, LLC “YugAgroHolding” and a number of other companies.

In the context of the implementation of these principles, the leading countries of the world are expected to reduce greenhouse gas emissions, up to a complete cessation by 2050.

The analysis has showed that the Chechen Republic is only at the beginning of the way to apply the principles of ESG in its activities. Sustainable environmentally oriented development of the region is an expensive and at the same time low-profit projects. At the same time, the ecological potential of the Chechen Republic is quite high. Therefore, the search for ways to form a sustainable institutional basis in the region based on the use of smart contracts in the ESG format is of particular importance today. This circumstance determines the relevance of the topic of this study.

An analysis of the possibilities of using smart contracts in order to increase the sustainable development of the region's economy allows us to conclude that the ESG agenda has become an urgent challenge for many Russian companies.

The study found that the use of smart contracts makes it possible to accelerate the transition of companies to the principles of work according to ESG standards. One of the advantages of implementing smart contracts in order to increase the sustainable development of the region's economy is the continuous monitoring of ESG parameters.

A survey conducted during the study of representatives of the business community of the Chechen Republic regarding the commitment of their companies to the principles of sustainable development showed that about 86% of companies consider the principles of ESG to be a priority. More

than 50% of companies have already developed programs for implementing ESG criteria in their activities; other companies (about 35%) plan to do so in the near future.

Particular attention is paid to ESG principles in such sectors of the republic's economy as the agro-industrial complex, the food industry, and the financial sector. Concerns about ESG development are caused with such areas of activity as transport, trade, and logistics. Respondents identified obstacles to the development of the ESG agenda: lack of funding, lack of government support, lack of reasonable unified transparent criteria for evaluating ESG standards.

4. DISCUSSION

The use of smart contracts from the standpoint of the concept of sustainable development of the region's economy should develop in a balanced way with respect to all spheres of human life by maintaining a balance between economic, environmental, social, and cultural development [16, 17].

A smart contract created using a programming language, on the one hand, minimizes the possibility of errors in transactions, on the other hand, it creates new risks, threats and dangers. "The lack of observability at the stage of concluding a deal gives rise to the risk of "hidden" knowledge, when one of the parties can enter into a deal that is obviously unprofitable for the other party" [18]. Collaboration and the adoption of a declaration on the responsible use of digital innovations are needed. It is necessary to jointly develop common standards and certification procedures together with embedding the principles of responsible use of smart contracts and their mandatory implementation.

To create a modern sustainable institutional environment in the region, it is advisable to create a center for testing the use of smart contracts in the ESG format. At the same time, it is important to use not only the latest technologies and tools to improve the quality of life, but also to introduce the principles of a common commitment of business entities to ESG standards.

This can be implemented through the mechanism of public-private partnership, the introduction of integrated methodologies for assessing and analyzing the risks of the impact of man-made consequences on the environment. The launch of a public-private partnership mechanism in this direction involves the adoption of obligations for

interaction with start-ups, innovative small and medium-sized enterprises, with the academic research community [10].

5. CONCLUSION

To summarize, the introduction of smart contracts into economic practice contributes to the development of the ESG agenda. Increasing attention of government authorities to the entry of companies into ESG processes contributes to the leveling of uncertainties in the standardization and certification of companies according to ESG criteria.

Note that the general trend towards a responsible attitude to the environmental, social and political situation causes changes in the views of a significant number of stakeholders [19]. In the economy of the region, the ESG vector is accompanied with institutional transformations of the digital communication environment based on the synergy of economic, environmental, social and political problems and the transformation of "green" technologies into a factor of competitiveness.

In Russia, large commodity corporations and the banking sector have become leaders in the implementation of ESG projects. Government authorities formed the request for the development of ESG trends. In the regions of the country, the activation of the process of introducing ESG projects into economic practice is possible due to the following factors:

- 1) the use of smart contracts in the processes of ESG transformation of the regional economy;
- 2) coordinated planning for the development of ESG projects between government agencies and business entities based on the use of public-private partnership tools;
- 3) development of a regional system of reasonable unified transparent criteria for evaluating ESG projects and implementing ESG standards;
- 4) creation of a unified regional infrastructure for "green" financing based on a system for monitoring and reporting on ESG parameters;
- 5) improving the legal and regulatory framework for the development of ESG principles.

The study of the phenomenon of using a smart contract as a connecting element of the institutional framework of the region's economy indicates that an interdisciplinary task has been set for scientists. It is

necessary to unite the efforts of specialists in the field of informatics, economists, lawyers, sociologists, etc.

AUTHORS' CONTRIBUTIONS

Contribution to research: Tamila S. Tasueva – 2/3; Vera V. Borisova – 1/3.

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