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МРНТИ 06.73.35
JEL Classification:G23
DOI: https://doi.org/10.52821/2789-4401-2023-4-96-106

USE OF DIGITAL TECHNOLOGIES IN FINANCING PROJECTS OF SUSTAINABLE DEVELOPMENT IN KAZAKHSTAN

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ANNOTATION

The purpose of the study is to identify new mechanisms for increasing financial support for sustainable development projects in Kazakhstan based on the use of digital technologies.

Methodology. To conduct the study, the methods of content analysis of scientific literature, dynamic analysis of indicators for the development of sustainable financing in Kazakhstan, and comparative analysis of the possibilities of investment platforms and portals were applied. The statistical data of the Green Finance Center in AIFC, the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, international and national standards and guidelines in the field of sustainable development were studied.

Originality/value of the research. The study is aimed at solving the actual problem of developing sustainable financing in Kazakhstan. To achieve this goal, the study proposes the use of digital platforms that will help to attract private investment in sustainable development. The criteria for checking projects for compliance with the goals of sustainable development have been systematized.

Research results. The stages of developing a digital platform for financing sustainable development projects, logical relationships between processes and information flows, types of connections between platform users are determined. The platform solution can contribute to the growth of funding for the green economy and social projects and make a significant contribution to the promotion of sustainable development priorities.

Keywords: digital platform, sustainable development projects, sustainable development standards, sustainable finance, green finance

INTRODUCTION

In 2020, at the Summit on Climate Ambition, Kazakhstan made a commitment to transform into a carbon neutral economy by 2060, which outlined the priority of sustainable development goals. At the same time, the

transition to sustainable development requires huge financial investments. Kazakhstan needs investments in the amount of more than 650 billion dollars to fulfill its climate obligation [1].

However, real data for Kazakhstan illustrate a significant gap between the amount of sustainable investment needed and the actual amount. Thus, according to the Bureau of National Statistics of the Agency for Strategic Planning and reforms of the Republic of Kazakhstan, investments and current costs for environmental protection in 2021 amounted to only 417 billion tenge [2]. According to the Green Finance Center in AIFC, the volume of issuance of sustainable bonds in our country does not exceed 100 billion tenge [3].

At the same time, in many states, the leading trend in economic policy is to reduce the share of direct state participation in the financing of the SDGs and stimulate private sector investment. But in Kazakhstan, there is a low interest of investors in financing projects in the field of sustainable development due to high risks, as well as a low interest of economic entities in the development of such projects due to limited access to financing. Thus, in order to solve existing problems, it is necessary to develop effective mechanisms for attracting private investment in the field of sustainable development, including through digital technologies.

The development of digital technologies for financing sustainable development projects requires a detailed scientific study of theoretical and methodological approaches and existing practical developments in this area.

The development of sustainable financing and the possibilities of digital technologies in the financial sector are being actively discussed in a wide range of domestic and foreign researchers. The issues of financing projects related to sustainable development were considered in the study Li Y. et al. [4]. One of the main obstacles is the lack of investment attractiveness of such projects, which is associated with high risks, novelty of technologies, and long periods of project implementation. Wang K.-H. and others in their study revealed a significant causal relationship between green finance and sustainable development based on an empirical analysis of the impact of multiple stakeholders on sustainable development through participation in green finance projects [5]. In work of Hadas-Dyduch M. et al., the most important incentives for expanding the issuance of green bonds are identified, such as capital mobilization, the development of a green financial market, demand from investors, and reputational benefits [6].

In the work of Bogoslavtseva L.V. et al. the positive experience of using innovative technologies and program financing tools are studied [7]. The authors come to the conclusion that the use of digital technologies is a key factor in improving management decisions to achieve the criteria for the effectiveness of funded programs. Researchers Pratono A. et al. studied the features of using the possibilities of crowdfunding platforms by social enterprises and financing social projects [8]. Sharma A. noted that significant amounts of financial resources concentrated with private investors and companies remain unused due to the lack of a convenient and efficient channel for directing funds to specific projects [9]. The authors are also convinced that digital platforms can provide a flow of funds to projects, including those for social infrastructure.

Consequently, the research and development of digital solutions will create a convenient mechanism for interaction between investors and developers of projects in the field of sustainable development and significantly expand the volume of their financing. A systematic approach to the development of a digital service will allow solving a number of tasks, such as collecting detailed information about sustainable development projects, checking projects in accordance with sustainable development criteria, creating an infrastructure for directing funds to these projects, creating a system for interaction between entities to finance and promote sustainable development projects.

Materials and methods. The study was carried out in two stages. At the first stage, the methodological foundations of sustainable financing, the specifics of the interaction between investors and project developers, taking into account their functions and interests, were studied, a comparative analysis of existing digital services and platforms that contribute to the financing of projects in the social, environmental and managerial sphere was carried out, with the identification of their advantages and disadvantages. At the second stage, the possibilities of developing a digital platform for financing sustainable development projects using SaaS-solutions were considered, and the criteria for checking projects for compliance with sustainable development goals were systematized.

As research methods, the methods of content analysis of scientific literature in the field of sustainable development, dynamic analysis of indicators for the development of sustainable financing in Kazakhstan, and comparative analysis of the possibilities of investment platforms and portals were used.

The theoretical and methodological basis of the study was represented by the works of Kazakhstani and foreign scientists and experts in the field of creating and developing digital solutions aimed at achieving sustainable development goals. The normative legal acts and strategic documents of the Republic of Kazakhstan, international reporting standards and sustainable development reports were used in the research. The information base of the study consists of analytical reports and studies, statistical data and websites of international organizations, rating agencies, Kazakhstani development institutions.

MAIN PART

Based on the goals and principles of sustainable development, a sustainable development project can be considered as a set of actions limited in time and resources and aimed at creating a unique product, service or result to achieve sustainable development goals. Sustainable development projects can be aimed both at preserving and protecting the environment and reducing environmental risks, and at the development of social aspects (inclusiveness, labor relations, investment in human capital, etc.). The large-scale implementation of projects in the field of sustainable development requires significant financial investments, not only from budgetary funds, but also from the entire potential of private investment. The unique features of sustainable development projects (for example, an extensive time horizon, low liquidity and high risks, possible positive synergies in one or more areas to achieve the SDGs) necessitate the introduction of innovative ways and tools for their financing, including using digital technologies.

Recently, platform solutions have been actively used in the field of digital transformation of economic processes. The main advantage of digital platforms is accessibility, which allows promising projects to receive financial resources for implementation and further promotion. The digital platform can act as a driver for a targeted and systematic expansion of funding for sustainable development projects, which will ultimately lead to dramatic improvements in the environmental and social sphere.

Platform technology allows solving the problems of interaction in a digital environment of a significant number of participants, integrating information systems, services, databases and providing solutions based on digital technologies with data and changes in the division of labor system. A feature of the digital platform is the functioning of horizontal mechanisms for the interaction of participants in financing sustainable development projects.

The work of the digital platform for financing sustainable development projects should be built on the interaction of four groups of participants. The first group - the developers of sustainable development projects - includes a specialist or a group of specialists directly working on the development and implementation of the project. The second group - investors are represented by entities investing in a sustainable development project. The third group - platform administrators - manages communications with the owners of information sources and developers of the digital platform, manage the information data warehouse, and ensure the functioning of business processes. The fourth group - experts - ensures that projects are checked for compliance with sustainable development goals and regulatory and legislative requirements. Expert judgment and regulation reduces the information asymmetry that exists between project developers who own a significant amount of data and investors who need this data to make informed decisions.

Analyzing current trends in sustainable financing in Kazakhstan, it should be noted that financial organizations and private businesses are showing a certain interest in sustainable financial instruments. The volume of sustainable financing in Kazakhstan increased from 14.1 billion tenge in 2020 to 96.2 billion tenge in 2021 [3; 10]. In the structure of sustainable financing, green bonds account for the largest share (54.3% of the total volume of sustainable financing). The share of "green" loans amounted to 22.5%, and social bonds - 23.2% of all sustainable finance in Kazakhstan. To further attract investors and project developers in the field of sustainable development, it is necessary to create an infrastructure and regulatory environment that stimulates the financing of sustainable development projects, as well as the development of digital tools that help to expand the volume of financing of sustainable development projects.

The results of the analytical study showed that digital portals and investment platforms for financing innovative projects are successfully operating in international practice. The InvestEU portal operates in the European Union, uniting investors and project developers on a single pan-European platform [11]. Benefits of the

InvestEU platform for project proponents include: the application process takes less than one hour; the project can be published on the portal within 3 years; the InvestEU portal is free; access to a large pool of potential investors. At the same time, projects must belong to one of the 25 sectors with high economic value added. According to the eligibility criteria, the project must be located in the EU or in a territory associated with an EU Member State.

Project financing is also possible through the implementation of P2P financing formats, through which it is possible to provide other users with access to temporarily unused assets. The P2P lending market is the fastest growing in the world and is projected to reach more than $705 billion by 2030. The capabilities of the P2P -financing platforms allow you to create loan offers based on templates with defined conditions; establish requirements for the borrower. P2P-platform processes the received loan applications, calculates the expected payback on the basis of the embedded algorithms. If the loan is approved, a loan agreement is created with user-defined loan conditions.

The next option for a project financing platform is a crowdfunding platform. The crowdfunding platform involves the interaction between the founder and the investor based on the functions they perform through a convenient and secure infrastructure that allows you to collect financial resources for projects hosted on it without strict limits on the amount of investments. With an average annual growth of 2.3% per year in global crowdfunding, it can be expected to reach $34 billion by 2027. Of great importance for the success of fundraising by the project is the popularity of the crowdfunding platform among investors. In Kazakhstan, the Starttime crowdfunding platform supports charitable, social and commercial projects aimed at improving the welfare of the population. The platform brings together Starttime users and project authors, organizes their interaction, information and consulting support for projects. In case of successful completion of the project, the Starttime service retains a commission in the amount of 2-8% of the collected funds, depending on the project.

In turn, a digital platform of the AIFC Green Finance Center has been created in Kazakhstan, which is designed to bring together experts and practitioners in the field of green finance. The platform provides an opportunity to submit applications for consideration of an investment project in order to assist in attracting financing through green financial instruments. At the same time, the functionality of the platform is limited to collecting information about projects and their initiators for subsequent verification [12].

To attract private investment in sustainable development in Kazakhstan, the following measures are required:

- formation of an infrastructure and a regulatory environment that stimulates the financing of sustainable development projects;
- development of digital tools that contribute to the expansion of financing for sustainable development projects;
- creation of a "sustainable bank" on the basis of the Development Bank of Kazakhstan. As a positive experience, we can take the activities of the European Investment Bank (EIB), which is the climate bank of the European Union and promotes the goals of the Green Deal both in Europe and beyond;
- risk reduction - collective financing of projects, ensuring access of institutional investors to financing sustainable development projects;
- prevention of "green laundering" (" green washing ") and "green bubbles" (overinvestment in renewable energy that is out of proportion to the debt levels of many cleantech companies);
- stimulation of the inflow of financial resources to the regions of Kazakhstan.

Therefore, it is necessary to develop a fully functioning digital platform in Kazakhstan, which will expand the volume of financing for sustainable development projects in Kazakhstan and reduce the costs of information and financial interaction between investors and project developers due to the functionality of the platform. In addition, with the growth in the number of projects in the field of sustainable development, the need for their financing, and hence the creation of new investment platforms, will increase.

To formalize and describe the business processes of the platform, an IDEF diagram was built (Figure 1). It shows the logical relationships between processes and information flows. As input information, information on projects provided by developers, as well as investor requests are used. The output information is information on funded projects and recommendations.

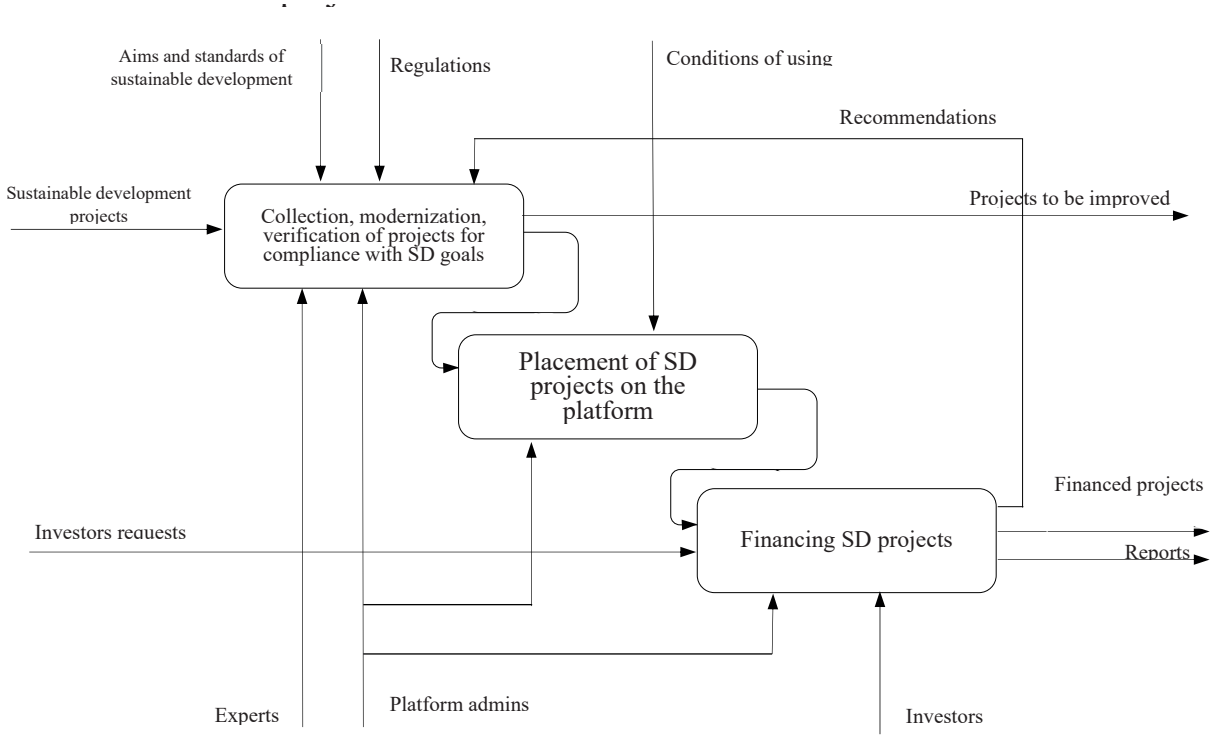

Figure 1 - IDEF diagram of a digital platform for financing sustainable development projects

Note - compiled by the authors

At the stage of designing and developing a digital platform, the purpose and objectives of the platform design are formulated, and its main functions are determined. It is also necessary to collect functional requirements (collecting information about projects and developers, checking projects, placing projects on the platform, providing access to funding, etc.), non-functional requirements (security, accessibility, convenience, speed, scalability, etc.), system requirements (authorization, caching, reporting, etc.), restrictions (development of micro service architecture, use of SaaS technology , compliance with legal and regulatory requirements, etc.) that must be taken into account when developing a platform. The digital platform is then tested and the MVP is launched to mitigate risks and validate the viability of the platform based on performance and efficiency criteria. Placing investment projects on the platform, reflecting in real time the volume of their financing and stages of implementation will ensure the transparency of project financing and the availability of information for all potential participants.

When developing the hardware and software architecture of the platform, SaaS cloud technologies (Software as a Service), which allow you to minimize the threshold for entering the system based on providing a simple and understandable interaction interface, as well as providing the necessary level of security. Figure 2 shows the structure of the digital platform developed on the basis of Wix technology.

To increase investor confidence in projects presented on a digital platform and to prevent unfair practices of greenwashing (“greenwashing”), it is necessary to ensure the transparency of information about projects and compliance with sustainable development goals. This can be done on the basis of a procedure for checking projects for compliance with social, environmental and ethical criteria.

Therefore, before being placed on the platform, submitted projects undergo a verification procedure for subsequent inclusion in the list of sustainable development projects. The verification procedure is based on the study of external information and data provided by the project developer. Experts need the most reliable and complete information about such projects in order to understand whether they meet the goals of sustainable development, what social, environmental and economic effects will be achieved during the implementation of

projects, how they will be implemented in the event of a change in the initial conditions (for example, environmental degradation, tightening regulation in the field of sustainable finance, etc.). In addition, relevant data is the main condition for making the right investment decision, having reliable information, investors can adapt, diversify their investment portfolios.

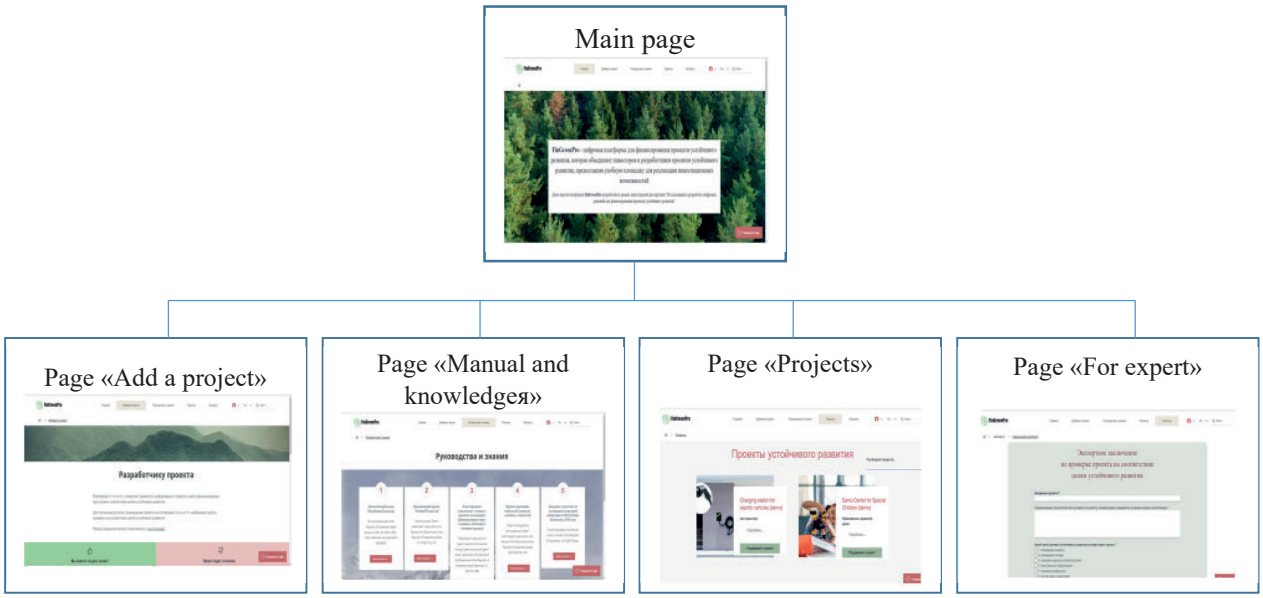

Figure 2 - The structure of the digital platform for financing sustainable development projects

Note - compiled by the authors

It is quite difficult to determine the optimal criteria for checking projects for compliance with sustainable development goals in Kazakhstan. The regulatory documentation regulates to a greater extent the provisions related to environmental projects, i.e. green projects. This is due to the fact that the "green" direction is the foundation of sustainable development, since environmental goals have an absolute priority in the hierarchy of sustainable development goals: 7 goals out of 17 SDGs are directly related to the environment and climate, the rest of the goals are directly and indirectly related to environmental problems countries and the world as a whole. Consequently, green projects can make up the bulk of sustainable development projects.

As criteria for checking projects for compliance with the SDGs, it is necessary to use international and national standards and guidelines in the field of sustainable development (Figure 3).

At the national level, such guidelines include the Classification (taxonomy) of "green" projects [13] and the Rules for recognizing technologies as "green" technologies in the Republic of Kazakhstan [14]. To introduce a transparent accounting system for "green" technologies and projects, the International Center for Green Technologies and Investment Projects maintains a Register of domestic manufacturers and suppliers of "green" technologies and equipment. Integration with the Register will make it possible to compare with it the information received from the developers/initiators of sustainable development projects.

Guided by the criteria and guidance materials, the expert decides whether the project meets the goals of sustainable development, and forms an appropriate conclusion. If, according to the decision of the expert, the project is in line with the SDGs, it can be placed on the platform for attracting funding; in case of non-compliance, the project is rejected or sent for revision. Refusal to post on the platform may also be due to the lack of provided project data, low quality of project preparation and planning, in case of complex cross-border projects, problems in the field of regulation.

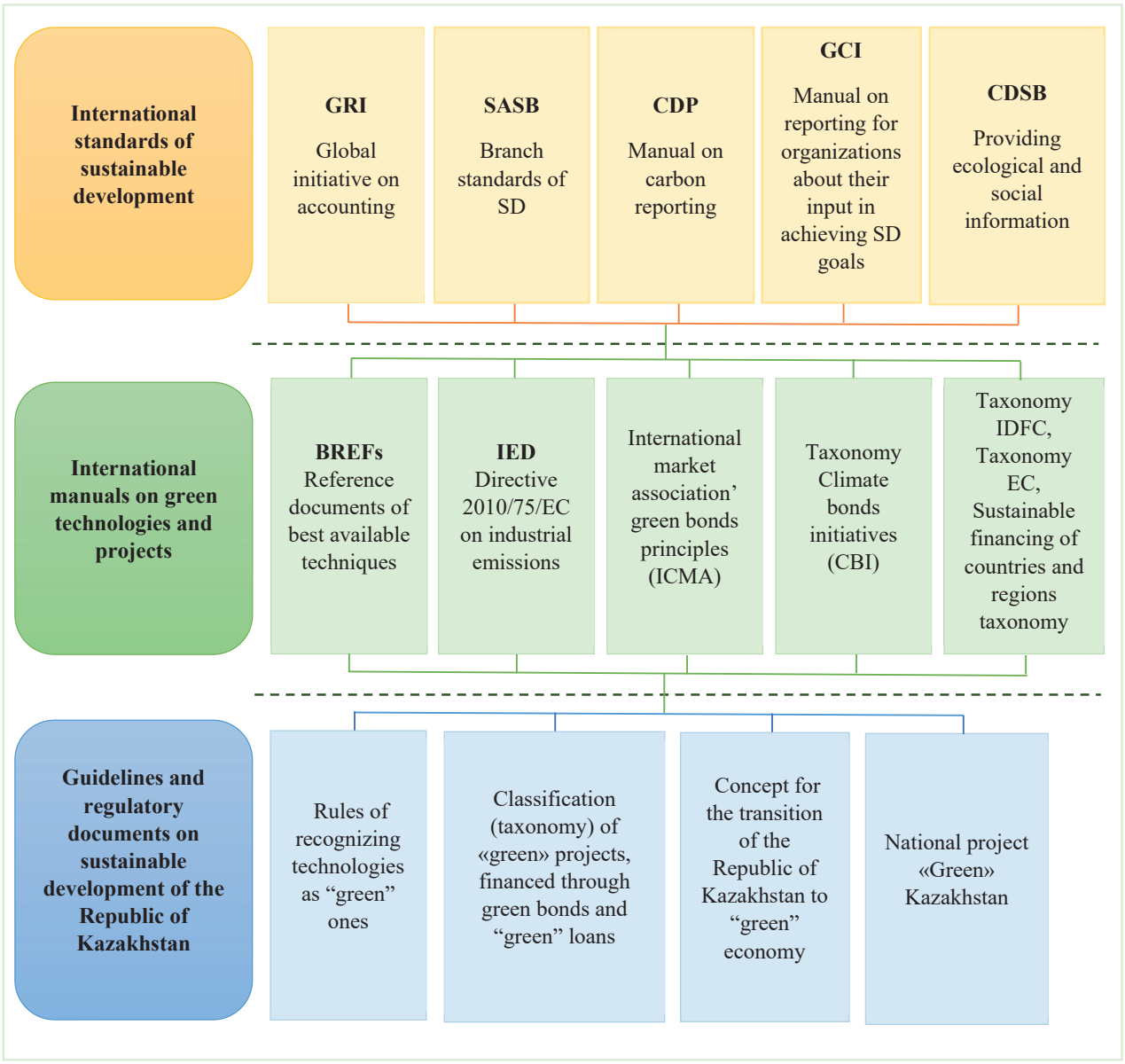

Figure 3 - Standards and guidelines in the field of sustainable development to determine the system of criteria

Note - compiled by the authors

The digital platform is aimed at developing interaction between participants and is associated with the presence of a large amount of personal data, so the platform ensures compliance with security requirements. Such requirements include a user identification system, the availability of message encryption systems, restriction of access rights to the content of the platform content, etc.

OBTAINED RESULTS (CONCLUSIONS)

Thus, based on the study of the possibilities and accessibility of digital platforms in Kazakhstan, it seems appropriate to develop a platform for financing sustainable development projects, which will create the appropriate infrastructure and the necessary tools for the market for financing sustainable development projects. The digital platform for financing sustainable development projects is a complex information system that

provides the functions of rational digital interaction between investors and developers of sustainable development projects based on optimally integrated mathematical algorithms, methods and models for their processing, and software and hardware tools for collecting, storing, processing and transmitting data and knowledge.

When developing a methodological basis for calculating a system of indicators/criteria for verifying sustainable development projects, indicators contained in international reporting standards in the field of sustainable development, such as the Global Reporting Initiative (GRI) [15], industry standards for sustainable development SASB [16] and etc. In Kazakhstan, the selection of projects for green financing is based on the Rules for the recognition of technologies as "green" technologies, as well as the Classification (taxonomy) of "green" projects. At the same time, it should be noted that the regulatory documentation of the Republic of Kazakhstan regulates to a greater extent the provisions related to environmental projects, i.e. green projects.

The functioning of the digital platform is based on the interaction of four groups of participants: developers/initiators of sustainable development projects, investors, platform administrators, experts. The stages of developing a digital platform for financing sustainable development projects include researching the needs of the region, development priorities and government programs; determination of the model of interaction between platform participants, goals of tasks and functions of the platform; design and development of a digital platform; testing a digital risk mitigation platform and launching an MVP. When developing the hardware and software architecture of the platform, you can use cloud technologies that allow you to minimize the threshold for entering the system based on providing a simple and understandable interaction interface, as well as providing the necessary level of security.

The inclusion of artificial intelligence in the platform will create opportunities for integrating the best world practices, selection mechanisms and services, as well as the formation of databases of projects and technologies. Also, artificial intelligence will provide opportunities to turn the platform into a convenient tool for communicating with regulatory authorities and financial institutions.

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ҚАЗАҚСТАННЫҢ ТҰРАҚТЫ ДАМУ ЖОБАЛАРЫН ҚАРЖЫЛАНДЫРУДА ЦИФРЛЫҚ ТЕХНОЛОГИЯЛАРДЫ ҚОЛДАНУ

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АҢДАТПА

Зерттеу мақсаты – цифрлық технологияларды пайдалану негізінде Қазақстандағы тұрақты даму жобаларын қаржылық қолдауды арттырудың жаңа тетіктерін анықтау.

Әдіснамасы. Зерттеуді жүргізу үшін ғылыми әдебиеттердің мазмұнын талдау, Қазақстандағы тұрақты қаржыландыруды дамыту көрсеткіштерінің динамикалық талдау, инвестициялық платформалар мен порталдардың мүмкіндіктерін салыстырмалы талдау әдістері қолданылды. АХҚО Жасыл қаржыландыру орталығының, Қазақстан Республикасы Стратегиялық жоспарлау және реформалар агенттігінің Ұлттық статистика бюросының статистикалық деректері, тұрақты даму саласындағы халықаралық және ұлттық стандарттар мен нұсқаулықтар зерделенді.

Зерттеудің бірегейлігі/құндылығы. Зерттеу Қазақстанда тұрақты қаржыландыруды дамытудың өзекті мәселесін шешуге бағытталған. Осы мақсатқа жету үшін зерттеу тұрақты дамуға жеке инвестицияларды тартуға көмектесетін цифрлық платформаларды пайдалануды ұсынады. Жобалардың тұрақты даму мақсаттарына сәйкестігін тексеру критерийлері жүйеленді.

Зерттеу нәтижелері. Тұрақты даму жобаларын қаржыландыруға арналған цифрлық платформаны әзірлеу кезеңдері, процестер мен ақпарат ағындары арасындағы логикалық байланыстар, платформаны пайдаланушылар арасындағы байланыс түрлері анықталды. Платформаның шешімі жасыл экономика мен әлеуметтік жобаларды қаржыландырудың өсуіне ықпал етіп, тұрақты даму басымдықтарын ілгерілетуге елеулі үлес қоса алады.

Түйін сөздер: цифрлық платформа, тұрақты даму жобалары, тұрақты даму стандарттары, тұрақты қаржы, жасыл қаржыландыру.

ИСПОЛЬЗОВАНИЕ ЦИФРОВЫХ ТЕХНОЛОГИЙ В ФИНАНСИРОВАНИИ ПРОЕКТОВ УСТОЙЧИВОГО РАЗВИТИЯ КАЗАХСТАНА

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АННОТАЦИЯ

Цель исследования – выявление новых механизмов увеличения финансовой поддержки проектов устойчивого развития в Казахстане на основе применения цифровых технологий.

Методология. Для проведения исследования были применены методы контент-анализа научной литературы, динамического анализа показателей развития устойчивого финансирования в

Казахстане, сравнительного анализа возможностей инвестиционных платформ и порталов. Изучены статистические данные Центра зеленых финансов МФЦА, Бюро национальной статистики Агентства по стратегическому планированию и реформам Республики Казахстан, международные и национальные стандарты и руководства в области устойчивого развития.

Оригинальность/ценность исследования. Исследование направлено на решение актуальной проблемы развития устойчивого финансирования в Казахстане. Для реализации поставленной цели в исследовании предложено использование цифровых платформ, которые помогут привлечь частные инвестиции в сферу устойчивого развития. Систематизированы критерии для проверки проектов на соответствие целям устойчивого развития.

Результаты исследования. Определены этапы разработки цифровой платформы для финансирования проектов устойчивого развития, логические отношения между процессами и потоки информации, типы связей между пользователями платформы. Платформенное решение может способствовать росту объемов финансирования зеленой экономики и социальных проектов и внести значительный вклад в продвижение приоритетов устойчивого развития.

Ключевые слова: цифровая платформа, проекты устойчивого развития, стандарты устойчивого развития, устойчивое финансирование, зеленые финансы

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