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SUSTAINABLE DEVELOPMENT GOALS IN PROJECT MANAGEMENT: BARRIERS AND INSIGHTS FROM KEY SECTORS IN KAZAKHSTAN

Sustainable project management plays a pivotal role in achieving Sustainable Development Goals (SDGs) across various sectors. This study focuses on examining project management practices within the healthcare, education, and construction sectors of Kazakhstan. The goal of the study is to identify barriers and propose solutions for improving the management of projects in these sectors. Key tasks include analyzing management practices, evaluating their effectiveness, and exploring pathways for integrating sustainable approaches. The research progressed through several stages: conducting a comprehensive literature review, developing targeted interview questions, and analyzing the responses.

Key results indicate that while some programs achieved moderate success, significant barriers remain, including financial constraints, inconsistent practices, and resistance to innovation. The study's analysis underscores the need for better integration of sustainability principles and enhanced project management frameworks.

This research contributes to the field by providing actionable insights into overcoming barriers to sustainable project management. Its practical significance lies in offering recommendations to policy-makers, project managers, and stakeholders to improve project implementation and ensure alignment with SDGs.

Keywords: Sustainable project management, project barriers, sustainable development goals.

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Жобаларды басқарудағы тұрақты даму мақсаттары: Қазақстанның негізгі секторларындағы кедергілері мен инсайттары

Жобаларды тұрақты басқару әртүрлі секторлардағы Тұрақты Даму Мақсаттарына (ТДМ) қол жеткізуде шешуші рөл атқарады. Бұл зерттеу Қазақстанның денсаулық сақтау, білім беру және құрылыс салаларындағы жобаларды басқару тәжірибесін зерттеуге бағытталған. Зерттеудің мақсаты – кедергілерді анықтау және осы салалардағы жобаларды басқаруды жетілдіру бойынша шешімдерді ұсынады. Негізгі міндеттерге басқару тәжірибесін талдау, олардың тиімділігін бағалау және тұрақты тәсілдерді интеграциялау жолдарын зерттеу кіреді. Зерттеу бірнеше кезеңдерден өтті: әдебиеттерге жан-жақты шолу жасау, мақсатты сұхбат сұрақтарын әзірлеу және жауаптарды талдау.

Негізгі нәтижелер кейбір бағдарламалар орташа табысқа қол жеткізгенімен, қаржылық шектеулерді, тиімсіз, жүйесіз тәжірибелер және инновацияларға төзімділікті қоса алғанда, айтарлықтай кедергілер сақталатынын көрсетеді. Зерттеуді талдау тұрақты даму принциптері мен жобаларды басқарудың жетілдірілген құрылымдарын жақсырақ біріктіру қажеттілігін көрсетеді.

Бұл зерттеу жобаны тұрақты басқарудағы кедергілерді еңсеру туралы нақты ақпарат беру арқылы осы саланың дамуына өз үлесін қосады. Оның практикалық маңыздылығы саясаткерлерге, жоба менеджерлеріне және мүдделі тараптарға жобаны іске асыруды жақсарту және ТДМ-мен сәйкестікті қамтамасыз ету бойынша ұсыныстар беру.

Түйін сөздер: жобаларды тұрақты басқару, жобалық кедергілер, тұрақты даму мақсаттары.

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Цели устойчивого развития в управлении проектами: барьеры и инсайты из ключевых секторов Казахстана

Устойчивое управление проектами играет ключевую роль в достижении целей устойчивого развития (ЦУР) в различных секторах. Данное исследование посвящено изучению практики управления проектами в секторах здравоохранения, образования и строительства Казахстана. Цель исследования – выявить барьеры и предложить решения для улучшения управления проектами в этих секторах. Ключевые задачи включают анализ методов управления, оценку их эффективности и поиск путей интеграции устойчивых подходов. Исследование проходило в несколько этапов: был проведен всесторонний обзор литературы, разработаны целевые вопросы для интервью и проанализированы ответы.

Основные результаты показывают, что, хотя некоторые программы достигли умеренного успеха, сохраняются значительные барьеры, включая финансовые ограничения, непоследовательную практику и сопротивление инновациям. Проведенный в исследовании анализ подчеркивает необходимость более эффективной интеграции принципов устойчивого развития и усовершенствованных систем управления проектами.

Это исследование вносит свой вклад в данную область, предоставляя практическую информацию о преодолении барьеров на пути устойчивого управления проектами. Его практическая значимость заключается в предоставлении рекомендаций политикам, руководителям проектов и заинтересованным сторонам для улучшения реализации проектов и обеспечения соответствия целям устойчивого развития.

Ключевые слова: устойчивое управление проектами, барьеры проектов, цели устойчивого развития.

Introduction

The concept of sustainable development emerged as a response to the economic stagnation, environmental challenges, and social inequalities that intensified globally in the latter half of the 20th century. This multidimensional framework, grounded in economic, environmental, and social dimensions, strives to improve the quality of life for current and future generations. Rooted in the theory of corporate social responsibility that originated in the 1950s, sustainable development has significantly influenced the fields of project management and investment practices (Soares, I., 2024). Over time, the escalating societal and environmental challenges, such as resource depletion, poverty, climate change, and social disparities, have underscored the pressing need for sustainable solutions. These interconnected issues threaten not only ecological stability and social harmony but also the long-term economic growth of nations.

The significance of sustainable development gained international recognition through major global initiatives. The United Nations Conference on Environment and Development in 1992 resulted in the adoption of the “Rio Declaration on

Environment and Development” and “Agenda 21,” which laid the groundwork for subsequent actions. In 2000, the Millennium Development Goals were established by 189 countries, aiming for tangible progress by 2015. Building on these efforts, the 2030 Agenda for Sustainable Development, adopted in 2015, introduced 17 Sustainable Development Goals (SDGs) with 169 targets, representing a universal framework for addressing global challenges. These goals demand an integrated approach, emphasizing the inseparable application of economic, social, and environmental dimensions of sustainability (National Center for Public-Private Partnership, 2021).

Kazakhstan has aligned its national development strategies with the SDGs, incorporating legal frameworks, taxonomies, and ecological standards to foster sustainable growth. Projects focused on smart cities, production and social infrastructure, and the digital transformation of industries are actively contributing to measurable outcomes. Such initiatives not only advance the national economy but also provide significant social and environmental benefits, underscoring the critical importance of studying the management and financing of sustainable development projects.

Projects within the SDGs framework represent organized efforts to create unique products or services under resource constraints, offering a practical mechanism for achieving sustainability objectives. These projects are categorized into green projects, targeting environmental improvements, and social projects, emphasizing societal well-being. Additionally, adaptive projects aim to address multiple sustainability dimensions across various economic sectors. Infrastructure projects play a pivotal role, particularly those aligned with SDG 9, which focuses on building resilient infrastructure powered by innovative technologies such as artificial intelligence and 5G. Achieving this goal enhances the overall implementation of more than 80% of the SDG targets, as estimated by experts (Voropaeva L.N., 2023).

Education, healthcare, and construction are among the key sectors driving societal development and shaping the trajectory of sustainable progress. Each of these fields contributes to the attainment of Sustainable Development Goals (SDGs), particularly those targeting quality education (SDG 4), good health and well-being (SDG 3), and sustainable cities and communities (SDG 11). However, the transition to sustainable practices in these sectors faces significant challenges, including financial constraints, uneven access to resources, and technological limitations. Addressing these barriers requires a comprehensive approach that integrates innovative project management strategies with a focus on economic, social, and environmental dimensions (Scaini, A., 2024).

Sustainable projects in education aim to ensure equitable access to quality education while promoting lifelong learning opportunities. Similarly, healthcare projects emphasize improving healthcare infrastructure, expanding access to essential services, and reducing health disparities. In the construction sector, sustainability efforts focus on resource-efficient building practices, renewable energy integration, and resilience to climate impacts (Bansard, 2019). These projects demand interdisciplinary approaches and collaborative frameworks to achieve their intended goals, which require extended research studies covering project development, realization and effective assessment. Following, the further research can be focused on the effective use of resources, assessment of risks, involvement of stakeholders and efficient planning procedures. Obviously, the achievement of sustainable project goals and overcoming of challenges in their implementation requires improvement of existing strategies and methods.

In this regard, the current research paper studies the existing sustainable development projects in various fields such as education, healthcare and construction, as well as, regional and foreign sustainable project management practices. The main goal of the research paper is to analyze the effectiveness of projects aimed at SDGs, to define the main challenges and potentials of such projects.

The key objectives of the paper are to analyze the level of project implementation, its impact on achieving the desired outcomes, and to recommend improved strategies to overcome existing challenges. The main significance and practicality of the current research is its input to enhance sustainable project management practices to achieve long-term global development goals.

Literature review

There is a great amount of evidence demonstrating a growing interest among researchers to integrate the topics of sustainability with the project management practices in the framework of the United Nations' 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). The integration of sustainability with SDGs is considered to be as a new field of study, since project managers acknowledge the importance and efficiency of sustainability to be fit in planning, implementation, and assessment of projects. There is a huge discussion in the literature demonstrating how sustainability can be incorporated in project management as critical success factors.

To illustrate, there is a study that develops and validates a conceptual model that links the SDGs to project management practices by identifying key barriers, motivation factors, and constructs necessary for successful integration. The study highlights the need for a sustainable project management methodology that incorporates the SDGs, along with the importance of training and certification for project management professionals to ensure sustainability as an integral part of their practice (Toledo, R.F. 2021). In recent times, public infrastructure projects have been studied more often since they play a pivotal role in improving sustainable communities (Hussain, S. 2023). As it is known, all UN member states approved the 2030 Agenda for Sustainable Development in 2016, where 17 SDGs were identified. Following, the topic of sustainability in project management is becoming an emerging new field of study.

The historical roots of sustainable neighbourhood development actually date back to the 18th and

19th centuries, developed in the US and Europe before the modern environmental movement gained prominence (MacDonald and Wheeler, 2005). The historical context shows that the principles of sustainable neighbourhood design have deep roots in the work of influential landscape architects and urban theorists, establishing a foundation for contemporary sustainability efforts in urban planning. McHarg (1969) claimed that the development of cities should be realised with fewer negative impacts on the environment. There is still a discussion on the definition of sustainable development of neighbourhoods. However, some principles of sustainable urban design have been proposed (Jabareen, 2006). The first one is ‘*compactness*’ – focus on compact development to prevent urban sprawl; second is ‘*sustainable transport*’ – designing urban areas to support walking, cycling, and public transport, reducing emissions, the third is ‘*density*’ – promoting higher density to support mixed land use and transportation options, such as transit; the next is ‘*mixed land uses*’ – placing compatible land uses close together to reduce travel distances and encourage walking or cycling, following ‘*diversity*’ – including a variety of housing types, architectural styles, and land uses to cater to different needs; ‘*passive solar design & renewable energy*’ – using building design and materials to reduce energy demand and rely on renewable energy for heating and cooling; and finally, ‘*greening*’ – integrating nature into urban spaces to reduce pollution, enhance biodiversity, and improve climate resilience.

In addition to the design principles, several scholars highlight the importance of water management, recycling, and food production in sustainable urban design. They suggest the following (Alberti, 1999; Jones et al., 2003; Pothukuchi and Kaufman, 2000; Wheeler, 2000):

Water Management: Promote water conservation through xeriscaping (using drought-resistant plants) in dry areas, prevent polluted runoff, and encourage groundwater recharge using porous materials like pavement and sidewalks.

Recycling: Use recycled materials in development projects and provide recycling facilities to encourage ongoing recycling efforts.

Food Production: Integrate local food production within urban areas to reduce the environmental impact of food transportation.

Actually, there is a rating system developed to assess the sustainability of neighbourhood-scale projects in the US, Canada, China, Mexico, and South Korea—the Leadership in Energy and Envi-

ronmental Design for Neighbourhood Development (LEED-ND) rating system (USGBC, 2007), which encompasses the above-mentioned principles to leverage sustainable neighbourhoods.

The LEED-ND rating system aims to achieve several key sustainability goals, including:

- Improving energy and water efficiency in neighbourhood projects.
- Revitalizing existing urban areas to make better use of space.
- Reducing land consumption by encouraging more compact development.
- Decreasing automobile dependence by promoting sustainable transportation options.
- Encouraging pedestrian activity through walkable designs.
- Improving air quality by reducing pollution and promoting green spaces.
- Decreasing polluted stormwater runoff with environmentally friendly infrastructure.
- Building livable, sustainable communities that are accessible and beneficial to people of all income levels.

This comprehensive approach supports the creation of more sustainable, vibrant, and equitable urban environments (USGBC, 2007). At the international level, the Green Globes system offers a similar set of sustainability standards to LEED-ND, aiming to promote sustainable building and development. The Green Globes system is recognized for its effectiveness in encouraging environmentally responsible development (GBI’s Green Globes).

Recently, the City of Toronto used these sustainability standards to help create the Toronto Green Development Standard. This standard combines elements from both LEED-ND and Green Globes, tailoring them to Toronto’s unique needs to guide sustainable development in the city (Garde, A., et al., 2010).

Indeed, most countries have already realized the importance of sustainable development of neighbourhoods. Below are some examples (Garde, A. et al., 2010):

- Brazil, Curitiba, Bogota, Los-Angeles: bus rapid transit system;
- Curitiba: green innovation projects aimed at recycling practices, where the poor community exchange trash for food vouchers;
- UAE: the world’s first zero-carbon city at Masdar;
- Dublin: A cutting-edge plan for the suburb of Clonburris that integrates the world’s highest environmental standards;

- Stockholm: the transformation of the industrial area into a green neighbourhood (Hammarly Sjöstad).

As for the importance of developing projects incorporated with sustainability in neighbourhoods, the research studies identified significant barriers and limited opportunities for promoting sustainable neighbourhood development. Research studies recommend strong policy interventions and mechanisms to foster greater adoption of sustainable planning and design in future neighbourhood developments. Most problems are related to the lack of planning and design concepts integrated with sustainable development. Secondly, there are problems associated with cost efficiency in the short term. The most sustainable neighbourhood projects are perceived to be innovative and inefficient in terms of long-term perspective. Considering these obstacles, there is not so much financial incentive for project managers and entrepreneurs to start such projects (Garde, A., et al., 2010).

The interim results of Kazakhstan's commitment to achieve the SDGs over the past 10 years have been presented during the recent extended meeting of the Parliamentary Commission to monitor implementation of National Sustainable Development Goals and Objectives. There is an institutional body responsible for the effective implementation of the SDGs – a Coordination Council for the SDGs and a Committee for Monitoring the Achievement of Sustainable Development Goals. From the perspective of the government commitment, regional development documents have been incorporated with SDGs to ensure development of priority sectors, such as healthcare, education, science, ecology, entrepreneurship, etc.

Kazakhstan continues to implement measures to decarbonize the economy within the framework of the Paris Agreement. In 2023, the Strategy for Achieving Carbon Neutrality by 2060 was approved, which is an important step in the fight against climate change (Ministry of National Economy of the Republic of Kazakhstan, n.d.).

The projects striving to promote sustainable development in education are primarily focused on the achievement of SDG Goal 4: quality education, “to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”. (Global Goals site, n.d.).

In the education sector, sustainable projects often revolve around improving access to quality education through digital inclusion, modernizing infrastructure, and fostering innovative teaching

practices. Studies have highlighted the importance of integrating information and communication technologies into educational systems, particularly in underserved regions. However, gaps in funding, teacher training, and equitable access remain significant barriers to achieving sustainable outcomes.

Healthcare sustainability research underscores the need for patient-centered care, efficient resource utilization, and the adoption of green technologies in hospital infrastructure. Evidence from various case studies suggests that sustainable healthcare projects not only reduce operational costs but also enhance patient outcomes and staff well-being. However, barriers such as regulatory hurdles, insufficient stakeholder engagement, and the slow adoption of innovative technologies often hinder the scalability of such projects.

The healthcare sector in the Republic of Kazakhstan is a cornerstone of the nation's sustainable development, with substantial investments and improvements marked in 2023. Total funding reached 2.5 trillion tenge, with a significant portion dedicated to outpatient care and a dramatic increase in medical rehabilitation funding, highlighting a comprehensive approach to health services. The sector is advancing towards its goal of healthcare spending constituting 5% of GDP by 2027. The focus on infrastructure is evident, with projects to acquire and upgrade 514 units of medical equipment and enhance equipment provision to 84.15% across healthcare institutions. This is complemented by a significant rise in consultative and diagnostic services, offering advanced diagnostics to 1.1 million residents. Human resource development is also prioritized, with 16,500 specialists receiving professional development and the graduation of approximately 7,000 doctors and over 23,000 mid-level medical workers. Major initiatives like the National Project for the Modernization of Rural Healthcare and the completion of the National Scientific Oncological Center in Astana, equipped with cutting-edge technology, underscore the sector's pivotal role in achieving healthcare sustainability (Official information resource Prime Minister of the Republic of Kazakhstan, n.d.).

The healthcare sector is pivotal for sustainable urban and national development, as it not only preserves and improves public health but also significantly impacts the environment through waste disposal and pollution, which can affect the health of both humans and ecosystems. Addressing sustainability in healthcare requires a multidisciplinary approach to ensure the implementation of sustain-

able procurement systems, policy innovation, and the development of new technologies, all of which contribute to the overall well-being and economic stability of societies (Molero, A. et al. 2021).

The construction sector is recognized as a cornerstone of sustainable development due to its profound impact on economic growth, environmental preservation, and social well-being. However, research indicates significant challenges in aligning construction projects with the principles of sustainability. Scholars emphasize that financial constraints, inconsistent regulatory frameworks, and limited awareness of sustainable practices remain persistent barriers. Additionally, the fragmented nature of the construction industry and its resistance to adopting innovative project management methodologies exacerbate these challenges. Studies also highlight the importance of integrating lifecycle assessments, stakeholder collaboration, and advanced project management tools to improve sustainability outcomes. Despite these efforts, the sector requires more robust frameworks to address complex issues such as balancing capital and operational budgets, fostering industry-wide commitment to sustainability, and overcoming cultural resistance to change (Sourani, Amr & Sohail, Mu., 2011).

The literature highlights the evolving role of project management in integrating sustainability principles to address global challenges. The incorporation of SDGs into project management practices has emerged as a critical area of study, revealing key barriers and motivational factors essential for achieving sustainability objectives. Urban and neighborhood development, guided by principles such as compactness, diversity, and renewable energy integration, illustrates the tangible benefits of sustainable design. Furthermore, innovative frameworks like the LEED-ND and Green Globes rating systems provide measurable benchmarks for sustainability in urban planning.

Despite notable progress, significant obstacles persist, including financial inefficiencies, planning deficiencies, and limited incentives for sustainable development. These challenges underscore the importance of strong policy interventions, innovative financing mechanisms, and interdisciplinary collaboration to advance sustainable project management. By addressing these gaps, future research and practice can ensure a more comprehensive integration of sustainability into project management, laying the groundwork for the subsequent analysis of Kazakhstan's progress and challenges in achieving the SDGs.

Methodology

Research Question: How do project management practices in the healthcare, education, and construction sectors influence their sustainability and alignment with SDGs?

The primary objective was to determine the extent to which the management of these projects/programs influenced their subsequent implementation and the outcomes currently observable through statistical data. Given that these projects/programs were implemented some time ago, the study involved locating and interviewing the leaders and team members of these programs who are now engaged in other projects within the healthcare, education, and construction sectors.

The study involved six participants from each program. The core of the interview consisted of five key questions, designed based on a comprehensive literature review, aimed at obtaining in-depth responses. The answers were coded as follows: 1 – Agree, -1 – Disagree, and 2 – Strongly Agree. These response options were approximate, with further probing questions used to clarify each answer. Kendall's coefficient of concordance was calculated for each criterion to assess the level of agreement among respondents. This provided a statistical measure of the consistency of responses, which was then interpreted to perform a detailed analysis of the management's impact on the programs' outcomes.

This statistical approach ensured that the results accurately reflected the consensus among participants regarding the management effectiveness and the subsequent success or shortcomings of the programs in question. This analysis provided valuable insights into how project management practices impacted the realization of projects/program goals and identified key areas for improvement in future initiatives.

Results and discussion

Sustainable educational projects in Kazakhstan have demonstrated measurable impacts, particularly in enhancing access to digital education platforms and modernizing school infrastructure. For example, initiatives focused on introducing renewable energy solutions in schools have significantly reduced operational costs while creating a model for sustainable practices within local communities. Despite these successes, challenges persist in reaching remote areas and ensuring the training of educators in sustainable teaching methodologies.

Table 1 – Comparative analysis of the use of project management in education programs of the Republic of Kazakhstan

Programs/Criteria	Project: «Training in Basic Digital Skills» (Program: «Digital Kazakhstan»)	Direction «Development of infrastructure in the field of education» under the state program for the development of education of the Republic of Kazakhstan for 2011 – 2020
Level of use of project management methodology at different stages of the project	Partial implementation, lack of full integration into processes	Implemented at the planning stage, minimally used at the execution stage
The project was managed by a project management specialist	Rarely utilized, no certified project manager involved	Applied, but not at all levels
The project team includes specialists trained in project management	No trained specialists in project management	A limited number of specialists, partial training
The project achieved environmental, social, and other sustainable development goals	Limited achievement, insufficient comprehensive approach	Significant achievements, but not all targets achieved
The project created opportunities for people	Significant impact on human potential, particularly in improving digital literacy	Huge improvement in skills and human resources
Note – compiled by the authors		

The project “Training in Basic Digital Skills” under the framework of “Digital Kazakhstan” and direction “Development of infrastructure in the field of education” under the state program for the development of education of the Republic of Kazakhstan for the 2011 – 2020 program represents a crucial initiative aimed at fostering digital literacy across various societal groups (Table 1). This project/program aligns with the broader national objective of integrating digital technologies into education, governance, and public services, thus contributing to sustainable development goals. The analysis reveals that while the project made significant strides in improving digital skills and opening new opportunities for individuals, it faced several limitations in project management practices. Partial implementation of project management methodologies, coupled with the absence of certified project managers and trained specialists, hindered its efficiency. These shortcomings led to fragmented processes and limited scalability of outcomes.

Regarding sustainability, the project’s environmental and social impacts were moderate but lacked a holistic approach to sustainability goals. However, the project contributed to increased human capital and provided opportunities for digital skills that help develop in the modern economy. It is possible to influence the program’s long-term impact by applying project management tools to the benefits received from the project.

The overall development of the healthcare sector was influenced by projects that aimed to expand

access to the most basic services and modernize infrastructure. The achievement of SDG 3 was influenced by the use of energy-efficient systems in hospitals, telemedicine services, and other activities in this direction. However, these projects faced barriers in the form of funding constraints, regulations, and challenges in integrating sustainable technologies into existing health systems.

The State Program for Healthcare Development of the Republic of Kazakhstan “Densaulyk” (2016-2020) is a nationwide initiative involving multiple government agencies and implementing organizations to improve public health through an integrated approach to disease prevention and treatment. It focuses on efficiency, financial sustainability, and supporting socio-economic growth through the modernization of the national healthcare system (website of the Ministry of Health of the Republic of Kazakhstan, n.d.). The program’s main directions include developing public health, integrating health services around population needs, ensuring the quality of medical services, and improving pharmaceutical policy and healthcare infrastructure. The program has partially laid the groundwork for infrastructure and human resource development by analyzing achieved results and successes.

The State Healthcare Development Program for 2011-2015, “Salamatty Kazakhstan”, shares similar characteristics with its successor, “Densaulyk” (2016-2020). “Densaulyk” aimed to address and rectify gaps left by the “Salamatty Kazakhstan” initia-

tive. Ambitious goals mark both programs, although only some of these goals have been fully achieved. Our research attempts to identify these projects'

common features and challenges, providing insights into their implementation and impact on the national healthcare system (Table 2).

Table 2 – Comparative analysis of the use of project management in state health development programs of the Republic of Kazakhstan

Programs and criteria	Healthcare development program for 2011-2015 «Salamatty Kazakhstan»	Healthcare development program of the Republic of Kazakhstan «Densaulyk» for 2016-2020
Level of use of project management methodology at different stages of the project	Not fully utilized, not integrated into management processes	Used at the planning stage, rarely used at the execution stage
The project was managed by a project management specialist	Only in some parts of projects, in some projects, insufficient qualifications	Yes, in most projects
The project team includes specialists trained in project management	Lack of training of specialists in project management	A limited number of trained specialists
The project achieved environmental, social, and other sustainable development goals	There are achievements in a small number of projects	Not all goals have been achieved, but there are significant achievements
The project created opportunities for people	Minimal impact on opening up opportunities for people	Significant impact on improving qualifications and human resources potential
Note – compiled by the authors		

As a result of in-depth interviews and analysis, it was found that during the implementation of the Salamatty Kazakhstan program in 2011-2015, project management was used very poorly and rarely. The main reason is that at that time, project management had not yet been introduced into the activities of government agencies. However, after that, in 2016-2020, during the implementation of the Densaulyk program, there were already the first confident steps in using project management at the planning stage and a little at the implementation stage. However, it is important to note that the practices were applied with gaps and uncoordinatedly. This may have been the reason for the impact on the program's final result and sustainable development goals, emphasizing that a systematic and comprehensive approach to project management is important. It is also necessary to note the onset of the pandemic during the end of the program.

The results of interviews with team members and participants in implementing the Salamatty Kazakhstan and Densaulyk programs show different levels of success. For example, Salamatty Kazakhstan made a partial contribution to the goals of sustainable development due to the focus of its strategy on environmental and social areas. The Densaulyk program, even if it was more focused on sustain-

ability, faced a large number of barriers in terms of environmental issues and the need for a developed infrastructure in healthcare, which caused problems in achieving its goals.

The analysis also showed a significant improvement in the potential, and qualifications of human resources according to the criterion "the project created opportunities for people". On the one hand, even if "Salamatty Kazakhstan" made a smaller contribution to the development of human resources, the "Densaulyk" program, in turn, helped to achieve significant success in this direction. This can be seen through the formed more stable human resources potential, which has increased professional qualifications since the beginning of the program. Even if this criterion is not the most central result of these programs, nevertheless, it shows the strengthening of actions towards the development of human resources in the field of health care in Kazakhstan.

These findings reflect that even though both programs had high sustainability goals, their implementation differed and thus the second program demonstrated more significant results. This shows that there is good potential for the development of the healthcare sector in integrating sustainability considerations into operational and strategic management in this area.

Table 3 – Comparative analysis of the use of project management in construction projects of the Republic of Kazakhstan

Programs and criteria	Project: Construction of fiber-optic communication lines (Kazakhtelecom JSC)	Project: Construction of main lines (Kazakhstan Temir Zholy, 2014–2015)
Level of use of project management methodology at different stages of the project	Medium level of integration, consistent processes applied	Medium level of integration, consistent processes applied
The project was managed by a project management specialist	Certified specialists were involved in the project	Certified specialists were involved in the project
The project team includes specialists trained in project management	The main staff of specialists are trained	A smaller proportion of specialists are trained
The project achieved environmental, social, and other sustainable development goals	There are medium-level achievements, but efforts do not fully correspond to sustainable development	There are medium-level achievements, but efforts do not fully correspond to sustainable development
The project created opportunities for people	Significant impact of economic growth	High impact on regional human resource growth and infrastructure development
Note – compiled by the authors		

Both projects “Construction of fiber-optic communication lines” of JSC “Kazakhtelecom” and “Construction of main lines” of JSC “Kazakhstan Temir Zholy” showed a significant impact on infrastructure and economic development in the telecommunications and railway sectors. According to the key project management criteria, a fairly good level of application and impact on sustainability was shown (Table 3).

In the projects mentioned, the inclusion of trained and certified professionals in the team members has most likely made it possible to contribute to sustainable results through systematic influence. However, there are barriers to the projects due to the incomplete integration of project practices into project management systems. This may be the reason for the moderate impact on the achievement of the project’s goals on social and environmental aspects, which would have been addressed by the use of project management systematically.

In the construction sector of Kazakhstan, according to the data received from respondents, it can be said that it faces problems with financing, and frequently changing management policies, which lead to the rejection of changes and weak application of sustainability standards. These projects, showing success, nevertheless faced barriers such as lack of, or incomplete awareness of sustainable practices, and limited access to clearer recommendations and tools in this area. To solve these problems, it is necessary to fully immerse the management in sustainable project management methods and a clearer and more strategically built policy. This in turn will help to better integrate global practices and will contribute to long-term sustainable development.

The ambitious SDGs, particularly in the healthcare sector, require substantial investments and an integrated approach that considers medical, social, and economic efficiency. Failures to meet these goals can demotivate key stakeholders, including healthcare professionals and managers, further complicating the implementation of sustainability principles. Economic constraints are among the most critical barriers to sustainable healthcare development. Insufficient funding for projects aimed at enhancing infrastructure and improving service quality limits the potential to achieve high sustainability standards. For instance, the costs associated with advanced medical technologies, personnel training, and infrastructure maintenance are often excluded from project budgets, hindering the adoption of innovative and sustainable solutions. Moreover, healthcare projects necessitate a multidimensional approach, addressing environmental, social, and economic aspects simultaneously. This points to the need for systemic project management strategies that can integrate sustainability principles across different stages of the project lifecycle (Molero, A. et al., 2021).

The main challenge in the construction sector is to balance social, economic, and environmental demands. The main barrier is the high cost of energy-efficient materials and renewable energy systems for sustainable technologies and construction practices, which increases the boundaries of established project budgets in social housing projects (Fathalizadeh et al., 2021a). In addition, the barriers can be added to the inconsistent regulatory framework and non-professional management of sustainable practices, which is caused by minimal government

support (Kiani et al., 2021). Other organizational problems, such as limited awareness of sustainable practices, inconsistent collaboration with stakeholders, and different levels of systemic approaches also complicate this process. It is important to note here that the education sector also has barriers such as organizational and financial ones, which affect the quality and speed of training, affecting sustainability challenges. In all these sectors, active government support, refined regulatory standards for sustainable practices, and joint systemic approaches to the development of sustainable practices are required to address the problems with the development of these sectors (Boeve-de Pauw et al., 2015).

To improve the integration of sustainability principles into projects and programs in the health, construction, and education sectors, there is a need to remove organizational, financial, and regulatory barriers, as highlighted by this study. Organizations will be able to make a greater contribution to project sustainability practices in line with the Sustainable Development Goals through long-term impact in these sectors through comprehensive strategies for integrating sustainable project management practices into existing management systems.

Conclusion

The main objective of this study was to assess the extent of application of sustainable project management practices in the healthcare, education, and construction sectors and to analyze the effectiveness of project management in achieving the Sustainable Development Goals. The study identified several key barriers in these sectors in Kazakhstan, which include financial constraints, non-systemic practices, and resistance to change due to the presence of regulatory barriers, which collectively affect the sustainability of projects in these sectors.

In healthcare, external factors such as environmental changes, economic fluctuations, and non-systemic management practices often lead to incomplete achievement of sustainable development goals. Similarly, projects and programs in the education sector face barriers in terms of funding, resource allocation, and non-compliance with sustainable practices that are not integrated into management.

The construction sector has shown more moderate success in this regard but faces similar barriers such as funding limitations, inconsistent practices, insufficient awareness, and incomplete integration of sustainable practices into management.

The main barriers include the lack of or insufficient awareness of the principles of sustainable development, resistance to the introduction of new practices due to frequently changing management policies, and the lack of or shortage of management tools and project management systems. In addition, barriers arise due to the discrepancy between capital and operating budgets, which occurs due to intermittent management coordination in the industry.

The study highlights that effective project management plays a crucial role in aligning project outcomes with the SDGs. While the analyzed projects were successfully completed, enhanced project management practices could have amplified their contributions to social, environmental, and economic objectives. By integrating sustainability-focused strategies throughout the project lifecycle, organizations can ensure a greater and more balanced impact across all SDG dimensions, maximizing the long-term value and resilience of their initiatives.

To address these issues, the study proposes the development of a new evaluation framework for project management, incorporating sustainability criteria and adaptive practices. This framework could serve as a guide for policymakers, practitioners, and stakeholders to achieve higher levels of efficiency and sustainability in project implementation. Furthermore, increased investments in training and capacity-building initiatives, coupled with clearer guidelines and best practices, will ensure a more long-term and sustainable approach to managing sectoral projects in the future.

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