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ЖУРНАЛДЫҢ МЕРЕЙТОЙЛЫҚ ШЫҒАРЫЛЫМЫ ТУРАЛЫ

Құрметті «ҚазҰУ хабаршысы. Экономика сериясы» (Journal of Economic Research & Business Administration) журналының авторлары және оқырмандары!

Редакция алқасы Экономика және бизнес жоғары мектебінің 75 жылдығына орайластырылған журналдың кезекті номерінің шығарылымын ұсынады. Университет қабырғасында факультет мерейтойын атап өту әл-Фараби атындағы ҚазҰУ-дың бұрыннан келе жатқан дәстүрі. Экономика және бизнес жоғары мектебінің мерейтойы бұдан да маңызды оқиға – университетіміздің 90 жылдық мерейтойымен түспа-түс келгенін ерекше атап өткім келеді. Университеттің құрылымдық бөлімшесі ретінде Экономика және бизнес Жоғары мектебі оның ең жақсы дәстүрлері мен жетістіктерін бойына сіңірді. Сонымен бірге экономикалық білім мен ғылымның өзіндік тарихы мен ерекшелігі бар. Бұл экономикалық білімнің кәсіби мамандарының: ғылым докторлары мен кандидаттарының, академиктердің, профессорлардың және доценттердің күшімен құрылған көрнекті түлектері, ғылыми және оқу жетістіктері бар бөлім.

Экономика және бизнес жоғары мектебіміздің үлкен жетістіктерінің бірі – шетелдік және отандық ғалымдардың еңбектерін біріктіретін, сонымен қатар авторлар қатарын жас зерттеушілермен толықтыратын өз журналының болуы. Мерейтой қарсаңында журнал басылымы оқырмандарды экономикалық ғылым мен білім берудегі қазіргі заманның өзекті мәселелері бойынша мақалалармен таныстырады. Олардың ішінде жалпы экономикалық зерттеулердің тақырыптық бағыттарына, сондай-ақ мемлекеттік басқару, қаржылық реттеу, адами капиталды дамыту, логистикалық процестерді оңтайландыру мәселелеріне арналған жұмыстар ұсынылған.

Әр түрлі елдердің мысалында қызмет көрсету саласындағы роботтандыру мәселелеріне, пандемияның экономикалық дамуға әсеріне, аумақтық және салалық зерттеулерге ерекше назар аударылады.

Сонымен қатар, журнал беттерінде Экономика және бизнес жоғары мектебінің мерейтойына орай шетелдік және қазақстандық ғалымдар мен басқа университеттерден серіктестерінің құттықтаулары бар.

Журнал редакциясы атынан басшылықты, барша оқытушылар мен студенттерді Экономика және бизнес жоғары мектебінің мерейтойымен құттықтап, бақ-береке, шығармашылық жеңістер тілейміз! Сонымен бірге авторларға атқарған жұмыстары үшін алғыс білдіреміз және ғылыми-зерттеу жұмыстарына табыс тілейміз.

Ғылыми редактор
– әл-Фараби ат. Қазақ ұлттық университеті
Экономика және бизнес жоғары мектебінің деканы, э.ғ.к., профессор м.а. **Л.А. Бимендиева**

ABOUT THE ANNIVERSARY ISSUE OF THE JOURNAL

Dear authors and readers of the "Journal of Economic Research & Business Administration"!

The editorial board is pleased to present the latest issue of the journal, dedicated to the 75th anniversary of the Higher School of Economics and Business. Celebrating faculty anniversaries within the walls of the university is a long-standing tradition at Al-Farabi Kazakh National University. Notably, the anniversary of the Higher School of Economics and Business coincides with an even more significant event – the 90th anniversary of the university itself.

As a structural division of the university, the Higher School of Economics and Business has absorbed its best traditions and achievements. At the same time, the field of economic education and science has its own history and specifics. This division boasts outstanding graduates, scientific and educational achievements, all made possible through the efforts of professional economic experts: doctors and candidates of sciences, academicians, professors, and associate professors.

One of the accomplishments of the Higher School of Economics and Business is the publication of its own journal, which brings together the works of both foreign and domestic scholars, and includes contributions from young researchers. On the eve of its anniversary, the journal presents readers with articles on contemporary issues in economic science and education. These include works dedicated to thematic directions of economic research in general, as well as problems of public administration, financial regulation, human capital development, and logistics process optimization.

Special attention is given to topics such as the robotization of the service sector in different countries, the economic impact of the pandemic, and territorial and sectoral studies. Additionally, the journal features congratulatory messages in honor of the anniversary of the Higher School of Economics and Business from international and Kazakhstani scholars, as well as partners from other universities.

The editorial board of the journal congratulates the administration, faculty, and students of the Higher School of Economics and Business on its anniversary, wishing them prosperity and creative achievements! We also express our gratitude to the authors for their hard work and wish them success in their research endeavors.

Scientific Editor of the Journal-
Dean of the Higher School of Economics
and Business, Al-Farabi Kazakh National
University, Candidate of Economic Sciences,
Acting Professor **L.A. Bimendiyeva**

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PERCEPTION OF USING SERVICE ROBOTS IN KAZAKHSTAN AND RUSSIA

This paper presents a comparative analysis of the clients' perception on the service robots' usage in Kazakhstan, and Russia. The main idea is to find out the level of people's understanding and acceptance of robotization in these neighbor countries, as these may influence the business development.

The researchers adopted survey method to collect respondents' views on the issue of interest. The research population includes people above 18 years of age in the two countries.

The statistical results differ for the studied countries, with Russia where the respondents are more positive about the robotization, compared to Kazakhstan, where the respondents show lower interest in that development, 62% and 52% respectively (Figure 12). The main question of interest is would the implementation of robots affect negatively the number of visits to robotized businesses, e.g., bank offices, hotels and restaurants, etc. More than 43% of the respondents in Kazakhstan expressed dissatisfaction with the ethical aspect of robots usage (Russia – 18%), and 42% of Kazakhstanis reported that they fear job loss due to automation, in comparison with 23% of Russian respondents.

This research contributes to the understanding of how the customers in the two studied countries consider the expected changes in the business and what may be their response to those changes. The limited number of respondents does not allow generalization of the results and conclusions, much bigger samples may be helpful to generalize. However, the findings are very informative and helpful in the decision-making process, as robotization requires financial investments and the attitude of the clientele about the quality of service they get is directly linked to the change of demand and business financial results. Based on these findings the hotel managers will be better prepared to decide if, when and how to introduce robots in the hotel business.

Key words: Robotization, Artificial intelligence (AI), consumers' attitude, services.

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Қазақстан мен Ресейде қызмет көрсету саласында роботтарды пайдалануға көзқарас

Бұл мақалада Қазақстан мен Ресейде қызмет көрсету саласында роботтарды пайдалану туралы тұтынушылардың қабылдауының салыстырмалы талдауы ұсынылған. Негізгі идея – осы көрші елдердегі адамдардың бизнестің дамуына әсер етуі мүмкін роботтандыруды түсіну және қабылдау деңгейін анықтау.

Зерттеушілер респонденттердің пікірлерін жинау үшін сауалнама әдісін қолданды. Зерттеуге екі елдегі 18 жастан асқан адамдар қатысты.

Статистикалық нәтижелер зерттелетін елдер үшін әр түрлі: Ресейде респонденттер роботтандыруға Қазақстанмен салыстырғанда оң көзқараспен қарайды, респонденттер бұл дамуға аз қызығушылық танытады, сәйкесінше 62% және 52% көрсетті (Сурет 12). Негізгі зерттеу сұрағы – роботтарды енгізу роботтық кәсіпорындарға, мысалы, банк кеңселеріне, қонақүйлер мен мейрамханаларға және т. б. адамдардың қызмет алуға келуіне теріс әсер ете ме? Қазақстандағы респонденттердің 43%-дан астамы роботтарды пайдаланудың этикалық аспектісіне наразылығын білдірді (Ресей-18%), ал қазақстандықтардың 42%-ы ресейлік респонденттердің 23% салыстырғанда автоматтандыру салдарынан жұмысынан айырылып қалудан қорқатынын хабарлаған.

Бұл зерттеу екі елдегі тұтынушылардың күтілетін бизнес өзгерістерін қалай қабылдайтынын және олардың осы өзгерістерге реакциясы қандай болуы мүмкін екенін түсінуге ықпал етеді. Респонденттердің шектеулі саны нәтижелер мен қорытындыларды жалпылауға мүмкіндік бермейді, жалпылау үшін әлдеқайда үлкен үлгілер пайдалы болуы мүмкін. Дегенмен, нәтижелер роботтарды тұтынушыларға қызмет көрсетуде қолдану туралы шешім қабылдау процесінде

қажет етеді және клиенттердің олар ұсынатын қызметтердің сапасына қатынасы сұраныстың өзгеруімен және бизнестің қаржылық нәтижелерімен тікелей байланысты. Осы шешімдерге сүйене отырып, қонақ үй басшылары қонақүйде роботтарды қашан және қалай қолдану керектігін талдай алады.

Түйін сөздер: Роботтандыру, жасанды интеллект, тұтынушылардың көзқарасы, қызметтер.

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Отношение к использованию роботов в области услуг в Казахстане и России

В данной статье представлен сравнительный анализ восприятия клиентами об использовании роботов в области услуг в Казахстане и России. Основная идея состоит в том, чтобы выяснить уровень понимания и принятия роботизации людьми в этих соседних странах, поскольку это может повлиять на развитие бизнеса.

Исследователи использовали метод опроса для сбора мнений респондентов. В исследование были включены люди старше 18 лет в двух странах.

Статистические результаты различаются для исследуемых стран: в России респонденты более позитивно относятся к роботизации, по сравнению с Казахстаном, где респонденты проявляют меньший интерес к этому развитию, 62% и 52% соответственно (Рисунок 12). Основной исследовательский вопрос заключается в том, повлияет ли внедрение роботов негативно на количество посещений роботизированных предприятий, например, банковских офисов, гостиниц и ресторанов и т.д. Более 43% респондентов в Казахстане выразили недовольство этическим аспектом использования роботов (Россия – 18%), а 42% казахстанцев сообщили, что опасаются потери работы из-за автоматизации, по сравнению с 23% российских респондентов.

Это исследование способствует пониманию того, как клиенты в двух исследуемых странах относятся к ожидаемым изменениям в бизнесе и какой может быть их реакция на эти изменения. Ограниченное число респондентов не позволяет обобщать результаты и выводы, для обобщения могут быть полезны гораздо большие выборки. Однако полученные результаты дают важную информацию, которую следует учитывать в процессе принятия решений по применению роботов в облуживании клиентов, поскольку роботизация требует финансовых вложений, а отношение клиентов к качеству предоставляемых ими услуг напрямую связано с изменением спроса и финансовыми результатами бизнеса. На основе этих решений руководители отелей могут анализировать надо ли, когда и как применить роботы в банке или отеле.

Ключевые слова: Роботизация, искусственный интеллект (ИИ), отношение потребителей, услуги.

Introduction

The clients' perception about using service robots in the service businesses, including finance and hospitality (e.g., banks, hotels, restaurants, tour-operators, etc.) is of huge importance, because their business results depend to a very high extent on the clients' judgment of the quality received. The clients will use, and will continue to use, the services of the particular entity only if they find the quality of services satisfactory vs the price paid. In the same time, there is a strong orientation of the business managers and owners to introduce service robots, both for face-to-face and back-office operations. This research adds understanding on the clients' perception and readiness to accept being served by robots and robotized systems in Kazakhstan and Russia.

The statistical results differ for the studied countries, with Russia where the respondents are more positive about the robotization, compared to Kazakhstan, where the respondents show lower interest in that development, 62% and 52% respectively (Figure 12). The main question of interest is would the implementation of robots negatively affect the number of visits to robotized businesses, e.g., bank offices, hotels and restaurants, etc. More than 43% of the respondents in Kazakhstan expressed dissatisfaction with the ethical aspect of robots' usage (Russia – 18%), and 42% of Kazakhstanis reported that they fear job loss due to automation, in comparison with 23% of Russian respondents.

The practical significance of this study is to identify the attitude of existing and potential customers of organizations in the service sector and

the hotel sector to go to service using robots, which will correctly determine the development strategies of these companies.

The implementation of robots and artificial intelligence (AI) in the services in all industries is not a new idea and it has been studied by many researchers (e.g., Bondareva, 2016; Ivanov, Webster & Berezina, 2017; Gasumova & Porter, 2019; Ermakova & Kovyazin, 2020; Choi, Choi & Kim, 2020; Bianki et al., 2021; So, Kim, Liu, Fang & Wirtz, 2023; Mariani et al., 2023; Rasul et al., 2024 and other). There are very interesting recent publications about the application of robots in the hotel business, which are addressing the consumer response in case of service by robots. For example, Soliman et al. (2024) are studying the drivers of the consumer behavior towards service robots, and Moriuchi et al. (2024) analyze factors affecting human-robot interactions, as well as Wang et al.(2023), which covers consumer resilience to service robots at the front desk. Most of the researchers were studying the usage of robots as an idea per se, the effects of such changes on the business based on the consumers' attitude, has not been considered much, although Lu, Cai & Gursoy (2019) and other scholars underline the importance of this aspect. At the same time, one of the major ideas of the World Economic Forum is to substitute up to 75% of the employees in the hospitality industry with robots. According to Christine Lagard 85 million jobs will be substituted by robots by 2025 (European Central Bank, 2020). If these WEF's and ECB's signals materialize, and 85 million jobs are lost by 2025, we will face a combination of two negative effects. First, a significant percentage of the current customers will not have enough willingness and ability to purchase products, and pay for services as usually, because of their reduced available financial resources. Second, the customers' perception about the quality of services they may expect to get in the specific businesses may not be universally positive (e.g., Borghi, Mariani, Vega & Wirtz, 2023; So, Kim, Liu, Fang & Wirtz, 2023) and this may be another reason to reduce their visits there. At the same time the vast majority of the managers perceive the robots as a substitute of the labour force with better workers, who work 24/7, do not get vacations, do not need health service, etc. and as a result lead to increased operational effectiveness, efficiency and profits.

Of course, we must take into consideration that the development and application of human-like robots of both types: humanoid (looking like people) and android (looking like moving and speaking machines) robots, may stimulate positively the customers' perception, but at least in the beginning it may have a negative effect as well. This study is looking into answering on comparative basis the question from the three angles: will the business efficiency improve, will the quality of services improve, and will the customers' perception be positive, at least in some specific operations, such as hotel check-in and check-out procedures (e.g., Ivanov, Webster & Berezina, 2017).

In addition, we consider the characteristics of the national culture in Russia and Kazakhstan as a possible explanation of the differences between the statistical results from the survey in the two countries.

Therefore, the objectives of this study are to analyze on comparative basis for the two countries – Kazakhstan, and Russia, the following:

1. The consumers' perception about the quality of services after possible robotization.

2. The changes of the business efficiency as perceived by the managers.

3. The changes of the customers' attitude towards using different businesses served by robots.

Literature review

In our research we use definition of robots and robotized systems of The International Federation of Robotics (IFR), which coincides with The International Organization for Standardization definition of **"**service robot**"** as a **"**robot in personal use or professional use that performs useful tasks for humans or equipment**"**. This definition is convenient for the survey, as it corresponds to the level of understanding of this issue by our respondents, which is generally basic.

Dozens of excellent research papers on the usage of service robots in different businesses have been published in the last 10 years, e.g. Ivanov & Webster (2017, 2018), Bondareva (2016), Van Doom et al. (2017), Huang & Rust (2018), Buhalis & Sinarta (2019), Ivanov, Webster & Berezina (2020), So et al., (2022) to mention just a few. By industry, there are many research papers, including for example electronics (Jörlinget et al., 2019), and automotive industry (Fernandes and Oliveira, 2021), where industrial types of robots are applied, as well as healthcare services (Ermakova & Kovyazin, 2020) and social sphere (Gasumova & Porter, 2019). Kim et al., (2023) studied hotels, and Mende et al., (2019) – the food and beverage industry. Moreover, some researchers focus on higher institutions and educational sphere (Sousa & Rocha, 2019; Machado et al., 2023). The spectrum

of publications includes from descriptive analysis of the active implementation of artificial intelligence (AI) and robots used for repetitive, tiring and causing stress operations (e.g., Huang & Rust, 2018; Fuentes, Moraleda et al.,2020) who studied from the simple cases of luggage and room services provided by robots in hotels, to analyzing the robots, artificial intelligence and service automation (RAISA) as becoming «increasingly influential on service quality and service experience» (e.g. Kuo et al., 2017).

Lu et al. (2020) and other scholars raised the issue of the necessity to research and analyze the effect of robots' application on the service quality and customers' satisfaction, which relates to the customers' perception of what RAISA adds as quality of service and additional value to the clients. Schepers et al. (2022) underline that the use of robots can add satisfaction in all possible applications, from low-cost services where mechanical robots are usually used, to full-service providers. The intensity of robotization can be illustrated with the numbers of robots installed and used in China (Figure 1) and the operational stock in the world in 2011-2021 (International Federation of Robotics, 2022).

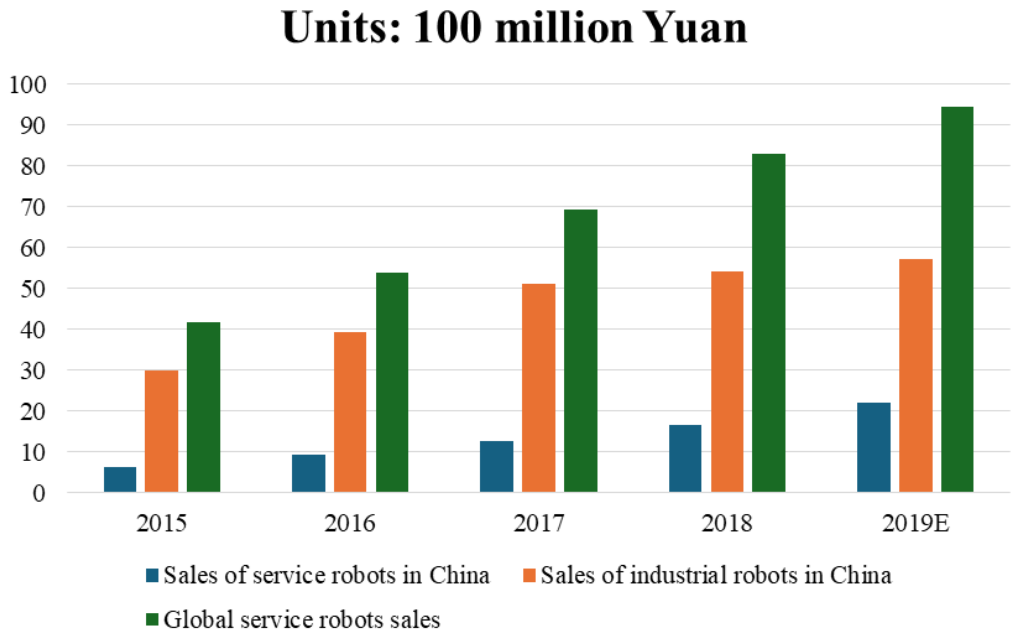

Figure 1 – Global and China service and industrial robots sales
Note – Compiled by the author based on the source: International Federation of Robotics, 2022

It is clear, that when the quality of service is discussed, we have to differentiate between the machine-type robots, which perform the specific operations but do not look like humans, and the so-called anthropomorphic (humanoid) service robots, which are designed to look like human beings, and as Wirtz et al. (2018) and other scholars suggest, they can, and they do interact meaningfully with the customers during the performed operations. Mende et al. (2019), and other suggest that the anthropomorphism is a desired, even preferred characteristic of the service robots, as it makes the interaction of the customers easier compared to interacting with a set of speaking boxes. For example, Sheehan et al. (2020) found that anthropomorphism enhances brand and product fondness. However, other scholars disagree, stating that the too-much-human-like robot can inspire negative feelings of the clients, if they consider it as "a threat to their human identity" (Mende et al., 2019, p. 539). It is clear that with the development of anthropomorphic (humanoid) robots and their massive application in industry and at home, more people will get used to them and will probably prefer humanoid designs.

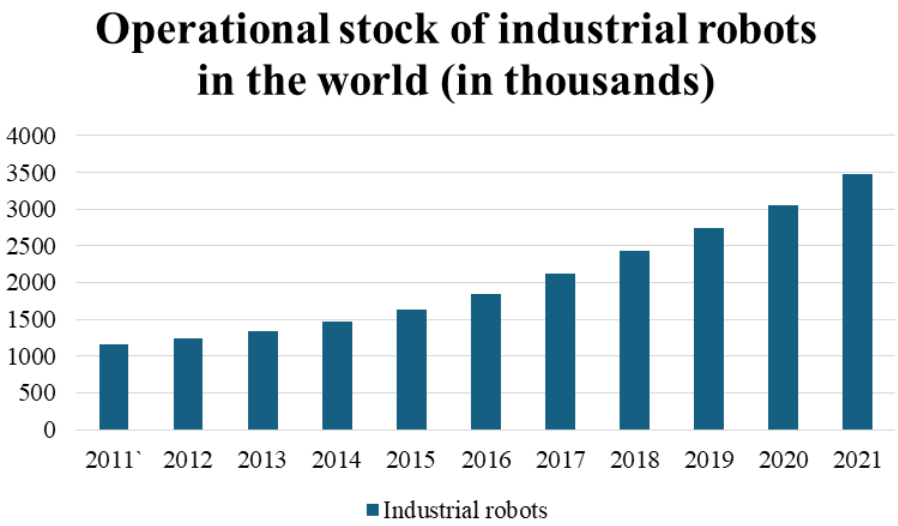

Figure 2 – Operational stock of industrial robots in the world for 2011-2021
Note – Compiled by the author based on the source: World Robotics, 2022

However, according to the uncanny valley theory (Mori, 1970, as per So et al., 2023) there might be a turning point (U-shaped relationship) between the customer and the human-like robot (e.g., Murphy et al., 2017; Crolic et al., 2021). So et al. (2023), for example, analyse the influence of robot anthropomorphism on consumers' trust, receptivity, and the effect on satisfaction. Huang & Rust (2021) believe that when the service robots have to higher extent human-like appearance, this is liked by the clients and there is rarely any discomfort in the process of being served by them. In this study we concentrate on the comparative analysis of the findings of the survey in Russia and Kazakhstan, and we do not analyze the uncanny valley effect as our respondents have limited personal experience with service robots.

Modern development of technology has a huge impact on the activities of almost all economic entities in the modern world. Of course, there are some countries where robotization processes and the use of AI technologies are being implemented more intensively than others, for example, Japan, China, Korea. However, in our countries, many enterprises operating in various industries are beginning to actively introduce them into the practice of their activities.

There are many research papers on robotization in the two studied countries (e.g., Bondareva, 2016; Tikhomirov et al, 2018; Melnichenko & Borodach, 2019; Gasumova & Porter, 2019; Ermakova & Kovyazin, 2020; Starovatova, 2023), which study the process of transferring from managing people to managing robotized systems. One of them analyzes the consumer perception towards robots, based on the findings of a study in hotels and restaurants in Russia (Ivanov, Webster & Garenko, 2018). The authors found out (Table 2, p. 28) that the preferences towards human employees vs robots in a hotel is rather high (Mean 4.18 of 5), although being served by a robot will be an interesting experience (Mean 4.04). The authors analyze the results including the gender and general attitude towards new technologies of respondents' effect. It is interesting that the main areas of implementing service robots in the hotel are luggage carrying (Mean 4.32), taking customer orders for new towel, etc. (Mean 4,22), processing card payment (Mean 4.12), processing cash payments (Mean 4.02), providing information for the hotel facilities (Mean 4.06) and providing information about the destination (Mean 3.98).

Methodology

Our analysis is based on survey, which was used to collect data from the recipients in the two studied countries – Russia and Kazakhstan. We applied survey, a non-probability convenience sampling method. The research population included people above the age of 18 living in Semei, Astana and Pavlodar in Kazakhstan, and St. Petersburg and Barnaul in Russia. The sampling frame included

hotel employees and managers, as well as alumni of our universities, and their colleagues and friends who are active customers of hotel services.

The two samples included 132 respondents in Russia, and 126 In Kazakhstan. In terms of gender distribution, Russia demonstrates a significant skew towards males, comprising 87% of the sample population, whereas females represent only 13%. In contrast, Kazakhstan exhibits a more balanced gender distribution, with 57% males and 43% females (Figure 3).

Regarding age composition, Russia's population is predominantly concentrated within the 18-25 age bracket, constituting 47% of respondents. Meanwhile, 26-40-year-olds and 41-65-year-olds each represent 26.5% of the population. Similarly, in Kazakhstan, the largest age group is within the 18-25 range, comprising 38% of respondents, followed by 41-65-year-olds at 37%, and 41-65-year-olds at 23%. Those aged 65 and above constitute a marginal 2% of the surveyed (Figure 4).

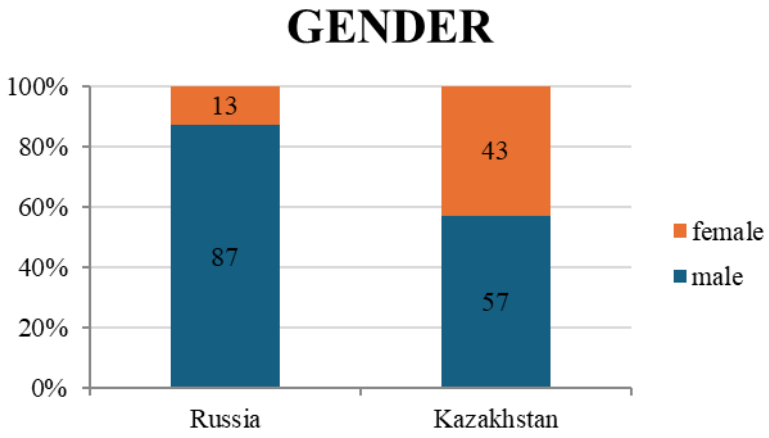

Figure 3 – Gender distribution of respondents
Note – Compiled by the author based on the survey data

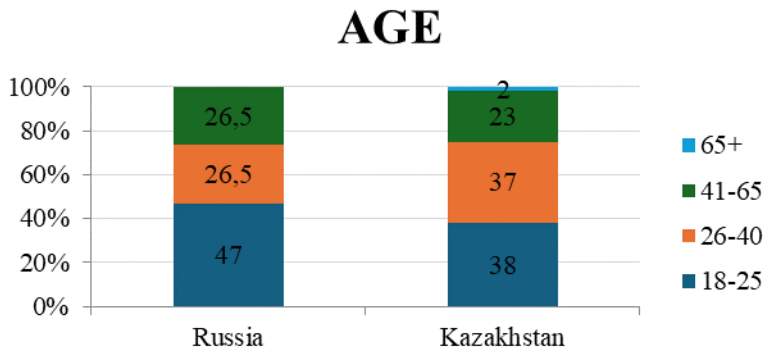

Figure 4 – Age composition of respondents
Note – Compiled by the author based on the survey data

Determining the age structure of the respondents is vital for the purposes of our study, as it will allow us to identify specific features in relation to robotization attitude, being the factor influencing individuals' perspectives, experiences, and adaptability, thereby providing insight into how different age groups perceive and interact with robotic technologies.

Education levels vary notably between the respondents of two countries, with Russia exhibiting a higher proportion of individuals with advanced

degrees. Specifically, 60% of respondents in Russia hold postgraduate qualifications, whereas in Kazakhstan, this figure is comparatively lower at 46%. Additionally, 27% of Russian respondents possess a PhD, compared to 12% in Kazakhstan. Conversely, a higher percentage of individuals in Kazakhstan hold college degrees (36%) compared to Russia (8%) (Figure 5).

Geographically, a substantial majority of respondents from Russia reside in urban areas, with 55% located in the capital city, followed by 32% in large cities, and 13% in smaller cities. In contrast, the distribution of respondents in Kazakhstan indicates a lower urban concentration, with only 8% residing in the capital, 35% in large cities, and 57% in smaller cities (Figure 6).

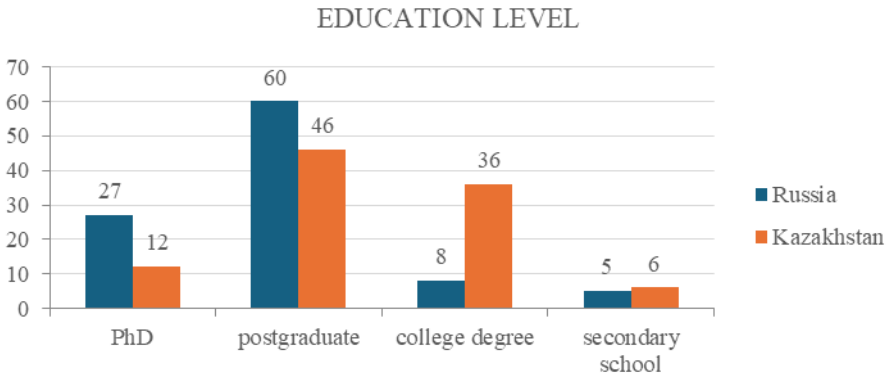

Figure 5 – Education levels of respondents
Note – Compiled by the author based on the survey data

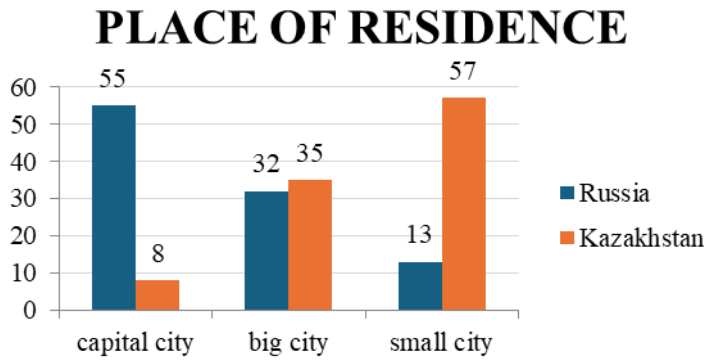

Figure 6 – Place of residence of respondents
Note – Compiled by the author based on the survey data

When considering employment positions, Russia displays a higher percentage of individuals occupying mid-level and top-management roles compared to Kazakhstan. Specifically, 60% of respondents in Russia hold regular employee positions, while 24% and 16% are in mid-level and top-management roles, respectively. In Kazakhstan, 48% are regular employees, with 28% and 24% in mid-level and top-management positions, respectively (Figure 7).

In terms of occupational sectors, education emerges as a predominant field in both countries, with 45% of respondents in Russia and 46% in Kazakhstan working within this sector. Additionally, IT is quite prominent in both countries, accounting for 8% and 7% of respondents in Kazakhstan and Russia respectively. However, there are notable differences in other sectors. For instance, in Russia, the business sector comprises 10% of respondents, while in Kazakhstan, tourism occupies a more significant share at 12%. Conversely, the restaurant business, media, hotel industry, and construction sectors exhibit varying degrees of prevalence across the two countries.

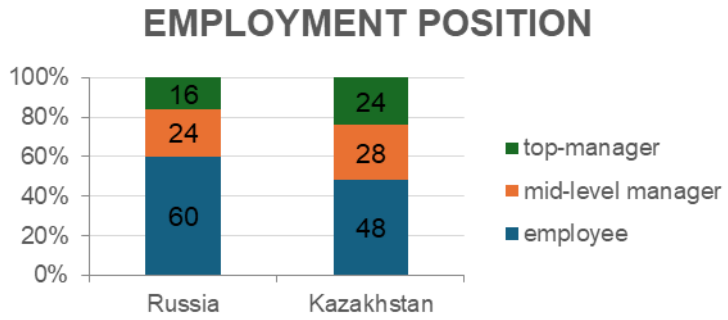

Figure 7 – An employment position of respondents
Note – Compiled by the author based on the survey data

Results and discussion

Given the relevance and high significance of these processes, the purpose of our research is to study the influence of technologies based on the use of artificial intelligence on the formation of the business environment of domestic companies, as well as to identify factors that promote or hinder the introduction of these technologies into business practices.

The project working group conducted a primary study based on a sociological survey of respondents from various companies and organizations in Kazakhstan (Semey, Pavlodar, Astana), as well as Russia (St. Petersburg, Barnaul). The research is conducted using a questionnaire based on Google form.

It was revealed that 42% of respondents from various companies from Kazakhstan are already actively using these technologies. In Russia, only 28% of respondents have experience of using it. The reasons why AI technologies and robots have not yet been put into practice include the high cost of development and implementation, as well as maintenance (31% Kazakhstan and 42% Russia) (Figure 8).

At the same time, 47% of respondents in Russia plan to introduce these technologies into the activities of their companies, while in Kazakhstan this figure is only 38% (Figure 9).

Figure 8 – AI technologies and robots used in the company
Note – Compiled by the author based on the survey data

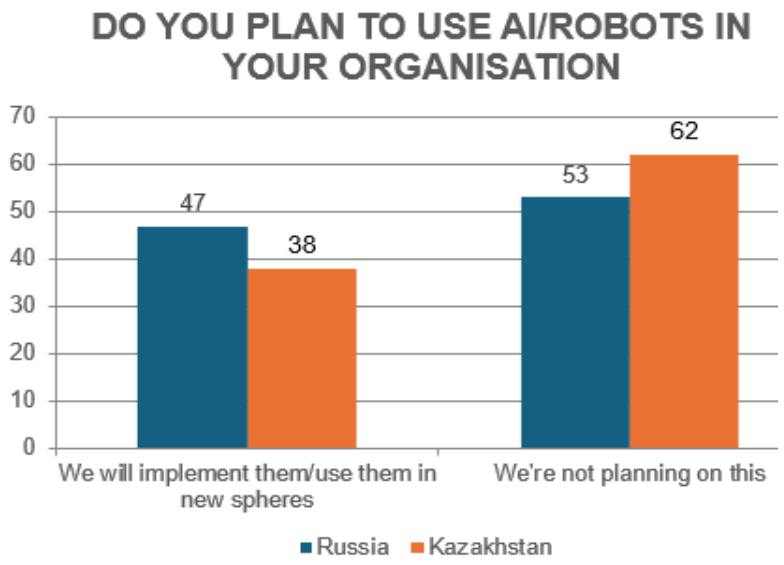

Figure 9 – Plans to implement AI/ robots
Note – Compiled by the author based on the survey data

It is important to identify the attitude of people, as real or potential customers of various service enterprises, to the format of service using robots. Although this form is already being actively implemented in many countries, such as China, Japan, and Korea, these technologies are being introduced very cautiously into the practice of domestic companies.

The findings of the survey show (Figure 10) that about 30% of Kazakhstani respondents have significantly higher perception about being served by human operators compared to Russia, while the majority of Russian respondents presume the combined application as a good idea.

Russian respondents noted that they are ready to be served by both robots and people in such areas as trade (67%), hotel business (55%), preparing food and drinks (57%), financial consulting (41%), educational online platforms (52%). Altogether, these results show that the Russian respondents are more positive about the implementation and use of AI and robots in services in almost all areas: trade, finance and banking, hotels, public catering establishments (restaurants, cafes, bars), gyms, medical services, education, and tourism.

In such areas as medical care, the fitness industry, and child care, the majority of respondents in both Russia and Kazakhstan prefer service only by people, not trusting artificial intelligence (this is 70%, 54% and 78% of Russian respondents and 58%, 55 % and 68% of Kazakhstani respondents, respectively).

The majority of respondents in Kazakhstan noted that the use of AI and robots will improve the quality of customer service (72% of respondents, vs 40% in Russia). This can be seen as indication that the quality of services in Kazakhstan is not considered satisfactory compared to respondents' judgment in Russia (Figure 11).

The respondents give similar results for the expected improvement of the efficiency of business processes (66% of respondents in Kazakhstan vs 67% in Russia), and for the expected reduction of company costs (69% of respondents in Kazakhstan vs 67% in Russia) (Figure 11).

About 35% of respondents in Russia and 18% of respondents in Kazakhstan believe that the use of robotics will not in any way affect the quality of customer service in their companies, nor will it lead to an increase in efficiency: 20% in Russia and 23% in Kazakhstan (Figure 11).

Figure 10 – Respondents perception about servicing
Note – Compiled by the author based on the survey data

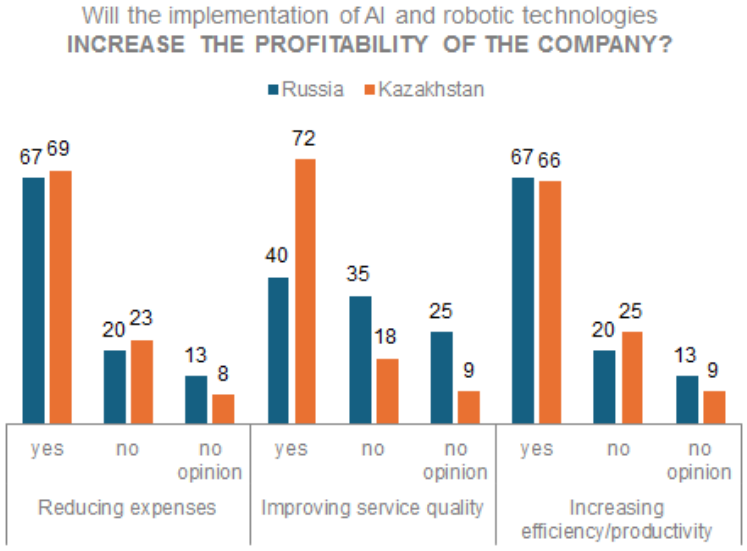

Figure 11 – The impact of AI and robotics technologies on the final results of the company's activities
Note – Compiled by the author based on the survey data

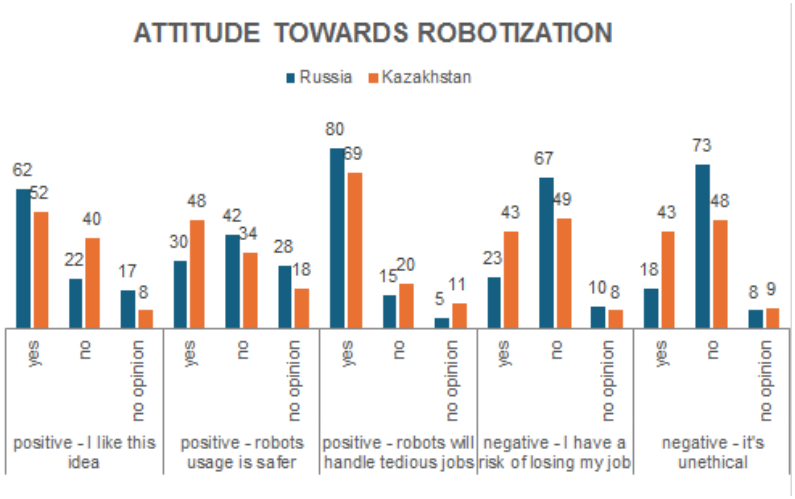

Figure 12 – The clients' attitude towards AI and robotics technologies usage
Note – Compiled by the author based on the survey data

At the same time, some respondents express concerns about the risk of losing their jobs as a result of the active implementation of these technologies in their company's practice (43% in Kazakhstan and 23% in Russia). In general, 43% of respondents in Kazakhstan and 18% in Russia also have a negative attitude towards the use of robotics in the public service sector. A fairly important issue, from the point of view of researchers, is the issue of the ethics of replacing people with robots and robotic programs. As the survey results show, 18% of respondents in Russia and 43% in Kazakhstan consider unethical in the practice of domestic companies if this leads to substitution of employees with robots (Figure 12).

Conclusion

The research findings allow us to formulate the following conclusions:

1. Robotization and AI technologies are already an objectively existing reality that penetrates all spheres of human life, so people need to acquire basic knowledge and be ready to use these technologies both in private life and in the workplace (e.g., Bondareva, 2016; Tikhomirov et al, 2018; Gasumova & Porter, 2019; Ermakova & Kovyazin, 2020; Starovatova, 2023). About 42% of the respondents in Kazakhstan report usage of AI and robots in their companies (Figure 8) compared to 28% in Russia. Obviously, such a difference has influenced the responses, as the Kazakhstani respondents have a better knowledge of the pros and cons of use of robots versus the respondents in Russia.

2. In the same time, the responses of people who have direct knowledge from their companies, as well as from being served as clients, might be effected by their expectation if the AI and robots implementation may lead to their substitution, and loss of jobs (43% in Kazakhstan and 23% in Russia) (Figure 12).

3. Although neighbor countries, there are some significant differences between the obtained statistics for Kazakhstan and Russia based on the survey results. For example, there is a significant difference between the respondents' judgement about the quality of services. About 72% of the respondents in Kazakhstan expect improvement of quality of the services after implementing AI and robots, while only 40% of the Russian respondents agree with that (Figure 11).

4. In the same time, this research (Figure 11) shows identical percentage of respondents in the two countries agree that the efficiency of business processes (66% of respondents in Kazakhstan vs 67% in Russia), and the expected reduction of company costs (69% of respondents in Kazakhstan vs 67% in Russia).

5. The age of the surveyed respondents affects their attitude towards the use of AI and robotization technologies: young and middle-aged respondents have a more positive attitude towards the use of these technologies in services.

In general, the introduction of these technologies will significantly increase the efficiency of companies operating in various sectors of the economy by reducing labor costs, intensifying work processes, increasing the level and quality of service

to the population (service enterprises), as well as the quality of products (for industrial enterprises). Additional research on the topic, including cross-cultural analysis of the influencing factors in the two countries will add important information to help making relevant decisions in the AI and robots implementation.

According to the authors of the study, the main trends in the development of new technologies based on artificial intelligence will be the following in the next 20-25 years:

- there will be certain shifts in the use of labor – this is a transition from the concept of reducing the labor cost to the organization of production without the use of human labor (production without people). As a result, technological unemployment is projected to be about 50% by the middle of the 21st century (Bondareva, 2016);

- artificial intelligence-based systems will be gradually introduced into public administration systems to manage social infrastructure facilities and law enforcement systems;

- robots will create new standards of efficiency in every business sector;

- making profits for new companies using these technologies will no longer be associated with the creation of real industries (for example, AliBaba, Facebook, Uber, etc.);

- markets for the production of robots in "home conditions", the so-called illegal markets, which will pose a certain threat, the appearance of "malicious robots", will develop rapidly;

- there will be significant changes in state of technological security, including military, social, technological and economic security, the ability to defend one's country in hybrid contactless wars;

- the requirements for the competitiveness of countries in the new hybrid environment will increase.

Human civilization will move to a new level of development, with a hybrid habitat forming, and people will become part of this new hybrid world in which robots and AI will be presented in all spheres of life, precisely AI learning to educate themselves, making independent decisions in respond to environmental changes. And there are both positive and negative effects of this change. Since in the framework of this study we do not set the task of investigating various kinds of consequences, as a result of the robotics development for society, we focus on the impact of robotics on the business sector only. Business is interested in the active implementation of these technologies, as they can significantly reduce costs and increase efficiency.

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FINANCIAL SUSTAINABILITY OF THE BANKS: AN EXPERTS' ASSESSMENT

The rise of sustainable finance, which involves financial tools operating within the framework of environmental, social, and governance principles adopted by companies and financial institutions, is gaining traction in major global markets. According to the Global Alliance for Sustainable Investments, these approaches already account for 35.9% of total invested assets. This trend is driven by a new global reality where long-term development cannot take place without addressing deepening environmental and social contradictions. The article aims to assess the priority of ESG of the banks as sustainable finance factors for the development of the recommendations, as the assessment of the ESG principles in the banks of the country allows for the identification of further courses of sustainable finance development. Furthermore, the investigation of leading countries' experiences in environmentally and socially responsible investment and its role in the banking system reveals both common and specific features that could be effectively implemented in Kazakhstan. The research methodology entails experts' assessment from the middle management level of the banks of ESG impact of 9 factors by AHP method. The AHP method allows investors to systematically compare and prioritize used ESG factors, that relates to their significance as the indicators for assessment the state and prospects for the ESG principles implementation in the bank's activity in Kazakhstan. The obtained results allow to suggest that priority instruments for ESG promotion in the country are a legislative framework and the state program. The study illustrates that the integration of ESG factors into the strategy of sustainable development of banks contributes to the growth of their assets by increasing demand for sustainable products and attracting new customers. The findings have practical implications for banks related to sustainable finance and ESG criteria-based investing.

Key words: Sustainable finance, ESG, decarbonization, banks, experts' assessment.
JEL Classification G21 G28.

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Банктердің қаржылық тұрақтылығы: сарапшылардың бағалауы

Әлемдік қаржы нарықтарында компаниялар мен қаржы институттары қабылдаған экологиялық, әлеуметтік және корпоративтік жауапкершілік қағидаттары аясында қаржы құралдарын пайдалануды көздейтін тұрақты қаржыландыру тұжырымдамасының танымалдығы артып келеді. Тұрақты инвестициялардың жаһандық Альянсының мәліметтері бойынша, мұндай тәсілдер инвестиция құйылған активтердің жалпы көлемінің 35,9% – қамтып отыр. Бұл үрдіс экологиялық және әлеуметтік қайшылықтарды шешпей ұзақ мерзімді дамуға бет алудың мүмкін еместігін түсіндіреді. Мақаланың мақсаты тұрақты қаржыландыру факторы ретінде банктердегі ESG принциптерінің басымдылығын бағалау. Сондай-ақ, тағы бір мақсат, еліміздің банктеріндегі ESG қағидаттарын бағалап, тұрақты қаржыны дамытудың одан әрі бағыттарын анықтауға мүмкіндік беретін тұшымды ұсынымдарды әзірлеу. Сонымен қатар, жетекші елдердің экологиялық және әлеуметтік жауапты инвестициялау саласындағы тәжірибесін және оның банк жүйесіндегі рөлін зерттейді және Қазақстан тәжірибесіне енгізуге болатын жалпы және ерекше белгілерін анықтайды. Зерттеу әдістемесі AHP (МИА) әдісі арқылы банк менеджментінің орта буын сарапшыларының 9 ESG факторының әсерін бағалалауға негізделген. Бұл әдіс инвесторларға Қазақстандағы банктердің қызметіне ESG қағидаттарын енгізгеннен кейін, оның жай-күйі мен перспективаларын бағалаудың индикаторы ретінде жүйелі түрде салыстырып отыруға және басымдық беруге мүмкіндік береді. Зерттеу нәтижесінде анықталғандай, ESG факторларын банктердің тұрақты даму стратегиясына енгізу тұрақты өнімге сұранысты арттырып және жаңа

ту арқылы олардың активтерінің өсуіне ықпал етеді. Алынған нәтижелер ESG шарттарына негізделген тұрақты қаржыландыру және инвестициялау аясында банктер үшін тәжірибелік мәні зор.
Түйін сөздер: тұрақты қаржыландыру, ESG, декаробандау, банктер, сарапшылар бағалауы.

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Финансовая устойчивость банков: оценка экспертов

Развитие устойчивого финансирования, которое включает в себя финансовые инструменты, действующие в рамках экологических, социальных и управленческих принципов, принятых компаниями и финансовыми институтами, набирает обороты на основных мировых рынках. По данным Глобального альянса устойчивых инвестиций, на данные подходы приходится 35,9% от общего объема инвестированных активов. Данная тенденция обусловлена новой глобальной реальностью, в которой долгосрочное развитие не может осуществляться без решения углубляющихся экологических и социальных противоречий. Данная статья направлена на оценку приоритетности ESG принципов банков как фактора устойчивого финансирования с целью разработки рекомендаций, поскольку оценуа принципов ESG в банках страны позволяет определить дальнейшие курсы развития устойчивых финансов. Более того, исследование опыта ведущих стран в области экологически и социально ответственного инвестирования и его роли в банковской системе выявляет как общие, так и специфические черты, которые могут быть эффективно реализованы в Казахстане. Методология исследования предполагает оценку экспертами среднего звена менеджмента банков влияния ESG 9 факторов методом AHP (МИА). Данный метод позволяет инвесторам систематически сравнивать и расставлять приоритеты по использованным ESG-факторам, связанных со значимостью в качестве индикаторов для оценки состояния и перспектив внедрения принципов ESG в деятельность банков в Казахстане. Исследование иллюстрирует, что интеграция ESG-факторов в стратегию устойчивого развития банков способствует росту их активов за счет увеличения спроса на устойчивые продукты и привлечения новых клиентов. Полученные результаты позволяют предположить, что приоритетными инструментами продвижения ESG в стране являются законодательная база и государственная программа. Результаты имеют практическое значение для банков, связанных с устойчивым финансированием и инвестированием на основе критериев ESG.
Ключевые слова: устойчивое финансирование, ESG, декарбонизация, банки, экспертная оценка.

Introduction

The biological crisis, which led to the stagnation and decline of the world economies, both developing and developed countries, caused quite serious damage to humanity. The current situation on the world stage was deepened by the political crisis, and persistent climate-related catastrophes, which led the world economies into imminent economic and social crises. During these challenges, ESG has come under increased scrutiny from regulators globally. There is a growing demand for stricter disclosure of climate goals in environmental funds, and more attention on ESG investments. This intensified focus on ESG has both positive and negative implications for companies operating in the international investment landscape. ESG investments are being influenced by significant trends based on the risks of climate change and the zero emissions. Increasing attention is being paid to issues related to ecosystem decline, social inequality, regulatory changes and the ongoing debate on the establishment of ESG criteria, which cover various aspects such as environmental sustainability, social accountability and corporate governance (MSCI ESG Research, 2024). These considerations encompass various aspects linked to climate change as carbon credit funds, emission insurance coverage, comprehensive exploration into achieving zero-emission targets, decarbonization strategies pertaining to industrial real estate.

Financial institutions must now use the stress tests related to climate change, and there are regulations concerning market access that are unrelated to deforestation. Investors have taken a proactive approach by reporting key indicators of adverse impacts ahead of potential mandatory requirements. ESG experts vigilantly observe supply chain challenges by examining potential for lab-created products, implementing blockchain technology to trace items, and recovering precious materials from electronic waste to transform the landscape of contentious raw material origins. The TCFD (Task

Force on Climate-related Financial Disclosure) identified reporting on climate targets as the most important area requiring improvement (Carney, 2017). Even though there are efforts for buildup uniform reporting standards across jurisdictions, differences still exist leading to inconsistencies in regulatory requirements for climate change targets resulting in data gaps which make it challenging to assess and compare corporate promises (Drago C. et al., 2024). An increasing number of authorities worldwide require financial institutions to conduct stress tests related to climate risks with several insights emerging from, the Bank of England, the European Central Bank and the Bank of Canada have used stress tests for assessment potential impact

Accurately modeling climate risks at the industry level and understanding the distribution of income and risks by sector or country, and emission intensity, continues to pose a significant challenge. Many banks evaluated by the ECB do not have enough predictive and detailed information about climate risks in their risk management processes Closing the gaps in data, specifically those related to category 3 emissions and the strategies of clients and contractors for adapting to climate change, is crucial for attaining a thorough comprehension of vulnerability to climate-related risks.

Challenges in developing and validating climate risk models arise from uncertainties surrounding the timing of climate-related risks and the limited availability of historical data. New regulations mandate banks to measure their balance sheets' exposure to climate change risks – regardless of zero-balance targets – highlighting deficiencies in data related to climate change which should be addressed through stress tests.

For gaining the objective of the article the structure consists from the Literature review section for investigating the main trends in the ESG studies and sustainable finance development in the different countries; the Methodology section for the implemented methods illustration; the Results and Discussion section for the obtained results discussion; and the Conclusion section for recommendations development for second-tier-banks in Kazakhstan integrated ESG principles as the element of the global sustainable system.

Literature review

Investors need comparable, consistent, and meaningful information to make decisions.

Kazakhstan, like other countries around the world, has been deeply impacted by global financial crises. These crises have manifested in various forms such as fluctuations and recessions across different sectors. A biological crisis ensued triggering an economic downturn which resulted in Kazakhstan's financial system experiencing its first recession in twenty years (Shirazi et al., 2021)

The financial system in the country primarily comprises the banking, with a smaller proportion represented by the insurance market and stock market. The number of banks within the sector has decreased significantly since its inception as an independent financial system, currently standing at 22. According to the National Bank of Kazakhstan, the second-tier-banks hold a total volume of assets amounting to 37,18 trillion tenge (nationalbank.kz).

Over the past decades, the banking industry has undoubtedly become a crucial component of the economy, serving as the foundation of the nation's financial framework., which makes a great contribution to economic growth and stability.

The country's financial institutions have successfully bounced back from a series of disruptions that have affected the economy since the onset of the worldwide economic downturn in 2008. They now exhibit strength and adaptability in coping with current challenges, such as the impact of COVID-19 and military operations in Ukraine.

Banks in Kazakhstan have achieved increased success in implementing fintech and digitalization, positioning the banking system as a leading sector of the country's economy when it comes to advancements in information technologies and innovations.

Nevertheless, despite the successful development, some indicators suggest that the banking sector still does not play a proper role in the economy – relative indicators such as the share of assets, loans, and deposits to GDP, allowing for international comparison, are still much lower than in developed and even in many developing countries.

The financial system and banking sector actual situation, the Global trend and necessity for turning the attention and development course for the sustainable and stable specter specifies further going on.

Banks, as middlemen, mainly employ the capital from their clients to conduct financial activities. It is essential for banks to carefully evaluate the cost-benefit outcome in order to safeguard their customers' funds. The efficient utilization of these resources by banks is a critical measure of their long-term sustainability. Although it is crucial for banks to integrate ESG measures, there is

insufficient research on whether they yield increased profits through the adoption of such programs and offsetting related expenses. Consequently, the impact of introducing and disclosing ESG initiatives on bank cost effectiveness remains uncertain (Chang Helen et al., 2021). The shift towards sustainable development necessitates prioritizing environmental factors for investment decision-making.

The issue stems from the fact that when enacting such investment choices, the anticipations of those involved in the procedure align with business principles, wherein profitability is sought after from green investment portfolios and at least breaking even from environmentally friendly business initiatives. However, this objective may not always be achievable. For resolving the issue, the United Nations Environment Program presented a concept of a "golden balance," which assumes that financial intermediaries strive to maximize profits in their daily activities and considering long-term environmental sustainability goals (Khudyakova, L.S. 2018).

Clients and investors are increasingly interested in investing in companies that follow high standards of ethics and social responsibility, as these information and tools for assessment ESG criteria, allow to make informed investment decisions (Volodina A.S et al., 2023).

Banks are facing increasing pressure to address ESG issues due to regulatory requirements, investor scrutiny, and consumer preferences for sustainability. Technological breakthroughs are crucial to facilitate ESG integration and drive growth. Companies that combine ESG innovation with technology are demonstrating rapid growth and attracting investment (Yadav R.A. et al., 2023).

As there are problems affecting daily living in today's world, as poor air quality, new regulations for online businesses, and others, Investors are becoming more inclined to hold their companies' boards accountable for addressing climate change, which involves scrutinizing data on climate risk management and strategies to minimize emissions in specific markets.

The ESG principles are one of the fast-developing area across the world, the state of the countries, companies and financial institutions turn their focus on the factors of the sustainable finance. Thus, there are jurisdictions that create and advance their legislative and regulation requirements and elaborate conditions for ESG principles implementation by companies and financial institutions.

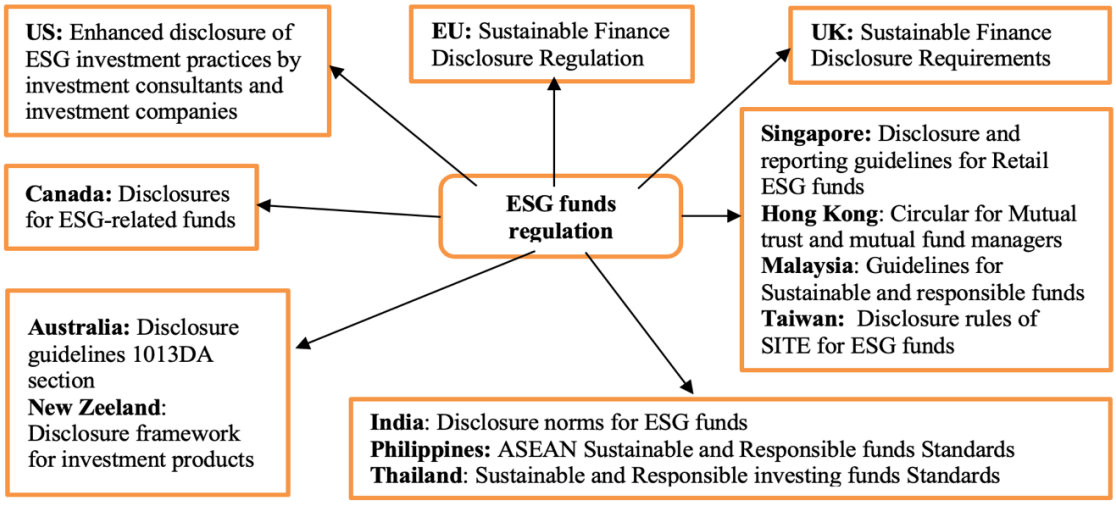

Figure 1 – ESG fund regulation in countries
Note – Compiled by the authors (Kuanova et al., 2023)

There is a noticeable trend towards increased regulation in ESG-focused funds. Regulatory authorities globally are showing greater concern about fund names and their responsibilities to reveal details about their categorization. The European Union's Sustainable Finance Disclosure Regulation has led the way by requiring more open reporting for ESG funds, prompting other prominent market regulators to adopt similar measures.

The countries such as Australia, and Singapore, Hong Kong have proposed recommendations for ESG reporting standardization in investment

decision-making. The in the European Union and Canada have done an extra step for classification of the sustainable funds based on their ESG integration levels, which corresponds with varying disclosure requirements. The United States has also initiated similar efforts – a significant development given its status as the world's largest fund market handling over 60% of global fund investments.

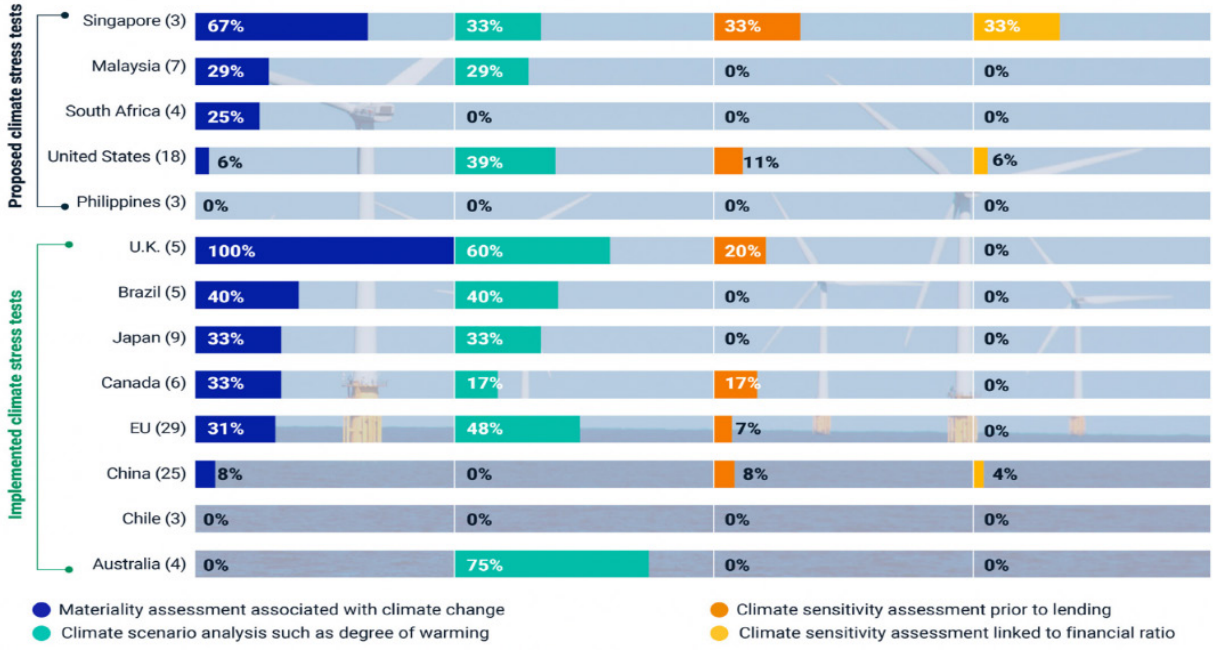

Figure 2 – Performance of the banks on climate risk indicators disclosure
Note – Compiled by the authors (MSCI ESG Research, 2024)

Business lending is in decline, which was noted by the Head of State in his Address to the People of Kazakhstan in September 2023 (Kassym-Jomart Tokayev, 2023).

The reasons for the extremely low level of corporate lending and its constantly decreasing share in the loan portfolio of banks are related to the fundamental problems of our economy.

There are the main points of the banking sector development:

- The assets and debt grow at a lower rate than the economics of the country;
- The industry still has excess liquidity that is accumulating and being used, but it have not been effectively directed to credit business;
- The main problem of the sector is still one of the insufficient lending of the business;
- The state dominates the mortgage lending market;
- Consumer loans continue to grow steadily and exceed business lending;
- Companies' funds are flowing into more profitable instruments;
- Deposits of the population are growing sluggishly;
- The dollarization of deposits has reached a historic low level for past 16 years;
- The banking sector's profits grow due to high interest margins and commission income is unstable and cyclical;
- Capital adequacy levels remain consistently high;
- The banking sector looks stable today against the background of the risks of secondary sanctions.

Kazakhstan's banking sector is represented by 21 second-tier banks, including 11 banks with foreign participation, and 8 subsidiary banks. The total assets of the banking sector was 15,109 billion tenge in 2013, and this figure had increased to KZT 49,172 billion in 2023, there was a significant increase for approximately 3,25 times in assets of the banking sector over this time.

Annual changes the assets of banks over the past 10 years (the period from 01.12.2013 – 01.12.2023) are graphically shown in figure 3.

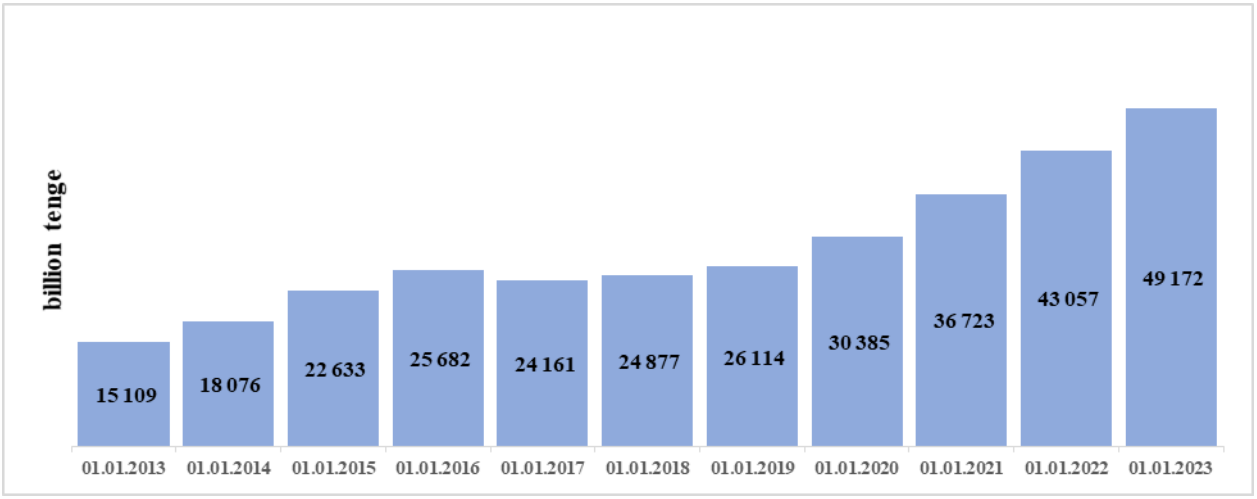

Figure 3 – The STB assets of the Republic of Kazakhstan for 2013-2023
Note – Compiled by the authors (Finreg, 2024)

Based on the data from the National Bank's summary reports of the, the authors analyzed the second-tier banks' assets increase rates for the period from 01.12.2013 to 01.12.2023 (figure 4.), with the decline in 2017 at -5.92%.

The second-tier banks' total assets average increase rate in Kazakhstan for the period from 2013 to 2023 is 12,9%, which is positive, indicating an increase in the sector.

With the growing awareness of environmental issues, social responsibility and effective management of the corporate sector, the demand for banking products and services that take these factors into account is increasing. Banks offering such products can attract more customers and increase their assets.

The banking sector role in driving economic development has witnessed a decline for the recent years. This is evident from indicators such as asset-to-GDP ratio (38,4%) and bank loans-to-GDP ratio (20%), both comparatively low figures when compared to developed countries where this indicator often exceeds 100%. The problem loans accounted for approximately 20% of total loans extended by Kazakh banks. In these circumstances, there is a need to be involved in the international processes of the financial system and to meet the requirements of development as well as sustainability.

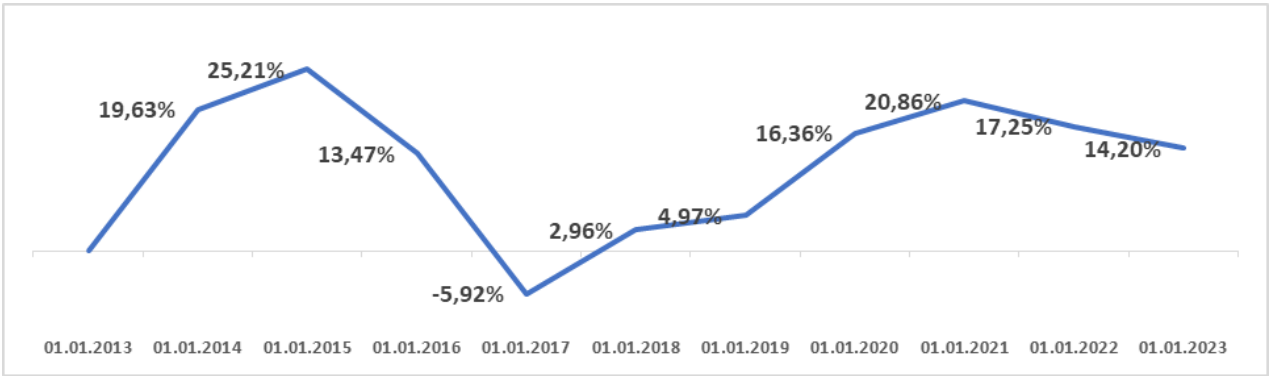

Figure 4 – The STB assets dynamic of the Republic of Kazakhstan for 2013-2023
Note – Compiled by the authors (Finreg, 2024)

Table 1 – The average growth rate of the total assets of the STB of the Republic of Kazakhstan for 2013-2023

Date, years	Total assets, billion tenge	The increase rate of assets, %	Average growth rate, %
01.12.2013	15 109	-	12,90
01.12.2014	18 076	19,63	
01.12.2015	22 633	25,21	
01.12.2016	25 681	13,47	
01.12.2017	24 161	-5,92	
01.12.2018	24 877	2,96	
01.12.2019	26 114	4,97	
01.12.2020	30 385	16,36	
01.12.2021	36 723	20,86	
01.12.2022	43 057	17,25	
01.12.2023	49 172	14,20	
Note – compiled by the author based on the source (Finreg, 2024)			

The previous research indicates a lack of in-depth investigation into the analysis of ESG experiences within international and local organizations. Recent studies have mainly focused on limited aspects of ESG principles and their relation to financial sustainability. Despite this, very few studies have investigated the ESG principles integration in the banks' activity.

Methodology

For assessing ESG effects on financial institutions sustainability the authors have choose the AHP method, this method is reorganized as suitable for valuation unmeasurable criteria, such as social, environmental and governance effects on the local level for the country. The Analytical Hierarchy Process is a widely utilized method in academic research and various industries for multi-criteria decision-making. Developed by researcher Saaty in the 1970s, this approach offers a straightforward and effective problem-solving tool that does not necessitate expensive or complex software. With its hierarchical model, AHP allows decision-makers to analyze their professional experience, knowledge, and judgments using numerical data. In addition to facilitating decisions with multiple competing goals, it also serves as an evaluation tool for different network providers based on various Quality of Service criteria (Saaty, 1980) (Wu et al., 2017) (Kuanova, 2022).

The AHP involves breaking down the issue at hand by examining its factors and their relationships. The selected elements are then grouped into hierarchical levels, forming a structured framework. Each element is compared to one another at each level, resulting in a judgment matrix being established. By calculating the maximum eigenvalue of the matrix and obtaining the corresponding orthogonal feature vector, the weights of these elements are determined. AHP proves to be a versatile and robust tool for assessment as it allows for evaluating results based on pairwise relative criteria and options. The relative significance of two criteria is assessed using a numerical scale ranging from 1 to 9. A score of 1 indicates the highest level of importance, while a score of 9 signifies that the first criterion is significantly more important than the second criterion.

To determine the values of the factors (A1, A2, ..., An) obtained from the mathematical matrix, each factor is assigned a corresponding positive number. The goal is to find the value for each factor Ak where k = 1, 2, ..., n.

Mathematical matrix AHP:

$$A = (a_{ij})(a_{1i} \cdots a_{ni} \vdots \ddots \vdots a_{1n} \cdots a_{nn}) \quad (1)$$

where

a_{ij} *and* a_{ji} – A matrix's elements;

i – matrix row;

j – matrix column.

The following task involves gathering the evaluations of the experts regarding the weightage of each criterion. The expert evaluates each criterion individually using a special scale called Relative Importance Scale, which assigns a specific assessment value to each criterion. These values

range from 1 to 9, with intermediate values such as 3, 5, and 7 in between.

The weights obtained are derived from the principal eigenvector of the decision matrix utilizing AHP methodology. The significance of eigenvalues becomes evident in various dynamic phenomena such as unstable oscillations and vibrations. Eigenvalues of a matrix determine the frequency of oscillations, while eigenvectors provide insight into their shape. Analyzing eigenvalues can be applied to evaluate ESG impacts on financial sustainability within banks.

$$(A)_{nxm} X_n =$$

$$= (a_{11}\, x_1 \cdots a_{1n} x_n \vdots \ddots \vdots a_{m1} \cdots a_{mn} x_n) \quad (2)$$

where

X = (x1, ..., xn) – selected indicator vector;

n – selected ESG factors

The factors of the AHP matrix for the financial institutions ESG activity there have been used factors based on the inputs and outputs indicators for the Environmental, Social and Governance areas of the financial institutions. The following table illustrates factors and criteria for the AHP matrix (Gai et al., 2023):

Table 2 – Factors for AHP of the banks' ESG activity

Environmental	Social	Governance
E – screening	Employee turnover	Disclosure of conflicts of interest
Financing of low-carbon and green projects	Gender wage gap	Transparency
Climate risk assessment	Employee satisfaction	Corruption and taken measures
Note – Authors' own		

Using the AHP method, we can weight and rank these factors and indicators based on their importance to financial institutions. This enables us to prioritize the development and implementation of ESG principles and make well-informed decisions.

E-screening plays a vital role for financial institutions in making decisions about financing projects. This process involves assessing the environmental impact of projects and ensuring compliance with sustainable development principles. By conducting e-screening, financial institutions can identify potential risks associated with negative environmental impacts, preventing possible financial losses, and reducing reputational risks. Actively conducting e-screening enhances the reputation of financial institutions among clients, investors, and society, influencing consumer choices and fostering long-term partnerships. Integrating environmental aspects into their strategies through e-screening contributes to sustainable development and adherence to modern business standards.

Financing low-carbon and green projects presents new business development opportunities for financial institutions such as loans for renewable energy, energy-efficient technologies, sustainable agriculture, and other environmentally sustainable sectors. Supporting projects aimed at reducing carbon emissions and mitigating environmental impacts contributes to global efforts against climate change.

Climate risk assessment is increasingly important due to its potential effects on various aspects of financial institution activities; it has become a key element in strategic risk management. Anticipating threats related to climate events like floods or droughts enables the development of mitigation measures while also identifying innovative opportunities for creating products or services that address climate challenges.

Constant staff turnover can reduce the operational efficiency of financial institutions. Frequent staff changes result in additional costs for training new employees and may lead to the loss of valuable experience and knowledge. Clients and investors may perceive high staff turnover as a sign of instability, affecting trustworthiness. Team resilience is crucial for achieving long-term goals, as a team with constant turnover faces difficulties in innovating and introducing new ideas. A sustainable team contributes to more efficient work processes and innovation.

The elimination of the gender wage gap demonstrates social responsibility on behalf of the financial institution while supporting equality. Nowadays, clients and investors are increasingly concerned about social justice issues, including gender equality in remuneration and career opportunities. Addressing the wage gap promotes talent utilization leading to improved business processes. Gender equality fosters employee satisfaction, motivation, and creates a positive work environment essential for increased productivity.

Employee satisfaction plays a pivotal role in maintaining organizational health and achieving long-term objectives. Higher employee satisfaction

also correlates within creased productivity, enriched customer service, and diminished staff turnover. Salary levels, bonus programs, career prospects transparency, and professional development opportunities significantly impact employees' contentment. Attention to determinants influencing employee satisfaction has become tantamount to effective HR management strategy. Disclosing information regarding conflicts of interest is essential for financial institutions as it aligns with their transparency and ethical behavior strategy. Revealing such conflicts help mitigate situations that may jeopardize clients' interests. Ethical standards mandate that these institutes serve client best interests diligently while avoiding conflicts of interest making disclosure perquisites. Institutions which display transparent policies regarding conflicts of interest build stronger, long-lasting relationships with their clients and partners. These practices also boost reputation and reduced ethical violation ship risks.

Transparency in the operations of financial institutions builds trust with customers. Clear insight into how the institution functions and manages finances helps to cultivate strong relationships. This transparency also ensures compliance with relevant laws and regulations, mitigating legal issues and fines. Understanding financial transactions and investment strategies enables more effective risk management. Transparent reporting allows for better identification and assessment of potential risks. Investors and partners typically prefer working with institutions that provide accurate information about their activities, making transparency a key factor in deciding on collaboration opportunities. Additionally, it can drive innovation in product development by aligning offerings with customer needs and expectations.

In today's landscape, clients are increasingly factoring in an anti-corruption stance when selecting a financial partner. Institutions actively combatting corruption stand to attract more clients and investors as they reduce associated financial risks such as asset loss or expenses related to corrupt practices' aftermaths while upholding corporate governance principles–contributing positively towards sustainable societal development aligned with Corporate Social Responsibility principles.

The selection of the considered 9 factors relates to their significance as the indicators for assessment the state and prospects for the ESG principles implementation in the bank's activity in Kazakhstan. To address the primary inquiry, it is essential to simulate the environmental, social, and governance elements of considered nine banks in Kazakhstan, and will be discussed in the next section.

Results and discussion

As has been explained the methodology of AHP for the effects, that are complicated measure in physical units and considering that ESG criteria implementation is essential for the country's financial system and financial sustainability of the organizations, the authors have analyzed experts' assessment. The method of AHP has been used to evaluate the ESG criteria effects in Kazakhstan on the level of second-tier-banks. There have been used 9 selected experts' (management of the banks) in finance from 9 different banks for receiving the index weight of ESG impact of 9 factors: for Environment – 3 factors, Social – 3 factors, and Governance – 3 factors. According to the obtained experts' assessment there has been developed the matrixes of the scales of priorities by 9 selected factors of ESG (table 3).

Table 3 – Resulting priorities of ESG principles, 9 factors

	Factor	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Ra nk	Prio rity%	Ra nk
		Expert 1		Expert 2		Expert 3		Expert 4		Expert 5		Expert 6		Expert 7		Expert 8		Expert 9*	
1	E – screening	30,6	1	33,7	1	28,3	1	14,7	1	15,2	2	14,8	3	28,1	1	27,2	1	-	-
2	Environmental risk information disclosure	20,0	2	17,7	3	18,7	3	13,6	2	23,8	1	22,5	1	21,7	2	26,0	2	-	-
3	Climate risk assessment	15,5	3	17,9	2	20,7	2	12,8	3	8,6	6	11,0	5	18,9	3	12,9	3	-	-
4	Employee turnover	5,8	7	7,8	5	7,9	5	12,0	4	14,3	3	11,3	4	17,1	4	9,2	5	-	-
5	Gender wage gap	9,2	4	8,1	4	8,8	4	10,8	5	10,4	5	15,6	2	5,5	5	9,5	4	-	-

Table continuation

	Factor	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Rank	Prior-ity%	Ra nk	Prio rity%	Ra nk
		Expert 1		Expert 2		Expert 3		Expert 4		Expert 5		Expert 6		Expert 7		Expert 8		Expert 9*	
6	Employee satisfaction	6,2	6	6,1	6	5,0	6	9,9	6	13,6	4	10,0	7	3,0	6	5,6	6	-	-
7	Disclosure of conflicts of interest	7,1	5	3,8	7	4,8	7	9,4	7	8,1	7	10,0	6	2,6	7	3,6	8	-	-
8	Transparency	4,1	8	2,8	8	3,7	8	8,8	8	4,2	8	2,8	8	1,8	8	3,6	7	-	-
9	Corruption and actions take	1,4	9	2,0	9	2,1	9	8,0	9	1,8	9	1,8	9	1,4	9	2,4	9	-	-
Note-Calculated using the AHP Priority Calculator																			

Expert 9* – Expert number 9 was excluded by the author due to the improbability of estimates of the ESG factors

Table 3 shows the obtained values of expert assessments on the priority of ESG principles, 9 factors calculated using the AHP calculator. Having built the matrix according to the estimates, 9 experts calculated the eigenvector and the priority scale of 9 factors, ESG principles.

Table 4 – Scale of priorities results for experts' assessment Matrixes

	Factor	Priority	Rank
1	E – screening	22,69%	1
2	Disclosure of Environmental risk information	20,53%	2
3	Climate risk assessment	15,16%	3
4	Employee turnover	10,86%	4
5	Gender wage gap	10,02%	5
6	Employee satisfaction	7,55%	6
7	Disclosure of conflicts of interest	6,49%	7
8	Transparency	4,06%	8
9	Corruption and actions take	2,63%	9
Note – Compiled by the authors			

As we can see from Table 4, the first priority was given to the Electronic Screening factor with a value of 22,69%, the second priority was the Financing of low–carbon and green projects (20,53%), the third was the Climate Risk Assessment factor (15,16%), the fourth priority was Staff turnover (10,86%), the fifth was the Gender Wage gap factor salary (10,02%), the sixth priority of the factor is Employee satisfaction (7,55%), the seventh is Disclosure of information about conflicts of interest (6,49%), the eighth is Transparency (4,06%) and the ninth priority is Corruption and actions taken (2,63%).

The investigated ESG factors development in selected countries of the world could be the case for the further promotion in the field. Thus, the ESG principles implementation Road map for Kazakhstani financial sector has been launched in March 2023. There are step by step plans for the common 3 years. There are 5 main objectives of the financial market regulation of the ESG principles integration:

- the ESG risks exposure information Disclosure by financial institutions;
- the ESG risk management and the carbon footprint of the loan portfolio assessment;
- Implementation of ESG principles in the risk management system and corporate governance;
- the ESG risks monitoring and integration into the supervision system (Finreg, 2023)

Kazakhstan has set a national goal of achieving carbon neutrality in its economy by 2060. The strategy outlines comprehensive decarbonization

measures across various sectors and emphasizes the need to update production processes. An estimated investment amount of 10 billion US dollars is required by 2030, with the remaining 600 billion US dollars expected to be invested by 2060. Approximately 610 billion US dollars will be allocated towards low-carbon technologies as part of efforts to attain carbon neutrality. The strategy addresses key areas such as energy, industry, transportation, agriculture, and buildings to work towards a Net Zero future.

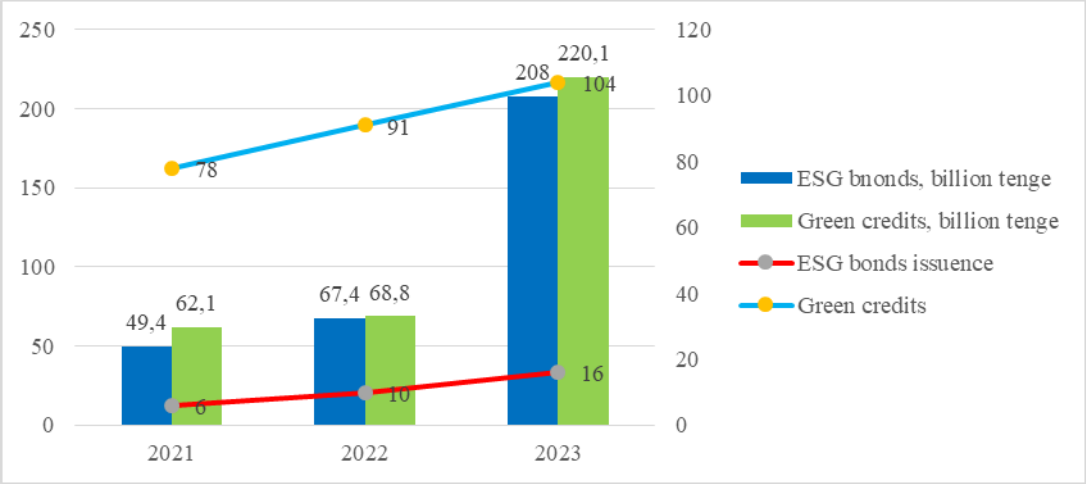

Figure 5 – ESG bonds and Green credits in Kazakhstan, 2021-2023
Note – Compiled by the authors, source: www.stat.gov.kz

The Agency for Regulation and Development of the Financial Market of Kazakhstan has approved a plan to gradually integrate ESG principles into the country's financial sector, starting in early 2023. This roadmap outlines phased strategies over the next three years. JSC "Development Bank of Kazakhstan" issued the first "green" bonds on the Kazakhstan Stock Exchange valued at 10 billion tenge in 2023,. The European Bank for Reconstruction and Development allocated up to 150 million US dollars in financing to financial institutions involved in the GEFF Kazakhstan II project, which is designated for lending to small and medium-sized enterprises and individuals aiming to develop green technologies, mitigate climate change risks, promote circular businesses, and foster gender equality.

Integrating ESG factors into risk analysis allows banks to better understand potential threats related to environmental, social, and managerial aspects while taking appropriate measures to reduce them. This enables banks to minimize losses and preserve their assets. Banks that actively engage in sustainable activities by integrating ESG factors into their strategy can attract more investors who prefer companies with high standards of management and social responsibility ultimately leading towards an increase in investment volume as well as an increase in bank assets.

ESG factors are driver of development of new products aimed at addressing environmental issues, promoting social justice, and improving governance. These innovative products may attract new customers thereby increasing a bank's assets. The adoption of sustainable practices can effectively reduce costs related to solving environmental problems, increase energy efficiency and optimize management– ultimately resulting in increased income and asset growth. Regulators are increasingly requiring banks to demonstrate compliance with ESG standards. Banks that successfully meet these requirements gain advantage over competitors leading to an increase in assets.

Conclusion

ESG factors contribute to the growth of banks' assets through increasing demand for sustainable products, reducing risks, attracting investments, stimulating innovation, improving efficiency and compliance with regulatory requirements.

The introduction of ESG factors into the strategy of banking sustainable development (STB) can contribute to an increase in the growth of banks'

assets. Banks need to develop products and services that consider ESG factors. These can be sustainable investments, green loans, socially responsible funds, etc. Supporting clients in their desire to invest in accordance with the principles of sustainable development will help to attract more funds and expand the bank's assets.

The expert's assessment demonstrates that the first priority is Environmental, the second priority is the Social, and the last is the Governmental as sustainable finance development factors. The obtained results allow to suggest that priority instruments for the ESG promotion in the country is legislative framework and the state program. The Decarbonization strategy with the Road map implementation started the process of environmentally sustainable development of the financial institutions, while other two factors under the recommendation characteristics from the regulator on the rudimentary period of implementation.

It is also necessary to implement an ESG risk management strategy. Develop systems and tools for assessing and managing risks associated with ESG factors. This includes the analysis of environmental, social, and managerial risks in making credit decisions, investments, and other operations. Minimizing such risks will help to preserve and increase the bank's assets.

Generally, financial institutions are encouraged to strengthen reporting on ESG factors by providing information on their sustainable development efforts, including specific indicators, achievements, and plans. Transparency about their ESG initiatives will help strengthen the trust of customers, investors, and the public, which in turn will lead to growth and efficiency of their activities.

The search for new opportunities in the field of green finance, energy conservation, sustainable construction, etc., as well as work on the development and implementation of effective sustainable development strategies, cooperation with various stakeholders will help identify new opportunities for growth and strengthen the position of financial institutions in the market.

The introduction of ESG factors into the sustainable development strategies of financial institutions not only contributes to the growth of their assets, but also improves their reputation, reduces risks, and creates long-term business value.

From the perspective of developing country potential for advancing sustainable finance in Kazakhstan, distributed stock market tools will play a crucial role in facilitating the effective allocation of environmentally friendly investments. This will enhance transparency in channeling these resources into the actual economy sector.

Given the unique raw material characteristics of national economy, along with the decline in air quality in major cities, growing water scarcity, and other environmental challenges, it is essential to develop a roadmap for sustainable finance that prioritizes key sectors and industries.

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CREATIVE ECONOMY AS A KEY TO SOLVING ECONOMIC ISSUES OF MODERN SOCIETY

The relevance of the development of creative industries, the promotion of the Kazakh creative economy is increasingly gaining its popularity, which is a young, fast-growing economic sector. That is, they are goods and services created through the process of creativity and economic value of society. The creative economy operates on the basis of freedom of expression, interest and motivation of people.

However, despite the presence of significant creative and intellectual potential, the process of recognizing human abilities as a full-fledged component of socio-economic formation faces a number of issues, for the solution of which it is necessary to develop new scientific and ideological approaches that correspond not only to modern realities, but also capable of developing in the future.

The article covers theoretical issues of the creative economy, examines its basic concepts and global content. The cultural prerequisites for the formation of a creative economy are shown, the issues of its measurement are explored, and the creativity index of regions such as Astana, Almaty and Shymkent is determined.

The place of Kazakhstan in the global markets of creative industries is shown, the potential of the cultural heritage sector, creative industries and the market of creative services in Kazakhstan is considered. Mechanisms for supporting creative industries are outlined.

The purpose of the study of the creative economy is to create an attractive investment climate, modernize the sphere of education, science, tourism and other economic issues of modern society.

As a result of the study of the issues of the creative economy, conclusions and proposals were made for the further successful development of the new economy, where creativity becomes the most important factor in the formation of a modern way of life and the prosperity of the economy.

Key words: creative economy, innovative services, investment climate, start-up industries, creative product.

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Креативті экономика қазіргі заманның экономикалық мәселелерін шешудің кілті ретінде

Креативті индустрияны дамытудың өзектілігі ол жас және қарқынды дамып келе жатқан экономикалық сектор болып табылатын өзінің танымалдылығы артып келе жатқан қазақтың жасампаз экономикасын ілгерілетумен түсіндіріледі. Яғни, бұл шығармашылық процесінде жасалған және экономикалық мәні бар тауарлар мен қызметтер. Креативті экономика адамдардың пікір білдіру, қызығушылық және мотивация бостандығы негізінде жұмыс істейді.

Алайда, елеулі шығармашылық және интеллектуалдық әлеуеттің болуына қарамастан, адамның қабілеттерін қоғамдық-экономикалық формацияның толыққанды құрамдас бөлігі ретінде тану процесі бірқатар мәселелермен бетпе-бет келіп отыр, оларды шешу үшін жаңа ғылыми және идеологиялық көзқарастарды әзірлеу қажет, қазіргі заманғы шындыққа сәйкес қана емес, сонымен қатар болашақта дами алатын.

Мақалада креативті экономиканың теориялық мәселелері қамтылып, оның негізгі ұғымдары мен жаһандық мазмұны қарастырылады. Креативті экономиканы қалыптастырудың мәдени алғышарттары көрсетіліп, оны өлшеу мәселелері зерттеліп, Астана, Алматы, Шымкент сияқты қалалардың креативті көрсеткіштері анықталды. Креативті индустрияның әлемдік нарықтарындағы Қазақстанның орны көрсетіліп, Қазақстанның мәдени мұра секторының, креативті индустрияның және қызмет көрсету нарығының әлеуеті қарастырылды. Қазақстандағы креативті экономиканың өсуінің перспективалық нүктелері көрсетілген. Ірі қалалардың ғана

қатар шағын қалалар мен ауылдық елді мекендердің, сондай-ақ ғылым, білім, мәдениет, туризм, бизнес және халықтың креативті бірегейлігін дамыту нұсқалары ұсынылды. Креативті салаларды қолдау тетіктері көрсетілген.

Креативті экономиканы зерттеудің мақсаты ол тартымды инвестициялық климат құру, әлеуметтік дамудың өсуіне ықпал ету, білім, ғылым, туризм саласын жаңғырту және қазіргі қоғамның басқа да экономикалық мәселелерін шешу жолдарын қарастыру болып табылыды.

Экономиканың бұл түрінің негізі тарихи әдіс, жүйелеу әдісі, құжаттарды талдау әдісі, шетелдік тәжірибені талдау, синтездеу әдісі, ақпаратты логикалық жалпылау әдісі сияқты әдістерді пайдалана отырып мәселелерді шешу мүмкіндігі болып табылады, бұл бәсекеге қабілеттіліктің жоғары деңгейіне қол жеткізуге (экономикалық және әлеуметтік) әсерлерді алуға мүмкіндік береді.

Креативті экономика мәселелерін зерттеу нәтижесінде қазіргі заманғы өмір салтын қалыптастырудың және халықтың гүлденуінің ең маңызды факторына айналатын жаңа экономиканың одан әрі табысты дамуы үшін қорытындылар мен ұсыныстар жасалды.

Түйін сөздер: креативті экономика, инновациялық қызметтер, инвестициялық ахуал, стартап индустрия, креативті өнім.

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Креативная экономика как ключ к решению экономических вопросов современного общества

Актуальность развития креативных индустрий объясняется, продвижением казахстанской креативной экономики все больше и больше набирая свою популярность, который является молодым быстроразвивающимся экономическим сектором. То есть это товары и услуги, созданные в процессе творчества и обладающие экономической ценностью. Креативная экономика работает на условиях свободы самовыражения, заинтересованности и мотивированности людей.

Тем не менее, несмотря на наличие значительного творческого и интеллектуального потенциала, процесс признания человеческих способностей в качестве полноценной составляющей социально-экономического формирования, сталкивается с рядом вопросов, для решения которых необходимо выработать новые научные и мировоззренческие подходы, соответствующие не только современным реалиям, но и способные развиваться в перспективе.

В статье освещены теоретические вопросы креативной экономики, рассмотрены ее основные концепции и глобальный контент. Показаны культурные предпосылки формирования креативной экономики, исследованы вопросы ее измерения , определен индекс креативности регионов таких как Астана, Алматы и Шымкент. Показано место Казахстана на глобальных рынках креативных индустри, рассмотрен потенциал сектора культурного наследия, творческих индустрий и рынок креативных услуг в Казахстане. Показаны перспективные точки роста креативной экономики в Казахстане. Предложены варианты развития креативной идиантичности не только крупных городов, но и малых городов и сельской местности, также науку, образование, культуру, туризм, бизнес и людей. Изложены механизмы поддержки креативных индустрий.

Цель исследования креативной экономики заключается в формировании привлекательного инвестиционного климата, способствовать росту социального развития, модернизировать сферу образования, науки, туризма и решения других экономичекских вопросов современного общества.

В основе экономики такого типа лежит способность, решать возникающие проблемы с помощью таких методов, как исторический, метод систематизации, метод анализа документов, метод анализа и синтеза зарубежной практики, метод логического обобщения информации, что позволяет добится высокой степени конкурентоспособности, получить дополнительные эффекты в экономике (экономические и социальные).

В результате исследования вопросов креативной экономики, сделаны выводы и предложения дальнейшего успешного развития новой экономики, где креативность становится важнейшим фактором формирования современного жизненного уклада и процветания экономики.

Ключевые слова: креативная экономика, инновационные услуги, инвестиционный климат, стртап-индустрии, креативный продукт.

Introduction

The creative economy is the economy of the «next generation», where the main capitalized value is new ideas. It is an economy based on innovation, novelties and creative products. The whole world is a potential consumer of a creative product: it depends on the efforts of the creator and the supporting infrastructure whether the idea or content will receive support, whether it will interest hundreds of people – if everything works out, then the idea will grow, with which monetization will come (Koshkin A.V., 2020).

The concept of "creative economy" is defined as a set of individuals and businesses that create cultural, artistic and innovative products and services. This system also includes spaces where creators can freely present their work, receive feedback and exchange ideas (Kazakova M.V., 2020). Sometimes the term "creative economy" is also used in a narrower sense – this is the name of the industry in which independent creators earn money from the unique content they create.

The sphere of creative industries is gaining more and more popularity in Kazakhstan. The development of the creative industry will help to change employment structures, create new enterprises and jobs, increase export potential and increase investment attractiveness.

The purpose of studying this issue is to study the features of education, trends and prospects of development, stimulation, government regulation, as well as the analysis of the creative economy and industries, taking into account their impact on the development of the creative economy of Kazakhstan.

As directions for the development of creative industries, attention should be paid to the necessity of creating a favorable institutional system, expanding the legislative framework, supporting SMEs, and government programs to promote investment.

Creative industries can turn the resources of Kazakh culture into economic resources and bring products enriched with Kazakh culture to the international market, promote Kazakh culture, introduce the world to Kazakhstan, participate in international competition and increase the international competitiveness of Kazakhstan.

After we have successfully operated not a dozen, as now, but hundreds, thousands of competitive brands in Kazakhstan, we will actually become industries in the full sense of the word, and the development of the infrastructure of wholesale and retail online and offline sales, logistics and transport will begin by itself, and the destroyed verticals of deep processing of raw materials and the production of the final product with high added value, which existed and successfully operated in all regions of our country. Life is cyclical, and now we all have a chance to revive our industrial, cultural, and spiritual traditions in new realities, when we need to be able to work not so much with our hands as with our head, heart, and soul.

However, due to a number of reasons, including the lack of a strategic vision and systemic transformations in the social and humanitarian spheres, the promotion of creative industries is proceeding at a restrained pace. As a result, the international mobility of the cultural and creative process slows down with the formation of a layer of untapped opportunities for socio-economic growth in the country.

Thus, I believe that the analysis of sources indicates little attention in the research of scientists to the determinants, factors and strategies for the development of creative industries in the households of the Republic of Kazakhstan, whereas it is the creative economy that is an alternative source of added value, jobs and a tool for leveling the socio-economic development of regions. In addition, the state policy of the Republic of Kazakhstan in addressing issues of supporting the promotion of creative industries at the legislative level is in its infancy and needs to be finalized in a number of areas.

Literature Review

Domestic scientific research related to the formation of creative industries in the Republic of Kazakhstan focuses on the economic content, on the fact that they serve as the basis for the aforementioned creative economy, in particular, its potential in modern realities is considered.

On a global scale, D. Hawkins acted as adherents of the sphere of industries that form the modern sector of the creative industry, taking into account their impact on socio-economic transformation. The issues of the concept of the development of creative cities were also dealt with by J. Jacobs (2011), E. Glazer (2015), C. Landry (2011).

A number of researchers drew attention to certain aspects of the formation and functioning of the creative economy industry, in particular, they considered the development of entrepreneurship in the cultural, artistic, scientific and technical spheres of creative industries Porfirio et al. (2016); Arieti (1976). The possibilities of implementing creative business models in depressed regions were explored by P. Collins and J. Cunningham (2017).

The issues of the creative industry as a special sector of the economy were covered in the works of Russian scientists and economists A.R. Agaeva et al. (2020), K.G. Grigoryan (2019), N.A. Malshina (2020), A.D. Molchanova (2020), etc. The innovative component in the creative economy sector is reflected in the works of Russian economists such as N.V. Latyshev (2017), M.N. Titova (2019), Yu.O. Glushkov and I.V. Babayan (2019), A.V. Koshkin (2020), K.G. Grigoryan (2019), etc.

The development of the creative economy, as well as the issues of the prospective formation of creative industries in Kazakhstan, were revealed by a number of domestic scientists, among whom Alzhanova F.G., Dnishev F., Baymuratov U., (2015,)Kurmasheva A., etc.

Resolution of the Government of the Republic of Kazakhstan dated November 30, 2021 No. 860 developed and approved the Concept of development of the creative industry for 2021-2025. This Concept examines the analysis of the current situation of the creative industry, provides an overview of international experience in the application of the creative industry, the basic principles and approaches for the development of a specific industry, target indicators, expected results and an action plan for the implementation of the concept.

The creative economy is already a reality for developed countries – it is gradually spreading around the world. The importance of this phenomenon is emphasized, among other things, by the fact that 2021 was declared by the United Nations the International Year of the Creative Economy for Sustainable Development (Agaeva A.R., 2020). Changing conditions force us to take a fresh look at the economy as a whole, at business, at the place of every person in this world.

There are many prerequisites for the emergence of a creative economy: this is an improvement in the standard of living and well – being in many countries of the world, and a trend for everything unique – as opposed to the same «serial» goods that have flooded the world (Shkarina V. S., 2022).

Having considered the types of economic activities, professions, products and services related to the creative industry, we will highlight the main areas, according to their place of origin. Figure 1.

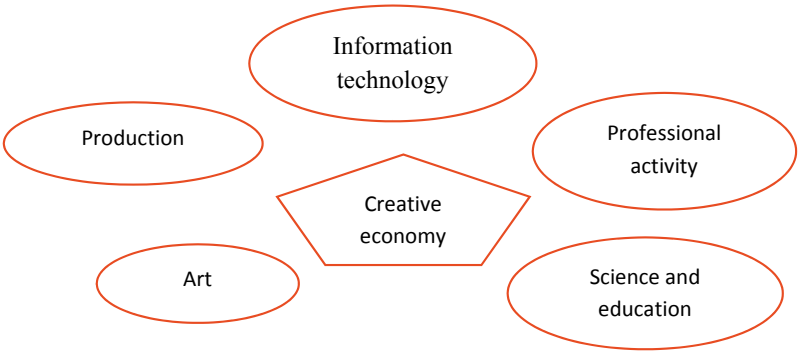

Figure 1 – Management of the development of creative industries by type of economic activity
Note – compiled by the author based on the source (Shkarina V. S., 2022)

The foundation of the creative industry is the development of creative entrepreneurship. It is the creative industries in the world today that act as the main source of new technologies, new industries, new material benefits and important economic advantages for the country (Latyshev N.V., 2017).

Based on progressive world practice, as well as taking into account existing gaps in the development of creative industries, the Concept has formed a unified view of the state on creative industries, a common framework for the development of the creative economy, which, in turn, will ensure a paradigm shift in government approaches (Xiaodong, F., 2019).

The National Plan provides for the task of providing employment for the creative and educated part of the youth through the emergence of new large domestic high-tech companies and the creation of new jobs through the development of technological and venture entrepreneurship as the basis for the development of the middle class of a new formation.

The solution of this task within the framework of the current Concept will lay the foundation for the progressive and systematic development of creative

industries in Kazakhstan as a new and promising source of growth.

Thus, the Concept is aimed at defining the vision, basic principles and approaches to development, as well as the expected results of the implementation of state policy in relation to the creative industries of Kazakhstan.

As a result of the implementation of the Concept, the necessary institutional conditions and prerequisites for the development of creative industries have been formed. Subjects of creative entrepreneurship, as well as creative persons, will have access to state support and incentive tools. (Concepts for the development of creative industries for 2021-2025).

Thus, against the background of the passing of the industrial era of development, our society is experiencing profound social and economic changes, where intellectual property becomes the main type of economic activity, and human intelligence becomes the tool, creativity in this case helps to achieve the best results. Currently, «ideas» make up the new economy, their creation is the main production, and creativity is an integral part of human life.

I also think it is beyond doubt that the Republic of Kazakhstan is endowed with creative and intellectual potential, which is the main resource for the development of the creative sector of the economy.

Methodology

The relevance of the development of creative industries in the Republic of Kazakhstan is explained by the presence of economic content in the process of production and commercialization of creative content, endowed with its own growth characteristics in international practice. The main research methods for the development of the creative economy in Kazakhstan are:

- a concrete historical method for revealing the genesis of the concept of «creative industries»;
- a method of systematization and generalization for a comprehensive review of the mechanisms of state assistance to the development of the creative economy;
- a method of analyzing documents for studying legislation in the field under study;
- a method of analysis and synthesis for the study of foreign practice on the presented topic;
- a method of logical generalization for the development of conclusions and recommendations in the field of improving public policy towards the development of creative industries in accordance with current global trends.

The study of state policy in the field of creative industries was further developed, and directions for improving this state policy were identified in the context of the deployment of creative transformations.

An assessment of the development of international creative economy practice indicates the presence of certain interactions with creative industries, among which economic development, trade, regional economic planning, labor market policy, domestic and foreign investments, technology and communications, social issues, and education can be distinguished.

As directions for the development of creative industries, attention should be paid to the need to create a favorable institutional system, expand the legislative framework, support SMEs, and government programs to promote investment.

The development of creative industries plays a huge role in global economic and political transformations. In general, developed economies remain the leaders in the creative industries, but the share of developing countries in this area is steadily growing. For example, if in the 1950s the US GDP amounted to more than 50% of world GDP, then by 2020 this result reached about 25% of the global figure. This is due, among other things, to the development of creative industries in countries such as India and China, as well as in the regions of Southeast Asia and Latin America. Significant progress in the development of the creative economy has been made by the countries of the Asia-Pacific region, in which the relevant sector generates about $740 billion in revenue (33% of global sales of creative products) and represents 12.7 million jobs (43% of jobs in creative industries globally).

The UK is considered to be the leading country in the field of creative economy, where the creative economy provides up to 7% of GDP, while the sector is constantly growing. The sphere of IT, software and computer games brings the most benefits.

This explains the policies of developed countries, which, increasingly realizing the importance of the creative sector for future economic development, create favorable conditions for the development of people's creative potential, support for creative industries and protection of intellectual property rights.

Based on the available world practice, methodological approaches to the classification of creative industries' activities have been formed.

Here are the main ways in which you can earn money in the creative industry:

- Creating ideas. Startup founders, writers, musicians, and directors are following an extremely difficult, but incomparable path of developing and implementing their own ideas.

- Creation of unique content. This is done by bloggers who regularly create unique content that is interesting to their audience. Content can be anything from Instagram photos to video reviews of movies, from small notes from life to works of art.

- Personal brand development. Sometimes the very content that is in demand and interesting can be your own personality. And when a certain amount of audience is reached, this person can at least advertise chips, even create his own cryptocurrency – everything will be commercially successful. The difficulty is that such success requires titanic work and the coincidence of many factors (Florida R., 2011).

- Work in the creator's team. You can not be a founder directly, but work in a startup team (or in a blogger's team), using your best skills to develop an idea.

- Selection of investments for ideas. The services of consultants and intermediaries are becoming more and more popular, with the help of which the creator finds reliable sources of financing.

- Flexibility of the idea creation process. With the development of such diverse technologies as AI, virtual reality, and NFT, there are more and more opportunities for creating creative content and innovation.

- Monetization of ideas and creativity. Every year there are more and more ways to monetize ideas and unique content in a variety of directions, and the amount of investment in ideas is growing – not only in technological ideas, but also purely artistic ones.

- The emergence of market leaders. While the creative economy market is still being formed and the rules are being determined on it, there are already leaders – both among auxiliary services for content production and among direct players-creators. Competition between them naturally leads to the development of the entire market (Glushkova Yu.O., 2019).

The development of the startup industry, which over the past 20 years has proved what value an idea can have. Perhaps one of the prerequisites can be considered an overabundance of information in the digital world: we hold our attention less, forget faster, we constantly need new information that will be remembered and surprising. Anyway, the market of ideas is growing on all fronts: the volume of venture investments in startups at the Pre-seed stage is growing, the market for influencers and content producers is growing (John H., 2021).

An innovative product does not have to be a new technology: it may be something familiar, but from a new angle, in a new context. In other words, something that will surprise the imagination of future consumers (Molchanova A.D., 2020).

Now the creative economy exists fully in developed countries (USA, Western Europe) with a stable economic situation and a high standard of living for citizens. Traditionally, wages in the creative industries are significantly higher than the national average wages. For example, in the United States, wages in the creative industries are 34.9% higher than the average. In Australia, this gap reaches 31%. In the UK, wages in the creative industries are 18% higher than the average wage. Those employed in the creative industries in Kazakhstan earn 20% more when compared with the average salary in the country (Becuț, A.G., 2017).

Thus, the creative industry, the creative economy is a special sector of the economy based on the sale of goods and services that are the result of intellectual activity. The development of technology and innovation plays an essential role in the production of these goods and services.

The global capitalization of the creative industries by 2023 is $2.3 trillion.

The main characteristics are:

- the high role of new technologies and discoveries in various fields of human activity;

- high creative component of work;

- a large amount of existing knowledge and the urgent need to generate new knowledge.

In addition, creative industries are characterized in terms of a creative approach based on project thinking, creative modeling, and practical orientation (Gouvea, R., 2021).

Results and discussions

Since the early 2000s, the growth rate of creative services (advertising, product creation, the music industry, and so on) has increased annually by 17%-20%. Thanks to economic growth, more and more people realized that ideas are not something opposite to material well–being, but on the contrary, something that can bring a lot of income. (Lazzeretti, L.; 2018). In the last 3-5 years, the creative economy

has been talked about as an important market trend and a new stage in the development of society.

In 2021, venture capital investors invested a total of more than $2 billion in 50 startups that focus on working with content creators. According to the Influencer Marketing Hub, by now the volume of the global creative industries market is about $104.2 billion, by the beginning of 2023 the volume of the venture capital market in Kazakhstan reaches $ 100 million, and by 2024 the volume of the creative economy in the world may exceed $5 trillion.

In February 2021, the first Department of Creative Industries in Kazakhstan was established. The current trend of the global economy is transforming into an economy of knowledge, ideas, and innovations. Kazakhstan has also begun to pay special attention to the development of the creative economy.

All creative enterprises in Kazakhstan account for the share of the cities of Astana and Almaty. These cities have signs of the development of clusters of video production, marketing, design and publishing, and are also the closest to the development of clusters of information technology. In addition, the agglomerations of Shymkent have a significant advantage in the development of creative industries due to the sufficient concentration of the population and favorable geographical location. Shymkent has the prerequisites to become the center of the Turkestan arc, «attracting» talents, including from other Central Asian countries. The development of creative industries in cities will contribute to the formation of independent regional brands that attract creative leaders, investments and innovations (Alzhanova F., 2015).

By 2025, the cities of Astana, Almaty and Shymkent will become territories of creativity and creativity. Each city will have its own niche, formed taking into account the «local identity» of the region. Defining a separate niche for each city will allow the cities of Astana, Almaty and Shymkent to ensure the targeted development of those niches that have the greatest growth potential, which in turn will make a significant leap in the development of creative industries. The development of creative industries in cities will be facilitated by the creation of special spaces and accessible infrastructure for creative growth. When developing creative platforms, their accessibility plays a special role. It is the diversity, mass character and accessibility of «creative societies» that can give the necessary impetus to the development of creative industries in Kazakhstan. In order to create special spaces and accessible infrastructure in Almaty, it is planned to create a Creative Industries Park, which will become the main point of development of the city's creative industries.

The practice of Almaty will be scaled up in other major cities of the country. As a result, during the period of implementation of the Concept, a modern infrastructure for the development of creative industries will be formed in the cities of Almaty, Astana and Shymkent, combining multifunctional open spaces (workshops, art studios, libraries) with support and development institutions based on creative technoparks. In particular, creative clusters and hubs will be formed in the cities of Astana, Almaty and Shymkent by 2023. In turn, in Astana, using the capabilities of the Astana Hub international business park will allow laying the foundation for a modern infrastructure for the development of creative industries.

One of the advantages of the development of creative industries for national economies has been and remains the opportunity to profit from exports, since goods and services produced in the field of creative economy can be objects of international trade (Grigoryan K.G., 2019).

In 2022, Russia, China, Italy, France and the Netherlands became the main trading partners of Kazakhstan. At the same time, Russia became the largest importer for Kazakhstan. The total amount of imported goods from Russia amounted to 1,497,697,4 thousand US dollars. Russia also became the main export destination of Kazakhstan, with a total amount of goods of 948,969.9 thousand US dollars. China ranks second in both imports (1,066,948.6 thousand US dollars) and exports (918,473.5 thousand US dollars) (Porfirio J., 2023).

Exports in December 2022 amounted to: 6,598,647.1 thousand US dollars, which is 301,692.3 thousand US dollars less than in the previous month. Imports, on the contrary, increased by 440 201.5 thousand US dollars and amounted to 5,300 184.2 thousand US dollars in December 2022 (Tremblay, G., 2023).

Thus, the structure of imports and exports in Kazakhstan remains stable. In monetary terms, the volume of foreign trade has increased.

Table 1 – Target indicators and expected results of the creative industry development concept for 2021-2025

№	Target indicator	2021 year	2022 year	2023 year	2024 year	2025 year
1.	Increasing the contribution of creative industries to the economy of Kazakhstan	3,14 %	3,6 %	4,07 %	4,53 %	5,0%.
2.	Increased employment in creative industries	3,6%	3,7%	3,8%	3,9%	4,0%
3.	The growth of the number of SMEs in the creative industries	53000	59000	66000	73000	80000
4	Contribution of medium-sized businesses to the economy of Kazakhstan	10,0%	11,2%	12,5%	13,7%	15%
5	Reduction of the unemployment rate of the population	5,0%	5,0%	4,9%	4,8%	4,7%
Note – compiled by the author based on the source (Wassall, G.H,2023)						

The volume of investments in fixed assets in creative industries will amount to 250 billion tenge, of which at least 90% of private investments until 2025 and 800 billion tenge, of which at least 90% of private investments until 2030.

Thus, from this table we see that the systematic and progressive implementation of the Concept will allow us to achieve the following indicators in 2025:

1. Target indicators:

a) increasing the contribution of creative industries to the economy of Kazakhstan to 5% in 2025;

c) increase employment in creative industries to 4 %;

(c) A 1.5-fold increase in the number of SMEs in the creative industries;

e) bringing the contribution of medium-sized businesses to the economy to 15% in 2025;

(e) Reducing the unemployment rate of the population to 4.7% in 2025, including through youth employment.

2. Expected results:

a) the formation of 30 thousand new jobs;

c) the growth of exports of creative industries products by 200 million US dollars.

The dynamic development of creative industries in the world is producing new areas of activity and employment for the population. State regulation of the creative industry in Kazakhstan is a relatively new phenomenon, a positive factor of which is the fixed list of economic activities, which allows analyzing data on the state of the creative economy as an industry as a whole.

An analysis of the development of creative industries by the end of 2022 showed the presence of several systemic barriers preventing their effective development:

- the lack of legally approved concepts of creative industries and the activities of business entities in creative industries. This, in turn, restricts business entities in the creative industries in access to available infrastructure, property and non-financial support;

- the existing state incentive measures are focused on such traditional priority sectors of the economy as agriculture and manufacturing, and do not take into account the peculiarities of the development of creative industries, where the main factor of production is not machinery and equipment, but human capital;

- small and medium-sized businesses (hereinafter referred to as SMEs) in the creative industries are directly dependent on the effectiveness of intellectual property management. There are problems with the development of modern tools for concluding license agreements. It is necessary to improve the law enforcement practice for the protection of intellectual property rights. Issues of increasing the transparency of the activities of organizations managing property rights on a collective basis and increasing the level of legal literacy of participants in the creative industries require special attention;

- the problem of shortage and low quality of human resources necessary for the development of creative industries. The current system of training and personnel development does not contribute to the formation of creative thinking and the disclosure of the creative potential of the country's population. Creative business entities are experiencing difficulties in finding, hiring and

developing staff, which are the basis of creative work. Thus, according to the World Intellectual Property Organization, Kazakhstan ranks 52nd in the world in terms of "employee knowledge" in the Global Innovation Index. At the same time, according to the indicator "human capital and science", Kazakhstan took 66th place out of 132 countries, significantly behind such countries as Turkey (26th place), Russia (29th place), Belarus (38th place) and Ukraine (44th place);

- promising creative initiatives with high business potential that arise at the junction of culture and other industries are often outside the focus of the state. Cultural spending is mainly focused on maintaining social facilities and holding cultural events, rather than creating added value in the creative industries; (Gouvea, R.; 2021).

- lack of infrastructure for the development of creative entrepreneurship and the formation of sustainable creative industries in the country. Creative clusters and hubs, business incubators and accelerators, specialized coworking, art spaces and art galleries focused on working in the creative industries, despite the high risks of this type of entrepreneurship, are placed on a par with business centers and shopping malls. The sites organized by the state on the basis of social infrastructure facilities, despite the costs of repair and purchase of equipment, are not managed efficiently enough and often continue to work "the old-fashioned way", due to the lack of appropriate competencies of state managers and multiple regulatory restrictions imposed on the activities of state-owned enterprises;

- weak investment attractiveness of creative industries in Kazakhstan.

Conclusion

The creative economy can develop only where certain conditions exist. This explains why the creative sector tends to concentrate in large global agglomerations (Porfirio J,.; 2023).

These conditions or requirements are generally classified by researchers into three areas. We are talking about consumers, labor resources and space (microclimate).

If we talk about consumers, then here the researchers emphasize the level of their intelligence and financial security, or, in other words, the presence of educated and wealthy consumers.

As for the labor resources, in addition to a high level of professional training, we are talking about the developed individual creative abilities of a person – creative thinking, generation of new ideas.

Another important component is space, microclimate. The researchers emphasize that this should be a highly developed economic and technological space, open to new original solutions and with a developed institutional base.

Openness is at the forefront, allowing creative individuals to generate new ideas.

Scientists have even identified the so-called theory of the "three T's" (talent, technology and tolerance), which are crucial in terms of the attractiveness of cities for creative professionals. That is, in the most general form, we are talking about how the contradiction between creativity and strict control is solved in certain cities (Wassall, G.H.,; 2023).

The role of the state in the development of the creative economy is one of the central, defining ones. First of all, we are talking about creating favorable economic and political conditions, which researchers consider to be among the determining factors for the development of the creative economy. In the context of economic conditions, we are talking about the stability of the economic situation, the exchange rate of the national currency, the degree of state regulation of the industry in which the enterprise operates, the level of inflation, and credit interest rates.

Whereas the political conditions for the development of the creative economy are the stability of the political situation and relations with partners, the degree of state regulation of the industry, the degree of liberalization of the market in which the enterprise operates, and changes in state innovation policy.

Defining in the context of these conditions are also:

- protection of freedom, personality and property;

- active support for entrepreneurship;

- the formation of an institutional environment conducive to the generation of innovations (Grigoryan K.G..,; 2019).

Ensuring legal certainty and protection of intellectual property producers, which also belongs to the sphere of influence of the state, is of great importance for the formation of the market of innovative ideas. It is worth emphasizing here that the main driver of the creative economy is free competition. According to the researchers, the presence of an uncorrupted environment acts as a guarantee that a modern creative worker will be able to find a place in it to apply his talent. Otherwise, there is an outflow of creative workers to other geographical regions.

Thus, the development of creative industries in our country can become one of the foundations of the transition to a post-industrial and highly intelligent economic system. Simultaneously with improving the quality of life of the population and leveling the socio – economic development of the regions, the possibility of cultural expansion will manifest itself, using the huge potential of the population of new Kazakhstan to position the country on the world market.

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THE INFLUENCE OF MONETARY POLICY ON THE FORMATION OF OIL PRICES

The relationship between monetary uncertainty and price volatility in the global crude oil market has attracted considerable attention in recent years. Understanding this relationship is extremely important for both policy makers and market participants and investors. The purpose of this article is to explore a modern approach to regime switching in order to shed light on the dynamic interaction between monetary uncertainty and price volatility in the crude oil market. If we consider that oil is one of the main sources of energy in the world, and the price of oil plays an important role in the global economy, then the formation of oil prices depends on many factors, including supply and demand, political stability in the production regions, geopolitical events, climate change and, of course, monetary policy. The scientific significance of the article lies in the fact that it allows for a deeper understanding of the relationship between the economic policy of central banks and the dynamics of commodity prices. The practical significance lies in the fact that understanding the impact of monetary policy on oil prices can be useful for both government agencies and businesses.

In this research methodology, an empirical method of work was used, in which the influence of monetary uncertainty on the volatility of world crude oil prices was considered. We also touch upon the issue of political uncertainty on the price of oil during the pandemic. The relevance of this article lies in the fact that the price of oil is one of the key indicators for the global economy, the study of the impact of monetary policy on this market is important. The price of oil can influence monetary policy in various ways. For example, changes in the interest rates of central banks affect investors and their decisions to invest in oil companies. In addition, monetary policy also affects the exchange rate, which also has an impact on the price of oil. In conclusion, it can be said that studying the impact of monetary policy on oil prices is important for both science and practice, and may lead to the development of more effective methods of economic and business management.

Key words: monetary policy, oil price uncertainty, crude oil, stock market, system modernization, political uncertainty, COVID-19.

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Мұнай бағасының қалыптасуына монетарлы саясаттың әсері

Әлемдік шикі мұнай нарығындағы монетарлық белгісіздік пен бағаның құбылмалылығы арасындағы байланыс соңғы жылдары айтарлықтай назар аударды. Бұл қатынасты түсіну саясаткерлер үшін де, нарық қатысушылары мен инвесторлар үшін де өте маңызды. Бұл мақаланың мақсаты-монетарлық белгісіздік пен шикі мұнай нарығындағы бағаның құбылмалылығы арасындағы динамикалық өзара әрекеттесуге жарық түсіру үшін режимдерді ауыстырудың заманауи тәсілін зерттеу. Мұнай әлемдегі негізгі энергия көздерінің бірі болып табылады және мұнай бағасы әлемдік экономикада маңызды рөл атқарады деп есептесек, мұнай бағасының қалыптасуы көптеген факторларға, соның ішінде сұраныс пен ұсынысқа, өндіріс аймақтарындағы саяси тұрақтылыққа, геосаяси оқиғаларға, климаттық өзгерістерге және, әрине, ақша-несие саясатына байланысты. Мақаланың ғылыми маңыздылығы-бұл орталық банктердің экономикалық саясаты мен шикізат бағасының динамикасы арасындағы байланысты тереңірек түсінуге мүмкіндік береді. Практикалық маңыздылығы-ақша-несие саясатының мұнай бағасына әсерін түсіну мемлекеттік органдар үшін де, бизнес үшін де пайдалы болуы мүмкін.

Зерттеудің бұл әдістемесінде шикі мұнайдың әлемдік бағасының құбылмалылығына монетарлық белгісіздіктің әсерін қарастыратын жұмыстың эмпирикалық әдісі қолданылды. Пандемия кезіндегі мұнай бағасына қатысты саяси белгісіздік мәселесін де қозғаймыз. Бұл мақаланың өзектілігі мұнай бағасы әлемдік экономика үшін негізгі көрсеткіштердің бірі болып табылады, монетарлық саясаттың осы нарыққа әсерін зерттеу өте маңызды. Мұнай бағасы ақша-несие саясатына әртүрлі жолдармен әсер етуі мүмкін. Мысалы, орталық банктердің пайыздық мөлшерлемелерінің өзгеруі инвесторларға және олардың мұнай компанияларына инвестициялау туралы шешімдеріне әсер етеді. Сонымен қатар, ақша-несие саясаты валюта бағамына да әсер етеді, бұл мұнай бағасына да әсер етеді. Қорытындылай келе, ақша-несие саясатының мұнай бағасына әсерін зерттеу ғылым үшін де, тәжірибе үшін де маңызды және экономика мен бизнесті басқарудың тиімді әдістерінің дамуына әкелуі мүмкін деп айтуға болады.

Түйін сөздер: монетарлы саясат, мұнай бағасының белгісіздігі, шикі мұнай, қор нарығы, жүйені жаңғырту, саяси белгісіздік, COVID-19.

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Влияние монетарной политики на формирование цены на нефть

Взаимосвязь между монетарной неопределенностью и волатильностью цены на мировом рынке сырой нефти привлекает значительное внимание в последние годы. Понимание этой взаимосвязи крайне важно как для политиков, так и для участников рынка и инвесторов. Цель данной статьи - изучить современный подход к переключению режимов, чтобы пролить свет на динамическое взаимодействие между монетарной неопределенностью и волатильностью цены на рынке сырой нефти. Если учесть, что нефть является одним из основных источников энергии в мире, и цена на нефть играет важную роль в мировой экономике, то формирование цены на нефть зависит от многих факторов, включая спрос и предложение, политическую стабильность в регионах добычи, геополитические события, климатические изменения и, конечно на монетарную политику. Научное значимость статьи заключается в том, что она позволяет глубже понять взаимосвязь между экономической политикой центральных банков и динамикой цен на сырьевые ресурсы. Практическое значение заключается в том, что понимание влияния монетарной политики на цены на нефть может быть полезным как для правительственных органов, так и для бизнеса.

В данной методологии исследования была использован эмпирический метод работы, в котором рассмотрено влияние монетарной неопределенности на волатильность мировых цен на сырую нефть. Так же затрагиваем вопрос о политической неопределенности на цену нефти в период пандемии. Актуальность данной статьи заключается в том что цена на нефть является одним из ключевых показателей для мировой экономики, изучение влияния монетарной политики на этот рынок имеет важное значение. Цена на нефть может влиять на монетарную политику различными способами. Например, изменение процентных ставок центральных банков влияет на инвесторов и их решения о вложении средств в нефтяные компании. Кроме того, монетарная политика также влияет на курс валют, что также оказывает влияние на цену на нефть. В заключении можно сказать, что изучение влияния монетарной политики на цены на нефть имеет важное значение как для науки, так и для практики, и может привести к развитию более эффективных методов управления экономикой и бизнесом.

Ключевые слова: монетарная политика, неопределенность цены на нефть, сырой нефть, фондовый рынок, модернизация системы, политическая неопределенность, COVID-19.

Introduction

Crude oil is one of the key commodities influencing global economic growth, financial stability and inflationary pressures. The volatility of crude oil prices has significant implications for various stakeholders, including governments, businesses and consumers. Decisions in the area of monetary uncertainty, on the other hand, have a profound impact on market sentiment and general economic conditions. Therefore, studying the relationship between these two factors is of great importance.

The monetary regulator, represented by the central bank, sets the interest rate for the economy in the short term and affects the money supply with its instruments. Their coordinated decisions should support the macroeconomic stability of the country, avoiding imbalances or distortions in the economy.

Since 2015, the National Bank of Kazakhstan (NBK) has officially switched to inflation targeting mode when conducting monetary policy. This means, on the one hand, moving away from a fixed exchange rate regime, and on the other, the active use of classical monetary instruments: the base rate, open market operations and macro prudential standards - to influence inflation or price growth in the economy, which in turn directly affects the financial stability of Kazakhstan.

As a result of asynchronous actions by the government and the National Bank, for example, in the case of the base rate, the effect of the transmission mechanism of the interest rate channel on inflation is strongly limited by uncontrolled price growth factors in the form of import inflation, as well as permanently high price expectations among economic agents. This arises due to the structural problems of the economy of Kazakhstan: the high dependence of the country's export revenues on the sale of finished raw materials and a high share of the import component in intermediate and final consumption. Monthly surveys of the National Bank of the Republic of Kazakhstan show that in recent years, expected and perceived inflation has consistently exceeded the level of official price growth in the economy, which indicates the absence of an element of anchoring expectations among economic agents.

In 2023, against the background of non-fulfillment of the tax revenue plan, the scheme of extra-budgetary withdrawal of funds from the National Fund through the purchase of a stake in the national company KazMunayGas was applied for the first time. Further, funds from capital transactions were sent to the budget by dividends from the Fund of the National Bank "Samruk-Kazyna".

In general, it has to be stated that the coordination of monetary policy in the economy of Kazakhstan is extremely weak, which is reflected not only in the fiscal dominance of the government through the constant increase in government spending and withdrawals from the National Fund, but also in the fact that the monetary regulator, in conditions of low efficiency of the transmission mechanism of monetary policy through open market operations, occupies the main market share of primary government securities (Forbes Kazakhstan, 2024).

Unlike the United States, government regulation is the main engine for the Kazakh economy and only a small role is played by the private sector due to the lack of large companies that could have their weight on the economic stabilization of the country. In this regard, this topic is not only relevant in developed consumer countries such as the United States, Europe and China, but it is also important for those countries whose budget is directly related to the price of crude oil. We continue to form and develop advanced clusters of our economy in this direction. In this regard, one of the President's messages outlined the following steps towards the development of the country's oil sector, which clearly shows the economic importance of crude oil prices: It is necessary to ensure the creation of a complex of deep oil refining at the Atyrau refinery worth $ 1.7 billion, which will increase gasoline output by almost 3 times – up to 1.7 million tons, and diesel fuel – up to 1.4 million tons and provide Kazakhstan with these types of fuel (Presidential Address, 2012) to increase the share of oil refining.

As for the largest oil consumers in the world today, the United States and China are. They are significantly ahead of other countries such as India, Russia, Germany, Japan, etc. In order to develop and strengthen economic cooperation between the United States and Kazakhstan on issues of American-Kazakh business cooperation in the period 1997 to 2009, it was formed to informally advise the Leadership of the Republic of Kazakhstan through discussions, written memoranda, reports and analytical summaries in the following areas:

1) macro and microeconomic policy;
2) monetary and fiscal policy;
3) economic legislation;
4) investment attraction programs, including the development of economic incentives and investment mechanisms;
5) strategic planning, including the development of basic industries, especially high-tech sectors, agriculture, financial sector and infrastructure, etc.

When conducting macroeconomic policy in Kazakhstan, big players such as Kenneth Derr, Chevron Corporation, and Paul J. came to business cooperation. Fribourg - Continental Grain; John B. Hess - Amerada Hess; Richard Cheney - Halliburton Company; William J. Lowry - Amoco Corporation; Lucio A. Noto - Mobile Corporation, David Rockefeller - Council for Relations with Foreign Countries, etc. The task of which is to develop and submit to the President of the Republic of Kazakhstan proposals and recommendations for the implementation of the Development Strategy of the Republic of Kazakhstan until 2030, as well as to solve global problems of sustainable development of the country in terms of ensuring economic growth, effective methods of environmental management and social reforms; interaction with international economic and financial organizations, specialists

involved in consultations on foreign economic cooperation and integration of Kazakhstan into the world economic community (information legal system of the National Assembly of the Republic of Kazakhstan).

The introduction of the right monetary policy can become a strong driver of investment at the company level. Recent data indicate that the investment effects of monetary policy are far from uniform and vary in many ways depending on such characteristics at the company level as age, profitability and leverage. Samer Adra, Yang Gao and Jiayi Yuan, in their study "Local Policy Uncertainty and the Firm's Investment Response to Monetary Policy Letters on Economics", say that they expand this analysis by presenting the first study of the role of local economic policy uncertainty in shaping the firm's investment response to monetary shocks (Samer Adra et al. 2024).

The growing uncertainty of local economic policy increases the sensitivity of the firm's investments to monetary shocks. This effect is due to the precautionary trend caused by uncertainty, which increases the firm's propensity to reduce investments in response to restraining monetary shocks. This effect is more pronounced for geographically connected firms experiencing financial difficulties.

Despite growing economic integration, most firms remain geographically connected and vulnerable. Moreover, recent events, such as the COVID-19 pandemic, have confirmed the view that differences at the state level in overcoming uncertainty have tangible consequences for how firms invest, hire employees and survive economic difficulties.

For example, in the United States, the COVID-19 pandemic has led to a sharp increase in political uncertainty, pushing (on average) 2.7 times the peak before COVID and (on average) more than four times the previous peak. Political uncertainty has increased more dramatically with stricter quarantine measures – as evidenced by the number and duration of self-isolation orders, business closure orders, restaurant closure orders, and school closure orders. This blocking effect is significant compared to the differences in the spikes in political uncertainty during the pandemic era in different states. Surprisingly, political uncertainty does not show a noticeable response to the severity of the pandemic, as measured by the number of deaths from COVID per capita in cities (S.R. Baker et al. 2022).

How does increasing political uncertainty at the state level affect a firm's investment response to monetary policy? To answer this question, it is necessary to recognize that policy uncertainty leads to precautionary delays on the part of companies engaged in irreversible investments (Gulen and Ion, 2016). In terms of real-world options, growing political uncertainty increases the value of being able to postpone irreversible investments, especially for firms whose business prospects depend heavily on local policy decisions.

States that imposed stricter restrictions during the pandemic saw a larger jump in unemployment, due to the severity of the pandemic and political uncertainty. The greater increase in policy uncertainty at the state level during the pandemic was also accompanied by a large increase in unemployment. As we discuss, there are good reasons to be careful when drawing causal conclusions from these patterns. However, they emphasize the value of additional research on how the severity of quarantine and policy uncertainty during the pandemic affected unemployment and other outcomes.

Literature review

Oil price volatility poses a great risk to economic institutions and devastating shocks to the global economy from the side from which it is easy to get information about how oil prices affect other components of the financial market, including stocks, mortgages, precious metals and other consumer goods. He believes that there is a significant amount of empirical data confirming the theoretical relationship between oil prices and capital on the example of stock markets. For example, a revolutionary analysis conducted in Chang et al., 2022, showed that oil has a detrimental effect on the stock market of industrialized countries. A number of studies using quantitative methods such as regression analysis (QR), capital asset pricing model (CAPM) and vector analysis (VAR) confirm this conclusion (Xiao Bai et al., 2022).

According to experts, oil volatility contains indications that significantly exceed those provided by conventional macroeconomic factors and can be used to predict volatility in the stock market (Pan et al., 2023). Using a VAR structure with quantile regression for time-varying variables, it has recently been tested how oil volatility flows into natural gas futures trading. However, overflowing significantly delays the start of the revolution in shale oil (Ullah et al., 2020). The report found compelling evidence of a spillover from the oil markets. Although most of these studies use GARCH or RV-based models to determine oil price volatility, a broader line of empirical research recommends using OVX.

GARCH or RV-based models require stock market volatility to be determined based on previous price data, so they provide only limited insight into upcoming economic risks. When using a forward benchmark, such as OVX, additional data is provided on both historical and current market prospects (Antonakakis, N.,2020).

Methodology

Empirical analysis indicates that there is a significant relationship between monetary policy uncertainty and price volatility in the global crude oil market. The results show that during periods of high monetary uncertainty, the volatility of crude oil prices tends to increase and vice versa, when monetary uncertainty is low, volatility in the crude oil market is relatively stable. This conclusion highlights the importance of taking monetary factors into account when assessing the dynamics of crude oil prices.

Understanding the relationship between monetary policy uncertainty and crude oil volatility has a number of implications. First, policymakers can use this knowledge to develop effective monetary policies that take into account the impact on energy markets. Secondly, investors and market participants can use this information to make informed decisions about investments in crude oil. Finally, businesses can evaluate their risk management strategies in light of the interaction between monetary policy uncertainty and crude oil price volatility.

To study the relationship between the uncertainty of monetary policy and the volatility of the price of crude oil, a modern approach using regime switching models is used. Mode-switching models allow you to capture potential changes in the relationships between variables over time. The analysis includes various indicators of monetary uncertainty, such as exchange rate volatility, inflation uncertainty and central bank policy uncertainty, as well as their impact on crude oil.

This segment explains the specific forecasting framework that was used during the study:

− Non-commuting GARCH

− MS-GARCH models

The models presented above do not take into account the change of modes between time sequences. As a result, consider the following FTP-MS-GARCH standards.

We also use this technique to get the daily volatility of stocks, for example, in the oil market. Many studies have used sliding approaches to obtain non-selective volatility. Two subsamples are created from the entire sample - the calculated and forecast windows. As a test sample, we select 70% of each data set, from which we conclude that the calculation period begins in January 2000. The division time is March 2014, and the planned window covers the remainder of the dataset.

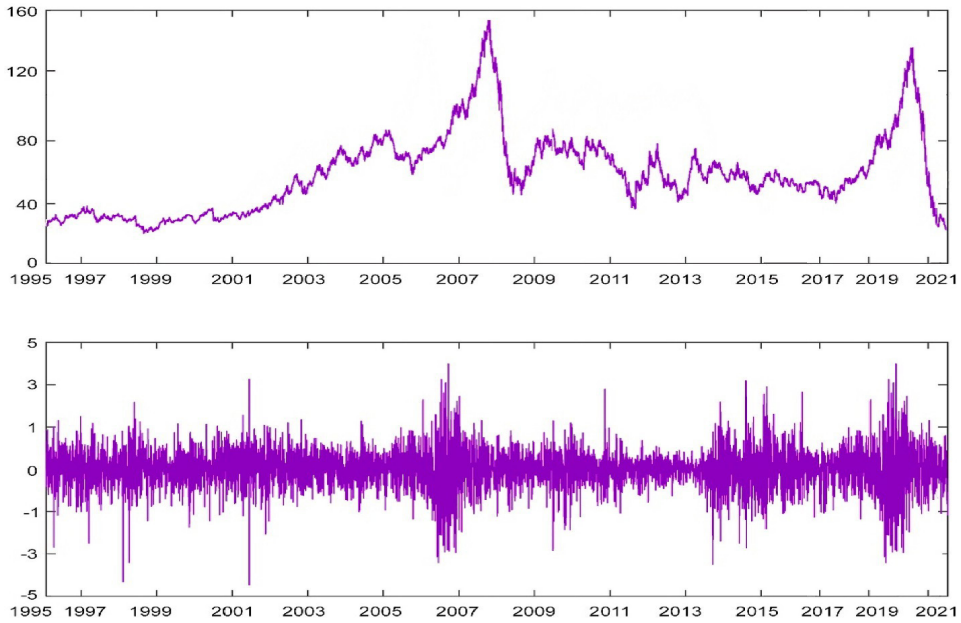

Figure 1 – Daily West Texas intermediate (WTI) futures prices (top) and yields (bottom).
Note – compiled based on the source (Menyang Yu et al.2023)

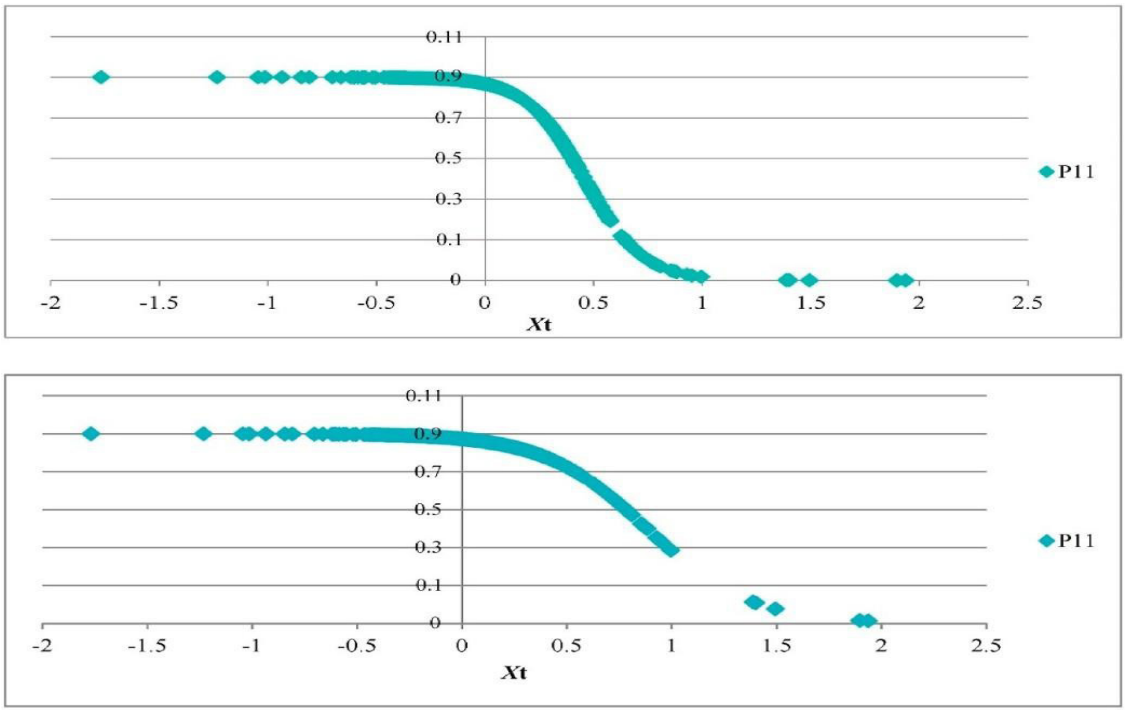

Figure 2 – The US monetary uncertainty index (top) and the first difference (bottom).
Note – compiled based on the source (Menyang Yu et al.2023)

The probability of regime change will change when the MUI changes based on a posteriori probability between both states that depend on it (Maghyereh and Abdoh, 2020). The state variables between the two situations seem to respond significantly to the change in MUI, since all coefficients (except 0) are statistically significant.

Oil volatility tends to persist in a stormy regime, which is experiencing great liquidity problems. This study is consistent with the researchers' view that when shareholders experience greater economic pressure during a storm, their emotions are more likely to be driven by fear (Singh et al., 2020). Obviously, oil volatility was higher during the turbulent events associated with monetary uncertainty.

As a result of the study of the factors influencing the volatility of oil prices on the country's monetary policy, 6 signs of the M1-M6 models were identified, which are presented in this table.

The figure shows the results of experiments with six models, designated as Model 1 - model 6. To assess the superiority of models 2 and 3 over models 1 and 2, a likelihood ratio of 1 (LR1) was used. To compare models 5 and 6 with models 1 and 2 and 3 and 4, respectively, likelihood coefficients 2 (LR 2) and 3 (LR3) were used. The training set is used to evaluate the parameters of the model, and the testing set is used to evaluate the effectiveness of the model. The model is trained on a training set and then used to predict on a test set (Falavigna and Ippoliti, 2023). The accuracy of the forecasts is estimated by comparing them with the actual results on the test set. Out-of-sample forecasting is an important tool when choosing a model, as it allows different models.

It is also useful for identifying over-fitting, which occurs when a model comes too close to training data and performs poorly on new data (Sharif et al., 2020).

The data in the figure reflects the results outside the sample. The reliability is 90%. The * sign marks cases when a null idea is rejected with 1% significance.

The figure shows the results of an investment approach for an individual focused on the balance between average return and risk. The various levels of risk aversion, denoted by the Greek letter gamma (γ), are represented by the values 3, 6 and 9. The report presents the results of the effectiveness of the strategy through CER and SR, which are measures of the success of the investment approach (Bakshan et al., 2017).

	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
ω1	0.0080***	- 0.0018	1.0148***	- 0.0291***	1.1409***	0.0894*
ω2	-	-	0.0050***	1.4299***	0.0051***	- 0.0057*** $_{\alpha 1}$
	0.0571***	0.1100***	0.1368***	0.1192***	0.1728***	0.2887*** $_{\alpha 2}$
	-	-	0.0404***	- 0.1008	0.0386***	0.0539*** β_1
	0.9327***	0.9880***	0.0462***	0.9540***	0	0.2145
β2	-	-	0.9459***	- 0.2889	0.9475***	0.9953*** γ1
	-	- 0.3857***	-	- 0.3996***	-	- 0.3956** γ2
	-	-	-	1.9885	-	- 0.8996**
P11	-	-	0.9595***	0.9973***	-	-
P22	-	-	0.9948***	0.9541***	-	-
δ0	-	-	-	-	3.4027***	3.5802***
λ0	-	-	-	-	- 7.4322	- 4.0615 $_{\delta 1}$
	-	-	-	-	5.5339***	5.5823***
λ1	-	-	-	-	- 2.8446***	- 2.6828***
L.L.	- 4260.200	- 4246.600	- 4232.100	- 4230.400	- 4227.600	- 4214.200
A.I.C.	8526.4	8501.2	8482.2	8482.9	8477.2	8454.3
B.I.C.	8544.9	8525.9	8537.8	8550.8	8545.1	8534.6
Л.Р.1.	-	-	56.2000***	32.4000***	-	-
Л.Р.2.	-	-	-	-	65.2000***	64.8000***
Л.Р.3.	-	-	-	-	9.0000*	32.4000***

Figure 3 – Results of sample assessments.
Note - This figure is compiled by the source (Mengyan Yu et al. 2023).

	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
S.R.	0.6864	0.6906	0.6906	0.6906	0.6906	0.6964
D.o.C.	14.9100***	15.1541***	15.0932***	15.0633***	14.9188***	15.4648***
The panel A: length = 4500						
S.R.	0.6673	0.6794	0.6754	0.6754	0.6693	0.6894
D.o.C.	9.0007***	9.4585***	9.3602***	9.3602***	9.0773***	9.7862***

Figure 4 – Success rates vary with different window estimates.
Note – This figure is compiled by the source (Mengyan Yu et al. 2023).

		Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
QLike	*TR*	0.0000	0.0649	0.0000	0.0000	0.0000	1.000
	TSQ	0.0000	0.0649	0.0000	0.0013	0.0000	1.000
M.C.Э.	*TR*	0.0055	0.0161	0.0055	0.0055	0.0055	1.000
	TSQ	0.0218	0.0218	0.0218	0.0218	0.0218	1.000
M.A.E.	*TR*	0.0089	0.0089	0.0089	0.0000	0.0000	1.000
	TSQ	0.013	0.013	0.013	0.0037	0.0037	1.000
H.M.S.E.	*TR*	0.0000	0.0000	0.0000	0.0000	0.0000	1.000
	TSQ	0.0000	0.0000	0.0000	0.0000	0.0000	1.000
H.M.A.E.	*TR*	0.0000	0.0000	0.0000	0.0000	0.0000	1.000
	TSQ	0.0000	0.0000	0.0000	0.0000	0.0000	1.000
S.R.		0.7049	0.7049	0.7009	0.7069	0.6996	0.7123
D.o.C.		18.0905***	18.2695***	17.7021***	18.2782***	17.6150***	18.5791***

Figure 5 – Dynamics of the WTI spot price outside the sample data.
Note – the drawing was compiled by the source (Mengyan Yu et al. 2023).

	γ = 3		γ = **6**		γ = **9**	
	C.E.R.	S.R.	C.E.R.	S.R.	C.E.R.	S.R.
Model-1	0.9191	0.3714	0.9185	0.3714	0.9183	0.3714
Model-2	0.9192	0.4038	0.9186	0.4038	0.9183	0.4038
Model-3	0.9194	0.4621	0.9186	0.4621	0.9184	0.4621
Model-4	0.9195	0.4592	0.9187	0.4592	0.9184	0.4592
Model-5	0.9192	0.4155	0.9185	0.4155	0.9183	0.4155
Model-6	**0.9198**	**0.5557**	**0.9189**	**0.5557**	**0.9185**	**0.5557**

Figure 6 – Comparison of the economic results of competing models.
Note – This figure is compiled by the source (Mengyan Yu et al.2023)

In the MCS simulation, the confidence level of consent was set at 90% (see Table 5).

(Chang et al., 2022e) In addition, Inspired Achievement (SR) is another possible predictive metric that we are considering in light of Herrera's research. In order to find out whether the development is statistically significant, we additionally use the experimental Direction-of-Change (DOC) test from (Wang et al., 2017).

Financial uncertainty has significantly increased the volatility of the oil market. The impact of monetary uncertainty on oil market volatility has already been noted in the work (Y. Li and Um air, 2023), and our results confirm their conclusions. The results obtained indicate that the volatility of world oil prices may be influenced by changes in monetary policy and economic indicators. Secondly, a regime-switching approach was used

to identify and define several market regimes, each of which is characterized by unique volatility. The results obtained indicate the presence of two separate regimes, one of which is characterized by minimal volatility, and the other by high volatility. It has been shown that changes in the degree of uncertainty of monetary policy affect these regimes. The multiplicity of market regimes in the context of oil price volatility is consistent with the conclusions drawn in the work (Wang et al., 2022).

In addition, the researchers compared the results obtained using the GARCH method with the results of other approaches. The mode-switching Model GARCH has surpassed the standard model GARCH in data fit and volatility prediction accuracy. In accordance with the results of the work (Safari and Davallou, 2018), which emphasizes the usefulness of mode-switching models to reflect the dynamics of oil price volatility, we have shown that oil prices tend to switch from one mode to another. We used the mode switching paradigm to represent the dynamic and unpredictable nature of volatility. Using this method, several market modes can be distinguished, each of which is characterized by a characteristic level of volatility. In our study, we found two separate volatility modes (low and high). It has been shown that changes in the degree of monetary uncertainty affect these regimes. Our results are consistent with the results obtained in the work (Chang et al., 2022a), which examined the relationship between oil price volatility and various market regimes.

In addition, the oil market is certainly seen as an indicator of danger. It also has a time-varying effect on macroeconomic factors, which increases the ability of the M5 and M6 models to predict oil volatility. Moreover, we include this effect in the model and determine whether its use can improve the accuracy of forecasts. The answer is positive (L.I. Tenkovskaya, 2023), therefore, when modeling the active relationship between MUI and the unpredictability of unrefined fuel, it is recommended to include transitions of variable modes. From the analysis of forecasts, it can be concluded that, given the impact of oil shocks on financial markets, the authorities should pay special attention to the development of monetary uncertainty (Ahmad, T. et al.2020). Meanwhile, the assessment of the oil surge is useful for understanding the impact of monetary uncertainty on the economic environment. However, policy makers must make appropriate policy decisions over time due to various time fluctuations that increase financial tensions and volatility of crude oil. On the other hand, increased monetary uncertainty may cause market volatility due to some external disruptions in the oil industry. Crude oil traders may tend to be passive. Better forecasting of crude oil volatility can help investors reconfigure their portfolios in advance and avoid significant economic losses.

Results and discussion

Currently, Kazakhstan's oil market is going through a period of transformation caused by various factors such as changes in the global economy, technological innovations and changing consumer preferences. The political situation in neighboring countries is particularly acute, such as Russia's war with Ukraine, EU sanctions against Russia and much more. Due to the unstable situation in a number of other countries, Kazakhstan is forced to look for ways of other transit routes bypassing Russia to ensure the safe transportation of oil to the eurozone to the main oil buyer.

The oil crisis was the main cause of the recession of the 1970s, which mainly affected the economies of Western countries. Since then, there have been many publications devoted to the study of the impact of oil price shocks on macroeconomic variables. However, the debate on this front continues due to conflicting empirical evidence and the general macroeconomic effects of oil price shocks in both developed and developing countries (Morana, 2017).

Fluctuations in oil prices have a significant impact on the economy and the financial sector. An increased concentration of unpredictability in oil prices indicates instability or activity in oil markets. Given the uncertainty of oil prices, business companies can make or reject a number of economically important decisions, such as investments, production volume, and a tendency to spend a lot (Li and Sun, 2020). Therefore, the volatility of oil prices will eventually have negative consequences for the economy or the monetary sphere (Chang et al., 2022d). It can be assumed that there is a significant connection, given that the debt burden and the unpredictability of oil prices regularly go hand in hand. The study of the relationship between oil and other global financial groups has traditionally been given great attention.

However, the new level of oil instability during the COVID-19 crisis has revived the attention of researchers to this topic. According to the results, the price of Brent oil also fell to $81.6 per barrel (-2.5%) after a member of the Board of Governors of the Federal Reserve, Christopher Waller, said that the reduction of interest rates in the United States

could be postponed for at least two more months. This, in turn, may limit economic growth in the United States and, consequently, the demand for oil from one of its main consumers. Also, some pressure on the quotes could be exerted by the ongoing negotiations on a truce in Gaza in Paris, the successful results of which could contribute to ending the Middle East conflict and, as a result, reduce the risk premium inherent in prices.

Forecasting oil volatility has long been an urgent problem. Past research has found evidence that monetary uncertainty or an indicator leads to economic recessions. Increased MUI rates are able to increase the cost of loans.

How else does oil volatility react to economic pressures? These facts can be interpreted as follows. First, MUI significantly increases the ability to anticipate changes in oil volatility. An increase in the volatility of the financial system can affect the productivity of the global economy, as well as the supply-demand structure of oil, one of the most important sources of energy, since it is inextricably linked to economic activity. Therefore, the supply-demand structure of crude oil is significantly influenced by the uncertainty of monetary policy, which, accordingly, affects the volatility of oil prices. The dangers of other financial markets have increased as the financialization of the oil industry increases, economic macroeconomic factors can directly affect changes in stock prices for unrefined fuel, model TVTP-MS-GARCH is working, so why? The question of the structural decomposition of oil volatility has long been a matter of concern. The logical explanation of elements such as exceptional cases causing temporary, permanent, modifications and changes in the numerical characteristics of price volatility. Motivated by previous research, they show that models that include the switching method significantly increase the accuracy of forecasting compared to models that do not (Aye, G.K. et al., 2014). The results emphasize the importance of taking into account monetary factors when studying the dynamics of crude oil prices.

It is worth paying attention to the fact that oil prices are not only dependent indicators, they are also capable of radically changing economic conditions. There are scientific studies proving that oil price shocks affect the stock markets of developed and developing countries, stock prices of individual companies, in particular energy companies, and exchange rates (Barron'S, 2023). It is known that oil at affordable prices has a negative impact on the environment.

It can be assumed that there is a significant connection, given that the debt burden and the unpredictability of oil prices regularly go hand in hand. The study of the relationship between oil and other global financial groups has traditionally been given great attention. Thus, the transformation of the oil market in Kazakhstan reflects the changing conditions and requirements of the modern economy, and companies and the government of the country are actively working to adapt to the new conditions.

Financial globalization has a significant impact on the oil market, leading to changes in the structure and dynamics of this market. One of the key aspects of the transformation of the oil market in the context of financial globalization is the increase in competition among oil producers from all over the world.

Currently, there is a need to search for new economic indicators that can change world oil prices. This is due to the fact that from 2014 to the present, according to the results of researchers, it has been proved on the world market that oil prices no longer depend on supply and demand (L.I. Tenkovskaya, 2023).

Financial instruments such as futures and options allow oil market participants to protect themselves from the risks of changes in oil prices. This helps to reduce price fluctuations and increase market transparency. In addition, financial globalization promotes the development of new technologies in the oil production and refining industry, which increases production efficiency and reduces costs.

In the context of financial globalization, investments in infrastructure development and oil transportation also play an important role, which contributes to the expansion of the world market and an increase in trade volumes. Thus, the transformation of the oil market in the context of financial globalization leads to its more efficient functioning, increased competition and increased transparency, which ultimately has a beneficial effect on the entire industry (Kamilla Aznabakieva, 2024). Thus, it can be concluded that the oil market of Kazakhstan is in the process of active transformation. This is influenced by various factors such as changes in global demand, technological innovations, geopolitical events and strategic government decisions.

For the successful development of the oil industry in Kazakhstan, it is necessary to take into account all these factors and make competent strategic decisions. It is important to continue investing in new technologies and developing our own production facilities in order to increase

competitiveness in the global market. In addition, it is important to develop partnerships with other countries and companies in order to expand sales markets and diversify oil supplies. This is the only way to ensure stable growth and sustainable development of the oil industry in Kazakhstan.

Conclusion

This article examines the impact of monetary policy on the formation of oil prices in modern conditions. Understanding these relationships will enable policymakers, investors and businesses to better navigate the complexities of the crude oil market. Continued research in this area will contribute to the development of the economies of the countries. Monetary policy is one of the main instruments of state regulation of the economy and has an impact on the formation of oil prices in modern conditions of Kazakhstan.

One of the main mechanisms for the impact of monetary policy on the price of oil is the management of interest rates. For example, if the central bank reduces interest rates, this may lead to a decrease in the cost of bank loans and stimulate investment in oil production, which in turn may affect the volume of oil production and, as a result, its price.

On February 23, 2024, the USDKZT pair decreased to 450.05 tenge per dollar (-0.41 tenge) with a trading volume of $167.8 million (+$11.8 million). Participants in the local currency market probably assessed the decision of the PREP committee to reduce the base rate immediately by 50 bps, to 14.75%. Meanwhile, the NBK noted that despite the steady slowdown in global inflation and price growth within the country, about inflationary factors (stable domestic demand, uncertainty of fiscal policy, high inflation expectations) they are still being saved. Against this background, the regulator signaled a possible pause in the cycle of easing monetary conditions in Kazakhstan.

It is well known how fluctuations in crude oil prices affect the global economy and financial markets. The relationship between oil shocks and other sectors of the global monetary system, in particular investment markets, has been studied in a number of earlier studies, bond markets, precious metals, exchange rates, interest rates and banking institutions. Interestingly, the susceptibility of the financial system to oil shocks cannot be accurately predicted if one focuses only on one sector of the financial markets, the study warns. However, this can give confusing signals. But despite all the difficulties of calculations to identify problems and solve oil shocks and much more, many countries set themselves the following tasks:

− ensuring wide reproduction of the entire raw material base of the oil industry;

− the appropriate use of oil reserves;

− energy saving;

− minimizing losses at all stages of the technological process;

− an increase in the number oil companies in foreign markets;

− deepening of oil refining;

− creation and improvement of new producing oil fields.

Of course, this significantly increases the risks of non-fulfillment of the set tasks in development. That is why it is necessary to involve the state itself in this industry and integrate the monetary system in such a way that it can quickly respond to certain shocks. This is the only way the oil and gas sector can become as efficient as possible, all available and promising reserves of petroleum products will be used productively, as well as reducing the energy intensity of GDP (Expocentre Fairgrounds, 2024).

As a result of taking into account periodic regime changes, investors in the crude oil market can manage their portfolio more flexibly and refrain from risky investments, balancing MUI and volatility of crude oil, which affects authorities controlling fiscal uncertainty and cost control in capital markets to a greater extent. In addition, we suggest that policy makers get an idea of the severity of the economic burden. Oil volatility has been an important parameter for some time now, showing the risks of the business environment. In addition, the volatility of oil, as a rare energy carrier, is easily affected by the development of the global economy, and many note that almost any kind of financial uncertainty and uncertainty can have a significant impact, stimulating the global financial system. This will transfer the risk of the business system to the crude oil market, as well as gradually complicate the study and training of actions in the crude oil markets. At the same time, several scientists are building numerous indices of monetary anxiety, reflecting the volatility and unpredictability of the financial market. A significant number of the Economic Stress Index (MUI) indicates that the financial market is becoming more volatile. In these circumstances, investors may face more stress on the financial sector than usual (Liang,C.,et al.,2022). In this regard, more and more research is devoted to the use of MUI to identify the mechanism that affects both the price of oil and the uncertainty of monetary policy.

Since the United States economy is relatively the largest, the US dollar is the first world currency, and the economic development of the United States is based on the monetary incentives of the US Federal Reserve System, it can be assumed that world oil prices expressed in US dollars will increasingly fall under the influence of American monetary policy. To test this hypothesis, a multiple linear regression equation has been calculated, proving the formation of Brent crude oil prices using indicators of the monetary policy of the US Federal Reserve System. Although the presented equation is not without drawbacks, it is already able to explain the behavior of the independent variable in the form of Brent crude oil prices. It is known that over time (for example, since the beginning of 2016), the correlation between oil prices and the indicators of the monetary policy of the United States only increases. But in this scientific article, the equation of multiple linear regression is given, calculated according to data from 2014-2023, because during this period, supply and demand no longer influenced oil prices on the world energy market. It is advisable to continue research in this area and investigate the dependence of these indicators in later periods. In connection with the above text, investors are advised to pay attention to the policy of the US Federal Reserve System when creating their investment strategy (Fischer, R. et al., 2022).

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IMPACT OF PANDEMIC COVID-19 IN THE GLOBAL SOUTH AND POLITICAL RESPONSE ON THE ECONOMY: A STUDY ON SELECTED AFRICAN COUNTRIES

The purpose of this paper is to examine how COVID-19 has affected the Global South and what major response was given by the policymakers to improve the pandemic situation and improve the economy of the Global south specially in selected countries in Africa. It explores the social and economic effects that pre-existing structures, inadequate political responses, and several crises, along with other variables. This pandemic had created significant adverse effects on the Global South economies. The shutdown declared by countries at the world level and its effect on business in commodity, tourism, service sector, education, and money flows have all had an impact on the gross domestic product (GDP). Those countries experience adverse effects that are vulnerable in all sectors in the middle lockdown term due to adverse implementation of their policy and less resourced supply to their population. Additionally, COVID -19 is having negative social effects like the emergence of new susceptible and increased inequality among the people. This paper discusses some of the policies implemented by the Global South at the time of the pandemic crisis, and their effects on the population which is also characterized by their inability to access domestic resources and their restricted ability to access foreign financial resources.

Key words: Global south, pandemic, COVID -19, political economy, gender disparity, unorganized sector, financial resources, African countries.

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COVID-19 пандемиясының жаһандық оңтүстікке әсері және экономикаға саяси жауаптар: Африканың жекелеген елдері бойынша зерттеу

Бұл мақаланың мақсаты COVID-19 жаһандық оңтүстікке қалай әсер еткенін және пандемия жағдайын жақсарту және жаһандық Оңтүстік экономикасын жақсарту үшін саясаткерлер қабылдаған негізгі шараларды, әсіресе Африканың жекелеген елдерінде зерттеу болып табылады. Ол бұрыннан бар құрылымдардың әлеуметтік және экономикалық салдарын, саяси жауаптардың жеткіліксіздігін және бірнеше дағдарыстарды, сондай-ақ басқа айнымалыларды зерттейді. Бұл пандемия жаһандық Оңтүстік елдерінің экономикасына айтарлықтай теріс әсер етті. Әлемдік деңгейде елдер жариялаған жабылу және оның тауарлар, туризм, қызмет көрсету секторы, білім беру және ақша ағындары саласындағы бизнеске әсері жалпы ішкі өнімге (ЖІӨ) әсер етті. Бұл елдер өз саясатының қолайсыз орындалуына және халықтың ресурстармен қамтамасыз етілуінің төмендеуіне байланысты карантиннің орта кезеңінде барлық секторларда айтарлықтай жағымсыз салдарға тап болды. Сонымен қатар, COVID-19 жаңа сезімтал аурулардың пайда болуы және адамдар арасындағы теңсіздіктің артуы сияқты жағымсыз әлеуметтік салдарға әкелді. Бұл мақалада пандемия дағдарысы кезінде жаһандық Оңтүстік елдері жүзеге асырған кейбір саясаттар және олардың ішкі ресурстарға қол жеткізе алмауымен және шетелдік қаржылық ресурстарға қол жеткізу қабілетінің шектеулі болуымен сипатталатын халыққа әсері талқыланады.

Түйін сөздер: Жаһандық оңтүстік, пандемия, COVID-19, саяси экономика, гендерлік теңсіздік, ұйымдаспаған сектор, қаржы ресурстары, Африка елдері.

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Влияние пандемии COVID-19 на глобальном юге и политические ответные меры на экономику: исследование по отдельным африканским странам

Целью данной статьи является изучение того, как COVID-19 повлиял на Глобальный Юг и какие основные меры были приняты директивными органами для улучшения ситуации с пандемией и экономикой Глобального Юга, особенно в отдельных странах Африки. В нем исследуются социальные и экономические последствия ранее существовавших структур, неадекватных политических ответов и нескольких кризисов, а также других переменных. Эта пандемия оказала серьезное негативное воздействие на экономику стран Глобального Юга. Закрытие, объявленное странами на мировом уровне, и его влияние на бизнес в сфере товаров, туризма, сектора услуг, образования и денежных потоков – все это оказало влияние на валовой внутренний продукт (ВВП). Эти страны испытывают неблагоприятные последствия, которые уязвимы во всех секторах в среднесрочном периоде карантина из-за неблагоприятной реализации их политики и недостаточного снабжения их населения ресурсами. Кроме того, COVID-19 имеет негативные социальные последствия, такие как появление новых уязвимых групп населения и усиление неравенства среди людей. В этом документе обсуждаются некоторые политики, реализованные странами Глобального Юга во время пандемического кризиса, и их влияние на население, которое также характеризуется неспособностью получить доступ к внутренним ресурсам и ограниченными возможностями доступа к иностранным финансовым ресурсам.

Ключевые слова: Глобальный юг, пандемия, COVID-19, политическая экономия, гендерное неравенство, неорганизованный сектор, финансовые ресурсы, африканские страны.

Introduction

This paper examines some of the major problems that the COVID-19 pandemic has brought up in the Global South. The paper explores the effects of the global health crisis on migration, climate change, economic inequality, development, and gender while contextualizing it within broader processes of globalization. This paper gives crucial insights into how the impact of COVID-19 might be mitigated in some of the most difficult socio-economic circumstances worldwide, providing solutions that will be crucial for development practitioners and policymakers. The world has been rocked by the COVID-19 (coronavirus infection 2019) epidemic. The virus has had a disastrous effect on economies and societies around the world, inflicting a great deal of pain on individuals both directly and indirectly. The world economy has stagnated, international travel has almost completely stopped, and several countries are experiencing "lockdowns" that are being imposed by the governments. Several countries have had severe recessions because of supply and demand shocks, and many global value chains have been badly affected. The government's response to the epidemic largely caused these economic shocks, which will have long-lasting social and economic effects (OECD, 2020; Azami, 2020).

Global South Countries

The Global South can be defined in several ways. The "Global South" refers to those nations that are underdeveloped or economically disadvantaged. These countries typically have fragile democracies because they historically have been colonized by the Global North or by the Capitalist Economies (especially by European countries like the United Kingdom, Germany, France, Portugal, The Netherlands etc). The second idea refers to the Global South to address populations that are negatively impacted by capitalist globalization. According to these ideas, the Global South is distinct from the Southern Region. However, to avoid ambiguity, inaccuracy, and potential harm, many academics prefer to use the terms "developing countries" or low-income economies. The global south consists of several nations encompassing the nations of Latin America, the vast majority of Africa, and some of the Middle East, Asian continent except Japan, South Korea and Singapore.

COVID – 19 and its impact on African countries in Global South

In the Global North, lockdowns have been utilized to halt the disease's spread and prevent the hospital sector from becoming overworked. The Global South appears to be affected differently, however; this is changing as the disease's geo-

graphic epicenters shift (Aidil,2020; Bhattacharya, and Islam, 2020).). Due to the developing world's high levels of reliance on the informal sector for survival and the general absence of comprehensive health, social security, and public policy aid measures, lockdowns were frequently promptly imposed, frequently with catastrophic repercussions on livelihoods. South Africa, Namibia, Mozambique, Botswana, South Sudan, Democratic Republic of Congo, Chad, Zambia and Zimbabwe are some countries that suffered more due to COVID-19 Even though a few countries recently lifted their lockdowns as of mid-2020, the "secondary impacts" of the crisis are therefore more noticeable among the Global South nations.

The right to health, education, money, and freedom from hunger are just a few of the other rights that the epidemic has called into doubt. States' actions and inactions may have caused disproportionately high rates of fatalities and serious disease among specific groups of the population (Bhattacharya, and Khan, 2020). For instance, why did many Global South regions cut back on public healthcare? Certain minorities may have been singled out by some states as "problem" population in their decisions.

This is particularly clear in the LDCs' dominant informal economy. In other countries in Africa, where subsistence farming is included, it makes up more than 85% of the labour force. This is partially attributable to the public and private formal sectors'. This is due to the poor marginal productivity of the labour force in this industry. Poor tax returns are the outcome of the unorganized sector's presence worldwide.

Most significantly, the Global South accounts for more than 75% of the nations in the index's lowest category–those deemed to be "least prepared." One would anticipate that the Global North and South experience the pandemic's effects differently, with the earlier dominating the latter. This is not always the case.

The Global South has experienced significant negative economic and social repercussions of COVID-19, which are especially severe in nations with greater poverty and inequality. Unfortunately, in these situations, adaptation strategies have been much more minimal, and the global community is doing nothing to change this.

Challenges of COVID-19

The events over the last 2 years in 2020 that have proven the pandemic has had a significant impact on both the economy and quality of life. This investigation uses a paradigm that incorporates transmissions, moderating factors, and impacts to investigate the systemic alterations brought on by Pandemics.

With three important spreading pathways (or linkages among the indirect and direct impact of a pandemic, see Figure 1), EBOLA and SAARS were discovered before 2015 in Africa, but according to the World Bank (2014) some developing countries were exposed to socioeconomics effect due to COVID -19 in the global south. The first pathway or route is directly related to the greater mortality, of sickness, including the price tag attached to healthcare sector preventative and care initiatives, etc. The second channel is concerned with the quick responses taken (such as social isolation and movement restrictions) to stop the infection from spreading. In the Global South, COVID-19 restrictions have varied in type, duration, and severity, and policies are always changing. The third transmission route is the COVID-19-related global slowdown.

The economic crisis will continue to affect all nations and areas (Delvac, 2020). This occurred due to the concerns about pandemic and health crises and the layer of the interconnection of those nations the degree of interconnectedness and the health crisis in the economy of the global south, most evaluations of the impact of a pandemic on the economy show that this crisis will be of old ratio and those countries in the northern hemisphere of the globe will feel a larger reduction in Comparisons of the southern hemisphere on the globe. An international body that is the "International Monetary Fund" (IMF), in the month of June 2020 had estimated and forecasted that developed economies would increase by 4.8% in 2021 and decrease by 8% in 2020.

According to IMF (2020[a]) estimates, developing and emerging countries in terms of their economic growth would decrease by 3% in 2020 and expand by 5.9% in 2021. According to later projections (by World Bank and by the IMF 2020[a]), some African economies suffered a 6% hit in 2020, but wealthy nations are anticipated to recover more quickly in 2021 and 2022. The COVID-19 pandemic's effects are influenced by several additional mediating elements in addition to these transmission pathways.

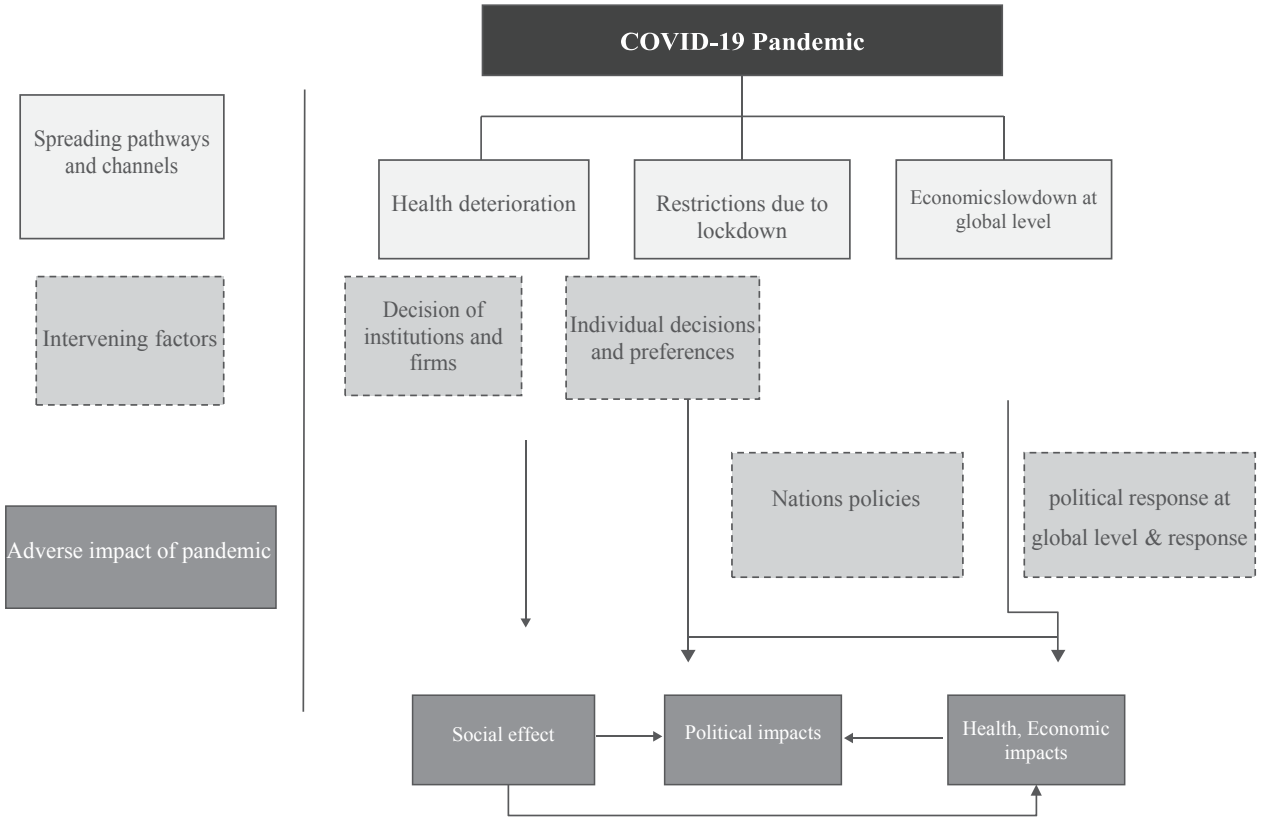

Figure 1 – Shows COVID-19's possible economic and social impact channels.
Note – adapted by the author from World Bank Group (2014)

The effects of three transmission channels – health decline, slowing of the world economy, and lockdowns and movement restrictions – are discussed in the following subsections. Even if some of these effects are now apparent, the full extent of these effects may only be determined with more time and information shortly.

Literature review

Following literature support, the objective of this paper deals with the pandemic and the political response given by policymakers, due to food instability brought on by the pandemic, new health hazards like malnutrition have emerged. A report published by Organization for Economic Co-operation and Development (OECD, 2020).

The World food program (FAO) projects that the pandemic will leave 130 million people with severe hunger and an additional 132 million people with insecurity about food availability (World Food Programme, 2020; FAO et al., 2020). These are especially concerning for nursing moms, young children, and expectant women. Children rely on ineffective school nutrition programmes in several LDC and middle-income economies. Early food insecurity has been linked to problems with physical and cognitive development, and more particularly, to later-life issues with poor scholastic performance and intellectual consequences (Perez-Escamilla et al., 2020).

Elderly deaths have additional negative effects on indigenous societies since they contribute to the loss of ancestors' knowledge (Cotacachi & Grigera, 2020). The policy preparing for Combatting COVID-19 and Sustainability of African Economies, what is the current response of COVID -19 in the global economy, this report was submitted to the Office of the United Nations High Commissioner for Human Rights (OHCHR, 2020).

Research gap

Much research has been done on COVID -19 and its impact on the economy, especially the global south and its effect during the pandemic, but there is a lack of study related to political economy of pandemic and the impact of COVID -19 in Global South. So, this paper will deal the study about the impact of pandemic and political response for

mitigation of COVID-19 impact and its future scope for facing such problems and its solution.

Effects of Pandemic COVID -19 on the world economy

Although the effects on health have been extremely varied, as was previously mentioned, all sectors are in negative growth due to the worldwide lockdown and all nations experienced see their economies decline. In general, nations that rely heavily on tourism, export oil, and have limited resources are projected to be the most negatively impacted in the medium-term medium-terms due to travel restrictions and the decline in demand for and pricing of commodities. On the other hand, nations with more diverse economic structures and less resource-intensive economies are anticipated to be more resilient. All regions are extremely vulnerable to outside shocks, especially those affecting the demand for important commodities.

The reduction in global commodity demand has an impact on Africa's major economies, including South Africa, Nigeria, and Angola. The basic need for the export of African mineral ores, oil, and metals, will continue to be impacted by the growth slowdown in major economies, including China, as well as other nations with significant supply chain participation. This is important for nations that are increasingly involved in manufacturing commodities, such as Ethiopia and Kenya, as well as agribusiness. Although global commerce and industrial output increased, business investment in Asia remained muted against the backdrop of persisting concerns about the US-China trade war resuming.

The likelihood of a rebound into 2020 appeared to have peaked late in 2019. During this time, the pandemic had a negative effect on the manufacturing industry and halted efforts to reduce trade tensions. Even as China begins to progressively reopen its industries, economic activity in nations like Indonesia, Vietnam, and the Philippines shrank drastically (World Economic Forum, 2020). China is expected to grow quickly in 2020 and 2021, while nations like Vietnam have made significant turnarounds.

In the Global South, industries like tourism, and the handicraft industry that are closely related to the core economy are especially in a challenging situation. Africa heavily depends on travelers from Europe and, to a greater extent, Asia. According to a poll conducted by (La Asociación de Investigación y Estudios Sociales [ASIES], 2020) in May 2020 in Guatemala, for instance, 85% of the country's tourism-related enterprises were shut down. Export-oriented industries are among the ones affected by the pandemic. For instance, the garment industry in Bangladesh has been negatively impacted since "orders were canceled worth of 3.15 billion. In Cambodia, 60,000 workers have had their work interrupted (Bhattacharya & Islam, 2020).

The chance that the economic crisis may turn into a financial crisis has increased because of countries, particularly those in Asia, experiencing reduced activity in financial markets and depreciation in their currencies. For instance, the Thai baht and the Indonesian rupiah have both seen significant devaluation even against the currencies of their trading partners, which has made bank lending difficult (OECD, 2020[b]). Finally, remittances are being impacted by COVID-19. "Remittance flows to middle- and low-income countries are projected to decline by around 20% by 2020, from $554 billion to $445 billion" (World Bank, 2020). This can be because of the workers' lack of security in the nations where they are now employed and their incapacity to utilize the financial assistance offered by the governments of south global.

Objectives

1) To analyze the impact of pandemic COVID 19 in the Global South.

2) To evaluate the response of political economy for improvement, Reform the economic situation suffered by people in the global south.

Methodology

This section analyses secondary data obtained from various sources and research journals. These include data from government sources, international organizations such as the ILO, IMF, UNCTAD, World Bank, BRICS, NDB, ADB, AIIB, IDB, and reputable global NGOs operating in the Global South. Additional sources include UNESCO, ECLAC, WHO, SAARC, OECD, and South-South cooperation initiatives. This comprehensive analysis underpins the study presented in this research paper.

Discussion

Impact of COVID -19 on the unorganized economy in global south

The epidemic is currently resulting in lost salaries and other kinds of revenue. A severe economic downturn is predicted to worsen inequality, unemployment, and poverty over the medium term. Over 1.6 billion undocumented

employees are affected by lockdowns and other restrictive measures globally (67% in middle-income nations and 90% of overall employment in low-income countries) to a report submitted by (ILO, 2020[b]). Most workers have no access to social security and have poor earnings. Because they have lost their source of daily revenue due to lockdowns, they are in a dire predicament. Small-business employees, migrant workers, and independent contractors like construction workers and street sellers did not receive payment at the time of the Pandemic and are expected to see a drop in earnings following. Extreme poverty is anticipated to affect a sizable portion of informal, insecure employees who make between USD 13 per day and a minimum of USD 5.5. As of January 2021, there was an estimation by the World Bank that between near about 124 million populations were living in severe poverty (Lakner et al., 2021). The majority of the world's poor, who lived in South Asia, mainly India, and Sub-Saharan Africa prior to the pandemic, may be severely hit.

ILO (2020[a]) claims that in comparison to men, women are working in informal sector of the developing nations, with 92% of women working in these situations compared to 87% of males. Women are disproportionately represented in informal employment (53% versus 47%) in Latin America. In addition, women typically work in the most vulnerable occupations in the unorganized economy, such as local labor or artisans and vegetable seller or street vendors which are also the ones most affected by the population during the pandemic (UN Women, 2015).

In a recent survey of refugees from Venezuela, 87% of participants said that COVID-19 and the steps taken to combat the epidemic have lowered accessibility to employment (center for Mixed Migration, 2020). 60%of those surveyed also mentioned a decline in the supply of necessities (66%), a loss of housing (31%), and a rise in xenophobia (22%). Additionally, we know that migrant workers from other nations are returning to other economies, mainly in South Asia, due to either economic considerations or concerns about the virus.

Governments are working to develop and put into place economic recovery plans as well as social measures to lessen hunger and social catastrophe while the pandemic is still out of control. But ambiguity still rules. To lessen the negative effects, stop inequality from growing, and improve the situation, new policies are required.

Impact of COVID -19 on Gender in Global South countries

More females than males are affected by the crisis worldwide, and this is especially true in poorer countries. The amount of unpaid care work has greatly grown during times of quarantine and other limitations, as well as when kids aren't in school. Women typically provide care for their families; thus, they naturally have more responsibilities and domestic duties than males.

Due to problems of COVID-19 contribution of domestic violence against women has increased. According to the literature, this increase is brought on by stress brought on by poverty and economic insecurity, social isolation and confinement, conflict-related unrest and instability, and decreased access to first responders and health services (Peterman et al., 2020; Mlambo-Ngcuka, 2020). For instance, after governments implemented lockdowns in Argentina and Colombia in March, emergency calls to hotlines for domestic abuse rose by 40% and 90%, respectively. More than 30% more calls have been placed to hotlines in Singapore and Cyprus.

Lockdown in global south

The ensuing economic downturn and Lockdowns will particularly hurt Micro, small, and medium but informal sector businesses, which make important businesses globally [ILO, 2020[a]). Typically, low-skilled individuals with low payments, insecure jobs without social or health protection, and minimal job security are employed by these businesses. These businesses also exhibit limited production, meager financial capability, and little capital accumulation. As a result, they are more at risk from the crisis and frequently do not profit from economic packages that were provided to those sectors affected due to the COVID-19 crisis because of their informal status. For instance, preliminary studies conducted in Latin America predict that just 15% of these businesses will be able to continue operating (Vázquez-Zamora, 2020). Shutdown and transportation prohibitions have also impacted the lowered customer demand and food supply chain. Because of this, farmers are discarding perishable goods, which results in substantial financial losses for them and their communities.

Declining health due to COVID -19 in global south

The level of health impact and risk varies between and within regions, and these consequences are subject to rapid change. It is challenging to determine the entire scope of the pandemic's health effects because outbreaks have returned in even those nations that had early success in containing them. There is little doubt that the inadequate

health systems in many Global South nations have made it difficult for them to combat the pandemic (Izquierdo, and Talvi, 2011; Bair, Friedman, and Schady, 2011). Although the focus of this research is not on the pandemic's impact on health, it is important to note how different it is in the Global South. Data generally shows that Africa survived the pandemic with lesser health effects, including cases and fatalities. Some nations, including the Democratic Republic of Congo, South Sudan, and North Sudan, have also had to contend with secondary epidemics like Ebola and yellow fever in addition to the pandemic's direct effects.

Impact of COVID-19 on Mobility due to lockdown in global south

After numerous lockdowns and other restrictive measures, many nations were forced to choose agonizingly between protecting lives and maintaining their economies. Greater effects have been felt by poor populations in low- and middle-income nations, particularly those who reside in slums and informal settlements with limited access to amenities and who will rarely be able to do work from home and maintain social distance. Other risks are related to access to sanitation, and water, which reduces the capacity of immunity and impairs hygiene.

Reactions to National economy

Understanding the constraints of governments' capacity and opportunities to deal with socioeconomic impacts and COVID-19 health will need to take seriously on intervening variables related to countries' monetary policies and national budgets, along with international shocks to susceptibility. The two important factors–declining revenues and rising debts–that are both closely related to the global economic downturn are highlighted in this section. The Global South governments have only been able to respond in part to COVID-19 in this environment.

Africa continues to have the worst potential for resource mobilization when compared to other areas. In contrast to Asia (14%) and Latin America (18%), the UNECA estimated that the tax-to-GDP ratio in 2018 was 13.4%. (2020). Several factors contribute to Africa's low revenue mobilization, including initiatives to increase investment that, in most cases, entail potential investors forgoing tax or paying no tax at all, like in export processing zones special. However, the high level of informality in the region's economy is the primary factor contributing to a lower tax-to-GDP ratio (UNECA,2020). Similar difficulties exist in Latin America. Additionally, the region's governments' revenue has been impacted by the decline in commodities prices by a special agency of United national that is called [ECLAC] or (United Nations Economic Commission for Latin America and the Caribbean, 2020). Other side, even though most nations are middle income economy, and they are mostly English-speaking Caribbean nations, they are nevertheless severely indebted, partly due to the ongoing need to repair production infrastructure damage caused by weather calamities (ECLAC, 2020).

For instance, the least developed nations which are 22 in number in global south, will have announced that by the middle of 2020 they will have stimulus measures totaling about USD 1.9 billion. However, according to (Bhattacharya, 2020; IMF,2020[a]) this is only 0.4% of their GDP amounts, whereas the G20 countries' 3% of their GDP in their package amounts. Additionally, some governments aided the groups and industries that were most directly and immediately impacted by the crisis, such as tourism-related businesses, and trade for urban poor. Governments implemented policies to assist firms, including loan subsidies, payment postponements, tax and fee exemptions, and payment grace periods. The sectors given priority varied between nations. Burkina Faso, for instance, sponsored utility and other payments that firms were required to make to the government. Cameroon concentrated on giving tax withholding concessions for minor traders, motorcycles, and taxis. For businesses in the tourism industry with cash flow issues, on taxes to be paid for the payment of Costa Rican Tourism Institute Costa Rica offered a four-month deferment. Countries like Malaysia, Cambodia, and Brazil gave cash transfers to help the most vulnerable households, while Tanzania made utilities more affordable.

Results

As discussed in the preceding sections, the Global South is not the only region of the world that was affected by the slowdown. To handle the pandemic's immediate effects, they also have limited capacity on their own. The global development organization has deployed assistance and will need to keep doing so to help the weaker Southern countries with their economic problems. Some nations have turned toward borrowing from home-based banks and from abroad or non-bank organizations. The declining balance of payments caused by the near collapse of remittances from migrant workers and export revenue (particularly oil money) in many countries increases the demand for

external investment. Revenue from exports of goods is the most significant external financing source (as a percentage of GDP) for both nations with low incomes and lower-middle countries with high. In terms of the (low-income country) LICs, other official flows (OOF)and official development aid (ODA) come in second (on average accounting for 22% of GDP) but have little bearing on the LMICs (less than 2%).

LICs are more dependent on bilateral suppliers, according to a detailed examination of the composition of dependency on ODA and OOF (OECD Development Assistance Committee). About 75% of the input comes from the reporting on-DAC countries or [DAC]) plus, with the remaining 25% coming from various multilateral sources. Bilateral have a less significant role in the LMICs, making up roughly 50% of ODA flows and OOF.

Table 1 – shows how much ODA and OOF depend on LICs and LMICs (bilateral and multilateral)

Indicators	Low income countries (LIC)	Lower-middle income countries (LMIC)	Total weighted average (LIC+LMIC)
(% of GDP) Multilateral OOF	3.38	0.41	3.60
(% of GDP) Multilateral ODA	3.31	0.20	1.65
(% of GDP) Total ODA	10.61	0.58	5.25
(% of GDP) Bilateral ODA	7.60	0.46	3.78
(% of GDP) Bilateral OOF	7.30	0.40	1.80
Total GDP %	10.98	0.87	5.58
Note – UNCTAD stat (2019), OECD stat (2019), adapted by the author.			

Table 2 – Lockdown use and COVID-19 infection rates in the African nations: selected countries

Country	Infection rate × 100,000
South Africa (lockdown)	1561.8
Nigeria (lockdown)	21.0
Namibia (lockdown)	918.1
South Sudan(lockdown)	27.5
Note - Authors' own elaboration based on data from WHO COVID-19 Dashboard.	

To overcome the structural weaknesses of the lower income countries (LIC) and lower middle-income countries (LIMC), external finance is essential. Given that they are only now being put into practice, it is challenging to gauge the effects of these initiatives, but it is nonetheless crucial to consider their method and scope to judge whether they will be faced by Global South and will be sufficient to address the economic challenges.

Many Southern agency providers struggled to respond in the weaker developing economies associated with major employment challenges and health emergencies. Regional development banks and International financial institutions played a more significant role in the immediate response to COVID-19 than their bilateral counterparts. Many of these organizations opened doors for the flow of funding. However, it is necessary to evaluate the efficacy of such initiatives to increase the fiscal space of low-middle and low-income nations in the Global South.

The increase in the distribution of development cooperation to LICs and LMICs is the focus of the second mode of the existing channels. Bilateral and multilateral channels are also possible sources of financial assistance. Bilateral organizations may decide to reallocate already made commitments to COVID-19 goals in addition to extending additional ODA. Under their quick reaction facilities, regional development banks, the IFIs, and the World Bank, which includes the IMF may provide fresh loan lines. Along with the new financial institutions and

traditional lenders established by Asian Infrastructure Investment Bank (AIIB), and Southern nations may play a noticeable role in supporting COVID-19 rehabilitation.

Funding support to the African nations in the region of the global south.

The International Monetary Fund (IMF) has been responding to requests for emergency funding from 102 nations since the pandemic's onset. In total, the IMF currently provides member nations with about USD 250 billion, in the form of loans or 25% of its that is USD 1 trillion lending capacity, grant-based debt relief. The main body of the IMF which is called the executive board has approved the grants to the poorest members to pay their IMF debt obligations for a six-month initial phase, providing immediate debt service relief to 29 countries (IMF, 2020[b]). The instruments and finance facilities used by the IMF to respond are already in place. Several of them, mainly the Rapid Credit Facility (RCF) and Rapid Financing Instrument were established in the wake of the 2008–2009 financial crisis (RFI) and global economy. The IMF has also launched new funding programmes or modified existing ones to address urgent new demands brought on by the pandemic, including a Short-term Liquidity Line (SLL), Relief Trust (CCRT) and Catastrophe Containment. To address the financial effects of COVID-19 most vulnerable members and on the poorest to pay for their debt obligations related to IMF, the CCRT was modified (IMF, 2020[b]). To dramatically increase the CCRT and expand the time frame up to two years for grant-based debt relief, the IMF is now seeking money.

1) The SLL was established to a renewable backstop facility and provides a rotating for member nations in need of temporary modest balance of payments support but with extremely strong policies and fundamentals (IMF, 2020[b]). For the certain balance of payment needs, this window offers very strong members "swap-like" liquidity support.

2) Money coming in from regional development banks: the Social Inclusion and Employment Facility and the COVID-19 Crisis Response Facility are the two principal funding sources that the African Development Bank (AfDB) has utilized (PARISE). The first offers loans, while the second offers grants. The LICs received a higher portion of the USD 1.6 billion overall contributions, which totaled USD 1.6 billion. A variety of financial tools, including new facilities, were proposed by the ADB. In 2009 the countercyclical support facility and a COVID-19 Pandemic Response Option (CPRO) were established, which was the most significant of them; has been added to it. $9.9 billion USD was the entire cost of the layout. USD 2.8 billion dollars is now allocated by The Inter-American Development Bank (IDB) to address the economic repercussions and public health crisis through new crisis-resolution initiatives and modifications to the 2020 loan program.

Passes via the UN system: About USD 16 million in funding came from the UN system, of which the LICs received about 56%. These monies were sourced in considerable part from the Worldwide UN Fund: more than 40% in the case of LICs and China has aided and support for the coronavirus outbreak, with an estimated USD 280 million going to Africa specifically. It should come as no surprise that private Chinese donations have exceeded government Chinese aid in the COVID-19 reaction. It is currently "the largest bilateral creditor on the continent, accounting for almost 20% of the region's external debt, according to many estimates" (Deutsche Welle, 2020). Southern development banks like some international banks are continuing to have access to global capital markets and have strong equity to loan ratios.

The role of BRICS bank to Global south region specially in south Africa and India

During the COVID-19 era, the BRICS New Development Bank (NDB), Asian Infrastructure Investment Bank (AIIB), and Islamic Development Bank (IsDB) have all started refocusing their financing programs toward investments related to health. The AIIB is providing up to USD 10 billion to assist member states in reducing health pressures. It also plans to increase investment in social infrastructure, raise liquidity, and increase budgetary support, the latter of which it will do in collaboration with other MDBs. The National Development Bank (NDB) has approved a USD 1 billion emergency loan to assist Chinese provinces in paying for public health expenses, such as the building of hospitals, and the purchase of medical supplies and is currently negotiating allocations of USD equal amounts to South Africa, India, and Brazil. According to reports, BRICS nations recently decided that the NDB should give up to USD 15 billion for BRICS members to help them rebuild their economies (New York Times, 2020).

On the other side, the IsDB has developed what it refers to as a "complete integrated response package" costing USD 2 billion with the intention of bolstering health systems, SMEs and funding trade in key countercyclical spending, generally assisting recovery and strategic value chain. According to UNCTAD, the sub-regional development banks in

Africa, the Caribbean, Latin America, and Asia, could increase the size of their loan portfolios by close to USD 25 billion by prudently reducing their equity-to-loan ratios. Additionally, Southern nations might use their current funds to increase urgently required liquidity. For instance, the BRICS might use their sizable foreign reserves to significantly increase their USD 100 billion Contingent Reserve Arrangement (CRA) and extend it to other developing nations that are experiencing severe cash constraints.

Regional banks and others in these areas could help considerably more if they increased the scale and scope of their assistance. In 2019, the equity-to-loan ratios of the Central American Bank for Economic Integration (CABEI) and China Development Bank (CDB), multilateral development banks (MDB), and CAF were all above 50%, exceeding the similarly high percentages now seen.

The Eurasian Development Bank (EDB), and Trade and Development Bank (TDB) in Africa had an equity-to-loan ratio of roughly 80%and 30% which was still rather high but lower than that of other sub-regional banks. As a result, these banks can lend more than they are already lending.

Another crucial area for South African cooperation is liquidity financing. Despite offering USD 1 trillion for nations in crisis, the IMF has yet to outline how it will proceed and what requirements countries must meet to access it. Another significant source of scaled-up liquidity might come from long-established regional liquidity pools, particularly for smaller nations with few or no other options.

These funds include the Eurasian Fund for Stabilization and Development (EFSD), the Arab Monetary Fund, and the Chiang-Mai Initiative Multilateralization (CMIM) the Latin American Reserve Fund (FLAR) the latter of which has a USD 240 billion pool for the benefit of the ASEAN+3 nations. These four funds are worth a combined USD 254.2 billion. Especially when compared to contemporary projections for the financial needs of emerging countries, this amount might not seem large (UNCTAD, 2020[b]; Georgieva, 2020b).

Traditional development partners' economic potential was partially constrained by lax trends in international commerce and investment, but more significantly, these nations were directly affected by the pandemic. Additionally, while the existing IFI facilities were set up to handle emergencies quickly, there was not enough liquidity to meet the urgent demand for money. Commentators have highlighted how COVID-19 has exposed the frailty of conventional development cooperation architecture and introduced cutting-edge approaches rooted in the given region (Khan, 2020[a]; Bhattacharya 2020[a]).

A proper response to the epidemic depends on a robust global system. Countries that have historically served as sources of development financing must investigate ways to maintain flexibility and be receptive to new ideas. But the international system also calls for active participation from nations in the Global South. For instance, developing nations must more actively investigate options to obtain financial flows from bilateral and multilateral sources in the South. Additionally, they must use the financial resources in the area. They should also coordinate their efforts to address some common problems, like debt alleviation. A global reaction should go beyond the total of the existing and newly created facilities by the development finance providers in keeping with the multilateral system's strengthening (Council of Europe. (2020). This is a rare chance to guarantee the coherence and coordination of these initiatives and to increase their impact. To achieve this, additional steps must be taken to bring providers and beneficiaries together to reach an understanding of the financial requirements, liquidity sources, priority locations, and nations, as well as the methods and funding instruments (McLean, R. and Marks, S. 2020).

Responses of national social policymakers in the African region

There are two different categories of susceptible groupings because of COVID-19: those who are directly impacted by the coronaviruses, and those who are impacted by its adverse social and economic effects. At the national level to maintain people's well-being means of subsistence, and human capital, an adequate response necessitates the articulation of economic, epidemiologic, policies, and social strategies (The Lancet, 2020). African Governments should prioritize vulnerable groups when battling the pandemic and during the recovery phase, not only to uphold human rights but also to minimize any potential long-term negative consequences on the welfare of their nations (Dongyu, 2020). Policies and Strategies created to protect vulnerable populations should consider the diversity of these groups, particularly in terms of the pandemic consequences they experience their vulnerabilities, and their unique needs (Venice Commission; 2016).

The difficulty of providing vulnerable populations with more than just social aid is one that southern nations must also overcome. For instance, by putting social policies into place to support

their effective reintegration into the economy. To that end, it's critical to make sure that any new or improved employment initiatives emphasize giving underemployed and jobless workers in precarious positions–particularly young people, women, and people with disabilities–economic prospects. To support these people, programs like "pay for work" and "food for work" should also be taken into consideration, learning from their prior deployment in Asia and Africa, primarily. Programs should also consider technical assistance and financial elements to support including self-employment, digital skills, and soft skills United Nations Office for Disaster Risk Reduction (NDRR) Africa (2020).

While the COVID-19 crisis is exposing the flaws in most nations' social safety systems and social security benefits must be better line with international norms, may arise specifically from the current crisis. In the future, the emergency measures that many nations adopted should be translated into long-term social safety programs for everyone, including those who are currently employed in the informal economy. To prevent the shrinkage of the formal sector and to foster formalization, policies should also give technical support and enough incentives to micro small, and medium enterprises.

Women, children, and youth should receive special attention from society as they are disproportionately affected by the crisis. In the upcoming months and years, action must be taken to safeguard children's access to education and better nutrition. The primary problem for governments is undoubtedly figuring out how to close the technological and digital divide across nations.

Conclusion

The conceptual framework used in this paper defines mediating elements and specific transmission channels to understand how the pandemic influenced the Global South, especially in African countries, in terms of social and economic effects. The framework makes it easier to pinpoint the characteristics that define the reactions and impact in African countries like Nigeria, Botswana, South Africa, and Namibia as part of the Global South. It also offers suggestions for future changes that could be made to the recovery plans.

In contrast to the Northern Hemisphere countries, African countries, as part of the global south, have experienced diverse effects from the epidemic. According to the evidence that is currently available, some regions of the Global South have had less severe health effects than others. A retrospective investigation in a few years might produce a difference. It is probable that the covid -19 will have more severe effects and endure longer in the Global South as countries wait for access to the vaccine when vaccination efforts get underway, prioritizing nations in the Global North. The possibilities for both economic growth and social progress in the Global South have been impacted. Pre-existing issues, including a lack of budgetary room, enduring gender inequities, and high levels of economic informality, have worsened, decreasing the effectiveness of policy interventions.

Even post-COVID has reflected the traditional top-down interpretation of issues in the discourse and a lack of awareness and voices from the South. Although it was able to take some quick action in response, the level of support is low given the severity of the problem. Supportive actions were initially focused on providing desperately needed health-related development support. The new objective is to go beyond providing immediate assistance and address medium- and long-term problems caused by the connected social and economic issues. This necessitates a swifter reaction from development partners worldwide.

Plans for recovering from the pandemic should consider the interaction of the elements, which have been customized to the various conditions of the African countries as part of the Global South. Resource mobilization among nations in the Global South needs special attention. Further progressive reform is required to increase the tax base because tax collections are still low. This reform should be implemented in tandem with the formalization of the African economy. The epidemic has also demonstrated that some African nations' governments need operational capability and financial resources to support their populations for gender empowerment and employment generation. For instance, it is essential to have current information about residents to provide support, track down viruses, use contact tracing, or transfer schooling online. Governments should also uphold the values of justice, equity, and dignity in all their policies. For instance, social protection programs that were too narrowly focused solely on people who were living in extreme poverty should be reviewed and designed to provide universal coverage. The development cooperation system must ensure that governments have the resources and flexibility to meet the challenge of recovery to support policies adopted by governments in the African nations in the Global South regions.

The global system must guarantee timely access to finance through various tools and channels. The new equipment and facilities to combat the pandemic should continue to get funding and have the flexibility to act quickly. At the very least, bilateral cooperation must stay at its pre-pandemic levels. Governments should ideally work toward achieving the 0.7% of gross national income for the ODA target that has been international. Finally, debt relief should be seen as a more long-lasting alternative to the payment delays used up to now. The global system needs to be rejuvenated above all else to respond to upcoming pandemics and effectively aid in recovering the Global South. (Irish Times, 2020).

The COVID-19 has identified ongoing issues that need to be resolved right away. It is obvious that a new kind of leadership is necessary for developing the cooperation system of these nations in the global south. Even though we have focused on limited factors that is very less, there is a need for more research in that area to understand the factors that affected the African nations in the Global South and what measures will be taken initiation by policymakers in these nations. Even this article will help to the researcher to understand the impact of the pandemic in Global south and suggestion for policymakers to take the initiative for the welfare of their nation the region of Global South.

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ECONOMIC BENEFITS OF ROUTE MONITORING: GPS TRACKING IN KAZAKHSTAN'S RAILWAYS

In the context of Kazakhstan's railway operations, this study explores the economic advantages derived from the implementation of GPS tracking technology focused on route monitoring. Employing Extreme Programming (XP) principles, a case study within a national railway company details the process, challenges, and outcomes of integrating GPS trackers on mobile phones for workforce location tracking and geo-fencing. Results demonstrate the significant improvement in monitoring workforce activities and precise payroll calculation based on actual working hours. Emphasizing the role of the XP methodology, the study showcases enhanced stakeholder communication, iterative development, and continuous system improvement. Technical aspects of the GPS tracking system, including architecture, data flow, and integration with existing railway management systems, are examined. Moreover, the study delves into encountered challenges such as privacy concerns, data security, and user acceptance during implementation. This case study presents valuable insights for transportation organizations aiming to implement location-tracking and geo-fencing technologies, providing a blueprint for effective project management, iterative development, and stakeholder engagement in pursuit of economic benefits through route monitoring.

Key words: remuneration system, GPS tracking, extreme programming, geo-fencing, automated payroll, railways.

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Маршруттар мониторингінің экономикалық артықшылықтары: Қазақстанның теміржол жүйесіндегі GPS-бақылау

Қазақстанның теміржол операциялары контекстінде бұл зерттеу маршруттар мониторингіне баса назар аудара отырып, GPS-қадағалау технологиясын енгізуден туындайтын экономикалық артықшылықтарды зерттейді. Экстремалды бағдарламалау принциптерін (Extreme Programming, XP) қолдана отырып, ұлттық теміржол компаниясы жұмыс күші мен геоқоршаудың орналасуын бақылау үшін ұялы телефондардағы GPS трекерлерін біріктіру процесін, қиындықтары мен нәтижелерін егжей-тегжейлі зерттеді. НӘТИЖЕЛЕР нақты жұмыс істеген сағаттар негізінде жұмыс күшін бақылау мен жалақыны дәл есептеудің айтарлықтай жақсарғанын көрсетеді. XP әдіснамасының рөлін атап көрсете отырып, зерттеу мүдделі тараптармен өзара әрекеттесуді, қайталанатын дамуды және жүйені үнемі жетілдіруді көрсетеді. GPS бақылау жүйесінің техникалық аспектілері, соның ішінде архитектура, деректер ағыны және қолданыстағы теміржолды басқару жүйелерімен интеграция қарастырылады. Сонымен қатар, құпиялылық туралы алаңдаушылық, деректердің қауіпсіздігі және іске асыру процесінде пайдаланушыларды қабылдау сияқты мәселелермен бетпе-бет келу зерттеледі. Бұл кейс-зерттеу маршруттарды бақылау арқылы тиімді жобаны басқару, итерациялық даму және мүдделі тараптарды экономикалық пайданы іздеуге тарту жоспарын ұсына отырып, орналасқан жерді бақылау және геоқоршау технологияларын енгізуге бағытталған көлік ұйымдары үшін құнды идеяларды ұсынады.

Түйін сөздер: сыйақы жүйесі, GPS-бақылау, экстремалды программалау, гео-аймақ, автоматтандырылған жалақы есептеу, темір жолдар.

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Экономические преимущества мониторинга маршрутов: GPS-отслеживание в железнодорожной системе Казахстана

В контексте железнодорожных операций Казахстана, данное исследование исследует экономические преимущества, вытекающие из внедрения технологии GPS-отслеживания с акцентом на мониторинге маршрутов. Используя принципы экстремального программирования (Extreme Programming, XP), в рамках национальной железнодорожной компании проведено кейс-исследование, детализирующее процесс, вызовы и результаты интеграции GPS-трекеров на мобильных телефонах для отслеживания местоположения рабочей силы и геозоны. Результаты демонстрируют значительное улучшение мониторинга деятельности рабочей силы и точного расчета заработной платы на основе фактически отработанных часов. Подчеркивая роль методологии XP, исследование показывает улучшенное взаимодействие с заинтересованными сторонами, итерационное развитие и постоянное совершенствование системы. Рассматриваются технические аспекты системы GPS-отслеживания, включая архитектуру, поток данных и интеграцию с существующими системами управления железной дорогой. Кроме того, исследуется столкновение с проблемами, такими как обеспокоенность конфиденциальностью, безопасность данных и принятие пользователей в процессе внедрения. Это кейс-исследование представляет ценные идеи для транспортных организаций, нацеленных на внедрение технологий отслеживания местоположения и геозон, предоставляя план эффективного управления проектом, итерационного развития и вовлечения заинтересованных сторон в стремлении к экономическим выгодам через мониторинг маршрутов.

Ключевые слова: система вознаграждения, GPS-отслеживание, экстремальное программирование, геозона, автоматизированный расчет заработной платы, железные дороги.

Introduction

In today's landscape, the fusion of technology and economic paradigms stands as the linchpin of operational efficiency across diverse industries. Central to organizational resilience, workforce management undergoes a profound metamorphosis in the wake of digital advancements. This manuscript focuses on an innovative case study within Kazakhstan's national railway, spotlighting the seamless amalgamation of digital tools to optimize remote work management.

Within the pivotal realm of transportation and logistics, the railway sector emerges as a prime arena ripe for reaping economic benefits through technology-driven methodologies. Yet, amidst this broad digital transformation, articulating specific research motives becomes paramount.

This study navigates an exploration into the successful incorporation of employee location tracking and boundary optimization technology within the framework of a national railway company in Kazakhstan. The integration of Global Positioning System (GPS) trackers on mobile devices, coupled with the application of strategic programming methodologies, has instigated a fundamental shift in economic strategies for workforce management.

At its essence, the convergence of mobile technology and geospatial information systems embodies unprecedented precision in monitoring employee movements within the railway premises. Beyond fortifying staff safety by ensuring adherence to safety protocols, this technology provides crucial insights for resource allocation and operational efficiency enhancements.

Furthermore, the adoption of strategic programming methodologies injects a novel facet into this endeavor. This agile software development approach champions iterative progress, continual feedback, and collaborative teamwork. Its infusion into the implementation of boundary optimization and employee tracking systems facilitated swift adaptability to evolving demands, integrating valuable end-user insights to tailor a solution harmonized with the distinct challenges of the railway industry.

Throughout this manuscript, a systematic elucidation unfolds, detailing the intricate process of implementing the employee location tracking and boundary optimization system. This comprehensive exploration encompasses an in-depth analysis of encountered challenges, deployed strategies, and attained outcomes. Additionally, the article delineates the broader ramifications of embracing strategic programming, extending its

potential applications beyond conventional software development domains.

In summary, this manuscript illuminates a groundbreaking case study that encapsulates the fusion of technology and economic methodologies, overcoming pivotal challenges in workforce management within a national railway company. The integration of GPS tracking and boundary optimization technology, synergized with strategic programming, serves as an exemplary model for industries striving to optimize employee monitoring, operational efficiency, and precision in economic management. By disseminating insights from this initiative, the aspiration is to catalyze further innovation at the dynamic intersection of workforce management and technological-economic integration.

The ensuing sections meticulously explore the literature review, project methodology, implementation intricacies, encountered challenges, achieved outcomes, and the broader implications of this successful initiative for the railway industry in Kazakhstan, considering its potential applicability beyond national borders

Literature Review

Employee attendance monitoring has attracted significant scholarly attention, highlighting diverse technological applications. Soewito implemented smartphone-based attendance management using the SDLC Waterfall methodology, emphasizing continuous monitoring (Soewito, 2019). Sudheer explored GPS and GPRS technologies, employing embedded ARM microcontrollers in ID cards for automated attendance recording within designated work areas, albeit requiring enhancements like fingerprint authentication (Sudheer, 2016). Lodha investigated Bluetooth smart wireless technology for student position monitoring, highlighting advantages such as low power consumption and rapid data transfer (Lodha, 2015). Hameed integrated RFID with wireless entry database records, offering comprehensive attendance metrics (Hameed, 2015).

However, prevailing studies often focus on location tracking within confined spaces, like offices or specific work zones. Our study diverges by tackling a more expansive context: the Kazakhstan Railway, an expansive territory ranked 9th globally in area. Addressing unique challenges, our focus extends beyond mere employee location tracking to ensure accurate work-time records and fair wage calculations in areas lacking consistent cellular signal coverage. This broadens the scope beyond traditional office-based monitoring.

Moreover, our research emphasizes the transition from conventional paperwork-intensive methods to digital solutions. Our goal is to streamline record-keeping and wage calculation without necessitating extensive manual documentation, marking a departure from previous approaches.

Beyond technical considerations, this article delves into the incorporation of Extreme Programming (XP), an agile methodology. XP allows real-time user feedback incorporation during implementation, ensuring adaptability and user-centric design in remote work management tools.

Sonal's 2016 project enhanced security through unique logins and passwords on Android devices, enabling comprehensive monitoring of mobile activities and geographical locations (Sonal, 2016). Aparna introduced a Smartphone Monitoring System in 2013, storing various data in a centralized database while tracking physical locations and unauthorized contacts (Aparna, 2013). Prajakta's 2015 software facilitated communication between field workers and managers through Android devices, storing relevant details in a centralized server for managerial access (Prajakta, 2015). Shermin's 2015 system emphasized location-based time and attendance tracking using GPS on mobile devices and personalized computers (Shermin, 2015). Nirmal's 2016 project integrated employee and GPS tracking, preventing unauthorized resource usage and enabling oversight of employees' activities (Mohan, 2019), (Pressman, 2015).

While the scientific community demonstrates considerable interest in employee location tracking, much of the emphasis remains on office settings. This study distinguishes itself by addressing challenges specific to expansive territories like the Kazakhstan Railway. It highlights the necessity for reliable tracking and fair wage computation in areas lacking continuous cellular coverage, all the while advocating the adoption of XP for the development of user-centric tools.

Methodology

Maximizing economic efficiency through Extreme Programming (XP) in railway workforce management.

Our research methodology strategically adopts XP; an iterative and incremental approach entrenched within agile software development, renowned for its adherence to an object-oriented paradigm. XP embodies collaboration, adaptability, and active

customer engagement throughout the software development process, aligning with our pursuit of economic efficiency within the Kazakhstan Railway context (Rostislav, 2011) (Burham, 2020) (Oxley, 2017).

Planning Phase: Enhancing Economic Goals Insights: The XP planning phase serves as a pivotal juncture for defining clear and economically prioritized user stories or requirements. Facilitating extensive communication among stakeholders, developers, and the client, this phase aims to establish a shared understanding of project objectives and economic scope. Common Economic Practices: Techniques like User Story Mapping, Release Planning, and the collaborative "planning game" enable the alignment of economic objectives, allowing stakeholders and the development team to estimate and prioritize tasks collaboratively. Emphasis is on setting short-term, economically feasible goals for each iteration, ensuring economic viability.

Design Phase: Economically Efficient Solutions Insights: Within XP's design phase, emphasis lies in devising economically simple, flexible, and maintainable solutions. Embracing continuous economic feedback and iterative design processes facilitates the evolution of the system architecture and design, aligning with economic objectives. Common Economic Practices: Strategies such as Simple Design, Refactoring, Pair Programming, and System Metaphor establishment contribute to creating an economically coherent and adaptive design structure. The focus is on maintaining economic adaptability to changing requirements, ensuring efficient resource allocation.

Coding Phase: Economic Development Insights: The coding phase marks the actual economic development phase, wherein developers collaborate in pairs, coding to fulfill economically defined user stories while ensuring high code quality and adherence to economic coding standards. Common Economic Practices: Methodologies like Test-Driven Development (TDD), Collective Code Ownership, Continuous Integration, and Pair Programming remain integral to this phase. The goal is to produce economically clean, functional code with comprehensive test coverage, optimizing economic resource utilization.

Testing Phase: Ensuring Economic Viability Insights: XP's testing phase entails rigorous economic testing at multiple levels (unit, integration, and acceptance) to validate functionality and ensure software aligns with specified economic requirements. Common Economic Practices: Test-Driven Development (TDD), Automated Testing, and Continuous Economic Feedback loops ensure maintenance of high software quality. Customer involvement in economic acceptance testing guarantees alignment with economic user expectations.

In summary, XP's structured four-phase approach embodies collaborative, adaptive, and iterative economic principles, fostering continuous economic improvement throughout the software development lifecycle. By adhering to these key components and practices, our study applies a structured and agile approach to maximize economic efficiency in managing remote work within the Kazakhstan Railway's economic framework

Application of XP Phases in the Research: Economic Insights.

In our study aimed at optimizing remote work management within Kazakhstan Railway, the implementation of XP's four phases unfolded as follows:

1. Planning Phase: Economic Perspectives

During the initial planning phase, a series of interviews were conducted with representatives from Kazakh Railways, with a primary focus on the technical condition assessment division–the track diagnostics center (CTD). The interviewees held diverse roles and had extensive experience within the organization:

Firstly, the Director of the CTD, bringing over 15 years of expertise in railway operations and management.

Secondly, the Chief Engineer of the CTD, with more than 10 years of experience overseeing technical aspects in railway diagnostics and maintenance.

Thirdly, the Deputy Director of the CTD, with a professional tenure exceeding 20 years, responsible for strategic decision-making and operational oversight within the CTD.

Additionally, there were Production Site Supervisors, each with over 10 years of experience, managing on-site railway maintenance activities.

Furthermore, Standardization Specialists of the CTD were involved, responsible for precise calculation methods related to engineers' working hours for railway track diagnostics.

The CTD Economist was also part of the interviews, tasked with planning and monitoring the CTD labor fund budget, possessing a comprehensive understanding of financial aspects within railway operations.

Lastly, an Accountant for the calculation and payroll of CTD employees, with over 20 years of

experience in payroll management and meticulous attention to compensation matters, was included in the interview process.

Selected after discussions with CTD management, these interviewees provided invaluable economic insights into critical remote work management issues. The Planning phase surfaced crucial economic concerns articulated by CTD stakeholders:

Selected interviewees provided insights into economic concerns:

Supervisor Monitoring Constraints: Existing monitoring mechanisms relying on manual paper-based route sheets hinder real-time oversight. Supervisors aspire to continuously track employee movements via a map, observing specific checkpoints along their routes to enhance economic efficiency.

Time-Intensive Payroll Handling: Current payroll processes, reliant on paper route sheets transferred to Excel, result in time-consuming aggregation prone to human errors. This impacts accurate payroll and overtime calculations, posing economic challenges.

Work Hour Reporting Inconsistencies: Absence of oversight mechanisms leads to inflated work hour reporting during track diagnostics, challenging the verification of actual task completion times, impacting economic resource allocation.Stakeholder analysis was integrated, identifying key stakeholders critical to the project's economic success. These stakeholders encompassed CTD employees, middle and top-level managers, HR and accounting functions, and the internal audit team evaluating annual payroll process quality within CTD.

This approach ensured a comprehensive economic exploration of remote work management challenges within Kazakhstan Railway, aligning our study with economically viable solutions.

APPROVE
Director _____

Route sheet
for a business trip of JSC "NC "KTZ" employees
май 2022
наладчик МДК

RETIREMENT					ARRIVAL				
№	**The date**	**The time**	**Point of depature**	**Signature**	**№**	**The date**	**The time**	**Destination**	**Signature**
1	17.05.2022	10:05	signature	print	2	17.05.2022	21:35	signature	print
3	18.05.2022	08:30	signature	print	4	18.05.2022	14:10	signature	print
5	18.05.2022	14:40	signature	print	6	18.05.2022	21:25	signature	print
7	19.05.2022	09:10	signature	print	8	19.05.2022	15:45	signature	print
9	19.05.2022	22:00	signature	print	10	20.05.2022	03:30	signature	print
11	20.05.2022	13:25	signature	print	12	20.05.2022	21:20	signature	print
13	21.05.2022	10:55	signature	print	14	21.05.2022	15:15	signature	print
15	22.05.2022	11:15	signature	print	16	22.05.2022	17:05	signature	print
17	23.05.2022	10:05	signature	print	18	22.05.2022	15:25	signature	print
19	23.05.2022	16:40	signature	print	20	23.05.2022	19:45	signature	print
21	24.05.2022	12:35	signature	print	22	24.05.2022	20:25	signature	print

Figure 1 – A sample of a completed route sheet in paper form
Note – source: KTZ internal materials translated

2. Design: Economic Considerations

Upon reviewing various prior research studies, our preference gravitated towards employing GPS technology (Burham, 2020). The additional equipment influenced this decision and extra expenses required for RFID or microchip tags. Moreover, given that the majority of employees carry cellphones during work, utilizing the GPS capabilities within these devices proves advantageous in terms of cost-effectiveness.

The Global Positioning System (GPS) serves as a technological innovation reliant on satellite-derived signal data to pinpoint precise locations. Processing this signal data enables establishing location points and recording various data, including distance traveled, departure and arrival times, crucial for economic efficiency.

A beta iteration of the mobile application, known as Dilau Tracker, was developed with specific economic objectives for the preliminary project. Firstly, the focus was on validating the hypothesis feasibility regarding the beta variant's ability to effectively gather real-time geolocation data from CTD employees' mobile devices across Kazakhstan's entire railway network, even in areas lacking cellular signal for data transmission. Various technologies such as GPRS, EDGE, HSPA, LTE (Sunrise...) were utilized, emphasizing cost-efficiency.

Next, the objective was to confirm the dependability and accuracy of geolocation markers on the map. This aimed to ensure consistent representation of points concerning chronological references, thereby visualizing uninterrupted employee movement routes and promoting economic efficiency in monitoring.

Following that, the goal was to verify the accurate recording of station and haul passages by CTD workers along their movement route. This involved leveraging preloaded GPS coordinates of these control points on the map for economic resource allocation.

Another objective was to validate the capability to automatically generate a digital route record based on employee mobile device geolocation input while logging progress through checkpoints. This aimed to streamline economic operational processes.

The next focus was to assess geolocation precision, ensuring the mobile device's location accuracy on the map within a 100-meter radius. This was crucial for efficient resource allocation.

Additionally, there was an objective to evaluate CTD employees' readiness to transition to a novel working hour recording method, considering economic implications and potential productivity gains.

Another goal was to test the mobile application's compatibility with various Android or IOS operating system-supporting devices used by CTD employees, focusing on economic device versatility.

Lastly, the objective was to identify potential shortcomings of the beta version during the trial operation period from August 01, 2022, to October 30, 2022. The aim was to find preemptive solutions before the official launch of the industrial version, thus ensuring economic effectiveness.

This meticulous economic-focused design phase ensured the economic viability of the GPS-based solution within Kazakhstan Railway, emphasizing cost-efficiency and resource optimization.

3. Coding: Economic Framework Development

The Dilau Tracker system, designed to efficiently manage remote work within Kazakhstan Railway, encompasses a structured framework comprising major components: the Control Panel, Mobile Application, Reporting System, and Integration Module. These components synergistically address outlined research gaps and align with research objectives. To provide a comprehensive visualization of the framework, a diagram (Figure 2) elucidates interconnections and functionalities among these major components.

Economic Framework Components.

1. Control Panel: Economic Centralized Management

The Control Panel acts as a centralized interface facilitating crucial functionalities for system administration and user interaction. Key functionalities include user authorization and registration, real-time visualization of user movement data on a geographical map, automated generation of electronic route sheets, and checkpoint management, emphasizing economic resource allocation and operational efficiency

2. Mobile Application: Economic User Connectivity.

Integral to the system, the Mobile Application (see Figure 3) operates on user devices, enabling remote tracking and communication. Its economic functionalities encompass user authorization and registration, mobile device movement data collection, and user action logging for monitoring and evaluation purposes, focusing on economic efficiency and seamless data acquisition

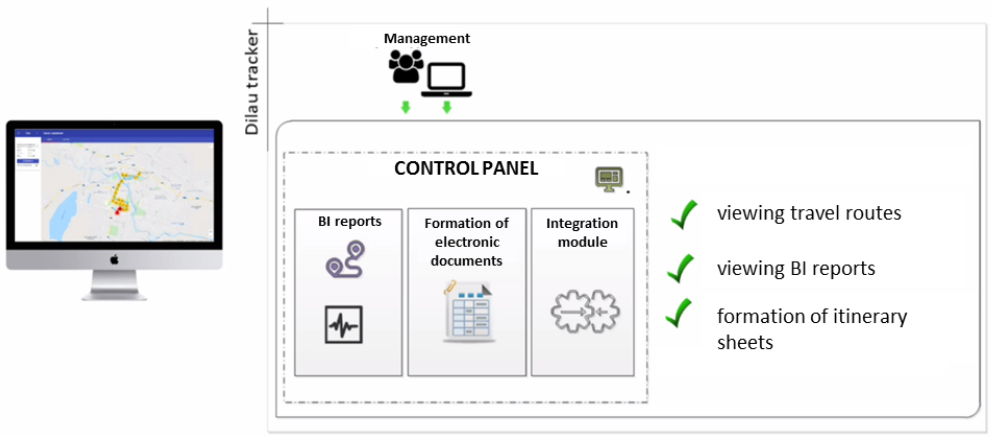

Figure 2 – Web application functionality
Note – source: authors development

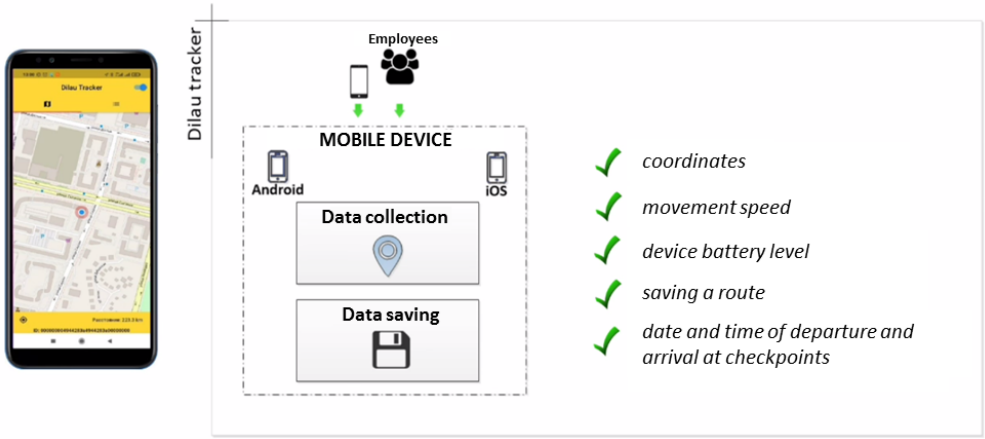

Figure 3 – Application functionality
Note – authors development

3. Reporting System: Economic Decision Support

The Reporting System provides a platform for viewing detailed reports derived from system-generated data, aiding in performance evaluation and decision-making processes, enhancing economic decision support within the railway operations.

4. Integration Module: Economic Interoperability.

The Integration Module ensures seamless data exchange with external systems through API integration, crucial for economic interoperability and enhancing system efficiency.

Functionality and Workflow: Economic Optimization

Each component's functionalities align with specific workflows designed to address identified research gaps and achieve economic research objectives:

- Control Panel Functionality Workflow emphasizes user interaction and efficient data handling, streamlining supervisory tasks to bridge the gap in real-time monitoring and management, enhancing economic operational efficiency.

- Mobile Application Functionality Workflow ensures smooth user mobility and data collection, focusing on remote user interaction and efficient data gathering, optimizing economic workflow between field operations and the central system.

- Reporting System Functionality offers comprehensive views of generated reports for informed decision-making, catering to economic performance assessment and user activity evaluation.

- Integration Module Functionality facilitates seamless data exchange with external systems, aligning with economic interoperability and integration objectives.

The Dilau Tracker system operates on a robust software stack comprising:

- Linux OS
- PostgreSQL as the object-relational database management system
- Java for backend programming, JavaScript for frontend, and Dart for mobile applications
- Frameworks such as Spring for Java backend, Angular/ReactJS for frontend, and Flutter for mobile app development.

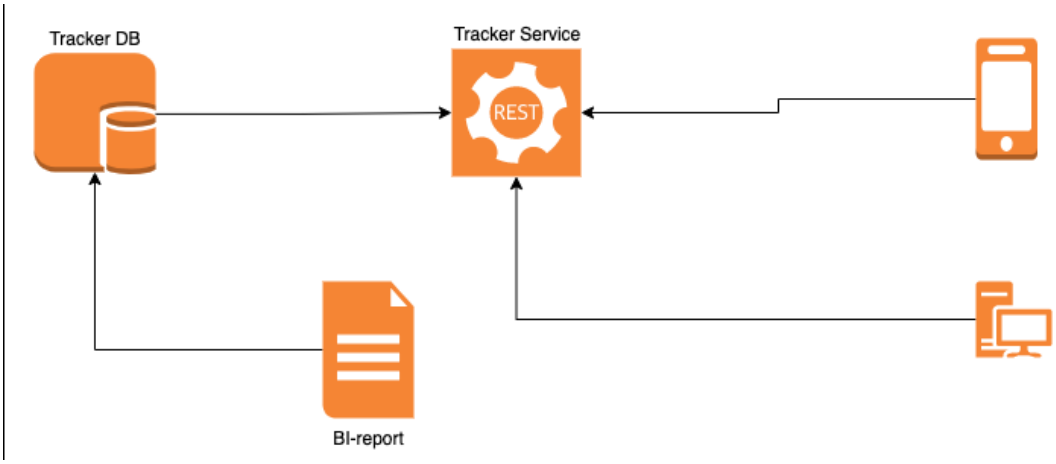

Figure 4 – Solution Logic Architecture
Note – authors development

Server Deployment involves two distinct servers:

1. Application Server: Hosting backend services, web applications, including the Control Panel, and PostgreSQL database with essential postgis extensions for coordinate-based operations.

2. PPPoE Server: Dedicated to deploying the reporting system.

Containerized Deployment using Docker technology streamlines system administration, minimizes resolution times, and allows scalable deployment via cluster deployment. Docker Compose is utilized to facilitate the deployment process across both servers.

4. Testing

The testing phase during the initial pilot rollout involved comprehensive user engagement and feedback collection, fostering an iterative and collaborative approach between development teams and end-users for ongoing system enhancement. The deployment of the Dilau tracker system underwent rigorous testing and user engagement, presenting opportunities for iterative improvements through feedback-driven modifications and collaborative strategies:

1. User Engagement and Feedback Collection: Economic Participation.

The pilot rollout successfully onboarded 365 users into the system, primarily utilizing their personal mobile phones for work-related assignments, after consenting to engage in the system. Subsequently, the observed user engagement displayed an escalating trend over time. Initially, daily usage involved a modest count of up to 20 individuals engaging with the mobile application. This count progressively increased, with an average daily user count reaching 60 to 70 individuals, culminating in a peak of 124 employees accessing the application on a single day.

2. Feedback-Guided Iterative Enhancements.

The feedback obtained from beta version testers of the Dilau tracker mobile application resulted in a sequence of iterative improvements, highlighting the collaborative relationship between development teams and end-users.

Firstly, challenges related to user adoption were addressed. The team responded to issues faced by some employees, such as smartphone unavailability or malfunctioning devices. Recommendations included providing company-provided mobile

devices or establishing incentives for using personal phones. These suggestions were informed by an online user survey indicating preferences.

Next, efforts were directed towards enhancing the regularity of usage. Recognizing sporadic usage patterns among initial rollout participants, recommendations emphasized the importance of continual employee engagement with the mobile application throughout the workday. Educational efforts focused on conveying the significance of consistent usage and maintaining well-prepared smartphones.

Following that, various recommendations for functional improvements were identified. These included the implementation of push notifications, integration of temporary work schedules, introduction of employees' work plans into the system, and optimizing map usage to reduce Internet traffic.

Moreover, feedback regarding security and access issues prompted plans to introduce an authorization and registration feature using SMS codes. This approach aimed to eliminate the dependency on manual password management in the initial registration interface, as illustrated in Figure 5.

Additionally, users' suggestions for enhanced supervisory controls within the Control Panel led to plans for real-time activity tracking of mobile application users and the provision of detailed activity status for supervisors. The initial Control panel interface is depicted in Figure 6.

Furthermore, recommendations for efficiency and coordination involved improving route sheet generation capabilities. This included the ability to create route sheets for multiple employees or employee groups simultaneously, streamlining the process for supervisors and enhancing operational efficiency.

Addressing system discrepancies in checkpoint logging, adjustments were made to include more precise coordinates, expanded boundaries around control points, and improvements in registering checkpoints. These changes aimed to ensure accurate tracking of employee movements in geo-fencing and checkpoint logging.

Lastly, feedback from accounting and personnel departments led to planned efforts for integrating route sheet information between the Dilau tracker system and the company's SAP ERP accounting system. This integration is aimed at ensuring data accuracy and streamlining workflow processes.

3. Collaboration and Continuous Improvement.

The feedback-driven iterative enhancements underscore the collaborative efforts between development teams and end-users. The system's agile development approach, coupled with ongoing user feedback, plays a pivotal role in refining functionalities and addressing user-specific requirements. These continuous improvement cycles, driven by user engagement and team collaboration, highlight the iterative nature of the framework and its responsiveness to evolving user needs and technological advancements.

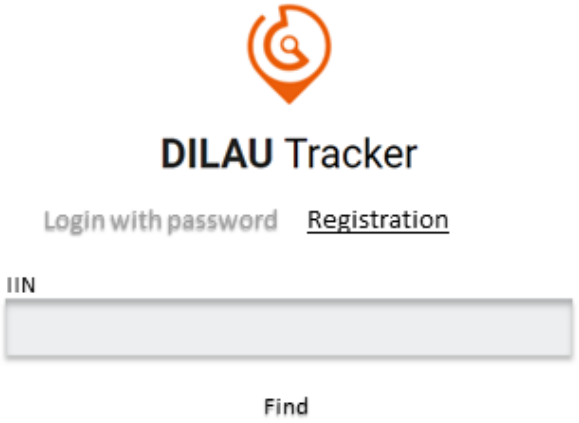

Figure 5 – Registration interface for mobile application
Note – print screen form application developed by authors' team

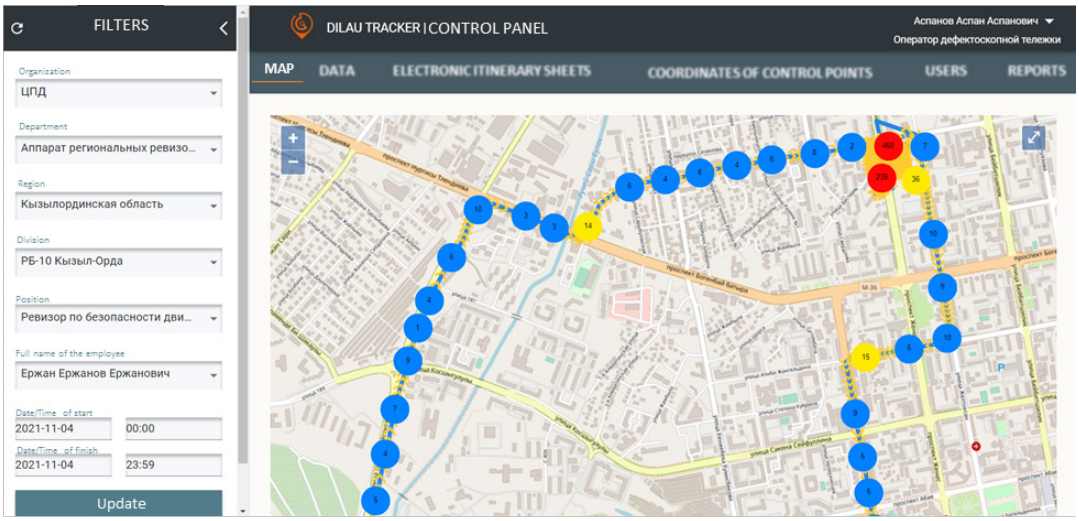

Figure 6 – Control Panel interface example
Note –print screen form application developed by authors' team

Results and discussions

The integration of employee location tracking and geo-fencing technology through GPS trackers on mobile phones resulted in significant positive outcomes within the realm of Kazakhstan Railway's remote work management, profoundly influencing the economic efficiency of route operations.

Firstly, precision in route-based payroll calculation was achieved. The implemented system utilized real-time location data along designated routes to enable accurate working hour calculations. This strategic shift effectively minimized errors and discrepancies in payroll processing associated with manual timekeeping methods. The result was enhanced economic accuracy and resource optimization along specific routes.

Next, efficiency in route operations was enhanced through the adoption of automated location tracking. This eliminated the need for manual timekeeping, substantially reducing administrative burdens specific to route management. The integration notably bolstered operational efficiency along designated routes, emphasizing the economic streamlining of labor resources and route-centric tasks.

The system also augmented transparency in route monitoring. By accurately recording and readily providing accessible working hour data for review along specified routes, the technology fostered heightened transparency between employees and management. This transparency ensured enhanced clarity, accountability, and optimal economic resource allocation within designated routes.

Furthermore, a reduction in overpayments along designated routes was observed. Rigorous evaluation assessed the impact of the system on overpayments for CTD engineers' overtime work along specific routes. Comparative analysis between pre-implementation and post-implementation periods revealed a significant 70% reduction in overpayments along designated routes. Data extracted from the accounting system showcased a noteworthy decline in overpayments, ensuring economic accuracy in payroll calculations and expenditure along specific routes.

Evaluation Process and Research Validity.

The evaluation process entailed a robust comparative analysis of overpayment data, focusing specifically on overtime payments to CTD engineers along designated routes. The comparison between pre-implementation and post-implementation periods ensured a thorough measure of the system's effectiveness in curtailing overpayments along specified routes. Consistency in the average monthly headcount during these periods fortified the validity of the research evaluation.

Furthermore, ongoing user testing and feedback collection reinforced research validity, allowing continual identification of critical issues and iterative improvement of both the beta version of the mobile application and the web interface, specifically tailored for route management. The application of the XP methodology facilitated adaptability and continuous enhancement in alignment with the evolving economic needs of the company's route-centric operations.

Before vs After Analysis.

The insights gathered from interviews and discussions with CTD management illuminated critical issues affecting remote work management within the organization. A comparison between the pre-implementation challenges and the observed post-implementation benefits highlights a transformation:

Before Implementation:

1. Supervisor Monitoring Constraints: Relying on manual submission of paper route sheets hindered real-time oversight.

2. Time-Intensive Payroll Handling: Manual processes resulted in time-consuming calculations, prone to errors affecting accurate payroll.

3. Work Hour Reporting Inconsistencies: Lack of oversight mechanisms led to inflated work hour reporting during track diagnostics, posing challenges in verifying actual task completion times.

After Implementation, the system facilitated:

1. Real-time monitoring of employee movements via a map.

2. Streamlined payroll processes, reducing errors and saving time.

3. Accurate tracking of work hour reporting, ensuring consistency and verification of task completion times.

The implementation of the digital solution effectively addressed these challenges, enhancing operational efficiency and accuracy in various aspects of remote work management within Kazakhstan Railway.

The implementation of employee location tracking and geo-fencing technology through GPS trackers on mobile phones, coupled with the application of the XP method, within a national railway company in Kazakhstan, has brought forth essential insights and outcomes. This section delves into the pivotal findings and economic implications derived from this research endeavor.

The adoption of GPS trackers for monitoring employee locations and enforcing geo-fencing within a railway company setting demonstrated promising outcomes, notably in augmenting operational efficiency and ensuring workforce accountability along designated routes. Real-time location data empowered the company to optimize resource allocation, leading to efficient route scheduling and improved response times during emergencies. The integration of geo-fencing further established virtual boundaries, ensuring adherence to specified work zones–an imperative factor in maintaining safety and preventing unauthorized access to restricted areas along designated routes.

Moreover, the application of the XP method yielded substantial advantages in managing the development and implementation of this technology solution along designated routes. The iterative and incremental nature of XP fostered continuous feedback loops and collaboration among the development team, stakeholders, and end-users. This iterative approach proved particularly advantageous, allowing the incorporation of evolving route-specific requirements and immediate adjustments based on real-world feedback. Consequently, the implemented solution aligned closely with the company's route-centric needs and adeptly addressed potential challenges more effectively.

However, this project also underscored specific economic challenges and considerations. Privacy concerns emerged as a significant issue, particularly with regards to route-specific employee tracking, raising pertinent questions about the balance between operational optimization and individual privacy rights along designated routes. Achieving this equilibrium mandates the establishment of a comprehensive data protection framework, ensuring responsible and ethical collection, storage, and utilization of employee data, particularly along specified routes.

The successful implementation of this technology solution hinged on comprehensive training and change management initiatives. Educating employees about the purpose and economic benefits of the system was essential in mitigating any resistance to adoption along designated routes. Additionally, the seamless integration of the technology with existing systems and processes necessitated meticulous planning and execution to prevent disruptions and ensure a smooth economic transition along designated routes.

Conclusion

The integration of employee location tracking, geo-fencing technology, and the application of XP methodology has demonstrated significant effectiveness in transforming remote work management practices within Kazakhstan's national railway company. The tangible outcomes observed highlight the substantial impact and economic potential of this integrated approach in reshaping workforce management paradigms in the transportation sector, particularly within the realm of Route Management. Aligning Objectives with Attained Results. The study's primary goals focused on enhancing efficiency, precision, and transparency in remote work management, specifically along

designated routes. The achieved results directly align with these objectives, showcasing substantial accomplishments:

Firstly, operational augmentations were evident. The implementation of employee location tracking and geo-fencing technology brought about notable enhancements in various operational facets. This included accurate payroll computation using real-time location data, significantly reducing errors and discrepancies in wage calculations along designated routes. Additionally, there were significant efficiency gains by replacing manual timekeeping with automated location tracking, alleviating administrative burdens and enhancing operational efficiency along designated routes.

Secondly, transparency and economic savings were notable outcomes. The system not only fostered improved transparency between employees and management by accurately documenting working hours but also resulted in noteworthy cost savings through a 70% decrease in overpayments along designated routes. The empirical validation of this reduction emphasizes the system's efficiency in mitigating overpayment instances related to overtime work along specified routes.

Thirdly, employee satisfaction and continuous improvement were observed. The precise calculation of working hours and iterative enhancements facilitated by the XP methodology contributed to heightened employee satisfaction along designated routes. This iterative process led to continual refinement of system functionalities based on ongoing user feedback, highlighting XP's efficacy in meeting evolving user needs and ensuring sustained improvements along specified routes.

Research Contributions and Limitations.

The study's contributions lie in its successful demonstration of a comprehensive framework that integrates technological advancements with agile development methodologies to address critical challenges in remote work management, especially along designated routes. The research validated the system's economic efficacy through a multi-layered evaluation process, ensuring statistical validity, practical effectiveness, and alignment with user requirements along specific routes. However, it is imperative to acknowledge certain limitations and potential areas for further exploration:

- Privacy and Training Considerations: The project underscores the significance of addressing privacy concerns and implementing robust data protection measures, emphasizing the importance of thorough training and change management efforts to ensure seamless integration and employee acceptance, particularly along specified routes.

- Future Directions: Future research endeavors could delve deeper into privacy-preserving implementations of similar technologies and explore enhanced strategies for employee training and acceptance along designated routes. Furthermore, investigating the long-term effects of system implementation and its adaptability in varying organizational contexts could provide valuable economic insights for broader industry adoption.

Implications for Future Practices.

The insights derived from this case study offer valuable economic perspectives for organizations aiming to enhance efficiency, transparency, and workforce management practices, specifically along designated routes. The successful integration of advanced technology and agile methodologies holds the potential to revolutionize operational practices not only in transportation but also across diverse industries, paving the way for heightened efficiency, transparency, and employee satisfaction along specified routes.

Complementary Data

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Data Availability Statement:

No Data associated in the manuscript

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EVALUATION OF THE EFFECTIVENESS OF INVESTMENTS INTO HUMAN CAPITAL AT THE MACRO LEVEL

This article is devoted to the study of the problem of evaluating the effectiveness of financing the education sector as an important industry that contributes to the creation of conditions for accelerated economic growth. In the context of the formation and development of an innovative economy, investments in education are of a priority nature and provide an important competitive advantage from a strategic point of view – the accumulation and development of the country's intellectual potential. At the same time, an increase in investment in education does not mean an increase in the effect and cannot guarantee an increase in the quality of educational services. Therefore, one of the topical issues in the implementation of investments in the industry is the evaluation of their effectiveness. The formation of a methodology for evaluating the effectiveness of investment in education at the macro level is based on a comparison of changes in national investment in education and changes in the human development index. Approbation of the proposed method is carried out on a specific example. This article analyzes the works of the classics of philosophy and economics, monographs, scientific and technical research, and articles by foreign and domestic scientists on the analysis and evaluation of the effectiveness of investments in human capital. The results of this study raise an important question for theoretical economists: what the mechanism by which human capital is affects economic growth, how to model the relationship between the stock of human capital, capital, and technological progress, as well as the law of accumulation of human capital in the model.

Key words: human capital, investment, performance evaluation, education, human capital index.

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Макродеңгейдегі адами капиталға инвестициялардың тиімділігін бағалау

Бұл мақала жедел экономикалық өсу үшін жағдай жасауға ықпал ететін маңызды сала ретінде білім беру саласын қаржыландырудың тиімділігін бағалау мәселесін зерттеуге арналған. Инновациялық экономиканың қалыптасуы мен дамуы жағдайында білім беру саласын инвестициялау басым сипатқа ие және стратегиялық тұрғыдан маңызды бәсекелестік артықшылықты – елдің зияткерлік әлеуетін жинақтау мен дамытуды қамтамасыз етеді. Сонымен қатар, білім беруге инвестициялардың ұлғаюы әсердің артуын білдірмейді және білім беру қызметтерінің сапасын арттыруға кепілдік бере алмайды. Сондықтан саладағы инвестицияларды жүзеге асырудағы өзекті мәселелердің бірі олардың тиімділігін бағалау болып табылады. Макро деңгейде білім беруге инвестициялардың тиімділігін бағалау әдістемесін қалыптастыру білім беруге ұлттық инвестициялардың өзгерістерін және адам дамуы индексінің өзгерістерін салыстыруға негізделген. Ұсынылған әдісті сынау нақты мысалда жүзеге асырылады. Бұл мақалада философия және экономика классиктерінің еңбектері, монографиялар, ғылыми-техникалық зерттеулер, шетелдік және отандық ғалымдардың адами капиталға салынған инвестициялардың тиімділігін талдауға және бағалауға арналған мақалалары талданады. Бұл зерттеудің нәтижелері экономист-теоретиктердің алдына маңызды мәселе қояды: адами капиталдың экономикалық өсуге әсер ету механизмі қандай, адами капитал қоры мен капитал және технологиялық прогресс арасындағы қатынасты қалай модельдеуге болады, және де адами капиталдың модельге жинақталуының заңдылығы.

Түйін сөздер: адами капитал, инвестициялар, тиімділікті бағалау, білім беру, адами капитал индексі.

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Оценка эффективности инвестиций в человеческий капитал на макроуровне

Данная статья посвящена исследованию проблемы оценки эффективности финансирования сферы образования как важной отрасли, способствующей созданию условий для ускоренного экономического роста. В условиях становления и развития инновационной экономики инвестиции в образование носят приоритетный характер и обеспечивают важное конкурентное преимущество со стратегической точки зрения – накопление и развитие интеллектуального потенциала страны. В то же время увеличение инвестиций в образование не означает повышения эффекта и не может гарантировать повышение качества образовательных услуг. Поэтому одним из актуальных вопросов при осуществлении инвестиций в отрасли является оценка их эффективности. Формирование методики оценки эффективности инвестиций в образование на макроуровне основано на сопоставлении изменений национальных инвестиций в образование и изменений индекса человеческого развития. Апробация предлагаемого метода производится на конкретном примере. В данной статье проведен анализ работ классиков философии и экономики, монографии, научно-технические исследования, статьи зарубежных и отечественных ученых по анализу и оценке эффективности инвестиций в человеческий капитал. Результаты данного исследования поднимают важный вопрос для экономистов-теоретиков: каков механизм, с помощью которого человеческий капитал влияет на экономический рост, как смоделировать взаимосвязь между запасом человеческого капитала, капиталом и технологическим прогрессом, а также закон накопления человеческого капитала в модели.

Ключевые слова: человеческий капитал, инвестиции, оценка эффективности, образование, индекс человеческого капитала.

Introduction

One of the most fundamental determinants of economic growth, which largely determines differences in income between countries, is often referred to as human capital – the store of knowledge, skills, and experience available to each species. In this sense, human capital is the same means of production as physical capital – additional investment in human capital (in the form of education or training) brings benefits and profits. At the same time, human capital differs significantly from other types of capital in its economic characteristics.

Human capital is the main driver of economic growth, both at the macro and micro levels. Human capital has a tangible impact on the development of firms and on improving competitiveness and sustainability. The competitive advantage of the economy in the international arena, the possibility of its development, and modernization in modern conditions directly depend on the accumulated and employed human capital in the country.

At the macroeconomic level, investment in human capital is an investment in the social sphere, aimed at increasing the productivity of labor in the future and contributing to the future growth of incomes of individual holders of capital and society. Therefore, when analyzing the effectiveness of such investments, it is customary to use indicators of the socio-economic development of a country or region. Investments of this type are heterogeneous in composition and specified by type of cost. For example, the literature most frequently mentions investments in health capital, educational capital, and cultural capital.

Currently, the education sector in Kazakhstan is at the stage of modernization, the main goal of which is to create a sustainable development mechanism and ensure high-quality training of specialists by international standards. In this context, in industrialized countries, the policy of not only the state but also private business is the principle of priority investment in education. In our country, this principle is declared in the Law of the Republic of Kazakhstan “On Education” (as amended and supplemented as of May 1, 2023). For the education system, the main source of financial resources is the budget of all levels.

However, the lack of budget financing and the low level of attraction of extra-budgetary sources of investment, combined with market elements of management, make it much more difficult to create economic conditions for the effective development of the education sector. All this does not allow to fully ensure the required quality of training of

specialists, and mechanisms for attracting additional investment are still at the stage of formation.

Therefore, one of the most pressing issues in the practice of managing investment processes in the field of education today is the effective and rational use of budgetary funds, not only in the formation of national strategic plans but also in the implementation of the budget process by the participants.

Methodology

The methodological basis of this research is the provisions of modern economic theory and the theory of human capital, which are applied through systematic theoretical analysis, as well as a structural and logical research method. This study uses the works of classics of economics and philosophy, monographs, scientific and technical works, and articles by domestic and foreign scientists on the analysis and evaluation of the effectiveness of investments in human capital.

When studying domestic and foreign works, such scientific methods as analysis and synthesis, deductive induction, etc. were used. The information base of the study is the regulations governing investment activities, including in the field of education, as well as information materials of the Ministry of Education and Science, the Statistical Committee of the Republic of Kazakhstan.

Literature review

Currently, there is a noticeable increase in interest in human capital in the economy. Several recent studies have highlighted the positive impact of human capital on long-term economic growth. For example, (Jones, 2014; Manuelli, 2014; Lucas, 2015; Jones, 2019) emphasize that human capital plays a crucial role in the economic development of different countries. At the same time, the study (Caselli, 2019) argues that cross-country differences in human capital cannot explain differences in per capita income between countries.

Evaluation of the effectiveness of educational investments is reflected through a system of various criteria and coefficients, according to the goals and objectives of the researcher.

In international studies conducted within the framework of management accounting, the following cost indicators are usually considered: education costs per student (or as a percentage of GDP), the number of students per teacher, the level of remuneration, the size of the educational area, and others. The indicators of the quality of education are the general education coverage of the population, the level of literacy as a percentage of the total population, the number of students enrolled in general education schools, and the results of an independent assessment of students' knowledge (Sagradov, 2010).

From a substantive point of view, a large proportion of studies devoted to the effectiveness of spending on education mainly affects the analysis of financial and economic indicators and, to a lesser extent, other qualitative and quantitative characteristics of the education system. From a methodological point of view, most studies on the effectiveness of public spending on education conducted in recent decades can be divided into two broad categories: studies based on 1) parametric and 2) non-parametric approaches (Measuring Development: An Index of Human Progress, 2001).

The concept of reforming the budget process improves the efficiency of the use of budget allocations. The task of the supervisory authorities is to assess the effectiveness of the use of budgetary funds and identify their misuse. Currently, such assessments are not always carried out. The reason for this is the lack of a clear methodology for conducting this performance assessment. A variety of criteria and methods for evaluating the activities of budgetary organizations also makes the issue of the effectiveness of the use of budgetary funds highly debatable and debatable.

Each country has its way of managing budgetary funds, which to a certain extent determines the effectiveness of their use. In this case, two fundamentally different approaches can be distinguished: effective and costly.

As part of an effective approach to managing budget funds, management and control of results are carried out when determining spending limits (expenditure of financial resources per cost unit). The recipients of the budget perform the established quantitative and qualitative tasks within the limits of the appropriations allocated to them.

Part of the money saved by optimizing their activities can be used for their own needs. This mechanism allows you to balance the conflicting interests of managers and recipients of budgetary funds. The presence of planned and actual indicators in an effective budget management model ensures the independence of budget recipients in decision-making and allows you to evaluate the results of the work performed.

The essence of the cost models lies in the lack of independence of budget recipients in determining

the spending of the appropriations allocated to them. The lack of legislatively fixed performance results makes it difficult to assess the effectiveness of the use of budgetary funds. However, despite this shortcoming, the cost model is stable, familiar, and convenient not only for managers but also for recipients of budget funds, without requiring a "credit of trust" from budget recipients since it provides them with a very limited amount of authority.

Considering the activities of educational institutions, it is impossible not to note some features inherent in their results. A feature of educational services is that they are not external objects of the recipients, but an improvement of the recipients themselves, contributing to the growth of their intellectual capital. Cognitive factors (changes in the level of knowledge, skills, and abilities of a person) must be considered when assessing the effectiveness of education spending, which is difficult to express in monetary terms. At the same time, some educational services are free for the population (for example, universal compulsory secondary education), while others are paid (higher education). This means that it is impossible to establish a unified and unified system of indicators that reflects the effectiveness of the use of funds in the entire field of education.

Analysis of the effectiveness of budget expenditures and assessment of their impact on the effectiveness of the educational process is one of the most important areas of economic analysis in the field of education. Most economically developed countries of the world spend significant funds on improving the education system and improving the quality of the educational process.

According to the World Bank, in the composition of national wealth in 192 countries of the world, physical wealth accounts for an average of 16% of all wealth, natural capital – 20%, and human capital – 64%. For this reason, a growing number of researchers believe that human capital is the most valuable resource in post-industrial societies, much more important than natural or accumulated wealth. In all countries, human (intellectual) capital now determines the pace of economic development and technological progress (Moiseeva, 2015).

The methods of production and dissemination of knowledge, as well as the person himself, and his intellectual capabilities, come to the fore. However, in most cases, this raises the question of evaluating the effectiveness of the use of funds, since an increase in spending on education does not mean an increase in the efficiency of using these funds.

From the point of view of assessing the effectiveness of budget expenditures in the field of education, an important feature is the high standardization of educational programs to assimilate the same amount of knowledge throughout the country. This feature provides the basis for a comparative analysis of the results of the educational process not only between educational institutions in different regions but also between educational institutions.

The reasons for the decline in the efficiency of the education sector may be related to the low level of spending allocated to the development of the general education system. In our opinion, one of the most important tasks is a deep and comprehensive modernization of education, for which the necessary resources are allocated and mechanisms for their effective use are established, i.e. the study of the problem posed is of importance (Rimashevskaya, 2004).

Economic impact is defined as return on invested capital, which can be measured using various tools, including return on investment, debt-to-equity ratio (debt-to-equity ratio), share price-to-earnings ratio, or other quantitative metrics. In the case of social investment, it makes sense to assess the effectiveness of social investment through a set of indicators characteristic of each resulting impact, separating the economic, social, and socio-economic consequences of each.

From a methodological point of view, the main studies on the effectiveness of public spending on education in recent decades fall into two broad categories – studies based on parametric and non-parametric methods. Of interest are non-parametric methods for assessing the effectiveness of the use of budgetary funds and the quality of education. Its strength lies in the construction of the "production possibilities curve" of the education industry for an individual educational institution, its group, or region of the country, based on the actual amount of funding and the level of results achieved, regardless of the ratio between them. The introduction of results-based management mechanisms in the social sphere, as well as the principles of results-based budgeting, requires a deeper scientific development of theoretical and applied issues of assessing the effectiveness of social investments in the industry.

The quantitative and qualitative growth of the production of goods and services requires an increase in production capacities and the development of a person, that is, the development of all components of capital, of which he is the owner. In turn, the development of a person leads to the emergence of new needs in him. All components of this capital

require additional resources or investments during reproduction. An increase in demand leads to an increase in investment in human capital. On the other hand, the level of investments depends on their efficiency. The more efficient the use of investment in human capital, the less human capital is required, and vice versa.

Results and discussion

Units of human labor are not always equal, and the realization that investing in people can increase their productivity is far from new. Like many other economic concepts, the concept of human capital goes back to A. Smith, who compared education to investment in equipment: "When some expensive machine is being built, it is usually expected that there will be a large amount of work that it will work before as long as it does not wear out, at least to replace the capital expended on it with ordinary profit. Man, having put in a lot of effort and long training, has learned that any occupation that requires extraordinary dexterity and skill can be compared with no less expensive machines. It is to be expected that the labor for which he is trained, besides the ordinary wages for simple labor, will repay all the expenses he has spent on training, at least with the usual rate of return on capital equal to these expenses... This is the basis of the wage gap between skilled and ordinary labor" (Smith, 2007). This short quote formulated the main idea of the theory of human capital, which was not fully developed until 200 years later.

The essence of what is usually called the theory of human capital is the application of the standard theory of capital to some economic phenomena that have not previously been studied from this point of view. Its basic premise is that people spend various resources on themselves not only to meet current needs but also to generate future income (monetary and non-monetary). Thus, many processes – for example, education, health care, job search, access to information, immigration, and on-the-job training – can be considered not only as consumption, but also as investments, and the results of these investments – as forms of capital (human capital). Then, to analyze such phenomena, one can apply the standard tools of the theory of capital and try to explain the effects observed.

Since spending on education, health care, food, and immigration are investments in a person, the theory leads to the following important conclusions. First, differences in wages (between people in the same country and between countries) can be explained by differences in investment in human capital. As a result of training, a person accumulates knowledge, performs work better and faster, and his productivity increases, which means that his income should also increase. Secondly, the growth of total human capital will lead to an increase in national income. An increase in individual human capital increases the stock of human capital at the national level, and human capital is used in the economy to produce more high-tech goods (Bulina, 2020: 163-187).

The term "investment" applied to the costs of building and developing human capital gives these costs a new connotation, so that they are productive rather than consumer, in other words, as investments in individuals that generate a return on investment of funds. measurable long-term economic and/or non-economic impacts. In this regard, investment in human capital is an integral part of the successful development of companies and society (Figure 1).

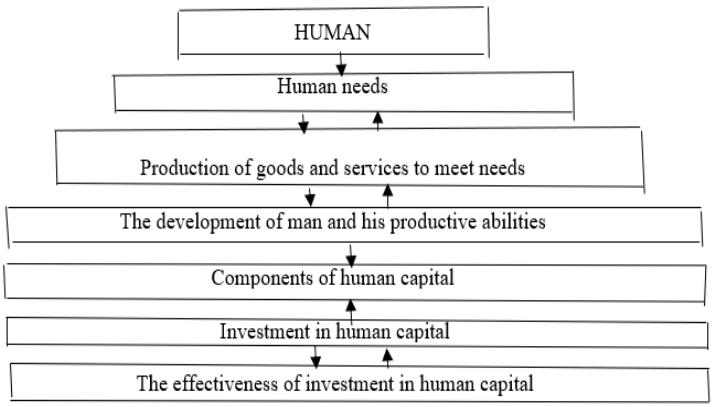

Figure 1 – The role of investment in the process of reproduction of human capital
Note – Developed based on sources (Tsapenko, 2022; Plotaeva, 2022)

The theory initially considers investment in human capital at the individual level. The decision to get an education is made by each person individually, based on some personal qualities (tendency to postpone current consumption), qualities (talents), or personal motives. Thus, by comparing the standard of living of people (considering their income, consumption, or quality of life), it seems possible to trace the return of people from their investment in human capital.

Many empirical studies have shown that graduating from high school or college significantly increases individual income, even after adjusting for direct and indirect costs, adjustment for ancestry and access to education, and national and cultural characteristics of economic systems.

The first illustration of this fact is the Mincer equation – a theoretical model of the dependence of individual income on education and work experience (Mincer, 1958: 281-302; Mincer, 1974: 178):

$$\log w(s, x) = \lambda + \rho s + \beta_1 x + \beta_2 x, \qquad (1)$$

where: w – salary,

ρ is the interest rate,

s is the number of years of study,

x – work experience.

The first part of the equation (1) is related to learning and can be obtained as an equilibrium condition in a model in which the same agents optimally invest in human capital to maximize the present value of their future income.

The second part of equation (1) appears if we additionally consider work experience related to investment in human capital after basic education.

In any case, the interest rate ρ plays a key role in the Mincer equation, which can be interpreted as the rate of return on investment in human capital. Ceteris paribus (if ρ is not very large), an extra year of education is associated with a loss of wages and, thus, is an investment that increases future wages, i.e. leading to additional profit. Therefore, the Mincer equation can be used as an econometric model for estimating returns to education at the individual level (rates of return).

The opinion that human capital largely determines the economic development of a country has also attracted the attention of theoretical economists. By creating a set of mathematical models, the main theoretical mechanism of the influence of human capital on economic growth is determined. Let us briefly dwell on the main provisions of the neoclassical theory of economic growth.

The output (Y) in an economy is determined by the total production function, which depends on the set of production factors (usually physical capital K and labor L) and the total productivity of the factor A: Y = F(K, A, L). At the same time, aggregate productivity can be associated both with efficiency (economic organization, institutions, correct distribution of resources, etc.) and with technological progress, that is, the level of technical development available to society. In the latter case, productivity is described in terms of R&D, the level of knowledge, and scientific developments.

For convenience and ease of presentation of results in theoretical models, production functions of the Cobb-Douglas type (Cobb et al, 1928: 139-165) are often considered:

$$Y = K^{\lambda}(A, L)^{\beta}, \qquad (2)$$

where $0 < \alpha$ и $\beta < 1$.

According to the model, variable A can be interpreted as labor efficiency or technological progress that increases labor.

The famous Solow model (Solow, 1956: 65-94) began to develop modern growth theory in the 1960s, showing that the accumulation of physical capital occurs at the expense of diminishing returns (more capital, slower accumulation, output slower than growth), no guarantees of sustainable economic growth. Long-term economic growth in the Solow model and similar exogenous growth models is provided on the assumption that technical progress A grows at a constant and given growth rate (1+ g):

$$A_{t+1} = (1 + g)A_t. \qquad (3)$$

In this case, the growth rate of production per capita in the long run coincides with the growth rate of technical progress (1 + g), but this constant growth rate has no explanation other than a simple assumption.

The effectiveness of investments in education is assessed from the standpoint of how the results of the functioning of the education system achieve the goals that guide the activities of the system. In this context, one speaks of the internal efficiency of investment in education.

Therefore, two concepts of efficiency are introduced – external efficiency and internal efficiency – to assess the results of education in terms of the implementation of two different systems of goals – what society seeks to achieve by financing education, and what the education system

seeks to achieve: the system itself directs the goals of its activities.

The effectiveness of investments in education largely depends on the form (source) of investments (Okunkova, 2021: 280; Davydov, 2009: 278-280):

1. Government spending. The state receives a material return on investment in education through the labor and social implementation of its citizens. This is manifested in an increase in the quality, intensity, and productivity of labor, an increase in tax revenues, and an increase in the level of employment by increasing the professional mobility of the population. Some authors consider the contribution of human capital to economic growth, they propose a decomposition method to account for employment growth, which is also influenced by the growth of human capital when explaining the growth of total output per employee (Son H. H., 2023).

All this makes it possible to characterize public spending on education as a long-term investment. Evaluation of the effectiveness of investments in education is reflected through a system of various criteria and coefficients, depending on the goals and objectives facing investors and researchers.

2. Budget financing (project financing). The effectiveness of the use of budgetary funds for the implementation of individual programs in the field of education can be assessed based on a comprehensive assessment of the achievement of specific program goals. However, most projects in the field of education are budget-funded (co-financed) but do not contain project performance indicators.

3. Private investment of citizens. A person's level of education is a guarantee of labor income and social mobility, which minimizes the risk of unemployment. The effectiveness of private investment in education can be measured by the rate of return on private investment in education. Statistical studies conducted in Kazakhstan and abroad have proven a strong relationship between a person's level of education and lifetime earnings.

4. Operating funds. Methods for evaluating the effectiveness of investments in corporate education can also be based on the theory of human capital. In this case, the knowledge and qualifications of employees are considered their income-generating capital, and the time and money spent on acquiring this knowledge and skills is an investment in it.

5. Projects of public-private partnership in the field of education. There are many forms of public-private cooperation, and its essence is to provide certain benefits for each participant. At the same time, the desired effect may lie in different areas for each stakeholder with different criteria that do not depend on the area of financial indicators.

Considering the activities of educational institutions, it is impossible not to note some features inherent in their results. In particular, the specificity of educational services is that for the recipients they are not external objects, but the improvement of the recipients themselves, contributing to the growth of their human capital. Cognitive factors (changes in the level of knowledge, skills, and abilities of a person) must be considered when assessing the effectiveness of education spending, which are difficult to express in monetary terms. At the same time, some educational services are free for the population (for example, universal compulsory secondary education), while others are paid (higher education). This means that it is impossible to establish a single and unified system of indicators that reflects the effectiveness of the use of funds in the entire field of education.

Analysis of the effectiveness of budget expenditures and assessment of their impact on the effectiveness of the educational process is one of the most important areas of economic analysis in the field of education. Most economically developed countries of the world spend significant funds on improving the education system and improving the quality of the educational process.

Performance evaluation is a difficult task, especially when it comes to public investment aimed at achieving positive socio-economic outcomes that cannot be directly measured in monetary terms. It is necessary to measure changes in social, environmental, sectoral, and other circumstances after the implementation of certain budget projects, i.e. focus on non-economic factors.

Analytical methods can be used as a tool for assessing the fulfillment of public policy tasks (Markov, 2023):

- Cost-benefit analysis (CBA);
- Cost Benefit Analysis (CEA);
- Cost-utility analysis (CUA);
- Weighted cost-benefit analysis (CEA) and various modifications of these methods.

Cost-benefit analysis assumes that any government initiative aims to achieve social benefits at some cost (or costs), both public (for example, in the form of taxes or targeted budget programs) and private. Social benefits and costs are based on monetary value. Since the national initiative has a period, the discounted cash flow method is used, if the value of money today is higher than the value of money tomorrow. If the benefits of the rebate outweigh the costs, then this is good for national

initiatives. Therefore, it is understood that the national initiative must be cost-effective, i.e. aimed at obtaining the maximum possible benefit at the minimum cost. In addition, all government goals are considered important, so when benchmarking, governments should prioritize those initiatives that maximize overall welfare (benefits) per unit of money spent in the national budget.

Cost-benefit analysis is characterized by significant gaps between theoretical research and the methods used to make practical calculations, in large part because of the difficulty of obtaining complete data to monetize social benefits and costs. In addition, it is often difficult to consider external positive and negative influences that can have a significant impact on the success of government initiatives. In addition to practical limitations, there are methodological limitations related to the fact that government initiatives can affect different social groups in different ways and lead to the redistribution of wealth, and not just to its maximization. In this regard, some economists propose to evaluate the social benefits of different groups and calculate the total benefit as a weighted sum of the benefits of different social groups. In addition, the size of government initiatives should always be considered, as cost-benefit analysis ultimately only shows the difference between benefits and costs, not their absolute value.

At the same time, the main advantages of the cost-benefit analysis method are a quantitative assessment of the effect of government measures, the use of the theory of money time, and the discounting method. At the same time, economists point to a cost-benefit analysis approach as one of the factors by which data-driven decisions about government initiatives can be made, but decision-making should not be reduced to just blindly following the approach.

The cost-effectiveness analysis method is a set of analytical techniques that allow you to determine the resources spent on achieving specific goals set by the public sector, and from this point of view, choose the best solution. The scope of this analysis includes not only productivity measurement itself but also productivity and economics, as they directly affect productivity. At the same time, cost-benefit analysis does not involve comparing dissimilar outcomes between them. In cost-benefit analysis, inputs are valued in kind or cash, and outputs are measured in kind or using tailor-made metrics that directly reflect industry characteristics and goals.

Although cost-benefit analysis is considered a highly explanatory technique in the analysis of any public investment proposal, it is still the most widely used in healthcare analysis. At the same time, in modern literature, this approach is increasingly recognized as the most common and attractive from a practical point of view. The main advantage of this tool is that it is based on a simple idea, and at the same time, the results obtained with this analysis are easy to interpret.

The cost-utility analysis method is a somewhat more complex modification of the cost-benefit analysis, based on a comparison of costs, measured in monetary terms, with the benefits that the population receives from the implementation of budget expenditures, expressed in units of utility (for example, in units of QALY) – years of life adjusted for quality – the number of years of life extension). The assessment of the expediency of budget expenditures is based on the analysis of the following criterion: C/U = Utility / Costs.

The method of cost analysis and weighted performance is often used in estimating budget expenditures related to education and health. The benefits to society from these expenditures often cannot be measured in monetary terms. In addition, such costs lead to different results, so they must be combined to obtain a decision-making tool. The final formula for calculating performance criteria is as follows:

$$wCE = price / \sum w_i E_i, \quad (4)$$

where: E_i – i- th effect,

w_i – the weight of the i-th effect.

The analysis made it possible to conclude that, considering the available information base, the most adequate method for assessing the effectiveness of investments in human capital – education is the method of cost-benefit analysis. The application of this method is not difficult, since the effects must be evaluated with expressions unusual for them, which is an indispensable condition for analysis in the framework of cost-beneficial methods.

When using the classical CEA method as a cost-benefit indicator, they are expressed in incremental form. Therefore, the efficiency of investment in human capital can be expressed as:

$$E = [\Delta I_t / (1 + i_t)] / \Delta HDI, \quad (5)$$

where: ΔC – increase in costs (investments),

ΔHDI is the productivity gain, i is the projected inflation rate for the period t.

The interpretation of this indicator is as follows: the lower the value of indicator E, the lower the

costs associated with achieving a certain level of performance and, therefore, the more effective the intervention under consideration.

The following case can be considered as an example of such an analysis. Let's analyze the implementation of the State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020 – 2025. The sources and amount of investment (I) are as follows (About Approval, 2023):

- republican budget – 9565 billion tenge;
- local budget – 716 billion tenge;
- World Bank – 13 billion tenge;
- private investments – 1284 billion tenge.

A total of 11578 billion tenge, including by years are shown in Table 1.

Table 1 – Dynamics of macroeconomic indicators of the Republic of Kazakhstan

Years	Actual values					Predicted values				
	HDI	Δ HDI	I	Δ I	i, %	HDI	Δ HDI	I	Δ I	i, %
2010	0,714	-0,09	797,4	50,9	7.97	-	-	-	-	
2011	0,745	0.031	1000,3	202,9	7.43	-	-	-	-	
2012	0,754	0	1255,6	255,3	6.06	-	-	-	-	
2013	0,757	0.003	1284,4	28,8	4.90	-	-	-	-	
2014	0,788	0.031	1471,7	187,3	7.54	-	-	-	-	
2015	0,794	0.006	1364,8	-10,.9	13.53	-	-	-	-	
2016	0,788	-0.006	1679,4	314,6	8.29	-	-	-	-	
2017	0,800	0.012	1843,2	163,8	7.22	-	-	-	-	
2018	0,800	0	1948,5	105,3	5,43	-	-	-	-	
2019	0,817	0,017	2332,0	383,5	5,43	-	-	-	-	
2020	0,825	0,008	2151.5	-180.5	6,37	-	-	-	-	
2021	-	-	-	-		0,757	-0.068	1336	-815.5	8,50
2022	-	-	-	-		0,781	0,024	1708	372	8,25
2023	-	-	-	-		0,821	0.040	2311	603	8,00
2024	-	-	-	-		0,825	0,004	2383	72	7,70
2025	-	-	-	-		0,845	0,020	2679	296	7,50
Note- Developed from source (Main socio-economic indicators of the Republic of Kazakhstan (1991-2022))										

The result of investments in education will be the Human Development Index (HDI) – an integral indicator calculated annually for cross-country comparisons and measuring the standard of living, literacy, education, and life expectancy as key characteristics of human potential in the area under study. It is a standard tool for general comparison of living standards across countries and regions. The index was developed in 1990 by a group of economists led by Mahbub ul-Haq of Pakistan; its conceptual framework was created through the work of Amartya Sen. The HDI has been published by the United Nations Development Program since 1990 in its annual Human Development Report.

The Human Development Index is compiled by the United Nations Development Program and is used as part of a special series of UN Human Development Reports. The HDI is a composite measure of a country's human development, measuring a country's achievements in terms of longevity, education, and a decent standard of living for the citizens for whom the index is being measured.

According to the Human Capital Report of the UN Development Program for 2010 – 2020 in Kazakhstan, the HDI of human development demonstrates a positive trend in the development of human capital. It should be noted that if in 2008 the republic was in the group of countries with an average level of human capital development, then since 2009 it has entered the group of countries with a high level of development and has managed to maintain its position so far.

The Human Development Index rose due to increased investment. We are faced with the task of determining in what year investments in education are effective, based on the years of implementation of the project under consideration. To do this, it is necessary to determine the dependence of HDI on changes in investment volumes (Figure 2):

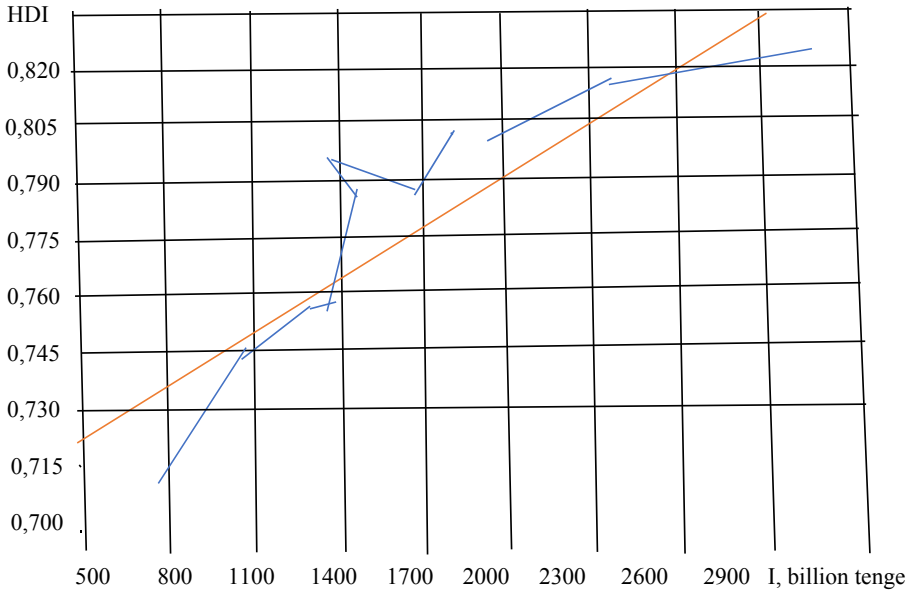

Figure 2 – The relationship of the human development index and investment in education
Note – Calculations were made by the authors independently based on the data in Table 1.

$$HDI = 0.6697 + 0{,}00006534 \cdot I. \quad (6)$$

According to the traditional incremental cost-benefit analysis, the following conclusions can be drawn:

- the costs that ensured the HDI growth to 0.781 in 2022 amounted to 1,708 billion tenge;

- the costs that ensured the HDI growth to 0.821 in 2023 amounted to 2311 billion tenge, etc.

The effectiveness of the implementation of investments in education, according to the State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020 – 2025, is shown in Table 2.

Table 2 – Calculation of the effectiveness of investments in education

Years	Investment efficiency	Years	Investment efficiency
2020	0	2023	13958,3
2021	11053,1	2024	16713,1
2022	14318,7	2025	13767,4
Note- Calculations were made by the authors according to the source (State Program for the Development of Education and Science of the Republic of Kazakhstan for 2020 – 2025).			

Conclusion

The application of the standard theory of capital to several economic phenomena (mainly education and training) that had previously been viewed as consumption rather than investment proved to be a fruitful idea. Treating education spending (along with health care, food, and immigration) as an investment in human capital has important implications at both the individual and aggregate

levels. From a microeconomic perspective, everyone has an incentive to accumulate human capital because it increases their productivity and personal income. Versatile human capital has a significant impact on customer satisfaction. This positive effect is a confirmation of the link between innovation and customer satisfaction (Fernán-dez Pérez de la Lastra, Sánchez Gardey,2024).

At the macroeconomic level, the accumulation of human capital has non-diminishing returns to scale, which contributes to long-term economic growth, and can also produce positive externalities that enhance this effect, which is reasonable.

The results of many empirical studies confirm that human capital is one of the main factors explaining the differences in the level of well-being in different countries. This raises an important question for theoretical economists, namely what the mechanism by which human capital influences economic growth is. As mentioned earlier, at this stage in the development of science, there are many theoretical approaches to the study of these mechanisms. The difference between them is not determined by the ratio between individual human capital and total human capital (most models assume the presence of a representative agent, so the total level of social human capital coincides with the level of individual human capital of a representative agent). Instead, how to model the relationship between the stock of human capital, capital, and technological progress, as well as the law of accumulation of human capital in the model. Of course, each model has its technical features that contribute to the theory of human capital.

Spending on education is one of the most important components of any country's investment in human capital. The money spent on educating the younger generation will soon determine the level of education of the country's population and, accordingly, the country's competitiveness in the world market.

It should be noted that human capital can only be formed through effective investment, and in this respect, it is like physical capital. Investments are justified if they have a sufficiently high rate of return and profitability, the main types of which are special training, the physical condition of a person, and the emotional behavior of employees. The formation of human capital is influenced by many factors that cannot be ignored when calculating the return on investment.

Financial literacy is an important element in the relationship between human capital, social capital, and access to finance, although it plays a greater role in the relationship between social capital and access to finance (Hj Talip, Wasiuzzaman, 2023).

The source of funding for the education system is the budgets of various levels. The concept of budgetary reform implies a more efficient use of funds. One of the tools to achieve this goal is to empower budget recipients with greater powers, which brings the existing costly model of managing budgetary resources closer to an effective one.

From the point of view of the effective use of budgetary funds in the field of education, in our opinion, the most important is the integral – the human development index.

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EMPOWERING ALMATY'S DISABLED WORKFORCE: ACTION FOR INCLUSIVE LABOR MARKET

The inclusion of people with disabilities in all spheres of public life is an important political issue in the country. However, according to the Ministry of Labour and Social Protection of the Population of the Republic of Kazakhstan, only 25% of people with disabilities under the age of 55 are employed in Kazakhstan. Most of them are predominantly employed in low-paid industries, as well as in areas where physical labor is required. The state implements numerous programs, projects, and creates favorable conditions for people with disabilities, but employment remains consistently low. My research reveals a multifaceted issue: employers' reluctance to offer suitable conditions for individuals with disabilities, hindering their access to common infrastructure. In Almaty, my findings indicate that some individuals opt to reside with family members who can fulfill their basic needs. Additionally, there is a deficiency in adequate education and experience among this demographic. The author conducted structured and unstructured face-to-face interviews and telephone surveys with various people with disabilities, employers, and government agencies to understand the barriers to employment for people with disabilities in Almaty. Most of the previous research has focused on people with disabilities in other regions of Kazakhstan, while my research has focused on the problems of people with disabilities in Almaty. In conclusion, the author makes recommendations to the local administration and the Ministry of Labour and Social Protection of the Population of the Republic of Kazakhstan.

Key words: Disability, social policy, labor market, social inclusion, inclusive education, barriers to employment.

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Алматы қаласында мүмкіндігі шектеулі адамдардың әлеуетін арттыру: инклюзивті еңбек нарығын құру бойынша іс-шаралар

Мүмкіндігі шектеулі жандарды қоғам өмірінің барлық саласына қосу – еліміздегі маңызды саяси мәселе. Алайда, ҚР Еңбек және халықты әлеуметтік қорғау министрлігінің мәліметі бойынша, Қазақстанда 55 жасқа дейінгі мүгедектердің 25% ғана жұмыспен қамтылған. Олардың көпшілігі негізінен жалақысы төмен өндірістерде немесе физикалық еңбекті қажет ететін салаларда жұмыс істейді. Мемлекет көптеген бағдарламалар мен жобаларды жүзеге асыруда, мүмкіндігі шектеулі жандарға қолайлы жағдай жасауда, бірақ жұмыспен қамту деңгейі тұрақты түрде төмен болып отыр. Менің зерттеулерім көп қырлы проблеманы көрсетеді: жұмыс берушілердің мүгедектерге қолайлы жағдай жасай алмауы, бұл олардың қоғамдық инфрақұрылымға қол жеткізуін қиындатады. Алматы қаласы бойынша менің зерттеулерім көрсеткендей, кейбір мүмкіндігі шектеулі адамдар өздерінің негізгі қажеттіліктерін қанағаттандыра алатын туыстарымен тұруды қалайды. Сондай-ақ, бұл халық арасында тиісті білім мен тәжірибе де жетіспейді. Автор Алматы қаласындағы мүгедектерді жұмысқа орналастырудағы кедергілерді түсіну үшін әртүрлі мүгедектермен, жұмыс берушілермен және мемлекеттік органдармен құрылымдық жеке сұхбаттар мен телефон арқылы сауалнамалар жүргізді. Бұрынғы зерттеулердің көпшілігі Қазақстанның басқа аймақтарындағы мүгедектерге арналса, менің зерттеулерім Алматыдағы мүгедектердің мәселелеріне арналды. Қорытындылай келе, автор жергілікті әкімшілікке және Қазақстан Республикасы Еңбек және халықты әлеуметтік қорғау министрлігіне ұсыныстар жасайды.

Түйін сөздер: Мүгедектік, әлеуметтік саясат, еңбек нарығы, әлеуметтік инклюзия, инклюзивті

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Усиление трудового потенциала инвалидов Алматы: меры по созданию инклюзивного рынка труда

Включение людей с инвалидностью во все сферы общественной жизни является важной политической проблемой в стране. Однако, согласно данным Министерства труда и социальной защиты населения Республики Казахстан, только 25% инвалидов в возрасте до 55 лет заняты на работе в Казахстане. Большинство из них работают в основном в низкооплачиваемых отраслях, а также в сферах, где требуется физический труд. Государство реализует множество программ и проектов, создает благоприятные условия для инвалидов, но уровень занятости остается стабильно низким. Мои исследования показывают многоаспектную проблему: неохоту работодателей предоставлять подходящие условия для индивидуумов с ограниченными возможностями, что затрудняет им доступ к общественной инфраструктуре. В Алматы мои исследования указывают на то, что некоторые люди предпочитают проживать с родственниками, которые могут удовлетворить их базовые потребности. Кроме того, среди данной группы населения наблюдается недостаток должного образования и опыта. Автор провел структурированные и неструктурированные личные интервью и телефонные опросы с различными инвалидами, работодателями и государственными органами, чтобы понять препятствия для трудоустройства инвалидов в Алматы. Большинство предыдущих исследований сосредоточено на инвалидах в других регионах Казахстана, в то время как мое исследование сосредоточено на проблемах инвалидов в Алматы. В заключение автор делает рекомендации местной администрации и Министерству труда и социальной защиты населения Республики Казахстан.

Ключевые слова: Инвалидность, социальная политика, рынок труда, социальная инклюзия, инклюзивное образование, барьеры для трудоустройства.

Introduction

In Almaty, as in other cities in Kazakhstan, there are measures to support the employment of people with disabilities. This can include training and rehabilitation, special technologies and equipment, and financial support. One important tool is the law «On Protecting the Rights of Persons with Disabilities» in Kazakhstan, which protects the rights of people with disabilities and supports their employment ("On social protection of persons with disabilities in the Republic of Kazakhstan" Law of the Republic of Kazakhstan). In addition, there are several organizations in Almaty that are engaged in supporting the employment of people with disabilities. They offer assistance in finding a job, training and rehabilitation, as well as provide financial assistance. Such organizations also work with employers to improve the accessibility and acceptability of jobs for people with disabilities.

Since 2012, actions were taken in Kazakhstan to exercise the Convention on the Rights of Disabled, which was ratified to ensure the inclusive company. In 2018, the Ministry of Labor and Social Protection completed a three -stage action plan, which is aimed at improving the quality of life and ensuring the rights of people with disabilities, and developed a national plan until 2025. The main goal of this plan is to integrate people with disabilities into the socio-economic life of the country through the creation of conditions for their economic independence and high-quality employment (MLSP, 2019). According to statistics on January 1, 2022, more than 700 thousand people with certain types of disability were registered in Kazakhstan, of which 466 thousand were at working age. However, only more than 110 thousand people from this group were employed, which is a rather low indicator. More than 57 thousand people with disabilities live in the city of Almaty, of which more than 40 thousand people of able -bodied revival, only 29 % are employed according to the employment center of the city of Almaty. According to the analytical report of the Enbek.kz electronic labor exchange, the share of vacancies available for persons with disabilities, in 2023 amounted to 3.8% of Almaty, 94 vacancies for 551 jobs from the total number of vacancies on the site (about 15 thousand) Mostly these vacancies are physical difficult work both for a full time and social jobs. In order to employ unemployed citizens, subsidizing wages is used in the creation of social jobs that are available for no longer than 12 months. The employer determines the size and pays wages, but the state reimburses 35% of this size, but not

more than 20 monthly calculation indicators (MCI). If the employer agrees and there is a vacancy, the participant may be employed on a permanent basis before the expiration of the employment contract.

One of the ways that are considered effective in the world to include people with disabilities in production activities is the installation of quotas for employment at enterprises. In Kazakhstan, in 2016 there were changes in the legislation, according to which a quota was installed on jobs for people with disabilities, which accounts for 2 to 4% of the total number of employees, not taking into account difficult work and places with harmful and dangerous working conditions. If we are talking about enterprises, then for those who have the number of employees from 50 to 100 people, the quota is 2%, from 101 to 250 people – 3%, and for those with more than 250 people, quota is 4% . Compared to most countries of the world, where this figure is 6%. Each year, all over Kazakhstan, the quota system includes approximately 3 thousand organizations of them more than 540 organizations in the city of Almaty, for which a quota of jobs for disabled people for 2022. 91% of them do not use employment quotas. The presence of unfilled quotas in enterprises is of concern, because this can be explained by the fact that, despite the desire of persons with disabilities to work, they ignore the jobs guaranteed to them in accordance with quotas. This is because the jobs on offer are often unattractive and, in some cases, simply not suitable for people with disabilities.

However, there are still many barriers to employment for people with disabilities in Almaty and other cities in Kazakhstan. These may include inadequate infrastructure, insufficient skills and resources to support employment, and inadequate access to the labor market. It is necessary to continue working to remove these barriers and improve working conditions for people with disabilities to increase their participation in society and improve their quality of life. The introduction of legislative measures that ensure equal opportunities for people with disabilities in the workplace, as well as the development of infrastructure and employment support programs can help. Public campaigns and educational programs can also play an important role in raising awareness and improving the acceptability of work for people with disabilities.

The topic of employment for people with disabilities is relevant because people with disabilities have the right to work and economic independence, and it is important for their inclusion in society. However, there are still barriers to employment for these people, such as stereotypes and lack of accessible jobs. The «barrier-free environment» currently being formed in Kazakhstan is not very effective and is more of a declaration for the sake of a tick in the report. The problems faced by people with disabilities are many, so the solution of these problems has become an urgent task for the state, whose main goal is the active involvement of people with disabilities in the workforce. Employment of people with disabilities brings them many positive changes. First, it gives them the opportunity to gain financial independence, which improves their economic situation. In Kazakhstan, on average, people with disabilities receive 57,000 tenge per month . Secondly, employment can improve their self-esteem and increase their level of dignity. Thirdly, work can provide them with social contacts and an opportunity to participate in social life. According to the Ministry of Labor and Social Protection of RK, employed people with disabilities in Almaty was only 26% of the total number of working age people with disabilities (National plan until 2025). General, employment can positively affect the quality of life of people with disabilities, improving their emotional and financial condition.

The main problems of employment of people with disabilities include:

1) lack of accessibility: many workplaces and environments are not adapted for people with disabilities, which prevents them from joining the workforce.

2) Unfavorable stereotypes: The opinion of society and employers that people with disabilities are less productive and incapable of performing work compared to others is one of the reasons for discrimination in employment.

3) Insufficient legislative measures: insufficient protection of the rights of people with disabilities in the legislation may hinder their employment or the provision of equal opportunities at work.

4) Lack of resources: Lack of appropriate resources, such as adapted technology, support for social services and resources necessary for employment and a successful career, can significantly limit the opportunities of people with disabilities in the labor market.

The problem raised in the article is limited access for people with disabilities to labor resources in the city of Almaty, Kazakhstan. This problem is relevant because people with disabilities often face barriers to finding work, and many of them are forced to live on government benefits. The article calls on employers and policy makers to take action to create jobs that are accessible to people with disabilities. This

includes creating more inclusive workplaces where people with disabilities can perform tasks according to their abilities and needs. The article also calls on politicians to take action to eliminate discrimination in the workplace and promote accessibility of jobs for people with disabilities.

In general, the problem of accessibility of work resources for people with disabilities is important and relevant in Almaty, as in many other cities around the world. Solving this problem will not only improve the lives of people with disabilities, but also contribute to economic growth and the development of society as a whole, by using their potential and talents.

A detailed analysis of the literature is required, demonstrating the achievements of Kazakhstani and foreign researchers, as a result of which it will be possible to formulate the main objectives of solving the problem.

Literature review

The literature review will review existing studies that analyze the barriers to employment faced by people with disabilities, the relationship between hiring people with disabilities and labor productivity, and the role of social employment and the quota system.

«Being a Hewmann» is the memoir of Judith Hewmann, a disability rights activist who has been at the forefront of the disability rights movement for more than four decades. The book recounts her life as a disabled person and her struggle for disability rights, including her sit-in, the landmark protest that led to the passage of the first-ever disability rights law in the United States. Throughout the book, Huhmann stresses the importance of disability rights, inclusion and accessibility, and highlights the challenges people with disabilities face in society. She also talks about her personal journey of self-discovery, including her struggle with depression and her journey to acceptance of her disability. From this book we can understand that employment for a disabled person can contribute to socialization, as a job or occupation can provide the disabled person with opportunities to interact with other people, establish social connections and a sense of belonging to society (Amber Hikes,2021).

According to Garcia-Ael and Cuadrado-Gordillo the authors are developing and testing a mediation model that explores how Discrimination against people with disabilities in the workplace is associated with negative attitudes towards them, lack of accommodation and lower job satisfaction. They believe that negative attitudes towards people with disabilities are an important factor in discrimination, and job satisfaction mediates the relationship between discrimination and the intention to quit a job (Garcia-Ael,2018).

Issues, Practices, and Aspirations (Owen et al.,2016) – The authors examine employers' issues, practices, and aspirations. on the employment of persons with disabilities in the private sector. They find that employers are concerned about the cost and productivity of housing, potential legal liability, and negative attitudes towards people with disabilities. However, they also found that employers who hire people with disabilities report positive experiences and benefits, including increased employee morale and loyalty(Owen,2016).

The authors Nguyen, T. and Chan, F. (2017) explore the process of workplace modification for people with disabilities and how it affects inclusion. at work. They believe that successful workplace modification requires a collaborative approach between employer, employee and disability service provider. They also found that successful workplace modifications can improve employee productivity and job satisfaction.

«The Impact of Employer Attitudes on the Employment of People with Disabilities» (Graffam J et al.,2002) – the authors examine the impact of employers' attitudes on the employment of people with disabilities. They found that negative attitudes towards people with disabilities lead to lower employment rates and limited career opportunities. They also found that employers who treat people with disabilities positively are more likely to hire them and provide them with housing (Graffam J,2002). Dew, B. & Bullock, H.E., (2015) – The authors review disability and employment research to gain insight into best practices for integrating people with disabilities in the workplace. . They believe that the successful inclusion of people with disabilities requires commitment from top management, active recruitment and hiring practices, and accommodations tailored to individual needs . So are authors such as Bell, MP, and Harrison, D.A., (2011) – they explore the impact of diversity training in reducing disability discrimination in the workplace. They believe that diversity education can be effective in reducing negative attitudes towards people with disabilities and improving inclusive behavior. However, they also find that the impact of diversity education may be limited and that other interventions may be required to achieve meaningful change (Bell,2011).

«Workplace amenities for people with disabilities: a review and research agenda» (Hernandez et al., 2020) – authors review research on workplace accommodations for people with disabilities and present a research agenda for future research. They found that workplace accommodations can lead to increased productivity, job satisfaction, and retention of employees with disabilities. They also identify several areas for future research, including the impact of workplace accommodations on the promotion of people with disabilities and the role of technology in facilitating accommodations.

In their work, Salhazan Nasutsia and other authors from Malaysia emphasize that for the disabled, employment is of particular importance in their lives, but, unfortunately, many people still worsen their need. Some people mistakenly believe that people with disabilities do not need a job to improve their lives, just as the average person does. They collect that the allowances chosen for the disabled are sufficient to ensure a decent life (Salhazan Nasutsia,2014).

Gurina, Moiseev, and Shurupova highlight a number of crucial concerns, such as the need for employers to make extra investments when employing individuals with disabilities. Moreover, certain disabled groups require customized workplaces to carry out their job duties. Nevertheless, the authors point out, based on expert opinions, that setting quotas for employment does not ensure job opportunities for all physically capable disabled individuals, but merely provides additional assurance for those who are deemed suitable for work according to their rehabilitation plan. It is worth stressing that employers create these quota-based job positions without much enthusiasm, as it is not financially beneficial for them (Gurina, 2019).

Many researchers state that reaching a certain level of education is of great importance when looking for a job. However, historically, many children and adults with disabilities have not been given high educational opportunities (WHO, 2011). According to the OECD (2017), people with disabilities generally have a lower level of education compared to those without disabilities in this area.

Scholars are attracted to the study of the work of persons with disabilities because of its importance and the wide range of problems it faces on a global scale. Some of these problems include discrimination against persons with disabilities, “mistrust” on the part of employers, the need for additional support from the state in the form of controls and other measures. These problems are relevant for different countries.

The purpose of this article is to consider the issue of creating equal opportunities for people with disabilities in the labor market of the city of Almaty. The article will highlight the problems associated with the employment of people with disabilities in the city, as well as offer practical recommendations and solutions aimed at improving the situation and ensuring equal opportunities for all. Specifically, the article will cover the following topics:

An analysis of the barriers people with disabilities face when looking for a job in Almaty. The study of legislative and legal acts regulating the employment of people with disabilities in the city.

An overview of best practices used in other regions and countries to create equal opportunities for people with disabilities in the workplace.

Offer concrete solutions and recommendations that can help remove barriers and provide equal opportunities for people with disabilities in the Almaty labor market.

The purpose of the article is to inform a wide audience about the problems associated with the employment of people with disabilities in the city of Almaty, as well as to assist in creating more equal opportunities for all.

Methodology

The article is a research paper that uses a qualitative data analysis method. The authors of the article collected and analyzed data obtained from a survey of employers and people with disabilities in the city of Almaty in order to identify the reasons why people with disabilities experience difficulties in finding employment.

The methodology of the article includes the following steps:

Preparing and conducting a survey. A questionnaire was developed containing questions about the employment and work experience of people with disabilities, as well as employers’ perceptions of the employment of people with disabilities. The survey was conducted in the city of Almaty, and both people with disabilities and employers took part in it.

Analysis of survey results. We analyzed the data obtained, identified the main reasons for the difficulties that people with disabilities face in finding employment, and proposed a number of measures that can help improve the situation in this area.

Formulation of recommendations. Based on the data obtained, the authors of the article formulated a number of recommendations for employers and politicians that can help create more opportunities for people with disabilities in the labor market in Almaty.

Article formatting. Finally, the authors prepared an article in which they described their research methods, the results of the survey, as well as proposals for improving the situation for people with disabilities in the labor market in Almaty.

Thus, the methodology of the article includes conducting a survey, analyzing the data obtained, formulating recommendations and designing the article.

Results and Discussion

Topics were identified to analyze participants' responses based on the questions contained in the interview protocol, the main research question, and working hypotheses. The answers received as a result of interviews and questionnaires of the study participants were analyzed.

A total of 56 people with disabilities were interviewed, of whom 3 had a first degree disability, 12 had a second degree disability, and 41 had a third degree disability (as shown in Figure 1), they were all of working age. The diversity of disability groups is an important factor to consider when analyzing employment levels by category and making policy recommendations. Among the participants, 20 people were born with a disability or acquired it at an early age, and the rest became disabled at a later age. This factor is important because it directly influences the level of education and acquired skills, which are crucial for employment (as shown in Figure 2).

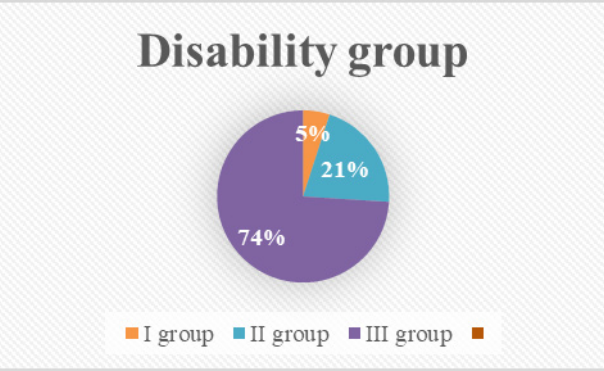

Figure 1 – Surveyed disabled people by groups
Note – compiled by the author based on a survey

The level of education plays a decisive role in employment opportunities. When asked what is your level of education, the respondents answered: 23 have higher education, 21 have secondary education (technical and vocational), 12 have secondary education.

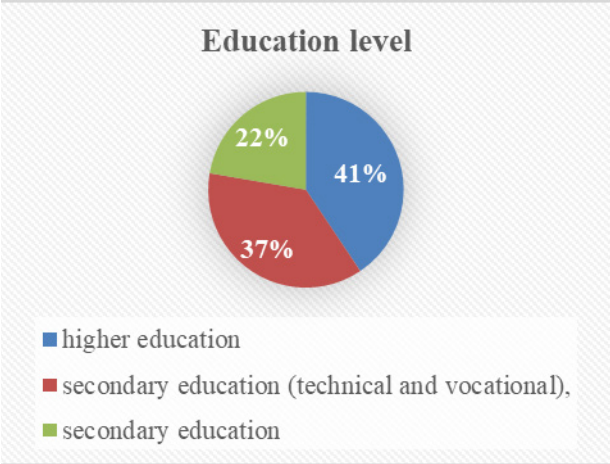

Figure 2 – Surveyed persons with disabilities by level of education
Note – compiled by the author based on a survey

To the question how did the detection of the disease and the establishment of the disability group affect your work activity? Have you had to change jobs? 75% of respondents answered that disability affected their work and are not currently working, 15% answered that disability did not affect and they work in the same place, 10% answered that they currently work but in a different profession. More than 90% answered that they are looking for a job or want to change their job.

As of July 1, 2022, the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan reported that the mean amount of state social disabilities was 56,974 tenge (132 dollar). By the standards of other countries, this is a very meager amount, while in Poland there are $ 216, Germany $ 832, UK 962 dollar, USA $ 1177. It is not surprising that the question of what are the main motives for the search for more than 80% of respondents who answered that the main motive for the search for work is to provide their material needs (purchase of products, clothes) People with disabilities answered that it does not matter where to work (60%), and 15% would like to open their own business. Many said that they did not face problems with colleagues, and 22% replied that they

experienced problems with the employers of their previous work.

The employment center's available job opportunities may not always be appealing or appropriate for individuals with disabilities. However, there is a high demand for job openings that consider the specific needs of disabled individuals. According to the Center for Employment of the Akimat of the city of Almaty for 2022, only 80 people with disabilities are employed according to the quota system. The fact that there are incomplete quotas in enterprises is concerning, as it suggests that despite having access to guaranteed workplaces through quotas, disabled individuals may not be taking advantage of these opportunities due to reasons that are yet to be understood. In order to clarify the opinions of employers about problems and prospects, an interview with 35 organizations for which a quota of jobs for the employment of disabled people was installed were held with 35 organizations. The main question was what problems they face in working with people with disabilities and how they solve them.The generalized conclusion drawn from the analysis of the data is that employers generally have a positive attitude towards people with disabilities and understand the need to address problems in this area. When asked what help you expect from the state when hiring an employee with disabilities, the answers were such as helping the type of subsidizing salaries and in the search for specialists. All respondents expressed a common opinion about the quota policy that the state is trying to shift the responsibility for social support for vulnerable groups to employers.

There are a number of reasons that reduce the social activity and competitiveness of people with disabilities in the labor market. Among these reasons, one can single out environmental barriers that impede movement and transportation to the place of work, as well as the inaccessibility or inconvenience of various social infrastructure facilities. In addition, persons with disabilities may lack the technical aids they need, which may also reduce their competitiveness in the labor market. One of the main problems that people with disabilities face is higher living expenses compared to non-disabled people. This creates difficulties in paying for vocational training and additional costs associated with employment. As a result, people with disabilities may be excluded from social recognition and educational opportunities due to their low socioeconomic status, problems finding work, and dependence on the client's social status.

Conclusion

One of the most assignments of the state is the wide inclusion of individuals with incapacities in labor movement, as this permits realizing the potential of attracting the populace and employing a substantial financial impact. Usually too expanded resilience to the social environment of the populace. It is imperative to note that people with inabilities are imaginative and beneficial laborers, given they are given with such openings. Physical incapacity ought to not be at hazard for work, and thus it is imperative that managers make uncommon employments for the crippled, which have more prominent imagination and concentration. To illuminate the issue of work of debilitated individuals, it is proposed to center on the taking after fundamental zones:

- Compilation of a enroll of unemployed impaired individuals and guardians raising debilitated children in each city and locale;
- Improvement of motivation measures for managers pointed at expanding the business of people with incapacities, such as a adaptable framework of assess benefits;
- Improvement of territorial laws and focused on programs that control the work of government offices for the work of individuals with incapacities;
- Making strides the framework of standards and work reservations, counting the creation of uncommon occupations for the debilitated;
- Improvement of social business enterprise pointed at including crippled individuals in labor exercises, both employees and business people;
- Extension of preparing and advanced preparing programs for people with inabilities;
- Taking under consideration the truth that bosses have plentiful openings to form uncommon employments and apply motivating force frameworks, it is vital to alter the existing component for controlling shares and saving occupations for individuals with incapacities;
- It is fundamental to utilize the mental potential of people with inabilities themselves to create imaginative arrangements to the issue of their work, counting recognizing and tending to the root causes of this issue.

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ENVIRONMENTAL AUDIT, AS THE MAIN TOOL FOR IMPROVING AND PROTECTING THE ENVIRONMENT

Environmental concerns are getting more evident in the context of establishing commercial links. In particular, the nature users themselves, governmental institutions, and private and public organizations that exert control have the challenge of determining the extent of harm done to it and the likelihood of such damage.

The primary goal of the study is to clarify how, while upholding the idea of sustainable development, the environmental audit helps to preserve and improve the environment. Because of this, one of the three worldwide strategies for determining and creating the environmental audit was applied.

After reviewing the pertinent and readily available domestic and international literature, conclusions about the environmental audit's influence on environmental protection and improvement were reached. The findings of the research indicate a clear link between environmental audit requirements and environmental improvement as well as pollution. The research findings will be put into practice by developing precise suggestions to minimize pollution and increase environmental protection.

The study's significance stems from the authors' definition of the prerequisites for the creation and formulation of an environmental audit for environmental improvement and protection purposes.

Key words: environmental audit, losses of pollutants, air pollution, losses, environment.

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Экологиялық аудит қоршаған ортаны жақсарту мен қорғаудың негізгі құралы ретінде

Нарықтық қатынастардың дамуы жағдайында қоршаған ортаға әсер ету проблемалары барған сайын айқындала түсуде. Атап айтқанда, оған келтірілген залалды және осы залалдың тәуекелін бағалау мәселелері табиғат пайдаланушылардың өздері, бақылауды жүргізетін мемлекеттік институттар, жеке және қоғамдық ұйымдар үшін де туындайды.

Мақаланың негізгі мақсаты – экологиялық аудит арқылы тұрақты даму тұжырымдамасын орындауын, яғни қоршаған ортаны қорғауды сақтай отырып, оны жақсартуда ықпалын түсіндіру болып отыр. Сондықтан да осы мақаланың мәнісін ашуда экологиялық аудитттің анықтауы мен дамуының үш жаһандық тәсілінің бірі қолданылды.

Экологиялық аудиттің қоршаған ортаны жақсартуға және қорғауға әсері туралы қорытынды жасау үшін, ең алдымен, тиісті және қол жетімді шетелдік және отандық әдебиеттер зерттелді. Зерттеу нәтижелері экологиялық аудит талаптары мен қоршаған ортаны ластайтын және ол ортаны жақсарту арасындағы тікелей байланысты көрсетеді. Зерттеу нәтижелерінің практикалық қолданылуы – ластануды азайту және қоршаған ортаны қорғауды жақсарту бойынша нақты ұсыныстар әзірлеу болып табылады.

Бұл зерттеудің құндылығы: авторлар қоршаған ортаны жақсарту және қорғау үшін экологиялық аудитті дамыту және қалыптастыру шарттарын анықтауда.

Түйін сөздер: экологиялық аудит, қоршаған орта, ауаның ластануы, ластаушы заттардың шығындылар, шығындар.

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Экологический аудит как главный инструмент улучшения и защиты окружающей среды

В условиях развития рыночных отношений проблемы воздействия на окружающую среду становятся все более очевидными. В частности, вопросы оценки причиненного ему ущерба и риска этого ущерба возникают и для самих природопользователей, государственных институтов, частных и общественных организаций, осуществляющих контроль.

Основная цель статьи – объяснение, как экологический аудит способствует улучшению и сохранению окружающей среды при сохранении концепции устойчивого развития. По этой причине был использован один из трех глобальных подходов к выявлению и развитию экологического аудита.

Сделаны выводы о влиянии экологического аудита на улучшение и защиту окружающей среды, была изучена, прежде всего, соответствующая и доступная зарубежная и отечественная литература. Результаты исследования показывают прямую связь между требованиями экологического аудита и загрязнением окружающей среды и улучшением окружающей среды. Практическое применение результатов исследования заключается в разработке конкретных рекомендаций по снижению загрязнения и улучшению охраны окружающей среды.

Ценность исследования заключается в том, что авторы определяют условия разработки и формирования экологического аудита для улучшения и защиты окружающей среды.

Ключевые слова: экологический аудит, окружающая среда, загрязнение воздуха, потери загрязняющих веществ, потери.

Introduction

Currently, industrial groups, the public, and the Republic of Kazakhstan's Administration are paying more and more attention to the problems of further deterioration of the environmental situation. Expanding ties with the global community requires the use of such a procedure as an environmental audit.

Environmental audit is a concept that began in the United States in the 1970s and has become a tool that covers a variety of issues aimed at making businesses more environmentally responsible. While there is no clear definition of the term "environmental audit," it is generally described as a systematic process of collecting and objectively assessing information on whether a particular environmental activity complies with audit conditions, criteria, and control systems. Environmental audit requires analyzing and monitoring the activities carried out by organizations that help control pollution and environmental protection at large.

Kazakhstan's environmental laws designate environmental audits as a distinct area of concentration for environmental protection efforts. Environmental audits are being used to check the efficacy of environmental management systems and environmental protection initiatives, and adherence to national law requirements for a large number of commercial organizations in Kazakhstan, in addition to being required by law.

The implementation of environmental audits as a form of operation spans a significant time frame in Kazakhstan's contemporary past. There is a matching reference and provision in the first version of the 1997 Republic of Kazakhstan *"On Environmental Protection"* Law. Consequently, the earlier version of Article 81 of the Law states that an environmental audit constitutes a distinct assessment of the economic as well as other operations conducted by organizations and citizens for adherence to the standards and laws of environmental protection, and environmental standards, including the correct creation of statements on the utilization and growth of natural resources.

The problem of the study is the need to improve the environmental situation in the Republic of Kazakhstan by introducing and improving environmental audit practices. In the context of the growing attention of industrial groups, the public, and the government to the issues of environmental degradation, it becomes critically important to assess the effectiveness of existing environmental management methods and develop new approaches to systematic monitoring and control of compliance with environmental legislation. The focus is on analyzing the role of environmental audit as a tool that helps reduce pollution and strengthen business environmental responsibility.

Literature review

The concept of sustainable development was advocated as a shared aim for environmental leadership in all nations during the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil, based on the Brundtland Report "Our Common Future".

The industrial sector has responded to this new approach to development by creating a system of environmental management to improve the production process (Watson M., Emery R.T., 2004). The environmental management system is based on extended quality standards with an environmental component. Consequently, businesses and companies have added an environmental component to their management system due to the environmental audit's outcome (Ledgerwood G., Street E. et al. 1992). In addition, financial investors have become more focused on the sustainability of their potential clients and have added a mandatory requirement for environmental and social audits. All these conditions and consequences have prompted the introduction of a new market instrument, the environmental audit, which initially involved compliance with environmental legislation (Todea N, Stanciu I. C. et al., 2011). Over time, however, it has evolved into a control mechanism based on internal self-assessment and control intentions (Power M., 1997).

In the late 1970s and early 1980s, environmental legislation was becoming increasingly stringent. It was these conditions that became one of the key factors for developing the concept of the environmental audit in North America, which later spread around the world (Hunt D., Jonson C., 1995).

There were several studies on how the audit contributes to the improvement of national regulation. Kairak (2008) showed that the environmental audit contributed to the implementation of an accountability system, increased transparency in regulation and public financial management, and directly and indirectly prevented and combated corruption in government. As for environmental regulation, some modern studies have proven the positive impact of environmental audit (Zhao D., Huang, X., 2010; Lu, H., Wei, Y., Yang, S. et al., 2020; Jiang K., Tan Q., 2021; Cao H. et al., 2022). An excellent environmental governance and leadership instrument is the environmental audit, as demonstrated by empirical research using data from nations that are part of the OECD, such as the US, the European Union, and Japan (Li H. et al., 2017; Han T., 2017; Ruban A., Rydén L., 2019, Xu Z. et al., 2022).

According to Medley's (1997) notion, the environmental audit's core concept, inception, and growth all started in 1988, and it has rapidly evolved since then. In his thorough analysis of the auditors' responsibilities, Medley pointed out that there exist 4 levels in the process of an environmental audit, each of which reflects a shift in the audit's primary goal and the responsibilities of environmental auditors (Figure 1) (Ljubisavljevic et al., 2017).

Three worldwide methods for determining the scope and growth of environmental audits have evolved (Peršić M. et al., 2007), despite variations in audit concept and implementation over time, environmental audits are meant to gauge the performance of environmental management; they additionally examine how smoothly business systems conform to environmental rules and legislation. Lastly, the environmental auditors evaluate the company's influence on the environment.

A complete and thorough audit that considers all three methods is known as an environmental audit (Ljubisavljevic et al., 2017).

The environmental audit is described broadly and comprehensively for the intent of this research, accounting for all three methodologies and real-world requirements. The environmental audit requires management and internal control systems to evaluate all business activities related to the environment in a methodical, objective, and scientifically supported manner. Additionally, management must ensure conformity with the environmental policy.

According to Grant Ledgerwood et al. (1992): the environmental audit is a new element of corporate strategy. It is the natural result of a growing environmental consciousness that began in the 1960s and peaked in the 1990s, realizing that it is the responsibility of every firm and individual to contribute to solving global environmental problems (Wardhani I., Yunus H. A., 2017).

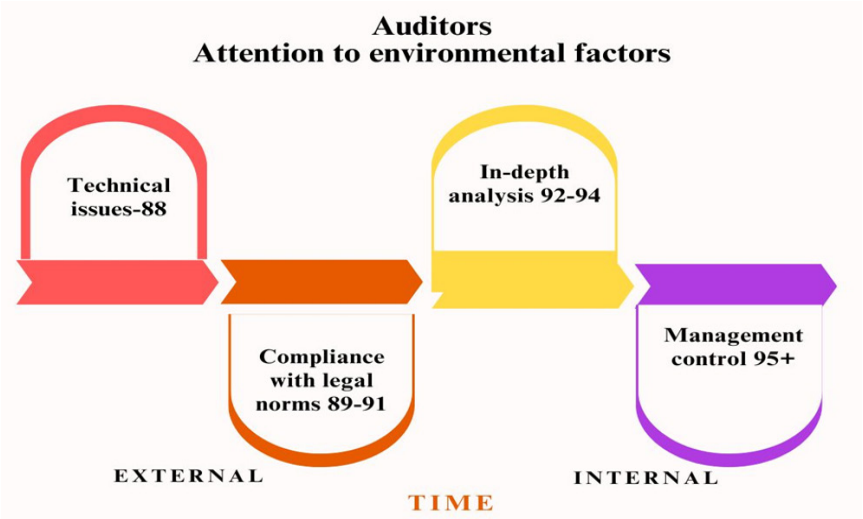

Figure 1 – Transformation of the environmental audit over time
Note – Compiled by the authors, source: (Medley,1997)

The environmental audit covers a wide range of environmental aspects, some examples include:

- emissions: assessment of air pollution, including volatile organic compounds, greenhouse gases, and other pollutants;
- water resources management: assessment of water use, wastewater production, and discharge procedures;
- waste management: the study of waste production, classification, storage, movement, and disposal;
- hazardous substances: identifying and evaluating the use, storage, processing and disposal of hazardous materials. This includes assessing compliance with chemical handling regulations such as labeling, material safety data sheets, and spill response plans (Environmental Assessment, 2022).

Methodology

Many individuals are concerned about environmental quality, and a variety of investigations have been undertaken in educational settings to investigate the elements influencing it from various viewpoints. The best known of these is the proposal and verification known as the environmental Kuznets curve (EKC) (Grossman M., Krueger B., 1995). EKC describes the link between economic growth and environmental quality as an inverted U-shaped relationship. As a result, several researchers have contributed to the investigation of various elements influencing environmental quality: foreign trade (Cole M.A., 2003), foreign investment (Abdouli M., Hammami S., 2016), industrial structure (Zhang, X.; Zheng, J.; Wang, L., 2022), technological progress (Chaudhry I.S. et al., 2022), income distribution (Mahalik, M.K. et al., 2018) and institutional structure (Mehmood U. et al., 2022).

However, as Lee H. et al. (2023) points out, economic development patterns and due to differences in industry structure, there is almost no single model that explains the relationship between a certain factor and environmental quality applied to pollutants in all regions.

Thus, the scientific writings of indigenous, Russian, and worldwide researchers as well as national and international studies addressing environmental protection concerns served as the foundation of theory and method for this research. Given the assigned variables, the comparison method, visual analysis, methodical, logical, quantifiable procedure, and depth of assessment all add to the credibility of the study's findings.

Results and discussion

The analysis of the main trends in environmental protection allowed the authors of the articles to identify the following features in Kazakhstan:

Industrialization has so far helped many societies and their economies move forward, but it has led to an effect known as a «silent spring» (Li X. and Heads, 2023).

In addition to economic growth since independence, our republic has also suffered significant damage in the form of environmental and

resource damage or heavy pollution. For example, the indicator of environmental pollution.

In the nation's metropolitan regions, and particularly in industrial districts that have stabilized and developed into industrial hubs, air pollution is turning into a major environmental concern. Urban areas account for the majority of air pollution nationwide. Most of the population in urban areas suffers from decreasing air quality, which causes the need to pay special attention to improving the situation in urban areas.

Air pollution that contains harmful components raises morbidness, which has an immediate and long-term impact on the nation's economy through higher medical expenses and decreased worker productivity. The nation's pollution regulations vastly surpass those of Europe. Therefore, it is essential to think about establishing stricter limits for emissions of dust, sulfur dioxide, and nitrogen oxide in order to enhance the quality of the air in Kazakhstan.

The National Bureau of Statistics estimates that 2314.7 thousand tons of pollutants were released into the atmosphere by stationary sources in 2022. Twenty.4% of them are solids, while the remaining 79.6% are gaseous liquids.

Nonetheless, compared to the previous year, the amount of air pollutants emitted by stationary sources fell by 3.8% this year. It is caused by the fact that in 2022 the republican organizations in the activities of enterprises, which constantly pollute the environment, capture and neutralize 93.4% of pollutants in the air.

Atmospheric emissions of substances negatively affecting the health and activity of the population and the natural environment from permanent, i.e. organized and unorganized emission sources, are the emissions of atmospheric pollutants.

Parts of the toxic gases released by stationary air infusion systems such as vents, chimneys, and aeration fixtures are considered organized permanent sources.

Now we will review the data by regions of the RoK. The main volume of pollutants was formed in Pavlodar region (724.2 thousand tons), Karaganda region (469 thousand tons).

Table 1 – Pollutant losses by regions, thousand tons

Regions	2018	2019	2020	2021	2022
By the Republic	2446.7	2483.1	2441	2407.5	2314.7
Abay region	-	-	40.7	40.9	39
Akmola region	84.5	76.7	77.2	77.3	69.5
Aktobe region	158.1	136.6	135.1	137.4	136.5
Almaty region	50.2	48.1	26.3	30.3	28.8
Atyrau region	172.3	164.5	153.9	160.3	132.1
West Kazakhstan region	48.2	41.2	30.8	26	25.8
Zhambyl region	52.1	55.8	55	55.8	52.9
Zhetysu region	-	-	19.9	17.7	13.1
Karaganda region	587.5	641.3	519	488	469
Kostanay region	124	130.5	123.4	137.9	121.4
Kyzylorda region	26	24.4	28.3	29.2	23.4
Mangistau region	65.5	64.5	72.5	75.2	78.7
Pavlodar region	709.3	721.5	723	736.1	724.2
North Kazakhstan region	75.5	74.7	76	61.2	52.7
Turkestan region	30	33.5	28.1	29	25.2
Ulytau region	-	-	108.7	81.7	105.1
East Kazakhstan region	130.7	128.8	86.5	87.2	83.3
Astana	56.4	65.1	62.4	62.2	57.7
Almaty	43	46.1	44.5	40.8	41.4
Shymkent	33.4	29.8	29.6	33.2	34.9
Note – Data from the Bureau of National Statictics					

As you can see from the table above, it can be seen where there has been a decrease in air pollutant emissions over the last 3 years. That is a decrease of 168.4 tons compared to 2019. Without a doubt, the establishment of the Republic of Kazakhstan's Ministry of Ecology, Geology, and Natural Resources in the year 2019 was the cause of this.

Let's look at the environmental costs that are applied in the manner used by entities that produce emissions of these air pollutants to reduce pollution in the environment.

The capacity of any business to establish the concept of environmental expenditures, categorize them, and compute them as a fundamental element in the logical environmental management system is a crucial move toward developing procedures for evaluating them. The thoroughness with which environmental expenses are reflected in cost accounting is critical for qualitative analysis. To solve this issue, basic guidelines for classifying environmental expenses and reflecting them in cost accounting accounts must be established.

According to investigators Hansen and Mendoza, expenditures can be classified as:

– environmental detection costs: expenses to ensure conformity with legislation and opt-in norms;

– environmental prevention costs: the expenses of efforts taken to avoid the development of waste;

– environmental external failure costs expenses incurred on tasks carried out after releasing waste into the environment;

– environmental internal failure costs expenses incurred from carrying out activities that have produced contaminants and waste that have not been discharged into the environment.

K. S. Saenko is of the opinion that the environmental procedures of a business should be taken into account in the context of nature management, i.e., in the areas of growth, the extraction process, utilization of resources from nature; adverse effects on the planet; and environmental protection operations. We believe that the generating entities should be required to pay compensation for harm to the environment. This is because the ecology is adversely impacted by the production and mining of minerals.

Environmental accounting is defined by S. M. Shapiguzov and L. Z. Shneidman as a method of keeping track of environmental protection operations with regard to the control of this topic in question. They state that a company's environmental accounting framework should have 4 key components: recording environmental expenses, recording environmental liabilities, environmental reporting, and auditing of relevant data.

Streamlining the expenditures of environmental protection and applying them to modern management accounting requirements – specifically in the context of building a cost control system–remain among the most important problems in environmental accounting research.

The ability to define the notion of environmental costs, classify them, and calculate them is critical in developing techniques for evaluating them inside any firm, as it serves as the key component in the system of logical environmental management. The thoroughness with which environmental expenses are reflected in cost accounting is critical for qualitative analysis.

K. S. Saenko carefully analyzed the categorization aspects of environmental costs, as shown in Figure 2.

In this cost categorization, expenses should be used instead of costs if the corporation settles them out of earnings.

There are variances between the phrases expenses and costs recently, regardless of the fact both are usually used in tandem.

Costs are factors used in the manufacture of items or works. Expenses are a resource utilized to create money for the present time.

The cost allocation in the RoK by Taigashinova K.T. can be introduced as follows (Figure 3).

The expense accounts under consideration are applied in all organizations of the country. It reflects the organization's financial situation, so organizations at the public and private levels of the country should include and control environmental costs in their part of expenses. This is because many foreign organizations pay much attention to environmental responsibility in the process of pilgrimage of domestic enterprises.

Further, we will consider the amount of expenses within the republic in recent years invested in environmental protection:

The Republic of Kazakhstan's business entities spent 444 billion dollars in 2022 and 417 billion dollars in 2021 on environmental conservation.

According to data for 2022, Atyrau (22.7%), Karaganda (10.3%), Aktobe (10.1%) regions allocated 191.8 billion tenge for environmental services, which is 43.1% of total environmental protection costs. This is explained by the high concentration of industrial organizations in these regions.

Classification features		Environmental cost groups	
	Employed in the manufacturing procedure		Basic and overhead expenditures
	By technique of adding to the sales expenses		Both direct and indirect expenditures
	By substance of the economy		Costs of compensating for an economic entity's negative environmental effect
	Relative to the business		Internal and external costs for preventing negative impacts and eliminating their repercussions
	In monetary terms		Capital and operational costs
	By manufacturing amenities		Cost of manufacturing networks, workplaces, regions, and facilities
	By nature utilize objects		Costs associated with environmental preservation, including air, water, soil, and perennial farms; Noise, radiation, and vibration reduction costs; Waste disposal and dump costs; Natural terrain conservation costs.
	Concerning the extent of environmental harm		Overt and covert techno genic impact costs
	By execution period		Current and advance expenses
	Through the discharge of contaminants		Specific and related environmental expenditures
	By degree of density		Expenses as compensation for a license to utilize natural resources; The costs of reproduction and environmental conservation; Expenditures including pollution levies; Expenditures in the form of other environmental fees.
	According to the contaminating level		Industrial pollution costs: - Within restrictions; - Exceeding regulations but not exceeding limits; - Exceeding defined limitations. - Fines and penalties for unexpected and unforeseen pollution incidents
	By kind of cost recuperation.		Costs associated with restoring people's health and compensating for pollution's negative impact on businesses and third parties.

Figure 2 – Classification of environmental costs according to K.S.Saenko
Note – Compiled by the authors, source: (Saenko, 2005)

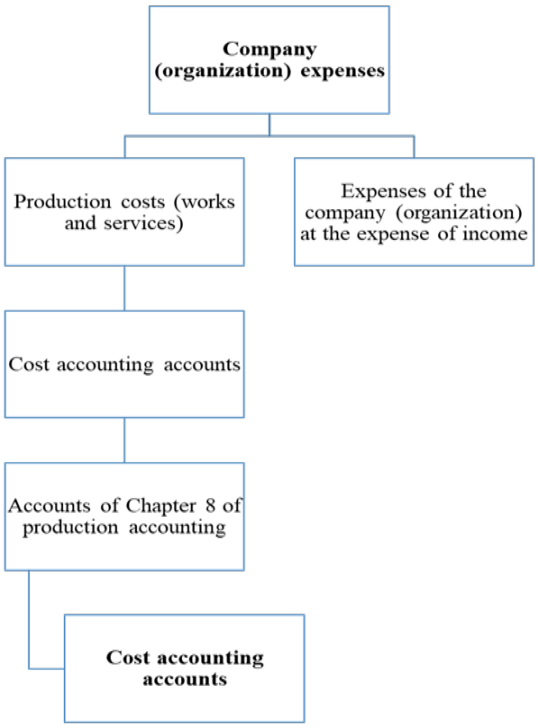

Figure 3 – Costs of production, accounts for cost accounting, accounts for expense accounting
Note – Compiled by the authors, source: (Ahmetova, 2016)

In 2022, the fraction of fixed capital investments that focused on environmental protection was 35.9% of total expenses, while current costs accounted for 64.1%. Table 2 shows the change in environmental protection expenses based on the kind of environmental protection activities:

Table 2 – Dynamics of environmental protection costs by types of environmental protection activities.

Types of activities	2020 (‘000 KZT)	2020 share, %	2021 (‘000 KZT)	2021 share, %	2022 (‘000 KZT)	2022 share, %
Total	384015734	100	416955575	100	444514269	100
Problems of atmospheric air protection and climate change	88476190	23.04	82513454	19.79	127995826	28.79
Aqaba water treatment	66978966	17.44	94165799	22.58	113096310	25.44
Waste management	73248476	19.07	90899013	21.80	107096519	24.09
Protection and rehabilitation of soil, ground, and surface waters	16180047	4.21	26808738	6.43	23695591	5.33
Reduction of noise and vibration impact	38788	0.01	94492	0.02	163944	0.04
Biodiversity and landscape conservation	6038736	1.57	2199854	0.53	3307758	0.74
Radiation safety	955709	0.25	779270	0.19	880252	
Research and development in the field of environmental protection	4502777	1.17	4921332	1.18	3479430	0.78
Other areas of environmental protection activities	127596045	33.23	114573623	27.48	64798639	14.58
Note – Data from the Bureau of National Statistics						

Table 2 shows the following arrangement of environmental protection expenses by kinds of environmental protection operations: Air protection: 28.8%, Aqaba water treatment: 25.4%, and waste management: 24.1%. Let us represent it in the format of figure 4.

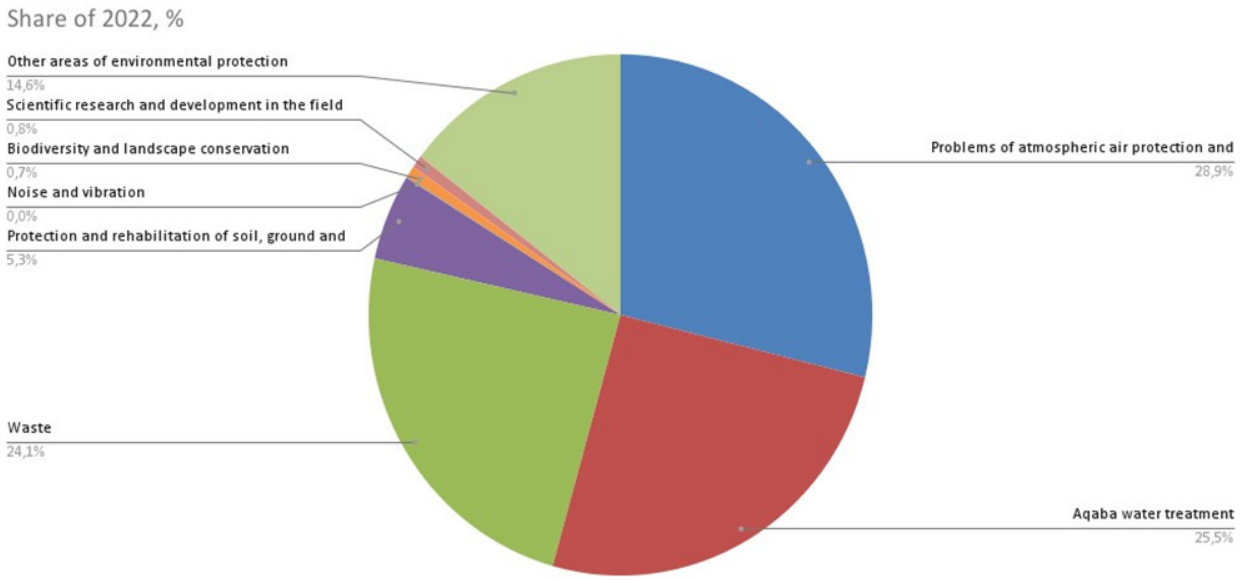

Figure 4 – Total environmental protection costs by type of environmental protection activities
Note – Data from Bureau of National Statistics

The classification of environmental protection activities – such as trash disposal, wastewater treatment, and combating climate change – determines the amount of money spent on each category of activity.

These expenses have an environmental component and are intended to safeguard the environment. In the case of conjugate (production, technical, and environmental) significance, only those are listed, where the main (primary) reason for their implementation is the objective of environmental protection.

Organizations must do their part to preserve the environment in a world that is facing environmental challenges. Conducting an audit of an organization's products, services and facilities is an important step towards achieving this goal. By ensuring environmental compliance, organizations reduce risks and adopt sustainable practices, strengthen relationships with stakeholders, and improve their environmental management systems. Environmental compliance and unwavering audit is the ultimate statement that the organization is committed to preserving our planet and positively impacting future generations.

The results of the study show that environmental audit is an important tool for improving environmental performance and reducing the negative impact on the environment. To improve the environmental situation in Kazakhstan, it is necessary:

- to develop a legal framework for environmental auditing by international standards;
- reduce and stabilize pollution volumes;
- set stricter emission standards;
- implement continuous emission monitoring systems;
- to develop methods of analysis and classification of environmental costs in companies.

Environmental audit contributes to compliance with environmental standards and risk reduction, introducing sustainable methods, strengthening relationships with stakeholders, and improving environmental management systems.

Conclusion

The outcomes of this investigation reveal that contaminating items impair every environmental category both locally and internationally by emitting hazardous contaminants into the atmosphere, leading to climatic variations, and failing to properly treat and dispose of toxic waste, all of which worsen public health and safety in the environment. Environmental audits help to reduce or prevent these damages.

An environmental audit is a useful tool that improves environmental performance and environment. That is, our article is analyzing and controlling air emissions and the environmental costs of removing air pollutants.

In addition to the legal demands of environmental audits, they may preserve money by reducing pollution remediation expenses, fines, penalties, and other regulatory requirements.

To enhance and maintain the environment, these fundamental elements must be met:

- the legal framework must align with global and national regulations, via the cooperation of state and autonomous professional regulation;
- the system of environmental audit regulation should be in line with the long-term development plans of the country;
- along with the consumption of natural resources, it is necessary to reduce and stabilize the amount of pollution;
- industrial enterprises need to install equipment for continuous measurement of atmospheric emissions, i.e. with large plants, boiler houses;
- Kazakhstan's authorized environmental protection authorities need to conduct continuous inspection and control of air pollutant emissions;
- as one of the tools for reducing air pollutant emissions by enterprises, it is necessary to control costs and expenses, display them in reports with cost accounts, and exercise supervision through environmental reports.

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OPTIMISING THE USE OF IRRIGATED LANDS IN KAZAKHSTAN: SYSTEM ANALYSIS AND RESOURCE MANAGEMENT

This article explores the challenges and opportunities in optimizing the use of irrigated lands in Kazakhstan, focusing on system analysis and resource management. The research purpose is to identify strategic improvements in irrigation practices and regional water governance, while aiming to enhance water resource management efficiency and sustainability in agriculture. The main directions of the study involve analyzing Kazakhstan's reliance on external water sources, infrastructural inefficiencies, and region-specific strategies for sustainable agricultural practices. Methodologically, the research relies on regional case studies, national statistical data, and quantitative analyses, including correlations and descriptive statistics. It also applies frameworks like Integrated Water Resources Management, Socio-Ecological Systems, Water-Energy-Food Nexus, and Participatory Water Management.

The research results highlight Kazakhstan's vulnerability due to its significant dependence on external water sources, accounting for 46% of its water supply, and inefficiencies in its aging irrigation infrastructure. The practical value of this research is in offering comprehensive, actionable recommendations to policymakers, agricultural stakeholders, and local communities for improving infrastructure, adopting efficient irrigation techniques, and fostering international collaboration. The research novelty lies in its interdisciplinary application of multiple strategic frameworks to develop tailored strategies addressing the unique challenges across Kazakhstan's economic districts, balancing agricultural productivity with sustainable water management practices.

Key words: water resource management in Kazakhstan, agricultural water efficiency and sustainability, impact of external water sources, innovation in irrigation practices, economic problems in agriculture.

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Қазақстандағы суармалы жерлерді пайдалануды оңтайландыру: жүйелік талдау және ресурстарды басқару

Бұл мақала жүйені талдау мен ресурстарды басқаруға баса назар аудара отырып, Қазақстандағы суармалы жерлерді пайдалануды оңтайландырудағы қиындықтар мен мүмкіндіктерді зерттейді. Зерттеу мақсаты ауыл шаруашылығындағы су ресурстарын басқару тиімділігі мен тұрақтылығын арттыруға бағытталған суару тәжірибесі мен аймақтық суды басқарудағы стратегиялық жақсартуларды анықтау болып табылады. Зерттеудің негізгі бағыттары Қазақстанның сыртқы су көздеріне тәуелділігін, инфрақұрылымдық тиімсіздігін және тұрақты ауылшаруашылық тәжірибесі үшін аймаққа тән стратегияларды талдауды қамтиды. Әдістемелік тұрғыдан зерттеу аймақтық жағдайлық зерттеулерге, ұлттық статистикалық деректерге және сандық талдауларға, соның ішінде корреляциялық және сипаттамалық статистикаға сүйенеді. Ол сондай-ақ су ресурстарын біріктірілген басқару, әлеуметтік-экологиялық жүйелер, су-энергия-азық-түлік байланысы және бірлескен суды басқару сияқты құрылымдарды қолданады.

Зерттеу нәтижелері Қазақстанның сумен қамтамасыз етудің 46% құрайтын сыртқы су көздеріне айтарлықтай тәуелділігіне және ескірген суару инфрақұрылымының тиімсіздігіне байланысты осалдығын көрсетеді. Бұл зерттеудің практикалық құндылығы саясаткерлерге, ауылшаруашылық мүдделі тараптарына және жергілікті қауымдастықтарға инфрақұрылымды жақсарту, суарудың тиімді әдістерін қабылдау және халықаралық ынтымақтастықты ынталандыру бойынша жан-жақты, әрекет етуге болатын ұсыныстарды ұсынуда. Зерттеудің жаңалығы оның Қазақстанның экономикалық аудандарындағы бірегей міндеттерді шешуге арналған бейімделген стратегияларды әзірлеу, ауыл шаруашылығы өнімділігін тұрақты су ресурстарын басқару тәжірибесімен теңестіру үшін көптеген стратегиялық негіздерді пәнаралық қолдануында жатыр.

Түйін сөздер: Қазақстандағы су ресурстарын басқару, ауылшаруашылық су тиімділігі мен тұрақтылығы, сыртқы су көздерінің әсері, суару тәжірибесіндегі инновациялар, ауыл шаруашылығындағы экономикалық мәселелер.

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Оптимизация использования орошаемых земель Казахстана: системный анализ и управление ресурсами

В данной статье исследуются проблемы и возможности оптимизации использования орошаемых земель в Казахстане, уделяя особое внимание системному анализу и управлению ресурсами. Целью исследования является определение стратегических улучшений в практике орошения и регионального управления водными ресурсами с целью повышения эффективности и устойчивости управления водными ресурсами в сельском хозяйстве. Основные направления исследования включают анализ зависимости Казахстана от внешних источников воды, неэффективности инфраструктуры и региональных стратегий устойчивого ведения сельского хозяйства. Методологически исследование опирается на региональные тематические исследования, национальные статистические данные и количественный анализ, включая корреляции и описательную статистику. Он также применяет такие концепции, как интегрированное управление водными ресурсами, социально-экологические системы, взаимосвязь воды, энергии и продовольствия и совместное управление водными ресурсами.

Результаты исследования подчеркивают уязвимость Казахстана из-за его значительной зависимости от внешних источников воды, на долю которых приходится 46% его водоснабжения, а также неэффективности стареющей ирригационной инфраструктуры. Практическая ценность этого исследования заключается в предложении всеобъемлющих и практических рекомендаций политикам, заинтересованным сторонам в сельском хозяйстве и местным сообществам по улучшению инфраструктуры, внедрению эффективных методов орошения и развитию международного сотрудничества. Новизна исследования заключается в междисциплинарном применении множества стратегических рамок для разработки индивидуальных стратегий, направленных на решение уникальных проблем в экономических районах Казахстана, балансируя производительность сельского хозяйства с практиками устойчивого управления водными ресурсами.

Ключевые слова: управление водными ресурсами в Казахстане, эффективность и устойчивость использования воды в сельском хозяйстве, влияние внешних источников воды, инновации в ирригационной практике, экономические проблемы в сельском хозяйстве.

Introduction

The topic “Optimizing the use of irrigated lands in Kazakhstan: system analysis and resource management” is chosen for understanding how the country can improve its agricultural productivity and sustainability through effective water resource management. The nation is characterized by significant reliance on transboundary rivers, with 46% of its water supply coming from neighboring countries. Consequently, this external dependency poses challenges to water security and highlights the need for international cooperation, infrastructure upgrades, and efficient irrigation practices.

The justification for this topic stems from Kazakhstan’s complex water resource situation, with around 60% of the country’s water being consumed by agriculture. Previous studies have identified the importance of international collaboration in managing shared resources. However, there is a dearth of region-specific data on how water-efficient practices could be implemented in different economic districts. This gap is critical, as it affects agricultural productivity and sustainable development.

The relevance of this study is underpinned by the growing importance of water resource management in an era of climate change and increasing competition for shared resources. Practically, the findings are expected to aid policymakers, agricultural stakeholders, and local communities in developing comprehensive water strategies that are tailored to the distinct needs of each region.

The object of this study is the irrigation network and management practices across Kazakhstan’s economic districts. The goal is to identify challenges and opportunities to optimize water usage in agriculture. This entails analyzing regional water usage patterns, infrastructural needs, and the effects of transboundary river agreements on irrigation.

The research objectives include:

- evaluating water usage trends in different economic districts;
- assessing the efficiency of current irrigation infrastructure;
- identifying challenges posed by transboundary water agreements;
- developing tailored frameworks for sustainable irrigation management.

The methodology used regional case studies and quantitative analyses, such as descriptive statistics and correlations, to understand the distribution of irrigated lands and identify infrastructural inefficiencies across the economic regions of Kazakhstan. Strategic frameworks like Integrated Water Resources Management, the Socio-Ecological Systems approach, the Water-Energy-Food Nexus, and Participatory Water Management were applied to address these challenges and optimize water resource management across the country's diverse regions. The research aim is to provide a detailed assessment of Kazakhstan's irrigation landscape and propose strategic based on the mentioned strategic frameworks.

The hypothesis is that significant dependence on external sources and infrastructural inefficiencies are primary contributors to water scarcity. By adopting modern irrigation techniques, upgrading infrastructure, and fostering international collaboration, Kazakhstan can improve its water resource sustainability.

The significance of this work lies in offering a comprehensive approach to managing irrigated lands and understanding the specific needs of each region. It aims to provide actionable recommendations that balance agricultural productivity with water sustainability. The research novelty lies in its interdisciplinary application of Integrated Water Resources Management, Socio-Ecological Systems, the Water-Energy-Food Nexus, and Participatory Water Management frameworks to develop tailored strategies that address regional water challenges and optimize the management of irrigated lands in Kazakhstan.

Literature review

Globalization and climate change are significantly transforming agricultural landscapes across the world. The study by Brown and Funk (2008) has highlighted this transformation, revealing a direct correlation between increased global warming and the reduction in agricultural productivity, especially in regions relying heavily on rain-fed agriculture. These findings underscore the urgency of adapting agricultural practices to rapidly changing climatic conditions. Lobell et al. (2008) further elucidate this issue, demonstrating the adverse impacts of rising temperatures and shifting precipitation patterns on crop yields. This situation becomes more critical when viewed in the context of the global population, which as of February 2024 stands at 8 billion and is projected to rise to 9.8 billion by 2050. Such growth intensifies the demand for food, exacerbating the challenges posed by declining agricultural productivity. The Food and Agriculture Organization of the United Nations (2024) reports that over 783 million people are currently suffering from hunger, thereby emphasizing the dire need for sustainable and efficient food production systems. In response to these challenges, the focus has shifted towards innovative water resource management frameworks. Water resource management involves diverse theoretical frameworks that shape different policy recommendations and assumptions. For instance, the Integrated Water Resources Management (IWRM) is a comprehensive approach that emphasizes coordinated management of water, land, and related resources to maximize economic and social welfare without compromising environmental sustainability. The model recognizes that water resource management requires a holistic and adaptive approach, considering environmental, economic, and social interactions (Grigg, 2016).

The IWRM is grounded in four key principles: economic efficiency, environmental sustainability, social equity, and policy coordination (Vieira, Sandoval-Solis, Pedrosa, & Ortiz-Partida, 2020). Economic efficiency involves maximizing the benefits of water use while recognizing it as a scarce economic good. Environmental sustainability emphasizes the balance between water use and renewal to maintain the integrity of ecosystems. Social equity ensures that all stakeholders have fair access to water resources and a voice in decision-making. Policy coordination aligns water management strategies across different sectors for a unified approach.

Kazakhstan, a water-scarce nation with unique geographical challenges, stands to benefit significantly from the IWRM. In the agricultural sector, which consumes about 60% of the nation's water supply, implementing the IWRM can optimize water use by incorporating efficient irrigation techniques and reducing wastage (Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, 2024; Grigg, 2016). Drip irrigation, precision farming,

and groundwater monitoring could improve water efficiency, particularly in the key regions of Turkestan and Almaty, where agricultural output heavily relies on irrigated lands (Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, 2024; Evett et al., 2020).

The country's reliance on transboundary rivers such as the Syr Darya, Talas, and Ili presents environmental challenges, as upstream activities impact downstream ecosystems (Radelyuk, Zhang, & Tussupova, 2022). The IWRM's focus on environmental sustainability calls for international cooperation to manage these resources responsibly. Enhanced collaboration with neighbouring countries like China, Kyrgyzstan, and Uzbekistan is crucial for safeguarding vital basins such as the Balkhash-Alakol while maintaining the ecological balance.

Social equity is a critical concern in Kazakhstan due to the uneven distribution of water resources. Many rural communities, especially in arid regions like Mangystau and Aktobe, lack sufficient access to water. The IWRM principles aim to address this issue by empowering the local Water User Associations (WUAs), providing them with the necessary capacity and resources to advocate for their water needs and participate in decision-making. This approach ensures that marginalized communities receive equitable access to water.

On the other hand, the Socio-Ecological Systems (SES) approach recognizes that human societies and ecological environments are deeply intertwined and should be analyzed as complex, adaptive systems. This theoretical framework helps to understand how interactions between ecological and social components shape each other over time, influencing outcomes like resource sustainability, ecosystem health, and community resilience (Berkes, Colding, & Folke, 2008).

In the SES, the emphasis is placed on studying the dynamic feedback loops between natural and human systems (Biggs et al., 2022). Human activities affect ecological conditions and, conversely, environmental changes reshape human behaviors and decisions. This reciprocal relationship demands holistic management strategies that incorporate environmental, economic, and social factors.

In Kazakhstan, the Socio-Ecological Systems (SES) framework provides essential insights into water resource management challenges, considering the influence of both natural climatic conditions and human activities such as agriculture, industry, and urban development. The SES model offers a holistic analysis of these interconnected factors.

In contrast to Integrated Water Resources Management (IWRM) and SES, two other prominent frameworks are the Water-Energy-Food Nexus and Participatory Water Management, each providing distinct insights into water management priorities.

The Water-Energy-Food (WEF) Nexus framework acknowledges the tight interconnection between water, energy, and food, advocating for their holistic management (Muthu, 2021). Each resource affects the others, creating dependencies where decisions in one sector impact the others. For example, expanding water-intensive crops increases irrigation needs and energy consumption for pumping. This framework promotes balancing trade-offs between sectors, such as biofuel production impacting food supply or hydropower production affecting agricultural water availability. It encourages systems thinking to capture broad impacts and optimize resource use across sectors. Cross-sectoral coordination is crucial to align strategies and avoid conflicting objectives.

Applying the WEF Nexus framework in Kazakhstan leads to policy recommendations such as increasing irrigation efficiency through advanced technologies, managing water allocation between agriculture and industry, and developing alternative energy sources to reduce reliance on hydropower. Improved data collection across water, energy, and food sectors is essential for evidence-based decision-making. However, this framework assumes strong institutional mechanisms for cross-sectoral collaboration and resources for policymakers to analyze complex trade-offs (Mabhaudhi et al., 2022).

Participatory Water Management emphasizes the active involvement of stakeholders, particularly local communities, in water resource decision-making (Soncini-Sessa, Castelletti, & Weber, 2007). It prioritizes inclusivity and equity, ensuring marginalized groups like smallholder farmers have a voice (von Korff et al., 2012). Local communities possess valuable knowledge about water resources that should inform decisions. Decentralizing water management by empowering Water User Associations (WUAs) helps create local solutions tailored to unique needs.

In Kazakhstan, each framework offers valuable insights. IWRM is relevant due to the country's dependence on transboundary rivers and the need for cross-sectoral coordination. SES is critical due to socio-economic disparities across regions and the ecological challenges of climate change and desertification. The WEF Nexus is essential given Kazakhstan's reliance on hydropower and irrigation-

based agriculture, requiring trade-offs between water, energy, and food. Participatory Water Management ensures marginalized stakeholders receive equitable access and can contribute their knowledge to policymaking.

These frameworks provide complementary perspectives to guide Kazakhstan's water management strategies. IWRM and SES ensure holistic, adaptive management, while the WEF Nexus balances trade-offs across sectors. Participatory Water Management promotes inclusivity. Applying these frameworks will help Kazakhstan navigate its unique water challenges and balance economic, environmental, and social priorities for sustainable development.Kazakhstan faces unique water management challenges due to its heavy reliance on transboundary rivers, arid climate, and outdated infrastructure. By examining the water resource management methodologies in countries like Australia and the Netherlands, we can better understand the adaptability and limitations of their approaches in Kazakhstan's specific geographic and cultural context.

Australia, particularly the Murray-Darling Basin, has faced severe water scarcity due to prolonged droughts and growing agricultural demands (Easter & Huang, 2014). To tackle this, Australia introduced a water trading system, which allows water rights holders to buy, sell, or lease their water entitlements (Garrick, 2015). This system incentivizes efficient water use by letting farmers allocate water to high-value crops and sell surplus allocations to others. It helps distribute scarce water resources more equitably across the agricultural sector.

However, implementing water trading in Kazakhstan presents challenges. The system relies heavily on robust legal frameworks and accurate measurement of water flows, something Kazakhstan currently lacks due to outdated irrigation infrastructure. Furthermore, water trading in Australia required significant investment in monitoring technology and administrative systems to ensure transparent and accurate transactions (Easter & Huang, 2014).

On the other hand, the Netherlands is a world leader in sustainable agriculture despite its limited land area. Dutch high-tech greenhouse systems can recycle up to 90% of their water, allowing crops to thrive with minimal waste. These greenhouses utilize hydroponics (growing plants without soil), sophisticated climate control, and advanced nutrient delivery systems to optimize plant growth and reduce water use significantly (Bakker et al., 2023).

Implementing such high-tech greenhouses in Kazakhstan could drastically improve water efficiency and agricultural productivity, especially in regions like Turkestan or Almaty where irrigated agriculture is concentrated. However, the high upfront costs of greenhouse infrastructure could hinder adoption, particularly for smallholder farmers who dominate the agricultural sector.

Methodology

The research focuses on understanding water resource management in Kazakhstan, particularly for irrigated agriculture, and identifying ways to improve efficiency and sustainability in light of climate change, population growth, and regional political factors.

The primary research question guiding this study was: how can Kazakhstan improve the efficiency and sustainability of its water resource management for irrigated agriculture, given its significant reliance on external water sources and aging infrastructure? The central hypothesis is that Kazakhstan's reliance on external water sources and inefficiencies in irrigation infrastructure contribute to water scarcity. Enhancing infrastructure, adopting efficient irrigation techniques, and fostering international collaboration could lead to more sustainable agricultural practices.

In the initial phase, a comprehensive literature review was conducted to identify gaps in current knowledge and existing challenges. This was followed by data collection from national and regional databases to understand water usage, irrigation patterns, and agricultural output. Analysis of this data helped identify patterns, inefficiencies, and the impact of transboundary water agreements on overall water management.

Regional case studies provided deeper insights into specific challenges faced by different economic districts, including water availability, agricultural practices, and governance structures. The strategic frameworks, like Integrated Water Resources Management (IWRM) and Socio-Ecological Systems (SES), were developed based on each district's unique needs.

Quantitative analysis, including descriptive statistics and correlation analysis, was used to evaluate trends in water usage and relationships with agricultural productivity. Qualitative content analysis of policy documents and stakeholder interviews provided valuable insights into ground-level impacts. Comparative analysis of Kazakhstan's water management practices against those of neighboring countries offered additional context.

By developing strategic frameworks such as IWRM, SES, Water-Energy-Food Nexus, and Participatory Water Management, the study provides actionable recommendations to optimize water distribution, improve infrastructure, and involve local communities in water management. These frameworks can help address Kazakhstan's unique challenges and ensure sustainable agricultural development.

Results and discussion

The research results demonstrate that Kazakhstan's water resources are heavily reliant on external sources. A significant portion, approximately 46%, of its water supply originates from neighbouring countries, flowing into Kazakhstan through transboundary rivers (Official Information Source of the Prime Minister of the Republic of Kazakhstan, 2023). These include (Radelyuk, Zhang, & Tussupova, 2022):

- the Irtys and Ile rivers from the People's Republic of China (PRC);
- the Syr Darya, Talas, and Shu rivers from Central Asian countries such as Kyrgyzstan, Uzbekistan, and Tajikistan;
- the Edil (Volga) and Zhayik (Ural) rivers from Russia;

Kazakhstani agriculture, which utilizes about 60% of the country's water resources, is particularly impacted by these inefficiencies. Despite the limited rainfall and challenges in water supply, the adoption of water-efficient technologies in agriculture remains low. This is reflected in the changes in agricultural practices over the years. For instance, from 1991 to 2023, there has been a significant decrease in the area of irrigated arable land. This decline–529.5 thousand hectares or 22.9 percent–over the last 33 years, illustrates the challenges faced by the agricultural sector in terms of water availability and efficient usage.

Table 1 – Area of irrigated arable lands by the regions of the Republic of Kazakhstan in 2023, thousand ha.

№	Regions	Area of irrigated arable lands		Place
		Area, thousand ha	Share from the total, %	
1	Abai	75.5	4.2	7
2	Akmola	17.2	0.9	12
3	Aktobe	12.3	0.7	15
4	Almaty	263.8	14.8	2
5	Atyrau	9.1	0.5	14
6	West Kazakhstan	27.4	1.5	10
7	Zhambyl	206.3	11.6	4
8	Zhetysu	215.2	12.1	3
9	Karaganda	66.3	3.7	8
10	Kostanay	9.1	0.5	16
11	Kyzylorda	187.0	10.5	5
12	Mangystau	0.8	0.04	18
13	Pavlodar	130.0	7.3	6
14	North Kazakhstan	13.6	0.8	13
15	Түркістан	458.8	25.8	1
16	Turkestan	64.1	3.6	9
17	Ulytau	1.3	0.07	17
	3 megalopolis cities	21.1	1.2	11
Total for Kazakhstan		1778.9	100	

Note – compiled by the authors based on the information from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.

Given the data from Table 1, which details the area of irrigated arable lands by region in the Republic of Kazakhstan for the year 2023, let's clarify and expand upon the current situation and future goals for the country's agricultural land:

As of 2023, the total area of irrigated agricultural lands in Kazakhstan amounts to approximately 1.77 million hectares (Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, 2024). The government has set ambitious goals to expand this to around 3 million hectares by 2025-2030. This expansion is crucial for enhancing agricultural productivity and sustainability, given the varying climatic conditions and water resource challenges in the region.

A significant concentration, about 80%, of these irrigated lands is found in five regions within the southern economic district: Zhetysu, Almaty, Zhambyl, Turkestan, and Kyzylorda. These regions are pivotal in Kazakhstan's agricultural sector due to their favorable climate and available water resources, making them ideal for intensive agriculture.

Analyzing the data from Table 1:

- Turkestan leads with the largest region under irrigation (458.8 thousand ha), contributing a substantial 25.8% to the national total;

- Almaty region follows with 263.8 thousand ha (14.8%), Zhetysu region with 215.2 thousand ha (12.1%), Zhambyl region with 206.3 thousand ha (11.6%), and Kyzylorda region with 187.0 thousand ha (10.5%).

In terms of statistical analysis, we can calculate the median (or middle value) and quartiles (which divide the data into four equal parts) from Table 1:

- the median area: sorting the regions by the area of irrigated land and finding the middle value, the median region is Pavlodar with 130 thousand ha;

- the first quartile (Q1): the lower quartile, or the 25th percentile, is around West Kazakhstan with 27.4 thousand ha;

- the third quartile (Q3): the upper quartile, or the 75th percentile, lies close to Zhambyl with 206.3 thousand ha.

These statistical measures give us a sense of how irrigated land is distributed across the regions of Kazakhstan, with a substantial skew towards the southern economic district. This distribution has direct implications for regional water resource management and agricultural policies.

Further discussions and strategies regarding the allocation and usage of irrigated lands are likely detailed in Table 2, which presents the share of irrigated arable land in economic districts. This table would provide a more macroscopic view of how irrigated land is distributed across the broader economic regions of Kazakhstan.

Table 2 – Area of irrigated arable lands by the economic districts of the Republic of Kazakhstan in 2023, thousand ha.

№	Economic districts	Regions	Area of irrigated arable lands	
			Area, thousand ha	Share from the total, %
1	South	Almaty	263.8	74.8
		Zhambyl	206.3	
		Zhetysu	215.2	
		Kyzylorda	187.0	
		Turkestan	458.8	
		Total for the Southern economic district	1331.1	
2	West	Aktobe	12.3	2.8
		Atyrau	9.1	
		West Kazakhstan region	27.4	
		Mangystau	0.8	
		Total for the Western economic district	49.6	
3	North	Akmola	17.2	9.6
		Kostanay	9.1	
		Pavlodar	130.0	
		North Kazakhstan region	13.6	
		Total for the Northern economic district	169.9	

Table continuation

№	Economic districts	Regions	Area of irrigated arable lands	
			Area, thousand ha	Share from the total, %
4	Central	Karaganda	66.3	3.8
		Ulytau	1.3	
		Total for the Central economic district	67.6	
5	East	Abai	75.5	7.8
		East Kazakhstan region	64.1	
		Total for the Eastern economic district	139.6	
6	Megapolises	Almaty	1.6	1.2
		Astana	0.1	
		Shymkent	19.4	
		Total for 3 megapolises	21.1	
Total for Kazakhstan			1778.9	100
Note – compiled by the authors based on the information from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan.				

To elucidate the current state and future objectives for irrigated land in Kazakhstan, while considering the information in Table 2, let's delve deeper into the context of water resource management and agricultural development:

Kazakhstan, facing the challenges of limited water resources and a declining trend in glacier stocks due to climate change, emphasizes the need for efficient water use in agriculture. The total area of irrigated land in the country currently stands at 1.77 million hectares, with a plan to expand this to 3 million hectares by 2025-2030. A significant 80% of these irrigated lands are concentrated in five regions of the southern economic district: Zhetysu, Almaty, Zhambyl, Turkestan, and Kyzylorda.

Table 2 provides a breakdown of irrigated arable lands by economic districts in 2023:

- the Southern economic district, encompassing regions like Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan, collectively accounts for a substantial portion of the total irrigated area, amounting to 1331.1 thousand hectares;

- other districts, such as the Western, Northern, Central, and Eastern economic districts, together with the three megapolises, contribute the remaining 25.2% of the irrigated land.

In the broader context, Kazakhstan is characterized as an industrial-agrarian country. With approximately 24 million hectares of arable land, the nation annually harvests around 17-20 million tons of grain, of which 7 million tons cater to domestic needs, and 8-10 million tons are earmarked for export. This agricultural output is underpinned by significant research and development efforts. Across the country, 17 experimental stations are actively engaged in research in plant and animal husbandry, yielding tangible results for production. The development of new agricultural breeds and varieties, such as sheep and vegetables, is a time-intensive process, often spanning a decade or more.

The combined data from Tables 1 and 2 offer a comprehensive understanding of the current state of irrigated agriculture in Kazakhstan, highlighting regional strengths and indicating potential areas for development and investment, particularly in the context of efficient water usage and sustainable agricultural practices amidst environmental challenges. The Integrated Water Resources Management (IWRM) framework offers structured guidance to optimize irrigated land usage across Kazakhstan's economic districts. By focusing on economic efficiency, environmental sustainability, social equity, and policy coordination, IWRM can help address the unique challenges faced by each region.

In the southern district (Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan regions), irrigation is crucial, covering 75% of the nation's irrigated lands. Reliance on transboundary rivers like the Syr Darya and Ili necessitates international collaboration with China and Uzbekistan. Infrastructure in Turkestan, with 25.8% of the irrigated area, requires modernization to reduce water loss. Efficient irrigation methods and precision farming should be supported by government

subsidies. Empowering Water User Associations (WUAs) is vital for equitable water distribution.

The western district (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions) faces arid conditions and limited surface water, contributing only 2.8% to irrigated land. Diversifying water sources through groundwater extraction and desalination, adopting efficient irrigation techniques, and cultivating drought-resistant crops are essential. Upgrading infrastructure and expanding water storage are also needed. Training local water managers will improve governance.

The northern district (Akmola, Kostanay, Pavlodar, and North Kazakhstan regions) is noted for grain farming and contributes 9.6% of irrigated land. Pavlodar has 130,000 hectares of this. Modernizing infrastructure, using automated irrigation controls, and employing precision farming will optimize water use. Enhanced data collection and sharing across ministries can improve water allocation.

The central district (Karaganda and Ulytau regions) has limited water, requiring efficient use and alternative sources like groundwater and wastewater reuse. Investments in groundwater exploration, desalination, and modern irrigation techniques are crucial. Strengthening local water management and WUAs will ensure equitable access.

The eastern district (Abai and East Kazakhstan regions) holds 7.8% of irrigated land, relying on the Irtysh and Ile rivers. Cross-border agreements with China are needed for sustainable use. Expanding reservoir capacity and monitoring water levels will support adaptive management. Promoting efficient irrigation and precision farming will optimize water use.

The IWRM framework aims to improve water management by upgrading infrastructure, empowering local institutions, and adopting efficient irrigation practices. Enhanced data collection, cross-border collaboration, and policy coordination are key for sustainable agriculture. The SES framework provides insights into the interaction between ecological systems and human societies, offering a nuanced approach to addressing region-specific challenges and solutions.

In the southern district (Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan regions), irrigation is crucial, covering nearly 75% of Kazakhstan's irrigated lands and relying on rivers like the Syr Darya and Ili. This area faces socio-ecological challenges due to upstream water usage and downstream degradation. An SES approach advocates for international cooperation with China and Uzbekistan to ensure equitable water access through joint conservation and water-sharing agreements.

Modernizing irrigation infrastructure is essential to reduce water wastage and maintain groundwater reserves. Efficient practices like drip irrigation and precision farming should be promoted to minimize ecological impact. Monitoring river flows, soil health, and aquifer levels will aid adaptive policymaking. Social equity is critical, especially in Turkestan and Kyzylorda, where outdated infrastructure and socio-economic vulnerabilities hinder clean water access. Empowering Water User Associations (WUAs) with resources and support will enable equitable water distribution and improved governance.

The western district (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions) faces severe water scarcity due to arid conditions, contributing only 2.8% of irrigated lands. Diversifying water sources, such as groundwater extraction, desalination, and rainwater harvesting, is vital. Modernizing irrigation infrastructure and adopting drought-resistant crops and advanced techniques will reduce water wastage and ecological degradation. Building local water management capacity is essential for resource monitoring, adaptive policy development, and equitable distribution.

In the northern district (Akmola, Kostanay, Pavlodar, and North Kazakhstan regions), extensive grain farming dominates, with 9.6% of irrigated lands. Pavlodar holds the largest share. Modernizing infrastructure to maintain soil health, regulate groundwater, and reduce water loss is crucial. Strengthening data management systems for water flow monitoring and optimizing irrigation schedules is recommended. Cross-sector collaboration ensures equitable water access between agriculture and industry. Empowering local institutions and WUAs improves governance and participation.

The central district (Karaganda and Ulytau regions) has limited water availability and fragile ecosystems. The SES framework emphasizes managing alternative water sources, such as groundwater extraction and wastewater reuse. Investments in groundwater exploration and desalination will support irrigation. Strengthening institutional capacity and WUAs will improve groundwater monitoring, equitable water allocation, and decision-making. Promoting modern irrigation technologies and drought-resistant crops will reduce water usage and maintain ecological balance.

The eastern district (Abai and East Kazakhstan regions) relies on transboundary rivers like the Irtysh and Ile, accounting for 7.8% of irrigated land. Cross-border agreements with China are vital for

sustainable water management. Expanding reservoir capacity supports adaptive water management and stable supplies during dry periods.

Promoting efficient irrigation techniques will reduce the ecological impact on river ecosystems. Enhanced data collection will allow policymakers to effectively monitor water availability, soil quality, and groundwater levels. Collaborative conservation programs can ensure that agriculture balances environmental needs.

The Socio-Ecological Systems (SES) framework provides a comprehensive understanding of the interplay between socio-economic vulnerabilities and environmental stress in Kazakhstan. Managing these interactions holistically will align water management strategies with ecological conditions, improving irrigation efficiency, empowering local stakeholders, and safeguarding natural resources. Adaptive management strategies will balance agricultural productivity and environmental sustainability, fostering resilient socio-ecological systems across the country.

The Water-Energy-Food (WEF) Nexus framework emphasizes the interdependence of water, energy, and food resources. This holistic approach is crucial for managing irrigated lands, as agricultural productivity relies on efficient water and energy use. The WEF Nexus framework helps identify trade-offs and synergies between these sectors to guide policies that balance competing demands.

In the southern economic district (Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan regions), agriculture is the backbone of the economy, with nearly 75% of Kazakhstan's irrigated lands. This region relies heavily on water from transboundary rivers like the Syr Darya and Ili. Turkestan alone has 458.8 thousand hectares of irrigated land, making up 25.8% of the nation's total. The WEF Nexus framework emphasizes modernizing irrigation to increase efficiency and reduce energy consumption. Drip and sprinkler irrigation systems reduce evaporation and ensure optimal hydration. Using solar-powered pumps can cut fossil fuel dependence, reducing energy use and costs.

Coordination between sectors is crucial to balance agricultural irrigation needs, energy demands, and environmental sustainability. Joint infrastructure investments and accurate monitoring with neighboring countries like China and Uzbekistan are essential for equitable water distribution. Upgrading irrigation infrastructure in Turkestan to reduce water loss is necessary for sustainable water use. Automated irrigation controls can optimize water distribution based on crop schedules.

The western economic district (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions) makes up only 2.8% of the nation's irrigated land due to arid conditions and water scarcity. The region relies on the Ural River and Caspian Sea Basin for inconsistent surface water. Diversifying the water supply with groundwater extraction, desalination, and rainwater harvesting is essential but energy-intensive. Energy-efficient irrigation systems powered by renewable sources like solar and wind can support these processes. Financial incentives for adopting efficient irrigation techniques and alternative energy will encourage uptake among farmers.

Infrastructure upgrades will help minimize water wastage, while diversifying crop selection to include drought-resistant varieties will align agriculture with available resources. Automated monitoring tools and carefully timed irrigation schedules are necessary for sustainable resource management.

In the northern economic district (Akmola, Kostanay, Pavlodar, and North Kazakhstan regions), grain farming dominates, contributing 9.6% of Kazakhstan's irrigated lands. Pavlodar alone has 130,000 hectares under irrigation, mainly sourced from local rivers and reservoirs. Modernizing irrigation infrastructure is crucial for reducing water loss and the energy burden of irrigation pumping. Soil moisture monitoring and climate data analysis will help farmers establish optimal irrigation schedules. Using renewable energy sources like wind and solar power will ensure sustainable irrigation.

Cross-sector collaboration will improve coordination between agriculture and industry, ensuring irrigation practices align with industrial energy demands. Subsidies and incentives for efficient irrigation practices will help farmers adopt them without prohibitive costs. Remote sensing and GIS technologies will monitor water flows, optimize crop management, and implement adaptive strategies.

The central economic district, comprising Karaganda and Ulytau regions, faces limited water availability and fragile ecosystems, contributing only 3.8% of the nation's irrigated lands. Groundwater extraction and wastewater reuse are essential for sustaining irrigation. Solar-powered pumps for groundwater extraction can minimize energy costs, while wastewater treatment systems can provide irrigation water. Training water managers and empowering Water User Associations (WUAs) will ensure equitable resource distribution. Automated

monitoring can identify optimal extraction rates for sustainable resource allocation. Farmers should adopt drought-resistant crops and modern irrigation technologies that align with the district's environmental conditions.

In the eastern economic district, including Abai and East Kazakhstan regions, securing equitable access to the Irtysh and Ile rivers is vital due to their importance for irrigation. Cross-border agreements with China are necessary, as these rivers provide 45% of the water in the Balkhash-Alakol Basin. Expanding the region's reservoir capacity will stabilize water supplies during dry periods. Efficient irrigation techniques like automated controls and precision farming will ensure effective water use.

The Water-Energy-Food (WEF) Nexus framework reveals the intricate connections between water, energy, and food production across Kazakhstan's economic districts. Focusing on region-specific challenges and promoting efficient irrigation technologies, renewable energy, and accurate monitoring systems will help Kazakhstan balance agricultural needs with sustainable water and energy consumption.

The Participatory Water Management framework emphasizes the involvement of local communities in decision-making, ensuring their voices are considered in policy development, planning, and implementation. This framework can guide strategies for optimizing irrigated land use across different economic districts, ensuring diverse regional needs are met through inclusive water governance.

In the southern economic district (Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan regions), irrigation plays a critical role in sustaining agricultural productivity, with nearly 75% of Kazakhstan's irrigated lands located here. The region relies heavily on water from transboundary rivers like the Syr Darya and Ili for high-value crops. Turkestan holds 458.8 thousand hectares of irrigated land, 25.8% of the national total. Local farmers and WUAs are directly impacted by water shortages and need involvement in decision-making for equitable water distribution and sustainable management.

The participatory framework advocates empowering WUAs with resources and technical support to manage local irrigation networks effectively. This involvement will help shape irrigation schedules that align with crop needs and minimize waste. Farmers should be encouraged to switch to water-efficient irrigation methods like drip and sprinkler systems, with financial incentives and training programs to support these technologies.

In Kyzylorda, socio-economic vulnerabilities make it crucial that marginalized communities have access to clean water. Engaging them through consultations and educational programs will help policymakers understand their needs and challenges. Cross-border negotiations with China and Uzbekistan must include local stakeholder input to secure equitable access to shared water resources. Collaborative conservation programs can maintain the ecological balance of transboundary rivers while ensuring farmers maximize agricultural productivity.

In the western economic district (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions), arid conditions and scarce water resources limit irrigation to 2.8% of the nation's irrigated lands. Despite this, many local farmers rely on irrigation for livestock grazing and crop cultivation, particularly in the Ural River and Caspian Sea Basin. Groundwater extraction, desalination, and rainwater harvesting can supplement surface water, though these methods are energy-intensive and require technical expertise.

The participatory framework ensures local stakeholders receive training on efficient irrigation practices. Financial support should help them adopt energy-efficient irrigation technologies like solar-powered pumps. Local WUAs should collaborate with agricultural research institutions to develop drought-resistant crops. Collaborative management between local water managers and government officials will minimize water use conflicts and establish equitable distribution.

In the northern economic district (Akmola, Kostanay, Pavlodar, and North Kazakhstan regions), grain farming dominates, contributing 9.6% of Kazakhstan's irrigated lands. Pavlodar alone holds 130,000 hectares under irrigation, primarily from local rivers and reservoirs. Grain farming relies heavily on irrigation, which must be balanced with industry and livestock production.

Empowering local WUAs to participate in water governance ensures equitable access between agriculture and other sectors. Training on precision irrigation practices that monitor soil moisture and optimize schedules will minimize water waste and align irrigation with crop requirements. Automated irrigation controls should be encouraged through government subsidies.

Cross-sector collaboration between agriculture and industry will improve data sharing and help develop coordinated water allocation policies. Farmers should receive incentives to grow water-efficient crops and adopt renewable energy sources like wind and solar power to reduce irrigation costs.

The central economic district, including Karaganda and Ulytau regions, faces fragile ecosystems and limited water availability, with only 3.8% of the country's irrigated lands. Groundwater extraction and wastewater reuse are critical to sustaining irrigation. Solar-powered groundwater pumps and wastewater treatment systems can supply irrigation water while minimizing energy consumption.

The participatory framework encourages collaboration between water managers, local WUAs, and government agencies. Local water managers need technical training on managing groundwater resources, while WUAs should receive funding to implement modern irrigation techniques and educate farmers on water-efficient practices. Aligning irrigation practices with available water resources will reduce water use while maintaining agricultural productivity.

Farmers should receive training and incentives to switch to drought-resistant crops, minimizing water consumption. This will align agricultural practices with environmental conditions, sustaining irrigation and reducing ecological stress.

In the eastern economic district (Abai and East Kazakhstan regions), securing equitable access to the Irtysh and Ile rivers is vital for irrigation. Cross-border agreements with China are necessary to ensure equitable water distribution. Expanding reservoir capacity will help stabilize water supplies during dry seasons and periods of reduced river flow.

Local WUAs should be involved in cross-border negotiations to ensure agricultural water needs are considered. Collaborative programs between local water managers and neighboring countries can enhance monitoring and conservation efforts. Automated irrigation systems and precision farming practices will help farmers maximize water use and reduce waste.

The Participatory Water Management framework ensures diverse local stakeholder needs are included in decision-making processes, helping advocate for equitable water access and sustainable irrigation practices. This inclusive approach balances sectoral trade-offs, improves irrigation efficiency, and develops coordinated policies across Kazakhstan's economic districts.

Conclusion

The primary goal of this study was to identify ways in which Kazakhstan could improve the efficiency and sustainability of its water resource management in the context of irrigated agriculture. This involved assessing the current state of water usage, understanding reliance on external sources, and evaluating the aging infrastructure. The methods included a comprehensive review of literature, quantitative data analysis, stakeholder interviews, and comparative analysis of water management practices in neighboring regions. There are several key findings and conclusions:

1. Heavy reliance on external water sources: Kazakhstan relies heavily on water originating from neighboring countries, especially from the Irtysh and Ili rivers in China, the Syr Darya, Talas, and Shu rivers from Central Asia, and the Volga and Ural rivers in Russia. This reliance on transboundary rivers poses significant challenges for water security. Approximately 46% of Kazakhstan's water supply comes from external sources, highlighting its vulnerability in ensuring equitable and consistent access to water.

2. Disparity in regional water availability: regional water availability varies significantly across Kazakhstan's economic districts. The southern district, with regions such as Turkestan, Almaty, and Zhambyl, accounts for 74.8% of irrigated lands. In contrast, the western and central districts collectively account for only about 6.6% due to arid conditions and limited surface water resources. This disparity necessitates region-specific management strategies that cater to local geographical and climatic conditions.

3. Inefficiencies in water transport and usage: about 40% of water sourced from transboundary rivers is lost due to inefficient infrastructure and management practices. The lack of modernized water management systems means substantial amounts of water are wasted before reaching agricultural or industrial areas. This inefficiency affects agricultural productivity, especially given that agriculture consumes approximately 60% of Kazakhstan's water resources.

4. Decline in irrigated arable land: From 1991 to 2023, Kazakhstan experienced a significant decline in irrigated arable land, reducing by 529.5 thousand hectares (or 22.9%). This decline is attributed to a combination of factors, including outdated irrigation infrastructure, changing agricultural practices, and challenges in water availability. Turkestan remains the region with the largest irrigated land (25.8% of the national total).

5. Potential for technology adoption: Implementing efficient irrigation techniques such as drip and sprinkler systems, alongside the adoption of precision farming, can improve water management.

However, high upfront costs and a lack of technical expertise have hindered widespread adoption, particularly among smallholder farmers.

6. By applying economic region-specific solutions informed by various frameworks, Kazakhstan can modernize irrigation, reduce water loss, and achieve sustainable agricultural development. IWRM focuses on policy coordination and international collaboration, SES balances socio-ecological dynamics, the WEF Nexus ensures balanced sectoral trade-offs, and Participatory Water Management enables local governance.

In the southern economic district (Almaty, Zhambyl, Zhetysu, Kyzylorda, and Turkestan regions), agriculture is central to the economy, with nearly 75% of Kazakhstan's irrigated land. This area relies on transboundary rivers like the Syr Darya and Ili for high-value crops. Integrated Water Resources Management (IWRM) emphasizes international collaboration with China and neighboring Central Asian countries to secure fair water-sharing agreements and invest in cross-border infrastructure. Modernizing outdated canal systems in Turkestan and adopting efficient irrigation techniques like drip and sprinkler systems can reduce water loss. Automated controls help optimize irrigation schedules and improve yields. The Socio-Ecological Systems (SES) framework highlights the impact of irrigation on groundwater, soil health, and ecosystems. Empowering Water User Associations (WUAs) ensures equitable water distribution, especially in socio-economically vulnerable regions like Kyzylorda. Adaptive management strategies should consider regional disparities and ensure sustainable irrigation access for marginalized communities. The Water-Energy-Food (WEF) Nexus underscores the interconnectedness of water, energy, and food production, advocating for renewable energy sources like solar-powered pumps to minimize energy consumption. Precision farming and soil moisture monitoring align irrigation schedules with crop needs. Participatory Water Management involves farmers and WUAs in decision-making, advocating for cross-border water sharing and water-efficient practices.

In the western economic district (Aktobe, Atyrau, West Kazakhstan, and Mangystau regions), arid conditions and scarce water resources cover only 2.8% of Kazakhstan's irrigated lands. IWRM emphasizes diversifying water supplies through groundwater extraction, desalination of Caspian Sea water, and rainwater harvesting. Groundwater extraction requires careful management to avoid over-extraction. Upgrading aging irrigation systems will reduce water losses and improve storage. The SES framework calls for resilience to climatic extremes, promoting adaptive irrigation practices like drought-resistant crops and efficient techniques. Capacity-building for local water managers will help monitor resources and develop region-specific strategies. The WEF Nexus encourages energy-efficient irrigation technologies like solar-powered pumps to minimize fossil fuel reliance. Switching to less water-intensive crops and using renewable energy sources aligns irrigation practices with ecological conditions. The participatory framework ensures farmers receive training and financial incentives for efficient irrigation systems. Collaboration between WUAs and research institutions promotes region-specific solutions.

In the northern economic district (Akmola, Kostanay, Pavlodar, and North Kazakhstan regions), grain farming dominates, contributing 9.6% of Kazakhstan's irrigated land. Pavlodar has 130,000 hectares under irrigation, mainly from local rivers and reservoirs. IWRM recommends modernizing infrastructure to reduce water loss and energy consumption. Automated irrigation controls and systems like sprinklers and micro-irrigation optimize practices. Cross-sector data sharing ensures irrigation schedules align with industrial energy needs. The SES framework emphasizes efficient management of surface and groundwater resources to maintain soil quality and groundwater levels. Remote sensing tools monitor irrigation practices and their impact on river flows. The WEF Nexus advocates for renewable energy sources like wind and solar power for irrigation. The participatory framework empowers local WUAs to ensure equitable schedules and provides precision farming training to minimize water waste.

In the central economic district (Karaganda and Ulytau regions), water availability is limited by fragile ecosystems. Groundwater extraction and desalination can supplement surface water but must be managed sustainably. IWRM recommends training local water managers and empowering WUAs to improve water distribution. SES emphasizes precision irrigation for efficient groundwater extraction to minimize ecological impact. Switching to drought-resistant crops aligns irrigation with available resources. The WEF Nexus recommends using solar-powered pumps to minimize energy costs, while wastewater treatment systems can supply irrigation water. The participatory framework promotes collaboration between WUAs and government agencies, ensuring

irrigation schedules align with groundwater availability and providing technical training to farmers.

The eastern economic district (Abai and East Kazakhstan regions) relies heavily on the Irtysh and Ile rivers for irrigation. IWRM emphasizes cross-border agreements with China to secure equitable river access. Expanding reservoir capacity stabilizes water supplies during dry periods, while SES highlights monitoring river flows and groundwater levels for adaptive management. The WEF Nexus recommends efficient irrigation technologies to align agricultural output with water availability, using solar-powered systems to optimize energy use. Participatory Water Management involves WUAs in cross-border negotiations to ensure local irrigation needs are met. Collaborative conservation efforts between local water managers and neighbouring countries balance agriculture with ecological requirements.

In conclusion, this study not only contributes to the academic understanding of water resource management in arid regions like Kazakhstan but also offers practical strategies that can be implemented to improve water efficiency in agriculture. The multi-faceted approach recommended by this study–encompassing technology implementation, farmer engagement, policy refinement, and international cooperation–provides a comprehensive roadmap for addressing the water challenges faced by Kazakhstan, ensuring the long-term sustainability of its water resources and agricultural sector.

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NEW APPROACHES TO THE DEVELOPMENT OF HUMAN CAPITAL

In the modern world, the increasing importance of human capital and the role of education in its formation is increasingly recognized. In educational practice, there is an underestimation of the possibilities of additional education, which does not allow children to fully reveal their potential. The purpose of the study is to develop recommendations that will help increase the level of enrollment of children in additional education.

The purpose of the study is to develop recommendations to help increase the level of enrollment of children in additional education in order to develop human capital.

The scientific and practical significance of the work lies in the fact that in the context of discussions about the contribution of education to the development of human capital, the importance of additional education for children and possible ways to more optimally organize this system are substantiated. During the study, formal logical methods and techniques were used. The main result of the study is that it highlighted not entirely obvious opportunities for the development of a system of additional education for children and measures were proposed to help increase the indicative indicator used in public administration - the level of enrollment of children in additional education. The value and practical significance of the study is expressed in the fact that, using the example of the central part of Almaty, a conceptually new approach to organizing additional education for children was proposed, which involves the creation of a system of additional school education that provides children with greater opportunities to unlock their potential during sensitive periods of development. At the same time, a model of an indicative map of the network of additional school education has been developed and proposed, promoting the formation of human capital at a qualitatively new level.

Key words: additional education for children; human potential; human capital; accessibility of education; inclinations and abilities; talent; indicative map of the locality.

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Адам капиталын дамытудағы жаңа тәсілдер

Қазіргі әлемде адами капиталдың маңыздылығы және оны қалыптастырудағы білімнің рөлі барған сайын мойындалуда. Білім беру тәжірибесінде балалардың өз мүмкіндіктерін толық ашуға мүмкіндік бермейтін қосымша білім беру мүмкіндіктерін жете бағаламау байқалады. Зерттеудің мақсаты – балаларды қосымша біліммен қамту деңгейін арттыруға көмектесетін ұсыныстар әзірлеу.

Жұмыстың ғылыми-тәжірибелік маңыздылығы білім берудің адами капиталды дамытуға қосқан үлесі туралы пікірталас аясында балаларға қосымша білім берудің маңыздылығы мен осы жүйені оңтайлы ұйымдастырудың ықтимал жолдары негізделуінде. Зерттеу барысында формальды логикалық әдістер мен әдістер қолданылды. Зерттеудің негізгі нәтижесі – онда балаларға қосымша білім беру жүйесін дамытудың толық айқын емес мүмкіндіктері көрсетілді және мемлекеттік басқаруда қолданылатын индикативті көрсеткіш – балаларды қосымша біліммен қамту деңгейін арттыруға көмектесетін шаралар ұсынылды. Зерттеудің құндылығы мен практикалық маңыздылығы Алматы қаласының орталық бөлігінің мысалын пайдалана отырып, балаларға қосымша білім беруді ұйымдастырудың тұжырымдамалық жаңа тәсілі ұсынылғанында, ол қосымша мектептік білім беру жүйесін құруды көздейді. балаларға дамудың сезімтал кезеңдерінде өз әлеуетін ашуға үлкен мүмкіндіктер береді. Бұл ретте адами капиталды сапалы жаңа деңгейде қалыптастыруға ықпал ететін қосымша мектептік білім беру желісінің индикативті картасының үлгісі әзірленіп, ұсынылды.

Түйін сөздер: балаларға қосымша білім беру; адам потенциалы; адам капиталы; білімнің қолжетімділігі; бейімділік пен қабілет, дарындылық; елді мекеннің индикативті картасы.

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Новые подходы к развитию человеческого капитала

В современном мире все очевиднее признается увеличивающаяся важность человеческого капитала и роли образования в его формировании. В образовательной практике наблюдается недооценка возможностей дополнительного образования, что не позволяет в полной мере раскрывать потенциал детей. Цель исследования – разработать рекомендации, способствующие повышению уровня охвата детей дополнительным образованием.

Научная и практическая значимость работы заключается в том, что в контексте дискуссий о вкладе образования в развитие человеческого капитала обосновывается важность дополнительного образования детей и возможные пути более оптимальной организации данной системы. В ходе исследования использовались формально-логические методы и приемы. Основным результатом исследования является то, что оно подсветило не вполне очевидные возможности для развития системы дополнительного образования детей и были предложены меры, способствующие повышению индикативного показателя, используемого в государственном управлении - уровень охвата детей дополнительным образованием. Ценность и практическое значение проведенного исследования выражается в том, что на примере центральной части города Алматы был предложен концептуально новый подход к организации дополнительного образования детей, который предполагает создание системы дополнительного школьного образования, предоставляющей детям более широкие возможности в раскрытии потенциала в течение сензитивных периодов развития. Вместе с тем, разработана и предложена модель индикативной карты сети дополнительного школьного образования, способствующая формированию человеческого капитала на качественно новом уровне.

Ключевые слова: дополнительное образование детей; человеческий потенциал; человеческий капитал; доступность образования; задатки и способности, талант; индикативная карта населенного пункта.

Introduction

The world is undergoing a transition to a post-industrial society, a knowledge society, where knowledge itself becomes one of the main values (Bell, 2020). It is not industrial or financial capital that begins to play a decisive role, but people, or human capital. Human capital is the set of competencies of people through which both personal and social needs are satisfied. From an economic point of view, the benefits received from these competencies exceed the resources spent on their development and the current costs of obtaining beneficial effects (Kuzminov, 2018).

At an extended meeting of the Government of the Republic of Kazakhstan on February 7, 2024, the head of state, Tokayev K-Zh. K., set an ambitious target: increasing the economy to $450 billion by 2029. It is important to understand that one of the key factors ensuring sustainable economic growth and increasing the competitiveness of the national economy is improving labor productivity indicators. Labor productivity indicators and the quality of labor resources are significantly influenced by social institutions such as education.

The modern educational system is based on compulsory secondary education; however, it should be noted that along with compulsory secondary education in Kazakhstan, in particular, there is a system of additional education for children. Additional education of children (AECh) acts as a process of education and training carried out for the purposes of moral, intellectual, cultural, and physical development, designed to satisfy diverse needs and create conditions for the development of the individual, his self-determination and creativity, the disclosure of abilities, social adaptation, and the formation of civic consciousness, general culture, a healthy lifestyle, and the organization of meaningful leisure. The provision of AECh in different countries is organized differently; for example, in accordance with the Law of the Republic of Kazakhstan dated July 27, 2007 No. 319-III “On Education” in Kazakhstan, the provision of additional education for children and the approval of the state educational order for AECh fall within the competence of local executive bodies (akimats).

Literature review

Compared to general education, the study of AECh issues occupies a very modest place on the research agenda. With the development of the topic of AECh, not everything is so clear. Thus, on the

one hand, the great potential of AECh is noted in the reports of international organizations and think tanks (McCombs, 2017); there are a large number of works examining various aspects of AECh (Deitch, 2020; Zhulyabina, 2017; Kosaretsky, 2019; Izumi Mori, 2014; Janice Aurini, 2013; Gaiser, 2020; Koinzer, 2013; Menefee, 2015; Tansel, 2013; Stina Hallsén, 2021).

On the other hand, despite the relevance of the topic, AECh is almost never mandatory, and children's participation in AECh programs is carried out on a voluntary basis. In addition, it should be noted that there are no constitutional guarantees for the general accessibility and freeness of AECh, and there is relatively little attention given to the problems of the AECh system in general and the issues of organization and management of AECh in particular. Unfortunately, there are practically no studies paying attention to the issues of local governance and organization of AECh; a small number of works pay attention to the issues of accessibility of AECh, coverage of AECh, and the barriers faced by children and their parents in the AECh system.

Currently, people are becoming important, not in themselves but in educated people with knowledge and competencies. The quality of human capital is largely determined by investments in education, where the most important actor is the state (Abrigo, 2018; Tanzi, Schuknecht, 2000; Thurow, 1970). It should be noted that the important role of AECh is also evidenced by the fact that in many countries, government authorities are pursuing policies to expand the coverage of AECh (Brodolini, 2013).

It should be noted that the state acts as the main accumulator of the needs of society and must carry out activities for strategic planning and improvement of the well-being of society. Educational projects, as a rule, are implemented over a long period of time, and at the same time, the effects of its influence on people are extended over time (Pashkus, 2014). Management is the optimal use of available resources. And the question of the most optimal development of available human resources is now, more than ever, clearly acquiring relevance. Management in the field of culture, including education, is an essential part of management in the field of economics due to the fact that it is financially connected with subsidies, taxes, and investment climates. At the same time, you need to understand that culture, in the broad sense of this category, influences all spheres of human activity. Economic policy is designed to ensure efficient management of the economy (Rybakov, 2011). M.I. Tugan-Baranovsky also wrote about the economic principle, the essence of which is to maximize results while minimizing costs (Tugan-Baranovsky, 2004). At the same time, experts note that there is an obvious need to understand the organizational foundations of the synthesis of general and AECh (Afanasyev, 2020).

In the education system, in our opinion, it makes sense to create an extensive network of various types of clubs and sections where optimal conditions will be created for children during sensitive periods that will contribute to the development of their inclinations and abilities for various types of activities. Society's resources are limited, so a completely adequate question arises as to how we can do this most optimally based on the available capabilities.

Reaching children during a sensitive period of their development is more effective, since it contributes to the formation of the inclinations and abilities inherent in children for various types of activities. Based on an analysis of existing educational schools, the government bodies governing school education in the Republic of Kazakhstan can increase the enrollment of children in various types of clubs and sections of additional school education, which will contribute to the development of human capital in the long term.

From the point of view of an ordinary person in state and local government, as a science, it is not so much the theoretical approach that is important but rather the practical and applied one, which helps improve various spheres of human life and society. That is why, in our opinion, state and local management as a science developed, first of all, as an analysis of the practice of managing the problems that people face in life, and theory was already developing in response to challenges from practice. An analysis of the theory and practice of domestic state and local management at AECh revealed certain "blank spots." Currently, in the practice of state and local management of AECh, there are some challenges and problems relating to public needs that cannot but affect the quality of life of the population. We can say that there is a public demand for modernizing the approach to state and local management in the field of AECh. In our opinion, one of the most important problems in the field of AECh management is increasing the coverage of AECh and improving the situation by organizing the accessibility of AECh. Zolotareva A.V. writes about the availability of AECh in her work. and others, noting that "accessibility of education" cannot be assessed in isolation from the characteristics of the subject of accessibility and depends on many factors (Zolotareva & al., 2018). The availability of additional income is one of the most important criteria for the effectiveness of social policy (Kosaretsky, 2019). The category "accessibility of education" is studied

in the works of Zolotareva A.V., Kosaretsky S.G., Perepelitsyna A.A., M. Skilbeck, H. Connell, and others. Accessibility of education means equality of rights to receive education, conditions and means of learning, and equality of opportunity to achieve and use educational results, i.e. The availability of AECh is influenced by many different factors. Zolotareva A.V. and others, in their work, grouped these factors into the following groups:

- informational;
- economic;
- social;
- territorial;
- institutional;
- individual and personal;
- pedagogical (Zolotareva & al., 2018).

In the long term, in our opinion, it is advisable to conduct separate, thorough, and more than one study for each group of factors. Various indicators are used in state and local government. One of the indicators used to assess the development of the AECh system is the EI coverage indicator. A unique indicator of the accessibility of AECh and the success of social policy in this area is the percentage of AECh coverage. In government program documents relating to AECh, this particular indicator is provided as an indicator: the percentage of coverage of AECh. National program documents have already been repeatedly adopted in which this indicator appeared, for example, in the State Program for the Development of Education of the Republic of Kazakhstan for 2011–2020, approved by Decree of the President of the Republic of Kazakhstan dated December 7, 2010 No. 1118, the analysis of the current situation reflects that the coverage of children with additional education compared to other countries (30–50%) is only 21.5%, and it was also planned that by 2020 30-50% of students and pupils will be covered by additional education. However, as an analysis of the current situation shows, in some regions it was not possible to achieve the set targets. And it makes sense to understand the reasons that influenced this. The first step, from our point of view, is to study the problems that parents and children face in the field of AECh. In order to improve the situation, first of all, it is advisable to understand what problems exist in this area. And only by identifying the existing problems based on the available capabilities will it be possible to develop practical proposals and recommendations for resolving existing problems, improving the theory and practice of state and local management in the development of the AECh system. Considering the high goals declared at the state level in program documents on the coverage of AECh, it is fundamentally important for state and local management in the field of AECh to understand what factors influence the coverage and accessibility of AECh.

As a rule, at the initial stages of involving children in additional education, parents play a very important role; they often themselves deliver children to AECh clubs and pay for it. Turning to the problems that exist in practice, it is extremely important to understand what problems children and their parents face when they want to attend various AECh clubs and sections. In general, at present, when it comes to limiting factors that do not allow children to participate in various clubs and sections of AECh, these are:

- lack of clubs and sections of AECh;
- limited financial capabilities of parents, since many AECh clubs and sections are paid;
- even the presence of AECh clubs and sections, but their distance from the child's place of residence or education can be equated to their actual absence;
- lack of coordination in the schedules of various AECh clubs and sections among themselves, as well as the lack of integration of AECh clubs and sections with school education, such as in a situation where a child wants to study in several different clubs, but due to the fact that the schedule is not coordinated, the child is forced to choose only one section of the AECh, etc.

One of the critical factors influencing the accessibility of AECh is the location of clubs and sections. In order to increase the coverage of EDS, from the point of view of organizing and managing the EDS system, there is an objective need to review and adjust the current system.

Currently, one can observe the following picture: on the one hand, there are children and parents who are interested in visiting AECh clubs and sections; on the other hand, there are educational, cultural, and sports organizations, the material and technical base of which is idle, not loaded, and there is the opportunity to organize circles and sections of AECh children's activities with them, but such work on organizing circles and sections of AECh children's activities is not carried out, and even if it is carried out, it does not satisfy social needs. From our point of view, there are certain organizational opportunities, the implementation of which will increase the level of coverage of AECh. In the current conditions, a tactical solution to the problems facing local management of children's activities is, in our opinion, to set the task and carry out more active work on the organization and creation of children's activities circles in educational, cultural, and sports organizations, especially in those places where there is increased demand. We consider it advisable to develop and organize a system of

AECh activities clubs and sections within walking distance on the basis of educational, cultural, sports, etc. organizations. An extensive network of AECh activity clubs and sections should be created so that this network covers the entire populated area. From the point of view of the most optimal use of existing material resources, as we see it, first of all, the existing network of secondary schools should be used more effectively. The first step could be the opening of AECh clubs and sections at secondary schools, since schools have a fairly extensive network in populated areas, and at the same time, schools have the opportunity to organize AECh clubs in terms of the material and technical base, the availability of premises, sports grounds, equipment, personnel, methodological support, etc. This, on the one hand, will make it possible to organize clubs and sections of AECh within walking distance and thereby increase the level of coverage of AECh. And on the other hand, this will ensure a more efficient and rational use of the material base available to society. We believe that the integration of school and additional education would be of great help in increasing the level of AECh coverage. We believe that there is a need to develop a standard model of school AECh in which general education and AECh are integrated.

If we are talking about what role AECh can play in unlocking the potential inherent in a child, we consider it important to organize an extensive network of clubs and sections of various directions at each school within walking distance, so that the child has the opportunity to try his hand at a wide variety of AECh clubs and sections. And in this sense, it is worth classifying the circles and sections of pre-school education on various grounds and areas, such as sports clubs, intellectual clubs, artistic and creative clubs, and so on. And it is important that AECh clubs and sections of various directions are available in any school so that every child has the opportunity to reveal their potential and develop their inclinations and abilities in various directions.

At the same time, if we approach solving this problem more comprehensively, it makes sense for neighboring schools to have clubs and sections in different areas without duplicating each other. For example, let's take three schools that are within walking distance of each other and create the following clubs and sections in these nearby schools: in the first school, mathematics, drawing, and gymnastics; in the second school, foreign languages, vocals, and athletics; and in the third school, robotics, playing a musical instrument, and football. And in this case, a child living nearby will have a wider choice. And at the same time, a child under 12 years of age will have the opportunity to try his hand at a wide variety of activities, choosing for himself what he is passionate about, and then further specialize in the chosen path. On the one hand, this will expand the capabilities of the AECh network as a whole, and on the other hand, it will allow for a more thorough screening of children who have certain inclinations and abilities for certain types of activities. At the same time, it is fundamentally important that such a network function from the first to the sixth grade, since it is at this time that children go through very important and sensitive periods in the process of growing up.

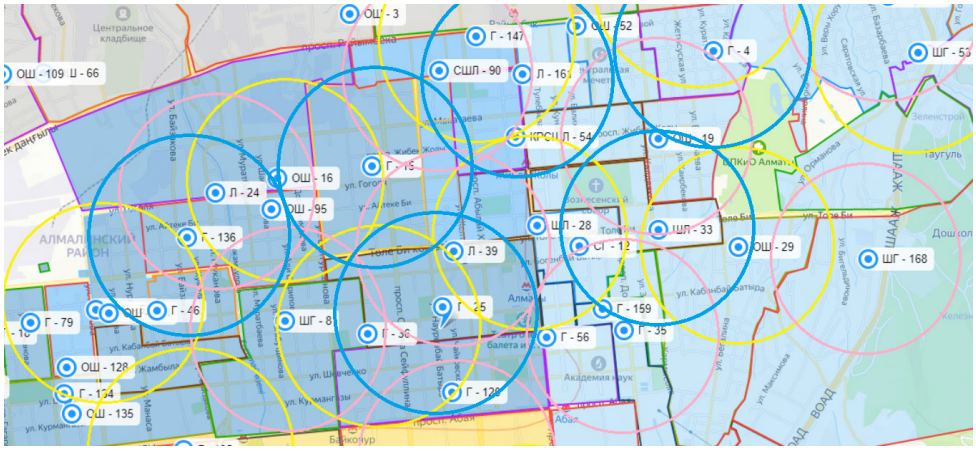

Figure 1 – Scheme of the organization of additional school education in a populated area using the example of the central part of the city of Almaty

Note – circles and sections of additional school education in an intellectual direction are highlighted in yellow; circles and sections of additional school education in an artistic and creative direction are highlighted in pink; and circles and sections of additional school education in a physical education and sports direction are highlighted in blue.

Methodology

The research question of our work was to find out whether there are managerial and organizational opportunities to increase the coverage of AECh.

We hypothesize that at this stage of the development of the education system at the state level, there are certain unrealized opportunities, the implementation of which will allow increasing the level of AECh coverage. During the study, formal logical methods and techniques were used.

Results and discussions

Speaking about the wide opportunities for the versatile and harmonious development of children, broadening their horizons, and enriching their erudition that the AECh system conceals, we should also remember that A. Einstein more than once reported that Dostoevsky gives him much more than Gauss (Yurkevich, 2001). In addition, if we proceed from the fact that at the age of up to 12 years, it makes sense for a child to try a variety of activities, then we believe that at the organizational level, it is worth raising the issue of revising the standard weekly schedule of clubs and sections for children under 12 years of age. Currently, according to the standard schedule, clubs and sections conduct classes three times a week and, as a rule, according to the following schedule: Monday, Wednesday, Friday, or Tuesday, Thursday, or Saturday. We believe that at the initial stage, when it is still unknown what inclinations and abilities the child has, it will be better if classes are held not three times a week but twice a week. This will increase the variability of clubs and sections attended. If a child attends, for example, three different clubs and sections on Mondays, Wednesdays, and Fridays and three others on Tuesdays, Thursdays, and Saturdays, then the child has the maximum possible number of clubs and sections attended–six per week. If the schedule is coordinated in such a way that at the initial stage the child has a certain circle and section twice a week, then the child will have expanded opportunities to test his strengths in developing inclinations and abilities in a variety of activities in various circles and sections. And the child will have the opportunity to attend not six sections, as in current conditions, but nine sections, which increases the variability of different circles and sections by one third. If we take into account that a child up to 12 years of age will have the opportunity to try his hand at a large number of different clubs and sections, then the likelihood that the child will find exactly his type of activity will increase significantly.

Taking into account modern achievements in the field of digital technologies, in our opinion, it is advisable to develop and implement an indicative map of a settlement as a management tool, which will take into account and reflect such factors as population density, taking into account age, organization of education, culture, and sports, their infrastructure and other opportunities, their workload, where AE circles already exist, and in which there are prerequisites for the creation of such, to classify AE circles according to various criteria, grounds, etc. This map, on the one hand, will show places where there is a higher demand for AE clubs; on the other hand, it will show "dead" zones where AE clubs should be developed. In addition, it will reflect the capabilities of the educational and cultural system, where there are prerequisites for the development of AE clubs. Such a tool will make it possible to optimally organize the coverage of a populated area with educational clubs in various directions and more effectively use the material and technical base of educational, cultural, and sports facilities. In addition, teaching staff will be more optimally involved, and, no less important, the loss of time for both children, their parents, and teachers in getting to AECh clubs will be reduced. To do this, it is necessary to develop a system for taking into account potential demand, on the one hand, and the capabilities of the additional income system, on the other hand. We believe that the development and implementation of such a management tool will facilitate decision-making in the field of organization and management of AECh at the local level and can serve as a convenient and useful tool in managing other aspects of society.

Conclusion

We believe that if appropriate changes are made to legislation and the practice of managing the development of school additional education is adjusted, this will be a good help in more fully unlocking the potential of children, and the percentage of talented children in our society will increase sharply. Since we believe that there are no untalented children, there are talented children whose talents were not revealed, conditions were not created for the development of talent, and they were

not given the opportunity to develop their talent. Thanks to the introduction of such a system, the number of children who have tried their hand at one activity or another will increase, choosing exactly those types of activities for which they have the ability, which will make it easier for our education system to find talented children. It should be noted that the famous Heckman curve (Ushakov, 2020), showing that earlier investments in childhood are much more effective than all subsequent programs for later life, is also a kind of argument in favor of our society setting itself the goal of creating a system of harmonious and diversified development for children. All this will ultimately lead to the fact that there will be more discovered talents and geniuses in society. And even more, in this case, there will be more happy people in society.

Thus, we believe that, in organizational and managerial terms, there are certain hidden and not entirely unobvious opportunities in the early childhood education system, which, if certain innovations and changes are implemented, will improve the effectiveness of the early childhood education system in more optimally unlocking the potential of children, developing their inclinations and abilities, increasing the availability of AECh, increasing the enrollment of children in additional education, etc.

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ASSESSMENT OF THE POTENTIAL FOR THE FORMATION AND DEVELOPMENT OF A CLUSTER OF CONSTRUCTION MATERIALS IN ASTANA

The article conducted a study to assess the potential for introducing and developing clusters in the production of construction materials based on the economy of the city of Astana, and the significance of the study was reflected in determining and proving the advantages of the clustering system in this area. The purpose of the scientific work is to study theoretical principles and develop practical recommendations for improving the competitiveness of the regional economy on the example of Astana through the mechanism of creating and developing clusters for the production of construction materials.

In the course of the study, such specific methods as general methods of economics, economic and statistical analysis, critical calculations, functional analysis and system direction were used. The theoretical foundations of the study are methodological concepts, scientific works and quantitative data of national statistics of various scientists, researchers on the implementation and development of the cluster system in the industry economy. Also, based on them, in order to achieve qualitative research results, such estimated indicators as localization coefficients, per capita production coefficients and specialization coefficients were calculated.

The results obtained confirm the effectiveness of the implementation of the clustering system for the production of building materials in the development of the economy of Kazakhstan, which is reflected in the example of the city of Astana. Evaluation of performance indicators made it possible to substantiate the presented concepts and prove their practical significance.

According to the authors, the results of the study can be effectively used in research work when solving the issues of clustering the construction industry in the development of the region. The key findings and these specific recommendations can serve as a basis for preparing development plans and strategies aimed at improving the competitiveness and efficiency of enterprises and organizations in the construction industry.

Key words: cluster, cluster of production materials, localization coefficient, per capita production coefficient, specialization coefficient.

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Астана қаласында құрылыс материалдары кластерін қалыптастыру және дамыту әлеуетін бағалау

Мақалада Астана қаласының экономикасы негізінде құрылыс материалдарының өндірісі саласында кластерлерді енгізу және дамыту мүмкіндіктерінің әлеуетін бағалау жөнінде зерттеу жүргізілді және зерттеудің маңыздылығы осы салада кластерлендіру жүйесінің артықшылықтарын айқындаумен және дәлелдеумен байланысты көрініс тапты. Ғылыми жұмыстың мақсаты – құрылыс материалдарын өндіру жөніндегі кластерлерді құру және дамыту тетігі арқылы Астана мысалында өңірлік экономиканың бәсекелік қабілеттілігін жақсартудың теориялық қағидаттарын зерттеу және практикалық ұсынымдарды әзірлеу.

Зерттеу барысында экономиканың жалпы әдістері, экономикалық-статистикалық талдау, сындарлы есептеу, функционалдық талдау және жүйелік бағыт сияқты ерекше әдістер қолданылды. Зерттеудің теориялық негіздерін сала экономикасына кластерлік жүйені енгізу және дамыту бойынша әртүрлі ғалымдардың, зерттеушілердің әдістемелік тұжырымдамалары, ғылыми

еңбектері және ұлттық статистиканың сандық мағлұматтары құрады. Сондай-ақ, осылардың негізінде зерттеудің сапалы нәтижелеріне қол жеткізу үшін оқшауландыру коэффициенттері, жан басына шаққандағы өндіріс коэффициенттері және мамандандыру коэффициенттері сияқты бағалау көрсеткіштері есептелді.

Алынған нәтижелер Қазақстан экономикасының дамуына құрылыс материалдары өндірісін кластерлеу жүйесін енгізу тиімділігін растайды, бұл Астана қаласының мысалында көрсетілді. Тиімділік көрсеткіштерін бағалау ұсынылған тұжырымдамаларды негіздеуге және олардың практикалық маңыздылығын дәлелдеуге мүмкіндік берді.

Авторлардың пікірінше, зерттеу нәтижелері өңірді дамыту жағдайында құрылыс өнімдерінің өндірісі саласын кластерлендіру мәселелерін шешу барысындағы ғылыми-зерттеушілік жұмыстарда тиімді қолданылуы мүмкін. Алынған түйінді қорытындылар мен берілген нақты ұсынымдар құрылыс саласындағы кәсіпорындар мен ұйымдардың бәсекелік қабілеттілігін көтеруге және олардың тиімділігін арттыруға бағытталған дамыту жоспарлары мен стратегияларын дайындау үшін негіз бола алады.

Түйін сөздер: кластер, құрылыс материалдарының өндірісі кластері, оқшауландыру коэффициенті, жан басына шаққандағы өндіріс коэффициенті, мамандандыру коэффициенті.

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Оценка потенциала формирования и развития кластера строительных материалов в городе Астана

В статье проведено исследование по оценке потенциала возможностей внедрения и развития кластеров в сфере производства строительных материалов на основе экономики города Астаны, и значимость исследования нашла свое отражение в определении и доказывании преимуществ системы кластеризации в данной сфере. Цель научной работы – изучение теоретических принципов и выработка практических рекомендаций по улучшению конкурентоспособности региональной экономики на примере Астаны через механизм создания и развития кластеров по производству строительных материалов.

В ходе исследования были использованы такие специфические методы, как общие методы экономики, экономико-статистический анализ, конструктивный расчет, функциональный анализ и системный подход. Теоретические основы исследования составляют методические концепции, научные труды различных ученых, исследователей и количественные данные национальной статистики по внедрению и развитию кластерной системы в экономику отрасли. Также на их основе для достижения качественных результатов исследования были рассчитаны такие оценочные показатели, как коэффициенты локализации, коэффициенты производства на душу населения и коэффициенты специализации.

Полученные результаты подтверждают эффективность внедрения системы кластеризации производства строительных материалов в развитие экономики Казахстана, что отражено на примере города Астаны. Оценка показателей эффективности позволила обосновать представленные концепции и доказать их практическую значимость.

По мнению авторов, результаты исследования могут быть эффективно использованы в научно-исследовательской работе при решении вопросов кластеризации отрасли производства строительной продукции в условиях развития региона. Полученные ключевые выводы и данные конкретные рекомендации могут служить основой для подготовки планов и стратегий развития, направленных на повышение конкурентоспособности и повышение эффективности предприятий и организаций строительной отрасли.

Ключевые слова: кластеры, кластер производства строительных материалов, коэффициент локализации, коэффициент производства на душу населения, коэффициент специализации.

Introduction

Today, the most important issue of any country is the formation of advantages and the search for ways to increase competitiveness for economic development. As one of the ways, it is possible to use mechanisms for creating highly efficient clusters and clustering systems to raise the economic activities of individual countries and regional economies to a qualitative level. As a rule, clusters and cluster

systems influence the establishment of mutually beneficial relations between various participants in economic reproduction, such as production enterprises and service organizations, higher educational institutions and research institutions, authorities and financial organizations, and create conditions for the development of production processes with high added value.

The fact that the transition to an innovative model of a new economic policy based on clustering is today evidenced by the active development of business projects, startup initiatives, innovative and scientific and technical centers. The emergence and active functioning of such organizations will make it possible to provide technological and production infrastructure that ensures the access of industrial enterprises engaged in the production of products to critical resources.

Cluster systems, which are formed within the framework of regional economies, have several unique advantages. They will contribute to significant progress in the framework of regional and socio-economic development as part of the new economic policy, while cluster systems will be able to provide the most effective mechanisms for stimulating territorial development. As a result, this is manifested in an increase in the number of new jobs in the regions, an increase in local budget revenues and, finally, in an increase in the competitiveness of local industries.

About twenty years ago, the introduction of cluster initiatives in the economy was launched in Kazakhstan, but time shows that this initiative is still a pilot and insufficiently studied in economic practice. This is due to several key issues. First, there is a lack of information that would allow various objects to be combined into a single environment to form clusters. Secondly, there is no consistent system of indicators that could assess the performance of such clusters. As a result, the territories in the regions where it is possible to create a cluster in industrial production must comply with the requirements of the law, require additional research to prove the influence of various external and internal factors that contribute to the effective functioning of legal support.

The creation of clusters that can have a multiplier and synergistic effect on the development of all sectors of the economy can become a good basis for increasing the competitiveness of not only an individual region, but also the country's economy as a whole, despite the existing world challenges and threats.

In this regard, now there is a need to improve the mechanisms for assessing the socio-economic potential of various industrial enterprises in the country and regions, based on the introduction and development of cluster projects, the effective use of cluster systems. In this case, the issue of ensuring the competitive advantages of the region's economy through the revival of cluster initiatives and clustering systems requires additional study in this area and further study predetermines its relevance.

Literature rewiew

Michael Porter, a well-known American scientist and economist, made a huge contribution to the development of cluster theory and cluster systems.

The work and research of this scientist covers priority areas of research on evidence-based cluster initiatives and mechanisms, issues of improving organizational and economic mechanisms for effective management of innovative development at the level of the country's economy, a particular region, a particular industry and individual enterprises. In his well-known book «Competitive Strategy: Methods of Analyzing Industries and Competitors», he pays special attention to improving the organizational and economic mechanisms of innovative development at the level of industries, regions and companies. According to Porter, priority research areas can be identified by implementing clusters related to the formation of innovative economic management processes and innovative systems, and providing evidence-based approaches to cluster projects. (Porter, 2011).

Since the object of research is the production of building materials and the construction industry as a whole, it is important for us to consider the research of various scientists involved in the study of the theory and practice of a construction cluster in order to fully understand how clusters can be introduced in this area and its importance. These specialists represent different branches of knowledge and have their own unique views on this problem. So, according to Isaksen, clusters aimed at developing the construction industry must meet four main criteria:

1. Clusters should consist of geographical groups of similar, related and interconnected economic activities.

2. Cluster activities focused on a specific industry (in our example, the construction industry) should be associated with various forms of local cooperation and competition in the region.

3. The subjects participating in the cluster should understand that they are part of the cluster and

develop common actions with mutual understanding to strengthen the cluster.

4. Clusters as a successful project should stimulate innovation in the construction industry and the competitiveness of their constituent building materials enterprises (Isaksen, 2018).

The development of the production of construction materials is of great importance for stimulating economic growth. Since the construction industry, as one of the most important sectors of the economy, affects many other industries. There is also special scientific interest when it comes to the success factors of large infrastructure projects in developing countries (Abdelalim et al., 2019).

Foreign scientist Lea, having deeply studied the priority sectors of the economy, especially construction, comes to the following conclusion, that is, he draws an important conclusion about providing industry with a cluster development path as an effective strategy that meets the requirements of the development of the world market (Lea, 2020).

Clusters in the construction industry and their contribution to the development of the regional economy have been studied by scientists such as P. Gordon and K. Kourtit. According to them, the cluster model is now widely known as one of the most effective types of achieving competitive advantages. The effective functioning of clusters in the field of building materials depends on several key factors. An important role is played by their centers, the development of the construction industry in a particular region, demand for building materials, initiatives from the management of construction companies and government agencies to introduce new forms of cooperation, stability of the economic situation, reliability and stability of construction enterprises, the presence of large advanced companies, which can become the core of the construction cluster and stimulate construction activities, availability and concentration of qualified personnel, availability of educational institutions of an appropriate profile, investment attractiveness of the region, the level of development of the manufacturing industry and the social sphere (Gordon and Kourtit, 2020).

D.I. Streltsov points out the need to create innovative territorial clusters in the development of the building materials industry. The construction cluster, according to Streltsov's definition, is a group of organizations working in the construction sector. This group includes scientific and educational institutions, companies engaged in innovation, investment, finance, production and infrastructure. In addition, representatives of regional authorities participate in the cluster. All these organizations unite to implement joint projects in order to improve their competitiveness in the market. The main direction of the cluster is the development and production of innovative construction materials (Streltsov, 2022).

L. N. Mulendeeva considers it expedient to assess the results of industry clustering in the industry under consideration by comparing the results of the functioning of the existing construction complex (the basic structure of the industry) and enterprises within the cluster organization (Mulendeeva, 2023).

Studies show that scientists and economists from different countries are actively studying cluster initiatives related to the development of the construction materials industry and increasing the competitiveness of enterprises in the construction sector. Kazakhstan also conducts scientific work aimed at developing a cluster approach to strengthen the competitiveness of the national economy. Most researchers agree that the introduction of clustering sytems can have a positive effect on the region's economy. However, estimating the economic impact of cluster creation and development requires more research.

Methodology

The main research methods for the trends in the formation and development of clusters in the regional economy are determined by the system direction, economic and statistical, calculation and design methods. As a research method, calculations of localization coefficients were used to assess the potential for clustering of the construction sector of the economy in the city of Astana, coefficients of per capita production of the region and coefficients of specialization in the construction industry of the region (Abdyrov and Toktogulova, 2017).

In this case, we are considering the process of creating and developing a cluster in the field of Russian construction. The focus is on assessing the innovation potential of building materials clustering. To do this, a quantitative analysis is carried out to determine the availability of favorable conditions for the formation of the necessary cluster.

In the economy of the domestic region, indicators for calculating localization coefficients, per capita production coefficients in the region and specialization coefficients in the field of construction are used as the main methodology for clustering the construction industry and quantifying the potential of the construction cluster (Table 1).

Table 1 – Methodology for assessing the potential of the cluster of contruction materials in the economy of Kazakhstan

Computational indicators	Comment	Calculation formula
1. The coefficient of localization of production of the construction materials	The coefficient of localization of production of the construction materials industry is defined as the ratio of the cost of products of this industry produced in the country to the total production of these products in the country. This indicator allows us to assess the degree of dependence of the country's economy on the import of building materials and determine the possibilities for the development of domestic production.	$K_L = (q_r / Q_R) \times 100\% / (q / Q) \times 100\%$ q_r – quantity of construction materials in the region; q – total quantity of construction materials in the country; Q_R – quantity of manufacturing industries in the region; Q – total quantity of manufacturing industries in the country.
2. The coefficient of per capita production of construction materials in the region	The coefficient of per capita production of construction materials in the region is defined as the ratio of the total production of construction materials in a given region to the population of this region. This indicator allows you to assess the efficiency of the use of labor and production capacities in the construction industry. It can be used to compare different regions with each other or to analyze the dynamics of the industry in the same region over a certain period of time.	$K_Д = (q_r / Q_R) \times 100\% / (H_R / H) \times 100\%$ q_r – quantity of construction materials in the region; q – total quantity of construction materials in the country; H_R – total population of the region; H – total population of the country.
3. The coefficient of specialization of the production of the construction industry in the region	The coefficient of specialization of the production of the construction industry in the region is defined as the ratio of the volume of products of the construction industry to the total volume of gross regional product in this region. This is a measure that is used to estimate the degree of concentration of production in a particular industry in a given region. It allows you to assess how much the region depends on one particular sector of the economy. The higher the specialization coefficient, the greater the region's dependence on this industry.	$K_S = (q_r / Q_R) \times 100\% / (GDP_R / GDP) \times 100\%$ qr – quantity of construction materials in the region; q – total quantity of construction materials in the country; GDP_R – gross regional product of the region; GDP – gross regional product of the country.
Note – (Abdyrov, 2019) compiled by authors using literature		

If the calculated values of the assigned factors exceed one, then this industry is considered a market specialization industry. When forming clusters and determining the most important directions, the dynamics of coefficients of localization of production of the construction materials should be analyzed. The increase in these indicators over time indicates the priorities for the further development of clusters the same territory, while their decrease cannot be considered a possible priority.

Results

To assess the effectiveness and potential of introducing clusters into the economy of the construction industry of Kazakhstan, we must choose a certain type of economic activity in the manufacturing industry of Astana, namely «production of other non-metallic mineral products». This choice is due to the fact that Astana is one of the leading cities in the country in terms of contribution to the gross regional product and the number of enterprises engaged in the production of building materials and products from them. According to official statistics of Kazakhstan, this activity is classified as «production of other non-metallic mineral products».

To analyze the economic efficiency and determine the development potential of clusters in the field of production of construction materials in Astana and the republic as a whole, we need to obtain primary statistics for the period from 2018 to 2022. We would like to use information from official sources of national statistics, including data on production volumes of construction materials, gross regional product and population. This will allow us to conduct a comprehensive analysis and draw reasonable conclusions regarding the current state and prospects for the development of this industry (Table 2).

Table 2 – Initial data necessary for calculating indicators for assessing the economic efficiency and potential for the formation and development of clusters in the field of production of construction materials

Indications	Years				
	2018	2019	2020	2021	2022
The Republic Of Kazakhstan					
Volume of construction materials production, million tenge	601367	632437	732210	965149	1133391
Volume of manufacturing industry, million tenge	10427356	11573350	13232696	17121392	20697327
Population, people	18157337	18395567	18631779	18879552	19503159
Gross regional product, million tenge	61819536	69532626	70649033	83951588	101522984
Astana city					
Volume of construction materials production, million tenge	62971	70916	96154	143983	188203
Volume of manufacturing industry, million tenge	505132	527198	532216	734236	948678
Population, people	1030577	1136156	1184411	1239744	1354507
Gross regional product, million tenge	6705933	7834829	7975283	8923712	10444137
Note – compiled by the authors based on data from the National Bureau of Statistics of the Republic of Kazakhstan					

Thus, using the given statistical data, we can assess the potential for clustering of the industry of construction materials production in the region in the domestic economy as a result of the corresponding calculations of localization coefficients, per capita production coefficients of the region and specialization coefficients in the construction industry of the region on the example of Astana (Table 3, Figure 1).

Table 3 – Evaluation indicators for the formation and development of clusters in the field of production of building materials in Astana

Calculation indicators	Years				
	2018	2019	2020	2021	2022
1. Production localization coefficients	2,16	2,46	3,27	3,48	3,62
2. Production coefficients per capita in the region	1,82	1,84	2,07	2,27	2,39
3. Coefficients of specialization in the construction industry of the region	1,00	1,11	1,16	1,40	1,61
Note – calculated by the authors based on the results of the research					

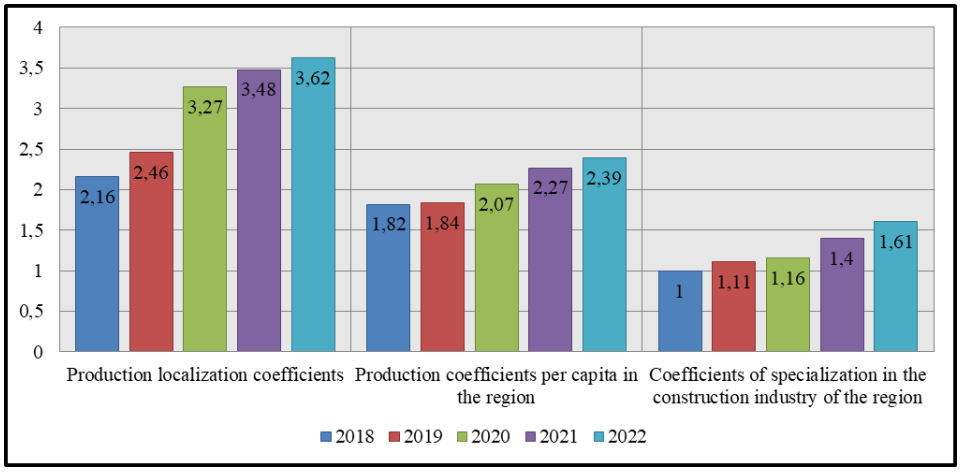

Figure 1 – Trends in indicators of calculated coefficients for the production of building materials in Astana
Note – calculated by the authors based on the results of the research

As we can see from Table 3, the obtained calculation results for 2018-2022 show that on the example of the city of Astana, the values of localization coefficients for the production of building materials, per capita production coefficients of the region and specialization coefficients in the construction industry of the region are higher than one and, in our opinion, the construction materials industry is the most developed compared to the national average.

The results of Figure 1 determine the values of the calculated coefficients increasing from year to year. In particular, in 2022, compared to 2018, localization coefficients increased by 40.3%, per capita production coefficients of the region by 23.0% and specialization coefficients by 61.0%.

The increase in the calculated values of the coefficients from year to year is explained by an increase in the production of building materials in the city of Astana, that is, in 2022 we observe an increase in its volumes by 125,232 million tenge and to a relative extent by 66.5% by 2018.

Discussion

From our point of view, even if a positive trend has been observed in the production process over the specified years, it is necessary to identify a number of possible factors that limit the production activities of domestic building materials and have a priority impact on the development of the production sector. Such factors include such factors as limited resources, competitive imports, lack of qualified personnel, administrative barriers and climatic conditions (Figure 2) (Dosmaganbetov and Aliyev, 2019).

The «competitive import» factor is a special case here. After all, according to our forecasts, the range of domestic products in the field of construction materials, both in terms of volume and quality, may not fully meet the needs of the modern construction process of the region in question in the future.

In this regard, it is necessary to limit competing imports, increase the volume of production and improve the quality of construction materials.

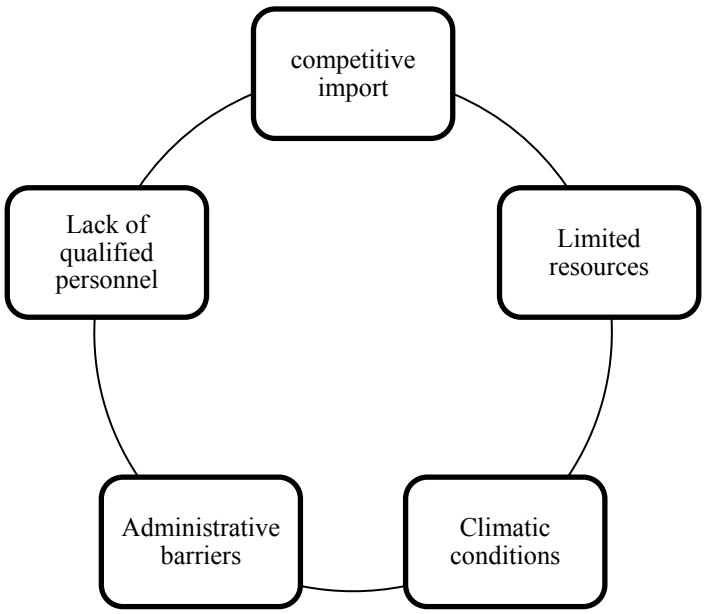

Figure 2 – Possible factors limiting the production of building materials
Note – (Dosmaganbetov and Aliyev, 2019) compiled by authors using literature

The obtained calculations and results helped to conclude that the production of building materials in Astana is more developed than the average in Kazakhstan. Thus, in this sphere of production, it is most appropriate to implement a clustering system at the level of the region's economy. As a result, in connection with the action plan adopted by the government decree, projects were carried out to launch pilot clusters in sectors of the domestic economy of strategic importance.

In particular, it was considered necessary to create and develop a cluster of "construction materials" in the territory of Astana for its studied

potential. So, we consider the scope of this region as an object of study.

Astana is known for its developed industrial sector producing construction materials. This sector ranks second in Kazakhstan and plays a key role in stimulating the city's economic growth. The production of building materials is a fundamental component of the construction cluster. It is important to note that during the implementation of this idea, within the framework of the development of the construction cluster in the city of Astana, a large industrial zone for the production of construction products and structures was created. Currently, various types of construction products are produced and actively developed on the territory of the industrial zone, such as commercial concrete, dry building mixtures, furniture, wooden products for construction, the production of frame houses, reinforced concrete structures and others. Given these circumstances, it is important to emphasize the need to develop our own production of construction materials in Astana. This will satisfy the growing demand for civilian housing and expand the range of domestic products. In addition, it will contribute to the development of the city's economy and its innovative infrastructure. Thus, the creation and development of a cluster of construction materials in Astana seems extremely important.

The creation and development of a construction cluster in Astana is a reasonable response to changing business conditions, increased competition from potential competitors from other regions, as well as consumer requirements for the quality of products and services. The construction cluster differs from other forms of association of enterprises in its wide composition and a large number of goals (Figure 3).

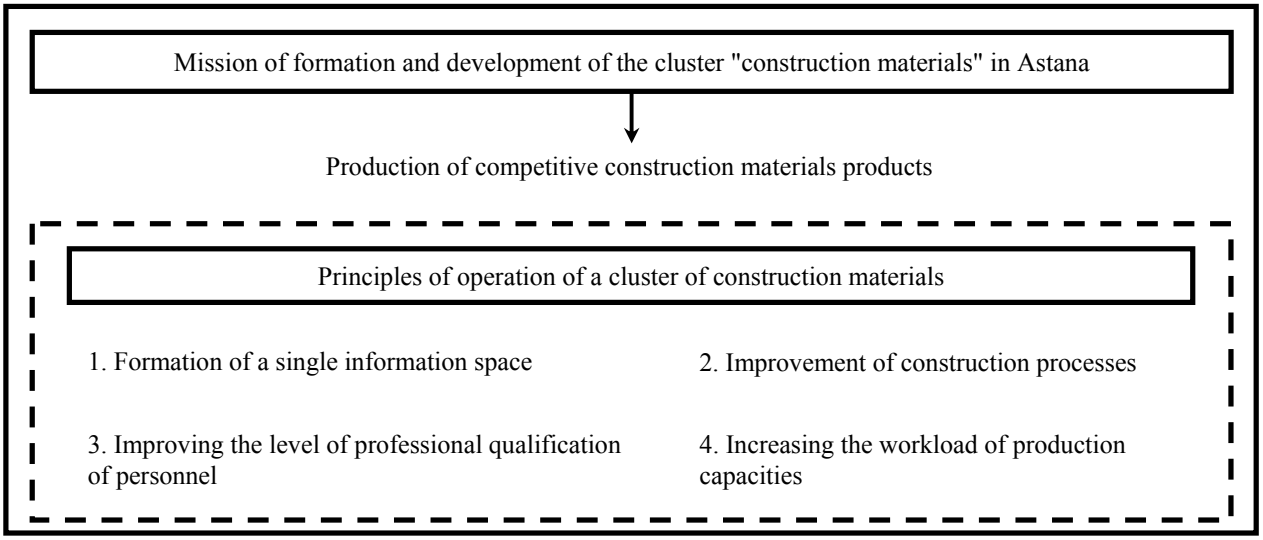

Figure 3 – System of goals and principles for the formation and development of the cluster «construction materials» in Astana
Note – Compiled by the authors

In our opinion, as the results of the assessment of the potential for the and development of a cluster of construction materials in Astana show, in order to characterize the effective way of functioning of the cluster in the region, it is necessary to create a cluster management company and form and present its system (Figure 4).

The study shows that a cluster management company is essential for the efficient functioning of a building materials cluster. This company is responsible for coordinating cluster projects and stimulating interaction between cluster members, both within it and with other clusters. Thus, the management company plays a key role in ensuring the successful operation of the construction cluster.

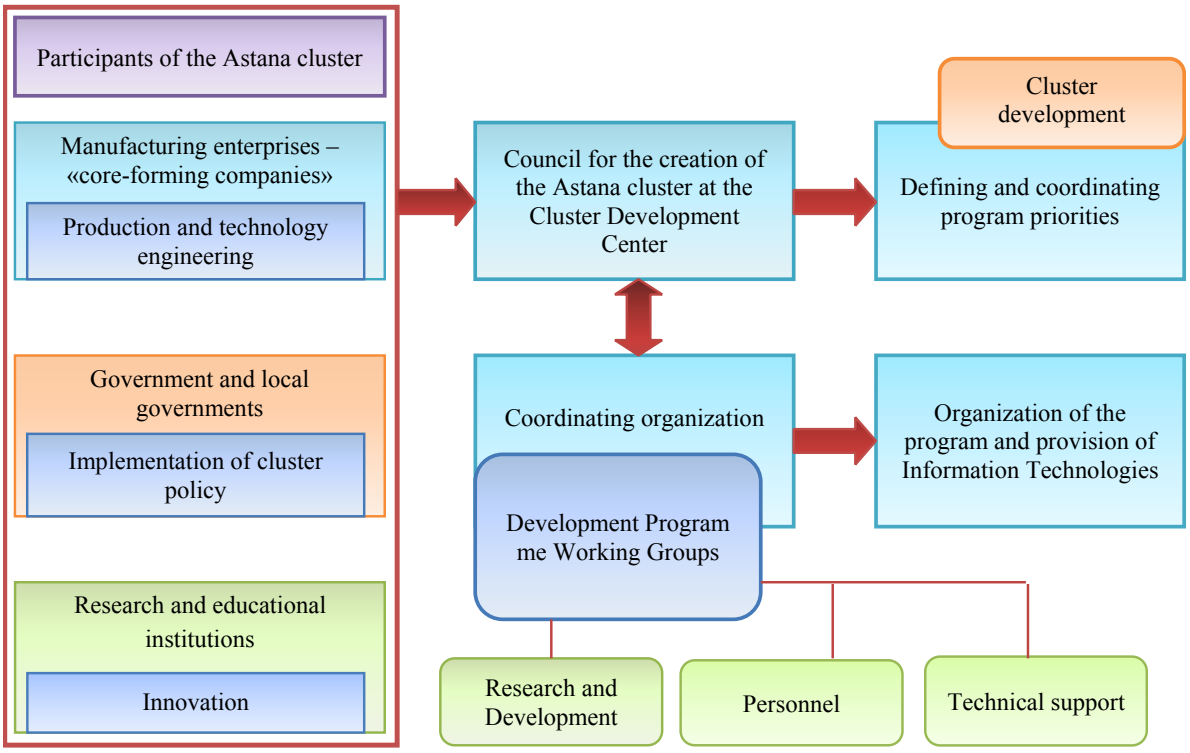

Figure 4 – Management system of the mechanism of formation and development of the cluster «construction materials» in Astana
Note – Compiled by the authors

The functions of the construction cluster management company (cluster Secretariat) should be entrusted to a non-profit partnership created for this purpose. To achieve its goal, the cluster management company must clearly fulfill the following tasks as part of the development of the construction cluster:

1. analysis of the potential of the city economy within the framework of the construction cluster, determination of the composition of the cluster participants, determination of the directions and priorities of the cluster development. This task gives a complete picture of the current state of the industry and its prospects;

2. create conditions for effective interaction between enterprises, educational institutions, non-profit organizations, government agencies and investors. The purpose of such cooperation is the development of a territorial cluster and the successful implementation of joint projects. It is important to ensure support from all stakeholders in order to achieve maximum effect from cooperation;

3. creation of information consulting and service systems aimed at supporting innovative areas of newly created and developing types of business within the cluster;

4. linking and integration of development strategies of Astana for different periods with strategies, programs and concepts of cluster development.

A cluster Council should be formed under the management company, which may include representatives of the cluster's participating enterprises, organizations of the innovative development infrastructure of the city and scientific and educational institutions.

According to our forecasts, in the future, the construction cluster Council will become a permanent collegial, advisory body created to solve the problems of cluster development. The Construction Cluster Council plays an important role in the development of the socio-economic potential of Astana. It promotes effective interaction between government agencies, local governments, public organizations, commercial and non-profit enterprises. One of the key tasks of the council is to support the creation and development of new production facilities in the construction materials industry. This helps to strengthen the competitiveness of products produced in the cluster, and stimulates the introduction of innovative technologies in the real sector of the city's economy.

Thus, based on the calculations made during the study of the preblem and the estimates obtained,

we can conclude that the sphere of production of building materials corresponds to the cluster type, the cluster has all the necessary potential participants, and therefore its creation in Astana is possible and desirable.

The results of the economic assessment of the clustering potential of the construction industry of the economy of Astana revealed the following key advantages:

1. The presence in the region of a significant amount of building materials necessary to create a cluster of industrial enterprises.

2. A complete value chain in the building materials industry, which ensures production efficiency and the ability to create a cluster.

3. A high level of interaction between the system of development of qualified personnel and personnel in the industry and its research institutions.

5. The presence of a developed infrastructure for managing innovations in the city's construction complex, which will affect the introduction of new technologies and increase the competitiveness of the industry.

6. Positive dynamics in the development of the building materials industry, which testifies to the stability and prospects of the industry.

7. The functioning of progressive legislation regulating innovative activities in the field of construction will create favorable conditions for the introduction of new technologies in this area.

8. The high level of demand for building materials products produced by industrial enterprises and the potential demand for innovative developments in this area, which stimulates the development of the industry.

9. The technological structure of the building materials industry meets modern requirements and allows the production of high-quality products.

10. Effective use of modern technologies in the construction industry will improve the quality of work performed and reduce the cost of their implementation in production.

11. Well-developed transport infrastructure facilitates the transportation of raw materials and finished products, which is important for the efficient operation of the cluster.

Conclusion

Thus, the results of the study show and confirm the existence of a large potential for the production of building materials in the city of Astana for the creation and development of clusters, as well as the positive value of the corresponding calculated indicators for assessing the potential of this industry. Thus, based on the results obtained, it can be concluded that the development of a cluster system in this area at the regional level is a completely reasonable step.

In our opinion, at the end of the study, important conclusions can be drawn and specific recommendations can be made based on the results of an assessment of the potential for the creation and development of a cluster system for the development of the building materials industry in Astana.

Final conclusions:

- the article considers the main aspects of formation of the cluster of building materials in Astana;
- the study showed that there is potential for building materials cluster in Astana city;
- key factors contributing to the formation of thi building materials cluster in Astana were identified;
- identified problems that impede the effective functioning of the cluster of building materials in the city of Astana.

Specific recommendations:

- develop a strategy for the development of a cluster of building materials in Astana, which will take into account all key factors and solve existing problems;
- improvement of urban infrastructure to ensure the transportation of raw materials and a favorable logistics system necessary for the production of building materials in Astana;
- wide attraction of investments in the sphere of construction industry and implementation of effective urban investment policy;
- conduct additional research on the market of building materials in order to determine the needs of consumers and adapt production to these requirements;
- organize training and advanced training of workers in the construction materials industry in order to improve the quality of products and increase the competitiveness of enterprises.

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THE TERRITORIAL ASPECT OF THE DEVELOPMENT OF THE LOGISTICS SUPPLY CHAIN

This article explores the role of territorial logistics in the integration of Kazakhstan's regions into the global economy. The main purpose of the article is to consider the territorial aspect of the development of the logistics supply chain in Kazakhstan and its impact on ensuring sustainable and balanced economic growth. The analysis of the key problems and challenges facing the country is carried out, as well as recommendations for improving territorial logistics to support the development process are proposed.

The study includes an analysis of the concept and strategy for the development of the transport logistics industry in Kazakhstan until 2030. The authors consider government programs such as «Nurly Zhol» and the National Development Plan until 2025 to identify key challenges and opportunities related to the country's territorial logistics and transport system. To achieve this goal, various analysis methods are used, including document analysis, bibliometric analysis and structural synthesis of transport systems.

That article emphasizes the importance of territorial logistics to ensure sustainable development and increase the efficiency of the use of territorial resources. Territorial logistics is considered as an integrated approach to the management of spatial aspects of economic activity, including the organization and optimization of transport flows at the regional and urban levels. In conclusion, the article highlights new ways for the research and development of this field in Kazakhstan. A review of current research in the field of territorial logistics shows the versatility of research interest and the importance of further research for the development of effective strategies for managing logistics processes at the territorial level.

Key words: Territorial logistics, territorial transport systems, regional transport systems.

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Логистикалық жеткізу желісін дамытудың аумақтық аспектісі

Мақалада Қазақстан өңірлерін жаһандық экономикаға кіріктірудегі аумақтық логистиканың рөлін зерттеуді қарастырады. Мақаланың негізгі мақсаты Қазақстанда жеткізілімдердің логистикалық желісін дамытудың аумақтық аспектісін және оның орнықты, әрі теңгерімді экономикалық өсуді қамтамасыз етуге әсерін қарастыру болып табылады. Ел алдында тұрған негізгі проблемалар мен сын-қатерлерге талдау жүргізілді, сондай-ақ даму процесін қолдау үшін аумақтық логистиканы жақсарту бойынша ұсыныстар берілді.

Зерттеу Қазақстанның көліктік логистикалық саласын дамытудың 2030 жылға дейінгі тұжырымдамасы мен стратегиясын талдауды қамтиды. Авторлар елдің аумақтық логистикасы мен көлік жүйесіне қатысты негізгі сын-қатерлер мен мүмкіндіктерді анықтау үшін «Нұрлы жол» және 2025 жылға дейінгі ұлттық даму жоспары сияқты мемлекеттік бағдарламаларды қарастырады. Осы мақсатқа жету үшін әртүрлі талдау әдістері қолданылады, соның ішінде құжаттарды талдау, библиометриялық талдау және көлік жүйелерінің құрылымдық синтезі.

Мақала тұрақты дамуды қамтамасыз ету және аумақтық ресурстарды пайдалану тиімділігін арттыру үшін, аумақтық логистиканың маңыздылығын көрсетеді. Аумақтық логистика экономикалық қызметтің кеңістіктік аспектілерін басқарудың кешенді тәсілі ретінде қарастырылады, соның ішінде аймақтар мен қалалар деңгейінде көлік ағындарын ұйымдастыру және оңтайландыру. Мақала зерттеуіндегі тұжырым бойынша Қазақстанда осы саланы зерттеу мен дамытудың жаңа жолдары айқындалады. Аумақтық логистика саласындағы заманауи зерттеулерге шолу зерттеу қызығушылығының жан-жақтылығын және аумақтық деңгейде логистикалық процестерді басқарудың тиімді стратегияларын әзірлеу, сонымен қатар зерттеулердің маңыздылығы айқындалды.

Түйін сөздер: Аумақтық логистика, аумақтық көлік жүйелері, өңірлік көлік жүйелері.

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Территориальный аспект развития логистической сети поставок

Данная статья исследует роль территориальной логистики в интеграции регионов Казахстана в глобальную экономику. Основной целью статьи является рассмотрение территориального аспекта развития логистической сети поставок в Казахстане и его влияние на обеспечение устойчивого и сбалансированного экономического роста. Проведен анализ ключевых проблем и вызовов, стоящих перед страной, а также предложены рекомендации по улучшению территориальной логистики для поддержки процесса развития.

Исследование включает анализ концепции и стратегии развития транспортной логистической отрасли Казахстана до 2030 года. Авторы рассматривают государственные программы, такие как «Нұрлы жол» и Национальный план развития до 2025 года, для определения ключевых вызовов и возможностей, связанных с территориальной логистикой и транспортной системой страны. Для достижения этой цели используются различные методы анализа, включая анализ документов, библиометрический анализ и структурный синтез транспортных систем.

Статья подчеркивает важность территориальной логистики для обеспечения устойчивого развития и повышения эффективности использования территориальных ресурсов. Территориальная логистика рассматривается как комплексный подход к управлению пространственными аспектами экономической деятельности, включая организацию и оптимизацию транспортных потоков на уровне регионов и городов. В заключение статьи выделяются новые пути для исследования и развития данной области в Казахстане. Обзор современных исследований в области территориальной логистики показывает многогранность исследовательского интереса и важность дальнейших исследований для разработки эффективных стратегий управления логистическими процессами на территориальном уровне.

Ключевые слова: территориальная логистика, территориальные транспортные системы, региональные транспортные системы.

Introduction

In the context of rapidly developing globalization and increasing international trade, the importance of an effective logistics supply chain is becoming increasingly apparent. In recent years, Kazakhstan's foreign trade turnover in January-December 2023 amounted to 139833.4 million US dollars and increased by 3.2% in nominal terms compared to January-December 2022. The territorial aspect of the development of the logistics network plays a key role in ensuring sustainable economic growth and increasing the competitiveness of the country. As emphasized by the President of Kazakhstan K. Zh. Tokayev, in his message to the people, the concept of fully utilizing the potential of the transport logistics industry and developing the country's logistics complex for the long term is one of the key areas of the development strategy until 2030.

The implementation of this concept includes a number of large projects for the construction and reconstruction of highways, modernization of railway infrastructure, as well as the development of airport and port infrastructure. These measures are aimed at improving the condition of the transport infrastructure and increasing its capacity and reliability.

Within the framework of the national development plan of Kazakhstan until 2025, special attention is paid to improving the quality of life and well-being of the population, taking into account the principle of «human centricity». The country's territorial development plan provides for reforms in the organization of the spatial structure, taking into account a number of key aspects, such as the absence of large domestic markets, low population density, the influence of neighboring countries and the concentration of population in urban and rural areas.

The aim of the plan is to increase the competitiveness of regions by supporting their potential, and various approaches are envisaged to achieve this goal, including providing institutional support and improving interregional ties.

In this article, we will consider the territorial aspect of the development of the logistics supply chain in Kazakhstan and its impact on ensuring sustainable and balanced economic growth. An analysis of the key problems and challenges facing the country will be conducted, as well as recommendations for improving territorial logistics to support the development process.

Because of natural market factors (agglomeration, migration, specialization). Centers of eco-

nomic growth are being formed in the regions on the basis of large cities. To ensure competitive advantages, local executive bodies will modernize regional infrastructure (transport, energy, etc.) as part of the implementation of national projects and plans for the development of regions, cities of republican significance, the capital, plans for the development of national management holdings, national holdings and national companies. At the same time, at the local level in the regions, the entire range of public services by local executive bodies will be provided through the so-called support settlements (promising small towns and support villages). The list of emerging centers of economic growth and intraregional support settlements is given in Table 1 ((Instruction of the President of the Republic of Kazakhstan, 2025) February 21, 2022 No.812).

Table 1 – Territorial development Plan of the Republic of Kazakhstan until 2025

The list of emerging centers of economic growth and intraregional support settlements			
Centers of economic growth:			
I. Urban agglomerations:		**IV. Small towns in urban agglomerations and FSDs:**	
1	Metropolitan agglomeration centered in the city of Nursultan	1	Akkol city
2	Almaty agglomeration with the center in the city of Almaty	2	Alga city
3	Shymkent agglomeration centered in the city of Shymkent	3	Yesik city
4	Aktobe agglomeration with the center in the city of Aktobe	4	Kapshagay city
II. Centres of Functional Urbanised Areas (FUAs):		**5**	Kaskelen city
1	Kokshetau city	6	Talgar city
2	Taldykorgan city	7	Shchuchinsk city
3	Atyrau city	8	Lenger city
4	Ust-Kamenogorsk city	9	Khromtau city
5	Taraz city	10	Tekeli town
6	Uralsk city	11	Saran city
7	Karaganda city	12	Abay city
8	Kostanai city	13	Aksu city
9	Kyzylorda city	**V. Small border towns:**	
10	Aktau city	1	Zharkent city
11	Pavlodar city	2	Zaisan city
12	Petropavlovsk city	3	Saryagash city
13	Turkestan city	4	Shardara city
14	Semey city	5	Shemonaikha city
		6	Mamlyutka city
		7	Bulaevo city
		8	Zhetysay city
		9	Zhitikara city

Table continuation

Reference localities:		
III. Monotowns with a population of more than 50 thousand people:		**VI. Supporting rural settlements (SRS) (including adjacent villages):**
1	1.1 thousand reference (SRS)	1.1 thousand reference (SRS)
2	Zhezkazgan city	
3	Satpayev city	
4	Temirtau city	
5	Rudnyi city	
6	Zhanaozen city	
7	Ekibastuz city	
8	Kentau city	
9	Stepnogorsk city	
10	Ridder city	
11	Kulsary city	
12	Baikonyr city	
Note-((Instruction of the President of the Republic of Kazakhstan, 2025) February 21, 2022 №812).		

For the successful implementation of the tasks of territorial development of Kazakhstan, it is necessary to focus efforts on a balanced distribution of powers between the levels of executive power, the development of strategic infrastructure in macro-regions and ensuring equal access to basic public services for all regions of the country. Only such an integrated approach will make it possible to achieve the goals of sustainable and balanced development, reduce interregional differences in the level and quality of life of the population, as well as promote high-quality and sustainable economic growth.

Increasing the competitiveness of Kazakhstan's regions largely depends on the rational allocation of productive forces, effective use of the transport complex, and improvement of transport and economic ties between the regions. The most important problems are the formation of the main transport network and the development of transport and logistics infrastructure in Kazakhstan. Today, during the consideration of these issues, it became necessary to define such a concept as «territorial logistics».

Literature review

A literature review in a scientific article is an analysis of the work of domestic and foreign researchers on the topic of research. Territorial logistics is becoming an important area of research in modern logistics, focusing on the management of economic and human flows in order to most effectively locate enterprises in a certain territory. The works of E. D. Konkova and Yu.I. Toluev highlight the main aspects of the concept of territorial logistics, including a set of methods and services, as well as the need to optimize spatial aspects to ensure effective placement of enterprises.

The area design process described by Goodrum highlights the importance of grouping geographic areas to create larger clusters based on planning criteria. This indicates the importance of territory design in the context of territorial logistics.

Studies by Gabbasova, Nikolaev and Magomedov indicate the importance of territorial transport and logistics systems (TTLS) to ensure the continuous movement of resources between the components of territorial public systems. These researches show the need for an integrated approach to the management of transport and logistics processes in the territory.

The management of territorial development, studied by Arapov and Sidorov, focuses on systemic actions to ensure sustainable and balanced development of territories. These studies highlight not only the economic, but also the social and environmental aspects of territorial logistics.

The bibliometric analysis of scientific publications on territorial logistics shows the versatility of research interest in this area. In the last decade, territorial analysis has become an important aspect of logistics research, especially in the context of globalization. A systematic search for the keyword «territorial logistics» in the Scopus

database revealed a significant volume of 685 scientific publications related to this topic. Using the VOSviewer program for bibliometric analysis, about 44 terms and concepts related to «territorial logistics» were identified, which indicates the multifaceted nature of research attention in this area (Figure 1).

Among these terms, the number of which exceeds 44, such as globalization, air transportation, efficiency, international trade, names of organizations, names of countries, competitiveness, logistics efficiency and others are mentioned. This diversity highlights the interdisciplinary nature of research in the field of territorial logistics, covering various aspects of transport, trade and organizational management in specific geographical areas. For example:

The literary review in the scientific article is an analysis of the works of domestic and foreign researchers on the research topic.

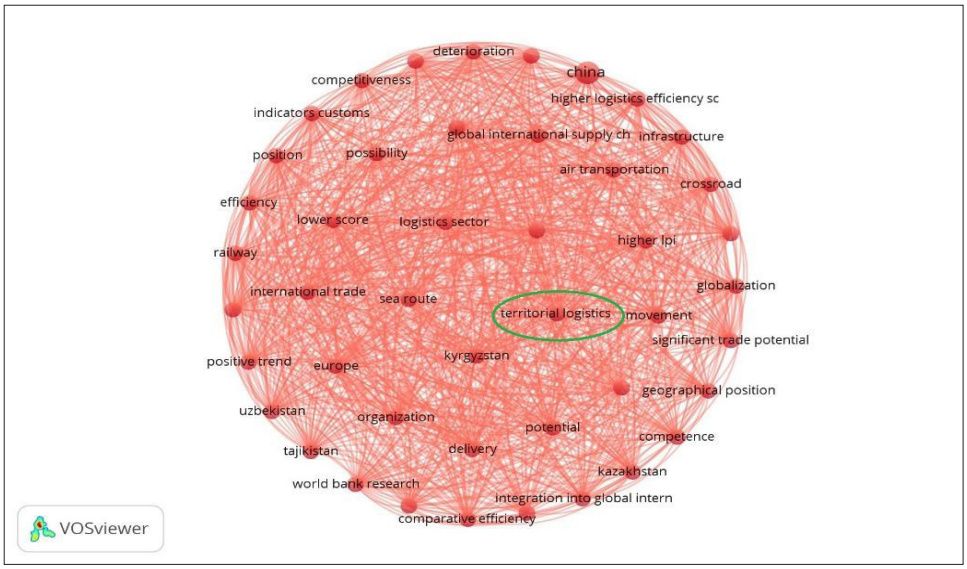

Figure 1 – Bibliometric analysis for the keyword «Territorial logistics»
Note – The result obtained using the Vosviewer platform

While researching the article, a search using the keywords "territorial logistics" in the Web of Science database revealed 9 articles published between 2016 and 2022. About 216 related terms were identified using the VOSviewer bibliometric analysis program. The analysis revealed 8 clusters, 4038 links and a total number of links equal to 4046. The results of this analysis are shown in the image generated by the VOSviewer program below (Figure 2).

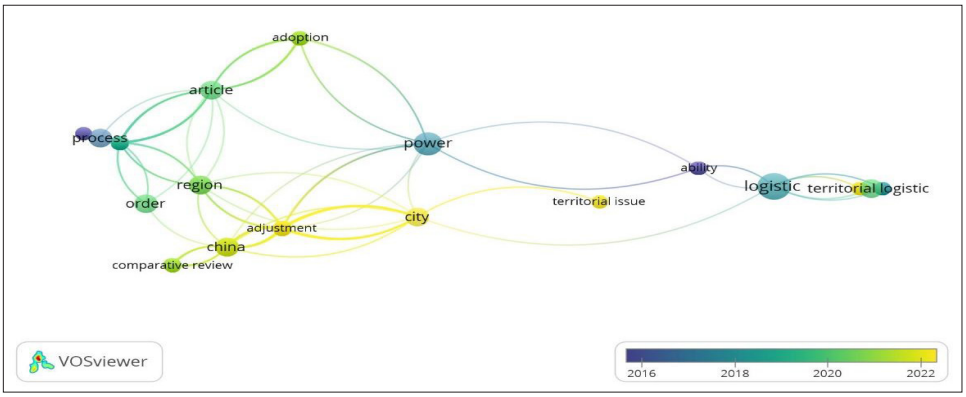

Figure 2 – Bibliometric analysis of the keyword «Territorial logistics» in the Web of Science database
Note – The result obtained using the Vosviewer platform

Finally, it should be noted that scientific research in the field of territorial logistics reflects the dynamic panorama of world trade and transport, while researchers explore various topics ranging from efficiency and competitiveness to the dynamics of international trade and air transport networks. By exploring these multifaceted topics, scientists contribute to a deeper understanding of territorial logistics and its implications for global supply chain management in an increasingly interconnected environment.

Methodology

An analysis of the structure of territorial transport systems is carried out to determine the composition, properties, nature and characteristics of the interaction of individual elements in the process of operation, which makes it possible to assess the adaptability of such systems to solve problems determined by their intended purpose.

The structure of the transport system in general may consist of three interconnected levels, differing in their composition and functions performed. However, the number of structural levels may be less than three, and the known methods of structural analysis do not allow us to unambiguously determine their number and composition, which creates difficulties in solving practical problems, including those related to the choice of optimal modes of operation.

The method of structural analysis of territorial transport systems is carried out in several stages:

1. Based on the existing scheme and the known nature of the interaction of individual elements, the composition of the local, regional and interregional levels of the analyzed territorial transport system is established in an assumed form.

2. Taking into account the existing traffic volumes, as well as the characteristics of the transport routes, the structure of the system is being clarified. To do this, the indicators of paired proximity are calculated, the structural index is determined, and the need to combine overlapping sets on the Y0X plane is estimated, if there is such an overlap.

3. After the implementation of all procedures related to the clarification of the composition of individual structural levels, their total number is determined.

The application of this methodology is illustrated by the example of territorial transport systems at the regional level (Slobodyanyuk & Gorobchenko, 2020; Slobodyanyuk, 2017).

The content of the territorial transport system, which includes both regional and transit cargo flows.

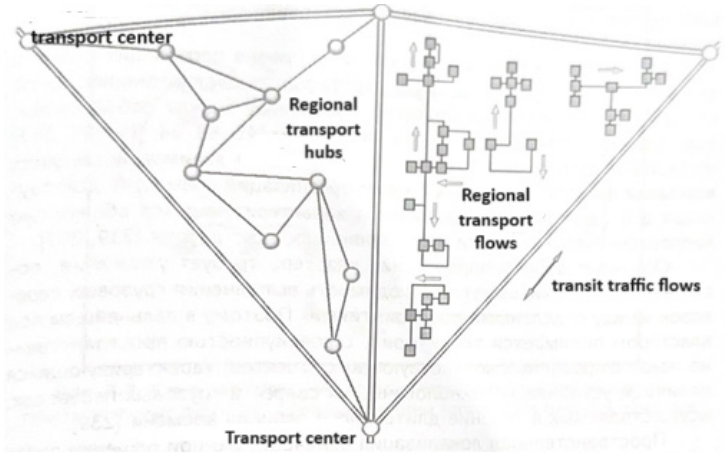

Figure 3 – The scheme of the territorial transport system, which includes both regional and transit cargo flows
Note – Slobodyanyuk, 2017

The features of the structural synthesis of multilevel transport systems are associated with the need to perform a number of sequential optimization procedures at each level, starting from the lowest. This is due to the fact that the operation of such systems includes a number of operational features:

1. Local enterprises and their economic activities create cargo flows, localized mainly at the local level.

2. Transit cargo transportation takes place along transport corridors connecting different regions. These corridors pass through interregional transport centers and play a key role in general cargo flows.

These features simplify the process of structural synthesis of transport systems, allowing them to be consistently formed at the local, regional and interregional levels, while maintaining the integrity of the entire system.

Structural synthesis begins at the local level, which is the basic one for any territorial transport system, regardless of its purpose and the number of levels (Slobodyanyuk, 2017). According to table 1, the principles of territorial localization include the following levels of the transport system:

1. Local level.
2. Regional level.
3. Interregional level.

When creating regional transport and logistics networks, common methodological principles are used, such as a systematic approach, synergy, territorial localization, efficiency, quality and competitiveness management, as well as sustainability and adaptability.

Territorial logistics manifests itself in the optimization and organization of transport systems that take into account the territorial localization of cargo flows and the need for effective interaction at different levels of the transport network.

The implementation of the principle of the minimum total length of transport routes at the regional level is advisable, since it reduces the cost of creating and maintaining the entire transport system at this level. In this case, the solution of the problem of synthesis of the regional level is associated with the need to minimize the total length of all transport routes belonging to this level of the system (1):

$$Ip = \sum_i \quad Ii\text{-min} \qquad (1)$$

where li is the distance between nodes combined into a single regional network.

The territorial transport system should take into account both local and transit cargo flows, ensuring their optimization at all levels: local, regional and interregional. This allows you to reduce costs and increase the efficiency of the transport network, taking into account the specifics of economic activity and key transport corridors.

The territorial approach is the main approach to managing the region. At the same time, the «territory» component is the basis of the logistics complex used in supply chain management. In this regard, there is a need to clarify and supplement the theory and methodology of the territorial approach to managing both the region and supply chains (Tyapukhin, A. P., 2021).

F. Mantino identifies the following characteristics of the territorial approach:

- focus on specific places and their territorial scale;
- An endogenous development strategy firmly based on the natural and socio-cultural assets of the Territory and aimed at supporting the provision of public goods and services;
- A multi-level management system aimed at coordination and networking both in the vertical sense (relations between different levels of government) and in the horizontal sense (relations between subjects and stakeholders living and/or operating in a particular territory);
- Focus on investments rather than subsidies (Mantino, F., 2011).

In the context of the highlighted characteristics of the author F. Mantino's territorial approach, the following conclusions can be drawn:

Focusing on specific sites and territorial scale emphasizes the importance of an individual approach to each territory, taking into account its unique characteristics and needs.

The endogenous development strategy, based on the natural and socio-cultural assets of the Territory, emphasizes the need to use local resources to achieve sustainable and harmonious development.

A multi-level management system covering both vertical and horizontal relations implies the need for cooperation and coordination of various levels of government and stakeholders for effective management of territorial development.

The focus on investments, rather than subsidies, indicates the importance of attracting investments as a tool to stimulate the development of territories and create a favorable investment environment.

Thus, the territorial approach is a comprehensive and integrated approach to managing the development of territories, which takes into account their specifics and is aimed at achieving sustainable and harmonious development.

Considering the territorial approach to regional management, it is necessary to identify structural scientific and theoretical approaches to regional development in general and the regional economy in particular.

The main principles that must be observed in the distribution of functions between the levels of the territorial administration structure are:

- the principle of subsidiarity, i.e. the maximum approximation of a specific function of territorial administration to the consumer of the function;

- the principle of sufficiency of powers, i.e. the powers of the management level implementing the function, must be necessary and sufficient for its effective implementation;

- the principle of the correspondence of powers and responsibilities, i.e. responsibility for the performance of a certain function should not exceed the amount of authority granted, but should not be less than these powers;

- the principle of resource availability, i.e. the implementation of a specific function at the appropriate level of territorial administration should be provided with the necessary information, material, financial, and human resources (Lyapina, I. R., 2011).

The principle of subsidiarity emphasizes the importance of keeping territorial government functions as close as possible to the end users of services, which helps to increase efficiency and meet local needs.

The principle of sufficiency of powers ensures that the management level performing a certain function has the necessary and sufficient powers to effectively perform this function, which prevents unnecessary bureaucracy and speeds up decision-making processes.

The principle of compliance of powers and responsibilities ensures that the level of responsibility for the performance of the function corresponds to the powers granted, which contributes to transparency and efficiency of management.

The principle of resource provision emphasizes the importance of providing the necessary resources at the local level for the successful implementation of the functions of territorial administration, which ensures the sustainable and harmonious development of territories.

In general, compliance with these principles in the distribution of functions between the levels of the territorial administration structure contributes to the effective and balanced development of regions, meeting the needs of the population and improving the quality of life of citizens.

The author (Sassi, E., Benabdelhafid, A., 2020) presents the territory as a complex system that includes space, society and an ecological system, and defines the territorial system as a set of gateways and flows. He describes the territorial system as «an interface system combining place and connection, networks and territory, points and lines, doors and corridors» which emphasizes its complexity and variety of interconnections.

When it comes to the territorial logistics system, the author points out the various strategic decisions needed to improve its overall efficiency. At the same time, he emphasizes the importance of taking into account each spatial feature and the requirements of economic activity when evaluating these decisions.

Thus, territorial logistics becomes a key aspect of the management of the territorial system, where strategic decisions and innovations are necessary to ensure optimal functioning and development.

Results and discussion

In table 2, you can see the formulation of the term «territorial logistics» as «an area of logistics research that includes a set of interrelated methods, factors and principles of managing economic and human flows, ensuring the optimal (most economically profitable) placement of enterprises in the logistics territory.»

Table 2 – Formulation of the term «territorial logistics»

№	Formulation of the term	The main idea of the author	A source
1	By territorial logistics, we will understand the field of logistics research, which includes a set of interrelated methods, factors and principles of managing economic and human flows, ensuring the optimal (most economically profitable) placement of enterprises in the logistics territory.	The main idea of the author is to define territorial logistics as an area of logistics research, which covers a set of methods, factors and principles of managing economic and human flows in order to ensure optimal placement of enterprises in a logistics territory, taking into account economic benefits.	(Konkova, E.D., 2012)

Table continuation

№	Formulation of the term	The main idea of the author	A source
2	A logistic territory is a complex economic system consisting of elements-links interconnected by economic flows (material, financial, information, etc.), and located in a certain territory, the boundaries and tasks of which are determined by the internal and external goals of this macrological system	The main idea of the author is that the logistic territory is a complex economic system consisting of interconnected elements-links that provide flows of various types: material, financial, information and others. These elements are located in a certain area and perform their functions in accordance with the internal and external goals of the macrological system.	(Konkova, E.D., 2012)
3	The concept of territorial logistics is associated with a complex of logistics services that are performed in some specific territory (starting from the city and ending with the globe) by a logistics enterprise, which itself cannot be represented as a node in the structure of material flows.	The main idea of the author is that territorial logistics includes a complex of logistics services provided in a certain territory, whether it is a city or the whole planet. These services are performed by logistics companies and cover various aspects of material flow management. It is important to note that a logistics enterprise in itself is not a node in the structure of material flows, but it plays a key role in ensuring the effective functioning of the logistics system in a certain area.	(Toluev, Yu.I. (2008)
4	Territory design is the problem of grouping small geographical territories (so–called base territories) into a fixed number of larger clusters (so-called districts or territories) in such a way that the latter are acceptable in accordance with relevant planning criteria such as balance, compactness and contiguity.	The main idea of the author is that the design of a territory is the task of grouping small geographical areas, called base territories, into a certain number of larger clusters, or districts, taking into account various planning criteria such as balance, compactness and contiguity. This task includes determining the optimal structure and distribution of territories in order to ensure efficient use of resources and compliance with specified planning criteria. The design of the territory, aimed at the optimal use of resources and ensuring compliance with planning criteria, is an important aspect of territorial logistics.	(Butsch, A., Kalcsics, J., 2022)
5	Territorial design is the process of distributing the population of a region according to a set of service providers.	The main idea of the author is that territorial design includes the distribution of the region's population among various service providers, which is directly related to territorial logistics, which is engaged in organizing and managing the flows of resources and services in the territory to ensure the effective functioning of regional infrastructure and meet the needs of the population.	(Goodrum, R. A., 2013)
6	Territorial design of logistics systems is an important aspect in the field of logistics, which deals with the organization and optimization of spatial aspects in the economy of trade and catering.	The main idea of the author is that the territorial design of logistics systems is an important aspect of logistics, since it focuses on the organization and optimization of spatial aspects in the economics of trade and catering, which is directly related to territorial logistics.	(Toluev, Yu.I., Plankovsky, S.I., 2009)
7	The territorial transport and logistics system (TLS) is understood as a complex of elements of transport and logistics systems that ensure the constant movement of material and non-material flows in space and time between the components of territorial public systems (TPS).	The main idea of the author is that the territorial transport and logistics system (TTLS) is a complex of elements of transport and logistics systems that ensure the continuous movement of material and non-material flows between the components of territorial public systems (TPS). This is directly related to territorial logistics, which deals with the effective management of flows and resources in a particular territory, including the organization of transport processes and logistics operations to ensure mobility and availability of resources.	(Gabbasova, V.V., 2019)

Table continuation

№	Formulation of the term	The main idea of the author	A source
8	A territorial transport and logistics system is a set of elements of transport and logistics complexes that ensure the continuous movement of material and non-material flows in space and time between the components of territorial social systems, aimed at meeting the needs arising in them.	The main idea of the author is that the territorial transport and logistics system is a complex of elements of transport and logistics complexes that ensure the continuous movement of material and non-material flows between the components of territorial public systems in order to meet their needs. This is directly related to territorial logistics, which is focused on the effective management of flows and resources in a specific territory, including the organization of transport processes and logistics operations to meet the needs of residents and businesses.	(Nikolaev, R.S., 2013)
9	At its core, the territorial (regional) logistics system is a new level of development of macrologistics.	The main idea of the author is that the territorial (regional) logistics system represents a new level of development of macrologistics. This means that the organization of logistics processes at the regional level is becoming an important aspect in the field of logistics, which is directly related to territorial logistics. Such systems usually include the management of flows and resources at the territorial level, taking into account the specifics of the region and its needs.	(Magomedov, A.M., 2008)
10	Territorial development management is a specially organized system of actions aimed at ensuring sustainable and balanced reproduction of the social, economic and natural potentials of the territory with positive dynamics of the parameters of the level and quality of life of the population.	The main idea of the author is that the management of territorial development is a specially organized systemic action aimed at ensuring sustainable and balanced development of the social, economic and natural potential of the territory while improving the quality of life of the population. This is directly related to territorial logistics, since effective management of territory development requires optimal allocation of resources, organization of logistics flows and creation of conditions for the sustainable functioning of infrastructure and social services.	(Arapov, S.V., Kurochkina, A.A., Petrova, E.E., 2021)
11	The territorial transport system (TTS) is a geographical system that includes transport hubs and transport points connected by stretches of the transport network; engineering structures; service organizations and personnel (infrastructure components); vehicles (rolling stock), as well as passengers, shippers and consignees, cargo, that is, consumers of transport services.	The main idea of the author is that the territorial transport system (TTS) is a geographical system that includes various components such as transport hubs, stretches of the transport network, engineering structures, service organizations, personnel, vehicles and various users of transport services. This concept is directly related to territorial logistics, since the effective functioning and management of the transport system play a key role in ensuring the flow of goods and services in the territory.	(Sidorov, V.P., 2011)
Note – compiled by the author			

This table discusses the main aspects of territorial logistics and its relationship with other areas of activity, such as territorial design, territorial development management and transport systems. The authors stressed the importance of effective management of resources and flows in the territory to ensure the sustainable development of the regions and improve the quality of life of the population. As a result of the analysis, it was revealed that territorial logistics plays a key role in the organization of economic and social activities at the regional and city levels. This confirms the need to develop and apply modern methods and technologies for managing territorial systems in order to achieve optimal results in the field of enterprise placement, transport infrastructure and the social environment. In general, the table highlights the relevance and importance of the topic of territorial logistics in the modern world and calls for further research and development of this area. Based on these conclusions, it can be concluded that an in-depth study and practical implementation of the principles of territorial logistics are necessary to achieve the goals of sustainable development of the regions.

Territorial logistics deals with the optimal placement of enterprises in a certain logistics area in order to minimize total costs in the logistics chain. It includes a set of methods and principles for managing economic and human flows. One of the main areas of interaction between territorial logistics and logistics science is distribution logistics, which seeks to reduce costs at all stages of the logistics chain by optimizing the location of enterprises and their size (Carlucci, F., Cirà, A., Forte, E., Siviero, L., 2017).

And also, territorial logistics is based not only on logistical principles and methods. It takes into account a wider range of indicators used in related scientific fields, which include:

− socio-economic composition of the population,

− demographic indicators of the area;

− indicators of the territorial organization of production and public services;

− indicators of the dynamics of economic development;

− the nature, volume and structure of supply and demand in the market under study, etc.

Territorial logistics covers strategic planning, systematic organization and effective management of the movement of goods, information and resources within a specific geographical region or territory. This discipline focuses on the coordination of various logistical functions such as transportation, storage, distribution and inventory management to facilitate the smooth and efficient movement of goods within a specific area.

Territorial logistics is an integrated approach to the management of spatial aspects of economic activity, including the organization and optimization of the movement of resources, transport flows and infrastructure at the regional and urban levels, in order to ensure sustainable development and increase the efficiency of the use of territorial resources.

The main goal of territorial logistics is to optimize supply chain operations and improve communication between different points in the territory. By optimizing logistics processes, territories can support economic activity, promote industrial development and stimulate regional growth. Effective territorial logistics not only ensures timely delivery of goods, but also helps to reduce costs and operational efficiency.

As such, area logistics plays a vital role in building a region's competitiveness and resilience by improving the overall performance of supply chain operations and facilitating seamless interactions among the various stakeholders involved in the logistics network.

Conclusion

In conclusion of this article emphasize the importance of rational allocation of productive forces and effective use of the transport complex to enhance the integration of the regions of Kazakhstan. The main problems requiring attention are the formation of a backbone transport network and the development of transport and logistics infrastructure in the country. In the context of these tasks, there is a need to define and further study territorial logistics.

Territorial logistics, in accordance with the analysis, is an integrated approach to managing the spatial aspects of economic activity. It covers the organization and optimization of the movement of resources, transport flows and infrastructure at the regional and urban levels, in order to ensure sustainable development and increase the efficiency of the use of territorial resources. At its core, territorial logistics strives to improve supply chain operations and improve connections between different points in the territory, which contributes to the smooth and efficient movement of goods within a certain area.

The article also revealed the need for further research in the field of territorial logistics to develop effective strategies for managing logistics processes at the territorial level in Kazakhstan. The bibliometric analysis of scientific publications on this topic highlights the versatility of research interest and the interdisciplinary nature of this field, which opens up prospects for further development of research in this direction.

Therefore, the understanding and development of territorial logistics play a key role in ensuring the sustainable development of the region and increasing their competitiveness in a global context.

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NAVIGATING THE FUTURE: RESILIENT SCENARIOS FOR DEVELOPMENT IN PUBLIC ADMINISTRATION

As the world around us changes, the field of public administration is no exception. The public sector in many developed countries feels the need to move beyond the static and machine bureaucratic paradigm, the public sector in the third world countries and developing countries is also experiencing difficulties in adjusting to polycrisis and wider changes that are taking place in society, economy and technological development.

This article's goal is to examine to what extent public administration has developed globally and to highlight th current trends and potential future directions for both the Republic of Kazakhstan and public administration worldwide.

As part of the scientific and practical significance of the work, the authors reveal questions about what changes are taking place in public administration and what development scenarios are possible there to improve the efficiency of the entire public administration system, which required transformations and changes. The authors of the paper reveal modern and highly developed trends in the field of public administration and do compare existing world experience with the Kazakh reality. Models of interaction between the public sector and the business community and civil institutions are presented in this research, which reveal the underlying problems of interaction, consisted in their size and scope, allowing to effectively manage the state, influence processes, improve the quality of life, balancing public policy, powers and responsibilities of each sector.

The value of this study lies in the fact that the authors identified systemic and structural problems in the development of public administration in the Republic of Kazakhstan and gave specific recommendations for changing approaches to the further development of public administration system in the Republic of Kazakhstan.

Key words: public administration, efficiency, models of sectors of society, scenario for the development of public administration, digitalization.

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Келешекке бағдарлану: мемлекеттік басқару дамуының орнықты сценарийлері

Бізді қоршаған әлем күннен-күнге өзгеруде, ол өзгерістер мемлекеттік басқару саласын да айналып өткен жоқ. Көптеген дамыған елдердің мемлекеттік секторы статикалық және машиналық бюрократиялық парадигмадан шығу қажеттілігін сезінуде, сонымен қатар үшінші әлем елдері мен дамушы елдердегі мемлекеттік сектор да қоғам мен экономикада және технологиялық дамуда орын алып жатқан көпқырлы дағдарыс пен кең ауқымды өзгерістерге бейімделуде қиындықтарды бастан кешіруде.

Бұл мақаланы жазудағы мақсат – Қазақстан Республикасындағы және әлемдегі мемлекеттік басқару дамуының аралық нәтижелерін қорытындылау.

Жұмыстың ғылыми және тәжірибелік маңыздылығы аясында авторлар мемлекеттік басқаруда қандай өзгерістер орын алып жатқандығын және бүкіл мемлекеттік басқару жүйесінің тиімділігін арттыру үшін түрлі даму сценарийлерін, қажетті түрлендірулер мен өзгерістерді қолдану мүмкіндігін ашып көрсетеді. Мақала авторлары мемлекеттік басқару саласындағы жоғары дамыған заманауи үрдістерді талдап, әлемдік тәжірибе мен Қазақстандағы жағдайдың ара қатынасын пайымдайды. Сонымен қатар мақалада мемлекеттік сектордың бизнес қоғамдастығы және азаматтық институттармен өзара әрекеттестік үлгілері ұсынылып, олардың көлемі мен ауқымынан туындайтын терең проблемалары атап көрсетіліп, мемлекеттік саясаттың және әрбір

өкілеттіктері мен міндеттерін теңгерімге келтіру арқылы мемлекетті тиімді басқаруға, түрлі үдерістерге ықпал етуге, өмір сүру сапасын жақсартуға болатыны аталып өткен.

Бұл зерттеудің құндылығы авторлардың Қазақстан Республикасындағы мемлекеттік басқаруды дамытудағы жүйелік және құрылымдық проблемаларды анықтап, Қазақстан Республикасындағы мемлекеттік басқаруды одан әрі дамытудың амал-тәсілдерін өзгерту бойынша нақты ұсыныстар беруінде.

Түйін сөздер: мемлекеттік басқару, тиімділік, қоғам секторларының үлгілері, мемлекеттік басқаруды дамыту сценарийі, цифрландыру.

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Навигация в будущее: устойчивые сценарии развития государственного управления

Мир вокруг нас быстро меняется, и область государственного управления не является исключением. Государственный сектор во многих развитых странах ощущает необходимость выйти за рамки статической и машинной бюрократической парадигмы, государственный сектор в странах третьего мира и развивающихся странах также испытывает трудности адаптации к поликризису и более широким изменениям, происходящим в обществе, экономике и в технологическом развитии.

Целью написания данной статьи является обзор эволюции госуправления в мире, раскрыть существующие фазы и сценарии развития государственного управления в Республике Казахстан и мире.

В рамках научной и практической значимости работы авторы раскрывают вопросы о том, какие изменения происходят в государственном управлении и какие сценарии развития возможны для повышения эффективности всей системы государственного управления, требующиеся трансформации и изменения. Авторы статьи анализируют современные высокоразвитые тренды в области госуправления и соотносят существующий мировой опыт с казахстанской действительностью. Приведены модели взаимодействия государственного сектора с бизнес-сообществом и гражданскими институтами, которые выявляют глубинные проблемы взаимодействия, заключающиеся в их размерах и объемах, позволяющие эффективно управлять государством, влиять на процессы, улучшать качество жизни, балансируя государственную политику, полномочия и ответственность каждого из секторов. В последнем предложении неразбериха.

Ценность данного исследования заключается в том, что авторами выявлены системные и структурные проблемы развития госуправления в Республике Казахстан и даны конкретные рекомендации по изменению подходов к дальнейшему развитию госуправления в Республике Казахстан.

Ключевые слова: государственное управление, эффективность, модели секторов общества, сценарий развития государственного управления, цифровизация.

Introduction

A report on global risks (WEF, 2023) was presented at the World Economic Forum in Davos. It outlined the risks that the world faces in the following years to come, including a crisis in the cost of living, natural disasters, geopolitical conflict, the inability to mitigate the effects of climate change, the breakdown of social cohesion, and polarization of society. The term *"polycrisis"* which describes a situation in which numerous risks collide and their interdependencies are all felt extremely keen, is recognised as a new to this report.

The research gives the authors of this paper the opportunity to evaluate the progress toward the intermediate and final goals in public administration, as well as areas that still require reform and transformation. For instance, the theory of *"Move Between the Balcony and the Dance Floor,"* which was put forth by Harvard University professors Ronald Heifetz, Marty Linsky, and Alexander Grashow in 2009, enables a thorough analysis of issues and the discovery of patterns in the field of public administration, making it perfect for the purposes of this study. This viewpoint makes it possible to comprehend, accept, and even shape reality. The authors' first goal is to make public and evident the theories that are currently in use in the field of public administration. Second, researchers sought to identify current issues and characteristics in Kazakh public administration

to be taken into account by applying international models of public administration.

Literature Review

The originators of the theory of public administration, which is seen from the viewpoint of the separation into politics and management, include Woodrow Wilson, F. Goodnew (1900), and other scientists.

Scholars in the field of global public administration provide their own definitions and methods for studying public administration. Public administration, for instance, would become *"the heart of the problem of modern government,"* according to Leonard D. White (1926), who saw it as a *"single process"* and *"the study of government from the principles of management rather than from the principles of law"* (Storing, 1965).

According to White, there have been numerous theories of public administration developed in the field of public administration research since Frederick Taylor's (1911) theory of scientific management and Max Weber's (1923) bureaucratic theory. The rules of job specialization, the executive role, and Luther Gulick's (1937) management principles have all had a significant influence on the field of public administration research. Efficiency and effectiveness were the ultimate goals of classical public administration theory.

Marc Holzer and Chengxin Xu put forth five excellent ideas, which are as follows: 1) fair, impartial, and businesslike government, which serve as basic principles for establishing the field; 2) Weber's bureaucracy model and Taylor's scientific management are two examples of classical management models that concentrated on organizational efficiency with little energy loss; 3) politics and policy making challenge business government's assumption that politics and management are mutually exclusive and emphasize the idea that "*bureaucrats are necessarily politicians as much as any other participants in the process"*; 4) human behavior, a significant branch of organizational management theory that highlights the significance of interpersonal connections and individual objectives; 5) program effectiveness, which defines the field of public administration as a synthesis, *"one that has to balance competing, often contradicting, values and which is open to continuous adaptation and improvement in pursuit of productive performance"* (Holzer and Gabrielian, 1998)" (Marc Holzer, Janice Flug, Seth J. Meyer, Chengxin Xu, Leanne McAuliffe).

The public administration theories of all the generations are complementary to one another rather than antagonistic. Burke (1989) states *"public administration may have to be redefined by each generation depending on current definitions of what is to be considered private and what public"* so he does not give readers a precise definition of the term. The seven theoretical blocks that George Frederickson and Kevin Smith distinguish between the field of public administration. Among these are the following: postmodern theory, decision theory, rational choice theory, bureaucratic politics, public institutional theory, public administration, Frederickson and Smith, 2003; Holzer and Gabrielian, 1998; Marc Holzer, Janice Flug, Seth J. Meyer, Chengxin Xu, Leanne McAuliffe; and theories of political control of bureaucracy.

An overview of all the above theories is given in tabular form (Table 1).

Table 1 – Theories of Public Administration

Theory	Content	Examples
The Theory of Political Control over Bureaucracy	Dichotomy of politics – administration, separation of powers, bureaucratic accountability and efficiency, bureaucratic discretion	Wilson (1887) Goodnow (1900) Lispky (1980)
Theory of Bureaucratic Politics	The political role of the administration and bureaucracy	Dwight Waldo: The Administrative State, Allison's model of bureaucratic politics, theories of representative bureaucracy
Public Institutional Theory	Organization and management of closed and limited government institutions, interdepartmental relations	Rainey (1997), Powell and DiMaggio (1991)

Table continuation

Theory	Content	Examples
Public Administration Theory	Scientific management theory, POSDCORB (Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting), leadership, human resource management, contract management	Principles of scientific management, Gulick (1937); The Hawthorne Studies, McGregor's, Theory X and Theory Y (1960)
Postmodern Theory	Organizational humanism and post-positivism	Particularism, Feminist perspective in public administration
Decision Theory	Logic of organizational decision making	Simon: Administrative Behaviour (1947), bounded. rationality, Garbage cans model
Rational Choice Theory	Neoclassical economic theory applied to the public sector, the rational, self-maximizing bureaucrat	Gordon Tullock: The Politics of Bureaucracy (1965), Anthony Downs: Inside Bureaucracy (1967), William Niskanen: Bureaucracy and Representative Government (1971), Tiebout's model
Theories of Democratic Government (Governance)	An expanded concept of public administration, not limited to bureaucracy, Governance and	Governance framework (Hill and Lynn, 2004), New Public Management
Note – compiled by the author based on the source [Frederickson, H. G., & Smith, K. B. (2003). The Public Administration Theory Primer. Colorado: Westview Press; Research Resources in Public Administration A Companion Guide to the Public Administration Gateway. Edited by: Marc Holzer, Janice Flug, Seth J. Meyer, Chengxin Xu, Leanne McAuliffe – https://www.aspanet.org/PAGateway]		

The widely read book on public administration, written by Nicolas Henry, separates public administration into six periods of development: 1) the political-administrative dichotomy, put forth by Woodrow Wilson, Frank Goodnow, and Leonard White in 1900–1926; 2) public administration as a political science, 1950–1970; 3) public administration as management, 1950–1970, divisions and their understanding, 1965–1970; 4) public administration as public administration from 1970 to the present; 6) governance, from 1990 to the present (Holzer and Zhang, 2009).

The history of public administration should be presented in four periods, according to a similar book by Shafritz and Hyde titled Classics of Public Administration: 1) early voices and the first quarter of the century, 1880–1920; 2) New Deal to mid-century, 1930–1950; 3) John F. Kennedy's focus on civil service reform, 1960–1970; and 4) Ronald Reagan after reinvention, 1980–2000. (Zhang and Holzer, 2009) (Marc Holzer, Janice Flug, Chengxin Xu, Leanne McAuliffe, Seth J. Meyer).

The theories and stages of public administration development in various nations around the world that served as the basis for public administration theory are described and presented by the authors in the literature review.

Methodology

The scientific writings of the classics in public administration, public management, and governance, as well as the theory of interactions between various societal sectors, serve as the theoretical and methodological foundation for this study (the business community, the public sector and civil sector institutions). A generalized and systematic comparison between the Kazakh public administration system and other public administration approaches from around the world was conducted in the form of comparative analysis. An examination of the evolution of public administration is done in retrospect.

Researchers determined to use qualitative methods in collecting the data, namely using the secondary data collection approach. The very data has been obtained from reports of existing indices of the development of public administration efficiency, such as the GovTech Maturity Index, developed by the World Bank, and more static data on indicators of the economy, digitalization, etc., based on the current theories in the field of public administration.

The authors have used references from the works that have previously been presented to the

entire academic and scientific community and have also studied the issues related to the effectiveness of public administration and its impact on the quality of life for number of years.

Regarding the research and methodologies related to foresight, the scholars arrived at conclusions setting the future trends in the evolution of public administration.

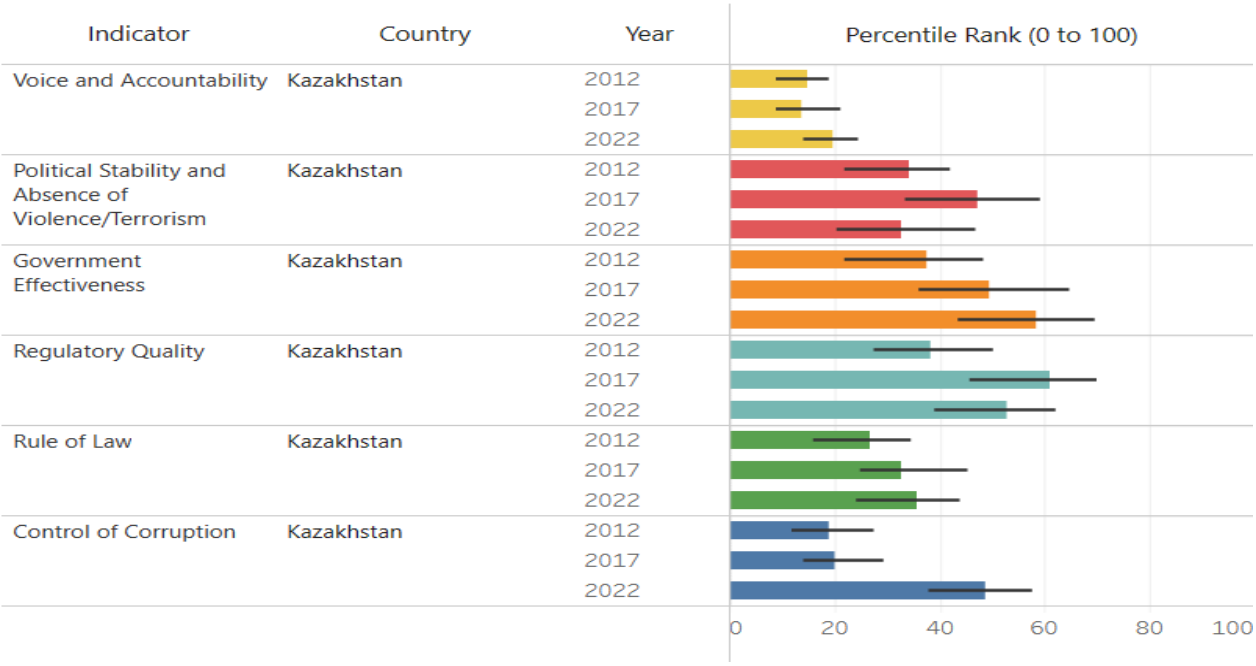


Figure 1 – Indicators of the quality of public administration in Kazakhstan
Note – Extracted from [http://info.worldbank.org/governance/wgi/; accessed: 4/11/2024]

Results and Discussion

The World Bank Governance Indicators (Figure 1) show six aggregate governance indicators: governance efficiency (57.21 percentile, 0.96 percentile deterioration); rule of law (34.13 percentile, 2.41 percentile worsening); voice and accountability (18.84 percentile, 2.9 percentile improvement); political stability and absence of violence/terrorism (37.74 percentile, 0.94 percentile worse); and anti-corruption (48.08 percentile, 5.77 percentile improvement).

The present approaches to the development of society and its sectors are what researchers would like to start with (Mustaghis-ur-Rahman, 2004; Noorjehan Bava, 1992; Richard Hollaway, 1995; L. D. Brown & David C. Korten, 1989). These approaches are divided into **three categories:** *the state (government organizations), the business sector (commercial organizations), and civil society (public organizations, local government institutions, etc.)*. The role of the public sector, business sector, and civil society institutions and what their dimensions are to effectively govern the state, improve the quality of life, and balance public policies, powers, and responsibilities of each sector are still being debated in academic, public, and government circles. What is the perfect balance between each sector and its boundaries of interaction so that each can coexist peacefully in a particular ecosystem and, above all, benefit the populace, satisfy them with the caliber of the services they receive, and involve them in the process of making decisions?

By applying this division to the Kazakh social sectors and their features—which are shown in Table 2 – the authors claim to have identified three models of the society's development.

The existence of a sizable public sector, which still refuses to give other sectors authority or engage them in collaboration and merely pretends to do so, is reflected in the first Model 1 of interactions between all societal sectors.

The researchers have found that considering the Model 2, the intended outcome is a situation in which the business sector and civil society

organizations surpass the size of the public sector in the near future. The effectiveness and transparency of public administration are demonstrated by the greater influence and participation of civil society and business structures in the decision-making process. This is evident in the existence of sophisticated local government, public sector, and business institutions.

The least developed nations are the subject of the third model, which is not displayed in the table and which the authors did not consider introducing it whilst designing the study's framework.

Table 2 – Scenarios for the Development of Sectoral Models of Society

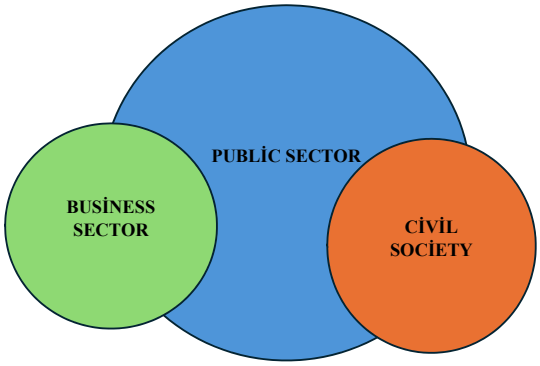
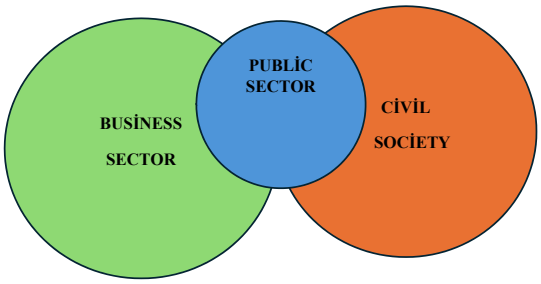
№	Sectoral Integration Models	Features
	Model #1 – Kazakhstan Current Model 	1. In the public sector, almost 47% of all large enterprises in Kazakhstan are owned by the state (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2017); more than 50 thousand government functions (Analytical report, 2022) 2. Business sector: 97.9% (479,609) of organizations in Kazakhstan are small; 1.5% (7,158) – average; 0.6% (2,931) – large (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2022). The share of SMEs in GDP is 17.3% (Financial climate in the Republic of Kazakhstan (2019). 3. Civil society: A. **NGOs are – 21,413 of which are active 17,044** (Civil Society, 2023) more than 30 thousand people work in this sector (0.2% of the population), almost all NGOs are government funded (Colin Knox & Sholpan Yessimova, 2015): i. Support for youth policy and children's initiatives – 8% ii. Support for socially vulnerable groups of the population – 15% iii. In the field of education, science, information, sports and physical education – 22% iv. Protection of rights and legitimate interests of citizens and organizations – 11% v. Protecting the health of citizens, promoting a healthy lifestyle – 4% vi. Assistance in resolving family, demographic and gender issues – 3% vii. Development of culture and art – 5% viii. Strengthening social harmony and national unity – 5% ix. Help for orphans, children from single-parent and large families – 2% x. Protection of historical and cultural heritage – 2% xi. Environmental protection – 3% xii. NGOs working in other socially significant areas – 20% B. The representation of the middle class in Kazakhstan varies between 14–20% according to various sources and studies (Colin Knox & Sholpan Yessimova, 2015).

Table continuation

№	Sectoral Integration Models	Features
	Model #2 – Desired Model for Kazakhstan 	1. The share of state ownership in countries with developed economies ranges from 20 to 40% and higher (A. A. Adambekova., 2011). In Abu Dhabi – 165 government functions; New Zealand, Australia, Denmark, USA, Singapore all use the best world practices, and they have 500, 1000, maximum 2000 functions (Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan, 2022). 2. European small businesses range between 70% and 90% of all businesses. The contribution of small enterprises to the country's economy is almost ½ of the total GDP. More than ½ of the working-age population is provided with jobs by small businesses (Business Statistics, 2020). 3. The size of civil society is represented in developed countries: the middle class of society varies from 65–75% and on average 10–15% of the population is involved in public activities (Steven Pressman, 2015). Government funding is the source of income up to 50–60%, the rest comes from sponsorship, donations, membership fees, etc. Japan has developed a development plan "Society 5.0" (Carolina Narvaez Rojas, Gustavo Adolfo Alomia Peñafiel, Diego Fernando Loaiza Buitrago and Carlos Andrés Tavera Romero, 2021)
Note – Compiled by Authors based on the source Frederickson, H. G., & Smith, K. B. (2003)		

A radical rethinking of the strategies, procedures, and equipment are required to increase the effectiveness of public administration should be aided by the presented characteristics of the current and proposed model of interaction between all societal sectors. This includes altering the development paradigm and creating an entirely new organizational culture in both the public and private sectors. The Republic of Kazakhstan has a small and inadequate business community, civil society, and strong state, according to the authors of this work, who also note the presence of low comparative indicators and indicators that support constructive dialogue with the public sector.

Based on the strength of the two sectors – the business community and civil society – researchers feel that Model 2 is more appealing and essential for the advancement of public administration. As the next ten years are devoted to this goal, all joint forces should continue to work toward creating a strong state and all other spheres of society. When laws are upheld, top-notch services are rendered, and each individual develops into a deserving, self-assured citizen, the state is strong. Additionally, a robust and engaged society is a requirement to prevent distortions and excesses in a powerful state (Acemoglu D et al., 2021). A resilient civil society and state can be assessed not only by the number of participants, the number of institutions in place, and other economic metrics, but also by the high level of awareness and culture among various societal segments.

In Kazakhstan, thirty years of development experience have resulted in numerous reforms that have advanced various spheres of society's daily activities. It is always pertinent to consider whether the public administration system is up to date with the changes occurring in the nation's daily affairs. Large-scale administrative reforms were also implemented in developed nations in the 1980s and 1990s under the banner of a new concept of public administration. The truth is that their previous system questioned the efficiency of government agencies. Ineffective management is increasingly associated with the public sector (Yessimova Sh. A., 2008).

Researchers tried to identify the stages of development by analysing the theories of public administration. These stages included traditional public administration, new public management, and governance (democratic public administration), as well as "managerialism" (Pollitt, Christopher, 1993; Hood, Christopher, 1991); "market government" (Lan, Zhiyong and Rosenbloom, David H., 1992); "post-

bureaucratic paradigm" (Barzelay, Michael, 1992); or "entrepreneurial government" (Osborne, David and Gaebler, Ted, 1992).

The above information allows the authors to comprehend the existing categories, approaches and models of public administration development (Yessimova Sh.A., 2022).

Furthermore, scholars have focused on Kazakhstan's public administration's strategic planning for the following ten years; the selection of one development scenario over another will determine the course of our society. A methodical, structured approach to addressing uncertainty and complexity that goes beyond the predicted course of events is known as a foresight approach. This is just one of many methods that can assist decision-makers in developing better strategies and policies to deal with erratic evolution and change. The practical use of foresight is not new; for many years, governments, businesses, and nonprofit organizations have employed it in developed nations (Report of Government Office for Science of the UK, 2021), but Kazakhstan has not. As authors look forward to putting forth several strategic scenarios for the evolution of public administration in Kazakhstani nation as part of this work.

Referring to the CEPA Strategy Guidance Note on Strategic Planning and Foresight (2021), researchers have identified performance and efficiency indicators that enable the identification of two development scenarios (see Fig. 2), or two pairs of the most significant trend variables that determine the primary direction of the ecosystem. These indicators are used to build the main scenarios.

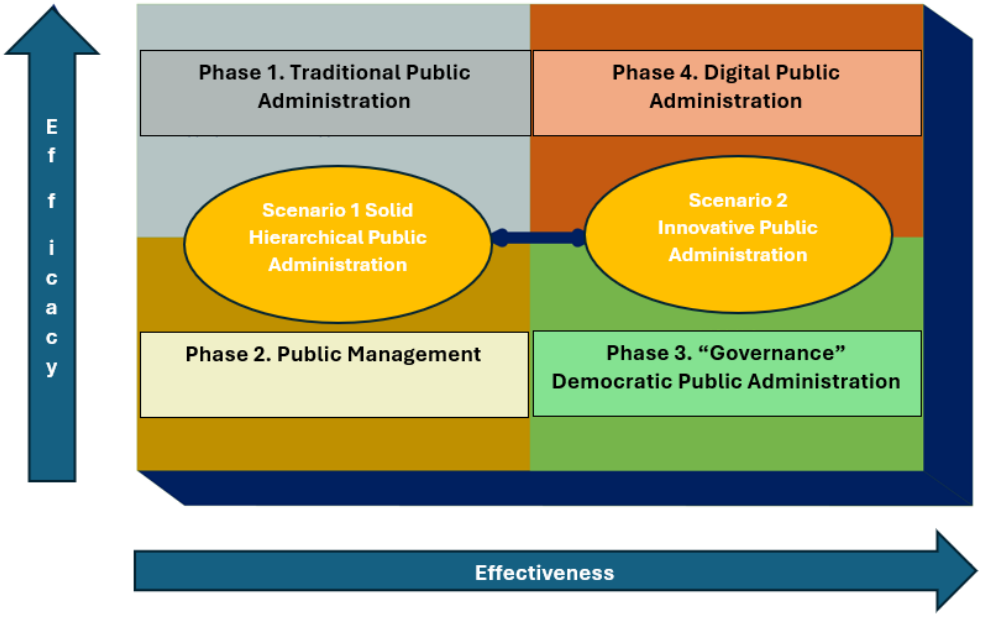


Figure 2 – Matrix of Scenario Development of Public Administration
Note – Compiled by the author based on the source Yessimova Sh.A. (2022).

Through the complete digital transformation of the economy and society, the modern world has entered a new phase of the information age. Highly developed countries have long since transitioned from purely hierarchical public administration to the innovative phase of growth and development, which our nation will enter in the decades to come.

Additionally, two more scenarios arise from the existing phases of public administration development, which have their own characteristics, features and problems (see Table 3).

Table 3 – Characteristics and development criteria of three phases of public administration development

№	Development Phases	Characteristics	Kazakhstan Experience
1	Traditional Public Administration	- Fragmentary execution of tasks - Lack of flexibility - Focus on compliance with established rules and guidelines; - The central role of bureaucracy in policy development and implementation; - The "politics – management" split in the public sector; - Commitment to incremental budgeting; - Hierarchical management structure - Uncoordinated business processes - Low stakeholder involvement	- Country still experiencing the issue of uncoordinated work of all government bodies, lack of integration and unity, interdepartmental communication and connections, lack of cooperation and cooperation between levels of government. - The work plans of each government agency, both at the central and local levels, are not integrated and each works according to its own adopted plan, which is not coordinated with each other. - The budget system does not meet the needs and goals of a market economy. - Low informatization and integration of digital platforms.
2	New Public Management	- Reducing the role of government; - Management techniques that are used in the private sector are used; - Value for money – ratio of price and quality; - Efficiency of public services; - Introduction of quantitative and qualitative indicators for assessing public administration - Focuses on measuring both individual and organizational results; - Organic (flexible) management structures;	- National projects have a system of indicators and indicators that allows to evaluate the results of government programs, but at the same time the quality of life of the population does not improve. - A system for providing services to the population has been built, but all processes and work of government agencies, civil society institutions and business are not integrated. - There are no flexible management structures, and many initiatives are not working at the proper level.
3	Governance (Democratic Governance): corporate governance, "good" governance, public governance. Public governance: socio-political governance; public policy governance; administrative governance; contract governance; network governance	- Responsible for how government organizations work with partners, stakeholders and their environment, responsible for public policy; - Collective activity in the decision-making process with the participation of other institutions of society and sectors of the economy; - Focus on the interaction of all sectors of society and their institutions to achieve joint effective results; - Decentralized management and involvement of everyone; - Monitoring the parameters and managing the regulators of all subsystems simultaneously to achieve one common goal (for example, its effective functioning) at the level of the entire system; - "Whole-of-Government" and the development of a unified plan and cooperation of all government bodies and stakeholders (interested participants) into a single integrated management system; - Network, project management structures.	- Weak integration and cooperation of all stakeholders, although public councils and other civil society institutions are already being created and are involved in the work of the public sector, still their effectiveness is not yet high enough. - There is no holistic "Whole-of-Government" approach and the development of a unified plan and cooperation of all government bodies and stakeholders (interested parties) into a single integrated management system. - There is still a centralized management system and a hierarchical management structure. - Weak policy in the field of integration of all information platforms of government agencies into a single portal. - Weak data management and analysis policies.
Note – Compiled by the Author based on the source Yessimova Sh.A. (2022)			

The public administration phases and a few of its performance results, which have had an impact on the overall system's development are discussed above. Kazakhstan continues to face challenges that make it more difficult to increase the effectiveness of public administration. The aforementioned studies provide compelling evidence for the need for additional reform, as the current system has long been evolving in order to serve its own interests rather than having any obstacle to improving the efficiency of its operations. It is immediately inevitable that the Republic of Kazakhstan will move into an innovative public administration phase that will transform every aspect of the economy and society.

The digitalization of every aspect of society is a powerful tool and direction for the creation of an efficient public administration system. Undoubtedly, digital technologies acting as engines in times of world crisis.

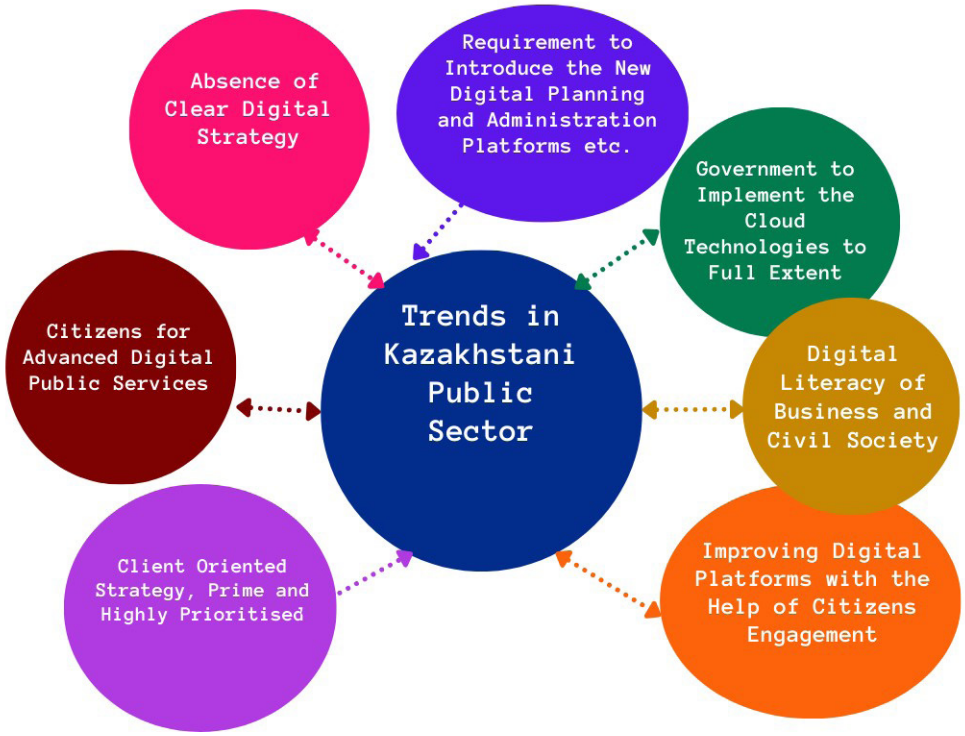


Figure 3 – Trends in Public Sector
Note – Compiled by Authors based on the source Yessimova Sh.A. (2022).

Kazakhstan has high aspirations for the development of digital technologies, pertaining to the results of the World Development Bank's annual GovTech Maturity Index study. A major obstacle to the establishment of a "digital government" is the lack of skilled professionals with knowledge of Big Data, Artificial Intelligence, the Internet of Things, and Information Technology respectively. In order to assist practitioners in creating new digital transformation projects, the GovTech Maturity Index was created as part of a World Bank initiative that focused *on four main areas*: *enabling GovTech, integrating citizen participation, enhancing service delivery, and supporting core government systems.* GovTech is the most complete indicator of the digital transformation of the public sector, designed for 198 countries.

The following areas should be the main focuses of digital government activity:

- *Analytics and citizen/customer insights:* assisting public sector organizations in better defining their target audiences, mission, etc. Citizen/Customer Lifetime Value (CLV) models and analytics algorithms, along with experience-based insights to be used by industry sectors like health and human services to help governments better anticipate citizen needs, track customer and citizen engagement, and report accurate outcome measures.

- *Citizen-centered service design:* feasible approaches for attaining objectives-centered service

design, minimize redundancies, and seal off service delivery gaps. Assist governments in providing citizens with a "no false doors" method of service access and in their ability to properly weigh the urgency, complexity, and risk of services for vulnerable populations. Services that are inclusive, flexible, and intelligent must be the public sector's hallmark.

- *Providing intelligent and connected services:* Assisting the public sector in providing proactive, individualized services that are catered to the needs of businesses and citizens. This service line offers the fundamental services and technologies required to assess how citizens are currently interacting with programs and services, recognize and anticipate their needs, and recommend the best course of action.

- *Mission-Driven Staff:* Public sector organizations need to have a clear mission that directs management, operations, and interactions, as well as a clear understanding of the citizens/clients they serve, why they are doing it, and what the expected outcomes are. Strategies, systems, and procedures that: (i) attract and develop talent that aligns with the organization's culture and goals; (ii) retain and develop talent; and (iii) enable the workforce to make decisions and provide services that advance the mission are to be counted as all necessity to support a mission-driven workforce. Results and engagement are the key indicators of productivity.

- *Government as a Platform:* To enable omnichannel access for citizens and businesses, public sector organizations require a streamlined, unified, and shared network of government digital services, infrastructure, resources, and systems. To facilitate the seamless connection between customers and authorized service providers, the government must act as an intermediary. The nerve center for citizen- and customer-centric services and a workforce with a mission-focused mindset will be this very shared platform of components, services, processes, data, and infrastructure.

- *Citizen-driven digital ecosystem:* By offering co-creation opportunities, the public sector can help citizens co-design services and gain insight into digital innovation. The following activities require citizen participation: (i) ongoing process improvement in business; (ii) real-time trusted transactions (contracting, voting); and (iii) policy reform. Businesses and citizens alike must contribute to the advancement of technology and data on the government platform.

Above were discussed and demonstrated the existing approaches to public administration and some of its results. Kazakhstan continues to face issues that make it more difficult to increase the effectiveness of public administration. In order to meet the new challenges within the digital age and digitize all facets of public administration, our (Kazakhstani) government needs to develop a completely new program/policy. If not, the nation will not advance. Scholars believe that coordinating regional policy and emphasizing local and regional self-government are essential to reach prosperity.

Conclusion

This article's goal is to examine to what extent public administration has developed globally and to highlight the current trends and potential future directions for both the Republic of Kazakhstan and public administration worldwide. The authors of have reached the aim of current paper by stressing the significance of described existing phases and designed future scenarios of public administration development in Kazakhstan and beyond. Since it is important for public administration to undergo a significant improvement over the next ten years, the conditions for a continuous, self-sustaining process of improving its efficiency must be established, in line with the government's development review that is being given.

The primary goal of first-stage initiatives is to strengthen society's legal foundation for influence over the public administration system.

1 – The establishment of a system and mechanisms for introducing the idea of a "Listening State" into a common practice. This can be done by keeping a close eye on public opinion regarding important matters pertaining to the nation's development and by setting up a distinct structural unit dedicated to researching citizens' needs, interests, and opinions about the state of the nation or region.

2 – To support the necessity and public utility of adopted strategic (at the very least) decisions, national projects, and formulated public administration goals, procedures and criteria must be carefully crafted. This also applies to decisions or programs that entail significant financial outlays. Legislation must be passed in for the purpose of establishing a certain justification that can only be conducted by researching public opinion on the topics being discussed. In addition, it is important to guarantee unrestricted access to collected primary data and research programs.

3 – The introduction of regulations for a profound reorganization of the entire system, including the budget system, and the importance of making the most crucial decisions regarding the

composition of public administration will widen the sense of the governance overall. A shift toward an interconnected government structural model is also required. This model should emphasize horizontal connections, agency integration, the one-stop-shop principle, joined-up, networking, shared services, and an entrepreneurial approach to government agency use of new information technologies (based on e-governance).

4 – To ensure public trust in data use and to accelerate Kazakhstan towards the status of a global leader in the data economy, a National Data Governance Strategy is an essential requirement.

The activities of the second stage are intended to provide society with means of altering the public administration system.

1 – The implementation of a focused strategy in public administration and the corresponding reorganization of public administration bodies' operational protocols. The shift to a project-based approach to public administration, which has long been discussed by experts and reformers in our field.

2 – Further implementation of proactive public services. Digital transformation and integration of every process.

3 – To ascertain through via a functional analysis of the complete system, an audit of the public administration system's business processes hs to be carried out.

The third set of measures was designed to lower barriers between the public administration system and society and increase transparency among its personnel.

1 – A nation's ability to advance and prosper is greatly influenced by its public sector. An analysis of regional and global trends in the civil service's development revealed that advanced nations are now concentrating on raising the standard of civil service by implementing new recruitment and promotion procedures, boosting employee productivity, and further guaranteeing government agencies' transparency. This is all while taking disruptive technologies like blockchain and artificial intelligence into account. The following is demonstrated by the University of Oxford's review of the International Public Service Performance Index.

2 – The authors aspire to emphasize on the system of education and training for civil servants, which needs a radical overhaul. A training policy that focuses on the execution of managerial, strategic, and creative tasks in the operations of government bodies must be put forth for civil servants at all levels.

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FEATURES OF THE ORGANIZATION OF ENVIRONMENTAL ACCOUNTING IN THE REPUBLIC OF KAZAKHSTAN

The successful functioning of any business entity in a complex and rapidly changing environment of the economy is determined by its competitiveness. A competitive entity is an organization that has a high value and demand for its products. Therefore, one of the most important conditions for business development and expansion is considered to be the correct accounting of environmental costs, along with the skillful Organization of the methodology for accounting for production costs and costing.

This article reveals the need to study environmental accounting in modern conditions aimed at achieving the ultimate goal of any production in order to reduce the impact of environmental damage caused by industrial enterprises.

The purpose of the article is to disclose the methodology of «environmental cost accounting», which reflects the relationship between economic costs and environmental protection costs, which allows ensuring the competitiveness and reliability of products.

During the execution of the article, various research methods were used, including the dialectical approach, monographic research and graphic methods.

The results and conclusions obtained from the study are highlighted by the degree of influence of companies on the effective organization of environmental activities of organizations, in addition to demonstrating the ability of companies to use rational methods of effective management of economic and environmental costs and the formation of cost.

In the scientific article, the definition of the formation of the target cost is formulated, the importance and methods of environmental accounting are studied to determine the competitiveness of products and the impact of production on the environment.

Key words: Environmental accounting, environmental costs, calculation of Target costs, management accounting, costing methods.

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Қазақстан Республикасында экологиялық есепті ұйымдастырудың ерекшеліктері

Экономиканың күрделі және тез өзгеретін жағдайында кез келген шаруашылық жүргізуші субъектінің табысты жұмыс істеуі оның бәсекеге қабілеттілігімен анықталады. Бәсекеге қабілетті субъект – бұл өз өнімдеріне жоғары құндылығы мен сұранысы бар ұйым. Сондықтан бизнесті дамыту мен кеңейтудің маңызды шарттарының бірі өндіріс шығындары мен өзіндік құнын есепке алу әдістемесін шебер ұйымдастырумен қатар экологиялық шығындарды дұрыс есепке алу болып саналады.

Бұл мақалада өнеркәсіптік кәсіпорындар келтіретін экологиялық залалдың әсерін азайту мақсатында кез-келген өндірістің түпкі мақсатына жетуге бағытталған қазіргі жағдайда экологиялық есепті зерделеу қажеттілігі ашылады.

Мақаланың мақсаты – өнімдердің бәсекелестік қабілеті мен сенімділігін қамтамасыз етуге мүмкіндік беретін экономикалық шығындар мен қоршаған ортаны қорғауға жұмсалатын шығындардың байланысын көрсететін «экологиялық шығындар есебінің» әдістемесін ашып көрсету.

Мақаланы орындау кезінде зерттеудің әртүрлі әдістер қолданылды, соның диалектикалық

Зерттеуден алған нәтижелер мен қорытындыларды компаниялардың экономикалық және қоршаған ортаны қорғау шығындарын тиімді басқару мен өзіндік құнды қалыптастырудың ұтымды әдістерін қолдануға мүмкіндіктерін көрсетумен қатар, ұйымдардың экологиялық қызметтерін тиімді ұйымдастыруға ықпал ету дәрежелерімен ерешеленеді.

Ғылыми мақалада мақсатты өзіндік құнды қалыптастырудың анықтамасы тұжырымдалады, өнімнің бәсекеге қабылеттілігі мен өндірістің қоршаған ортаға әсерін анықтау үшін экологиялық есептің маңыздылығы мен әдістері зерттеледі.

Түйін сөздер: Экологиялық есеп, экологиялық шығындар, мақсатты шығындарды есептеу, басқару есебі, калькуляциялау әдістері.

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Особенности организации экологического учета в Республике Казахстан

Успешное функционирование любого хозяйствующего субъекта в сложных и быстро меняющихся условиях экономики определяется его конкурентоспособностью.

Конкурентоспособный субъект – это организация, имеющая высокую ценность и спрос на свою продукцию. Поэтому одним из важнейших условий развития и расширения бизнеса считается правильный учет экологических затрат, наряду с умелой организацией методологии учета производственных затрат и калькулирования себестоимости.

Данная статья раскрывает необходимость изучения экологического учета в современных условиях, направленного на достижение конечной цели любого производства с целью снижения воздействия экологического ущерба, наносимого промышленными предприятиями.

Целью статьи является раскрытие методологии «учета затрат на охрану окружающей среды», которая отражает взаимосвязь между экономическими затратами и затратами на охрану окружающей среды, что позволяет обеспечить конкурентоспособность и надежность продукции.

При выполнении статьи были использованы различные методы исследования, в том числе диалектический подход, монографическое исследование и графические методы.

Результаты и выводы, полученные в результате исследования, выделяются степенью влияния компаний на эффективную организацию природоохранной деятельности организаций, в дополнение к демонстрации способности компаний использовать рациональные методы эффективного управления экономическими и экологическими затратами и формирования себестоимости.

В научной статье сформулировано определение формирования целевой себестоимости, изучены важность и методы экологического учета для определения конкурентоспособности продукции и воздействия производства на окружающую среду.

Ключевые слова: Экологический учет, затраты на охрану окружающей среды, расчет плановых затрат, управленческий учет, методы калькулирования себестоимости.

Introduction

The United Nations (UN) stressed the importance of the environment as the main and most important prerequisites and point for the formation of a socio-economic scientific system for the purpose of sustainable development.

Also, considering the development of the Republic of Kazakhstan, it should be noted that the fragmentation between the economic and environmental directions is clearly visible. As evidence of this, it can be noted that our country is based on the raw material environment, which initially had a positive effect on the economic situation, but in the long term, neglecting ecology from the point of view of the economy affected the sensitivity to fluctuations in the prices of raw materials and the low diversification of the economy.

In order to reduce the negative impact of production on the environment as a whole, along with the proper development of production technologies, it will be necessary to improve production standards, environmental quality standards, monitor compliance with laws and methods of environmental accounting and their analysis.

Currently, one of the modern methods of general accounting requires high attention to environmental accounting. In itself, it includes innovations in the development of economic sciences, environmental rules and requirements. At the same time, issues such as the production of waste-free products,

the disposal of industrial waste, their recycling and production require the development of environmental accounting.

Reasonable interaction of environmental standards and requirements with accounting rules contributes to economic growth aimed not only at economic benefits, but also at environmental protection, as well as progress in the field of the most innovative methods of accounting that more effectively affect the reality of the modern world.

Literature review

Since the 70s of the last century, environmental accounting has developed into a new branch of accounting, forming a new concept of general economic development. Since the early 1970s, environmental accounting has been a specific category of management accounting as a means of showing and monitoring economic activity related to environmental protection.

In this regard, for the purpose of sustainable development, the United Nations Organization (UN), the World Bank, the United Nations Environment Program (UNEP) and others. such organizations have made a significant contribution to the development and introduction of environmental reporting.

Authors A. Haleem, Abdul -Nazar, M. C., M-I Mujahid Hilal (2021), «The environmental report was discussed with great interest at the UN conferences in 1987 and 1992. Since then, there have been many studies and discussions about environmental accounting. In the 1990s, Roba Gray's research work entitled «Environmental Accounting: The Professional Accountant After Peirce» is considered a milestone in environmental accounting. That is, at this point, research on environmental accounting has become the main subject area discussed in the world academic environment» (Haleem, et al., 2021). Currently, the problem of environmental protection, which worries the whole world, including Kazakhstan, requires consideration of environmental accounting as an important part of the general accounting system. Elements of environmental reporting and reporting are legislated in Denmark, Norway, France and Great Britain.

The Australian author Dijk, V. A., et al., in their work, points out that the concentrated population density in Europe contributes to the lack of environmental data. In addition, they pointed out that the lack of sufficient environmental management accounting at the required level, the lack of agreement between accountants and the Department of Environmental Management, is one of the main barriers to entry into the emergency agency (Dijk, et al., 2014).

Foreign scientists Bouma, J. J. and Correlje, A. pointed out that, in general, the environmental report must be duly established in all organizations. In their opinion, environmental accounting can serve as the basis for the formation of Environmental Management Accounting and was able to explain that it is a set of accounting systems and methods that provide financial and non-financial data and information about the environment to decision makers and the owner. (Bouma, 2003).

Japanese scientists Burritt, R. pointed out that if the proper organization of an environmental management report is insufficient, the achievement of environmental efficiency is slow due to insufficient information about the nizations and is not regulated by law today. In this regard, difficulties arise when accoureport contained in it (Burritt, 2004).

J. Shen, Y. Chen by fully disclosing information about environmental reporting in their works, enterprises can inform the public about environmental protection measures. It has also shown that social supervision and control allow firms to focus on their environmental behavior, strengthen their focus on Environmental Protection, strengthen organizations sense of Social Responsibility, and achieve a higher degree of harmony between economic and environmental benefits (Shen, Chen., 2020).

Foreign scientists studying the problems of environmental costs and environmental accounting K.M.K. Uddin, M.M. Rahman, S. Saha, the organization of accounting for environmental costs allows companies to quantify the impact of their activities on the environment. Overall sustainability reporting-communicates information to potential stakeholders and parties in a transparent manner. And he stressed that keeping records of carbon losses is an important aspect of the fight against climate change, aimed at measuring gas emissions into the environment (Uddin et al., 2023).

O. Arodudu, O. Therasme, T. Volk, R.Malmsheimer, P. Crovella, R. Germain, D. Kumar, In their next work, they conclude: «Environmental Management Accounting is the means by which companies analyze, evaluate, control and manage environmental indicators that contribute to long – term sustainability and environmental efficiency» (Arodudu et al., 2023). Continuing the views of the authors, we also understand this as an environmental management report, a systematized calculation of costs associated with the receipt and compensation

of damage caused by business entities to the environment.

In the scientific works of these authors Md. S. A. Mondal, N. Akter, A. M. Ibrahim, «Environmental management accounting – serves as a tool for identifying, assessing environmental costs and integrating them into everyday management decision-making. (Md.S.A. Mondal et al., 2024) Environmental costs are essential for making important management decisions that combine and harmonize the economy and the surrounding environment. Therefore, keeping records of environmental costs is necessary to solve environmental problems arising from economic development and ensure a sustainable production process». Joining the reasoning of these authors, we note that the purpose of environmental cost accounting is that when determining the cost of production, including environmental costs, it is necessary to pay special attention to its correct calculation. In addition, the environmental management report – can highly contribute to the demonstration of ways to effectively use natural resources, systematize environmental protection services, determine the impact of harmful waste on human health, and assess the economic and environmental sustainability in the general space masshatab.

According to domestic scientists B.S. Korabaev and N.B. Abdrakhmanova, «The concept of environmental accounting is still unfamiliar to domestic organting for the costs of measures to improve the environmental safety of domestic production (Korabaev, 2020).

According to the analysis of domestic economists A. Samambaeva and V. Kovalenko, on June 26, 2023, the International Sustainability Reporting Standards Board (ISSB) approved the first package of IFRS S1 «General requirements for the disclosure of financial information related to sustainable development» and the first thematic standard IFRS S2 «Climate Change Disclosure», which will be implemented from 1 January 2024. This Standard applies to financial statements issued in 2025. (Samambaeva, 2023).

The ISSB was created on the initiative of IFRS and works alongside the Accounting Standards Board (IASB). The new standards follow in the footsteps of IFRS financial reporting standards used in around 150 jurisdictions and are expected to be recognized worldwide by becoming part of national legislation. Similar to accounting standards, IFRS S1/S2 can be mandatory for large companies, joint-stock companies, commercial banks, leasing companies, medium-sized businesses and state-owned enterprises (Samambayeva, Kovalenko, 2023).

Studying in detail the work of A. Samambaev and V. Kovalenko, one can give examples that «ignoring climate risks can lead to bankruptcy». For example, California's largest electric utility has gone bankrupt twice in the past 20 years due to drought and wildfires. Drought in Kazakhstan occurs every four years, and heat every five years. As a result, the reserves that ensure the operation of hydroelectric power stations may decrease, the loss of thermal power capacity by 10%, and production delays in regions dependent on river energy (Samambayeva, 2023).

Thus, by not disclosing climate opportunities, companies are missing out on opportunities to attract investors. Recent research from energy companies shows that climate transition risks are not part of the companies' economic model and therefore do not represent a reduction in the cost of carbon-intensive energy sources in the face of increasing regulatory pressure. In addition, renewable energy providers are underestimating their prospects in terms of cash flow growth. This means investors don't see potential losses or gains on their investments, and companies miss out on growth opportunities.

Most companies in the countries of Central Asia and the Caucasus have not yet begun to identify and assess the impact of climate risks on the financial condition of their business and the sustainability of their development strategy. In addition, for global investors, information about the impact of these risks on profits moves from the «nice-to-have» category to the «necessary» category when choosing projects for financing.

IFRS S1/S2 represents a new round in the evolution of reporting standards, starting a multi-year race for sustainable development that curbs global warming. The new standards integrate the world's best practices in financial and non-financial reporting into a single set of standards, thereby showing that the link between sustainable development, namely climate and financial well-being, is no longer a theorem that requires years of proof, but an ineffective axiom to ignore.

Currently, environmental reporting is an urgent issue at the global level, owners (investors) and consumers are interested in and demand more necessary information about the company's economic indicators as well as environmental and social indicators.

On January 2, 2021, the «Environmental Code of the Republic of Kazakhstan» was adopted in the

Republic of Kazakhstan. According to clause 1 of Article 3 of this Code, the purpose of this legislation is to define the legal bases, tasks and principles, as well as mechanisms of implementation of the unified state environmental policy in the country («Environmental Code of the Republic of Kazakhstan», 02.01.2021).

Considering that the law on environmental protection and environmental restoration was adopted only in 2021 since the Republic of Kazakhstan gained independence, we all know that the level of environmental pollution and its consequences are becoming an urgent problem as a result of not paying much attention to environmental issues in the country and wasting time.

In the country, enterprises for the extraction and processing of oil and underground minerals, electric power enterprises leave huge amounts of production waste in the environment. Therefore, enterprises and organizations producing products, in order to comply with the requirements of environmental legislation, must take and implement measures related to the restoration of the polluted environment and compensation for damage caused to the environment. And the implementation of these measures in itself requires capital expenditures.

In connection with these issues, the main problem of environmental accounting is the organization of accounting for environmental protection costs. In the practice of the Republic of Kazakhstan, an environmental report is not disclosed as part of a special report. Only in accordance with Article 573 of the Tax Code of the Republic of Kazakhstan (2024) does a settlement procedure for individual entrepreneurs and legal organizations with the objects of calculation and the basis for calculation «payment for negative impact on the environment» be provided, «Tax code of the Republic of Kazakhstan», as amended in 2024). Therefore, in our opinion, we believe that the time has come to formulate and put into practice a holistic methodology for the correct organization and accounting of environmental costs of domestic manufacturing enterprises and organizations.

Mongush, A. D. Environmental reporting can be carried out by enterprises of any size. Whether they are run by a global corporation or a small business, there are elements necessary for success. The company's senior management should support these practices (Mongush, 2014).

In 1992, at the UN International Conference on Environment and development (1992), he proposed the concept of environmental accounting as a tool for organizing consistent policies in the direction of sustainable development. The Council of Europe proposed environmental reporting as a system used to identify, systematize, regulate and present data and information about the state of the environment through physical and atmospheric indicators (1992).

As a result of general foreign research, foreign authors consider environmental reporting for the purposes of internal management reporting, external financial reporting, as well as a comprehensive system of product cost and financial performance analysis.

At the same time, considering the works of the authors of the domestic and CIS countries, we found out that there are different approaches to the methods of organization of environmental reporting. For example, dmestic authors Begeeva, G. J. and Imanbayeva, Z. O. (Begeeva, 2018) Environmental accounting is considered a part of the accounting system among the operational, accounting and statistical reports that are part of the traditional accounting system of the economic entity (Begeeva, 2018). Continuing the concepts of these authors, we propose to consider environmental accounting as an integral part of production and management accounting, including in its composition elements of tax accounting that regulate the accounting of environmental fees and payments.

Russian scientist Saenko, K. S. considers environmental reporting as one of the branches of the accounting system, which continuously keeps records of environmental payments and debts of an economic entity, depending on the level of damage caused to the environment within the organization Saenko, (Saenko, 2005). This author's concept of environmental accounting is deeper. Here, the author includes the environmental obligations of enterprises in the environmental report, because environmental taxes, fees or payments are considered to be the main source of compensation for environmental damages. Therefore, here again we would like to say that the place of the ecological tax calculation in the ecological accounting is considered important.

It should be remembered that environmental accounting is not only management accounting, including environmental costs, but also an accounting system regulated by a tax return on tax legality.

Therefore, along with financial and tax reports, the environmental report must be highly reliable and documented. We believe that environmental, financial and tax reports should be carried out in accordance with the regulatory and legal documents of the Republic of Kazakhstan (such as the Environmental Code, the Tax Code, the Civil Code).

It should be noted that according to Article 575 (2024) of the Tax Code of the Republic of Kazakhstan, the types of payments for negative impact on the environment include:

- emissions of pollutants;
- spills of pollutants;
- buried waste;
- open sulfur.

Individuals or legal entities, i.e. «facility operators», who own or otherwise legally use facilities that have a negative impact on the environment, are considered payers for environmental impact.

Studying the work of the Russian research scientist E. B. Ilyicheva, it should be noted that he divided the environmental report into the following three groups (Ilyicheva, 2009):

1) Accounting for environmental obligations;
2) Ecologically oriented reporting;
3) Environmental audit.

As a result of studying the scientific works of the authors, we propose to organize environmental reporting in the following areas:

1) Calculation of environmental obligations and fees (taxes);
2) Ecological and statistical report;
3) Environmental cost accounting;
4) Environmental audit and analysis.

Therefore, as a result of the literature review, we can summarize the differences between the generally accepted conventional accounting and environmental accounting in the table below (Table 1).

Table 1 – Differences between accounting and environmental accounting

№	Characteristic signs	Accounting	Environmental report
1	According to official figures	Focused on financial results	Environmental aspects of enterprise activity
2	According to the origin of the information	Based on financial and economic information	It is based on quantitative, qualitative, physical, regulatory, limit information depending on the way of obtaining information
Note – the table was compiled using the authors' research			

According to the Kyoto protocol, the most successful definition of accounting environmental accounting can be explained as follows: «environmental accounting is a system of recording, collecting, measuring, processing, preparing relevant information that provides the possibility of planning and forecasting, monitoring and analysis of environmental costs and environmental liabilities. (Kyoto Protocol 10th Anniversary, 1997).

One of the foreign authors Nguyen, T. D. «Environmental accounting» – suggests the use of accounting, economics and the environment as a unifying science. At the same time, he conceptualizes environmental reporting as a discipline that implies the honest and complete collection, verification, registration of environmental requirements in accordance with laws and regulations, national accounting standards and accounting policies, as well as the provision of environmental report data to interested parties using the information (Nguyen, 2020).

Therefore, in the global economic situation, the economy of any country cannot develop at an adequate level without environmental mechanisms, which is first of all manifested by the need to spend capital on the restoration and compensation of factors and damages that have a negative effect on the environment. And we believe that it is necessary to organize new mechanisms of environmental accounting and reporting as a structure of the economy.

Results and discussion

We all know that in the period of complex development of economic relations, the negative impact of industrial, manufacturing enterprises and means of transport on the environment is becoming an urgent problem not only of an individual country, but of the entire world society.

In addition, nowadays in Kazakhstan, urgent environmental problems related to pollution of air, water and soil, i.e. land, are becoming more complicated day by day.

Air pollution in our country, like the rest of the world, causes:

1) Industrial organizations annually release more than 20 billion tons of production waste into the environment, which in itself has a negative impact on the environment.

2) Soot wastes – oil and gas producing enterprises burn and release to nature the waste oil and gases associated with the processing and production of oil and gas.

3) Fuels and gases used by cars emit carbon and lead oxide into the air.

All of these will harm the country's ecology and have a negative impact on its excessive pollution.

Using table 2 below, we can evaluate the environmental efficiency rating of the countries of the world, and compare the environmental efficiency of the Republic of Kazakhstan with other countries, and determine the level of environmental efficiency of our country.

As we can see from this table, in 2002, according to research, the index of ecological efficiency of the Republic of Kazakhstan was 92nd out of 178 countries. This shows how serious the environmental problem of our country is.

Leading ecologists and eco-activists of the country have been sounding the alarm about increasing environmental problems since independence. If we rely on the research and experience of ecologists and activists, it shows the need to solve the ecological problem of the country at the state level. We would like to emphasize that the need to solve environmental problems not only with the strength of the domestic country, but also with the help of neighboring countries, as well as with the help and cooperation of the entire world eco-communities, is the main task of finding a solution today.

Table 2 – Ranking according to the Environmental Efficiency Index (2022)

Places	Countries	Index	Ecosystem viability	Environmental condition	Climate change
1	Denmark	77,9	61,3	85,5	92,4
2	Great Britain	77,7	62,3	83,9	91,5
3	Finland	76,5	62,0	93,4	83,6
4	Malta	75,2	68,2	76,5	82,3
5	Sweden	72,7	60,6	93,1	75,4
6	Luxembourg	32,3	70,3	86,7	67,4
7	Slovenia	67,3	72,7	64,4	62,9
55	Belarus	48,5	55,4	51,1	39,6
56	Armenia	48,3	58,1	40,7	41,4
84	Moldova	42,7	42,9	42,0	42,9
92	Kazakhstan	40,9	48,1	37,5	34,9
103	Azerbaijan	38,6	44,4	30,7	36,4
111	Russia	37,5	39,0	50,6	29,1
178	India	18,9	19,3	12,5	21,7
Note – information was taken from https://finprom.kz/					

Capital expenditures from the budget and other sources have been spent on protection of the protected environment by the state for years, and the restoration of its pollution has been spent for years, and how much return is there, and the questions of replacing and restoring environmental disasters have not yet been sufficiently resolved. we see from the table.

According to the report provided by the agency of Statistics of the Republic of Kazakhstan, the amount of Environmental Protection costs in the country can be indicated in the table below.

During the period under investigation, it can be determined that the level of expenses spent on environmental protection and pollution restoration from the state budget of the Republic of Kazakhstan and extra-budgetary sources is very high. The level of expenses spent on the environment in 2019 was 97,767 billion tenge, in 2020 it was 384,015 billion tenge, and in 2022 it reached 444,514 billion tenge. Therefore, the amount of capital spent on environmental protection in the country is very high.

Table 3 – Dynamics of spending on environmental protection

№	Years	Cost amount, thousand Tenge	Growth rate compared to previous years (%)
1	2019	97 767 570	-
2	2020	384 015 734	395,87
3	2021	416 955 575	425,53
4	2022	444 514 269	454,66
Note – the details of the table were taken from the official website of the Statistics Agency of the Republic of Kazakhstan			

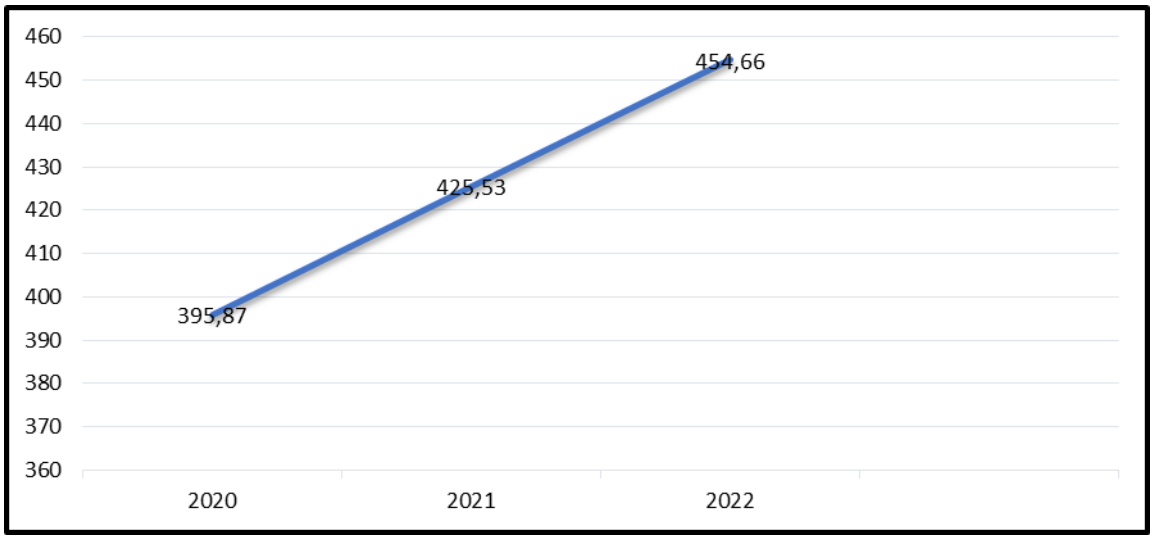

Figure 1 – Growth rate of environmental spending (%)
Note – chart is based on table 3

With the given diagram, we can see the rate of growth of costs related to the restoration of environmental costs in the Republic of Kazakhstan over the last 3 years. Therefore, in 2022, compared to 2019, the amount of expenses will increase up to 4.5 times (up to 454,66). Now, researching the efficiency of this spent capital is one of the big issues and there is a need to implement it together as a state and society, on the basis of strategic programs.

Table 4 – Dynamics of Environmental Protection costs by type of environmental activitiesthousand tenge

№	Types of services	2020 year	2021 year	2022 year
	Total	384 015 734	416 955 575	444 514 269
1	**Problems of atmospheric air protection and climate change,** among them:	88 476 190	82 513 454	127 995 826
1.1	reduction in greenhouse gas emissions	936 307	1 534 936	2 024 375
1.2	sewage treatment	66 978 966	94 165 799	113 096 310
1.3	waste processing	73 248 476	90 899 013	107 096 519
1.4	soil, underground and surface water protection and rehabilitation	16 180 047	26 808 738	23 695 591
1.5	reducing the impact of noise and vibration	38 788	94 492	163 944
1.6	conservation of biodiversity and landscapes	6 038 736	2 199 854	3 307 758

Table continuation

№	Types of services	2020 year	2021 year	2022 year
1.7	radiation safety	955 709	779 270	880 252
1.8	scientific research and development in the field of Environmental Protection	4 502 777	4 921 332	3 479 430
2	**Other areas of environmental activity,** among them are:	127 596 045	114 573 623	64 798 639
2.1	activities in the field of renewable energy sources energy saving	115 447 352	100 677 264	46 647 977
2.2	technologies and activities in the field of energy efficiency improvement	6 896 744	8 602 944	8 177 847
Note – the data of the table are taken from the official website of the agency for Statistics of the Republic of Kazakhstan				

As we can see, the dynamics of costs in the Republic by types of activities aimed at protecting nature increases every year. The most important tasks of each industrial and industrial entity should be to compensate for the negative impact on the environment, to restore damage. In this regard, it is necessary to demonstrate the possibilities of practical study and application of improved mechanisms and methods for organizing Accounting, Audit and analysis of costs for the recovery of damage caused to the environment.

As a result of studying Western literature, developed countries of the world have already legally introduced environmental accounting and reporting as one of the forms of accounting in countries such as Denmark, France, Great Britain, Norway.

Thus, Shapiguzov, S. M. and Shneidman, L. Z. consider environmental reporting – a system of accounting for environmental services, including accounting for environmental costs, obligations and their audit (Shapiguzov, 1997). Agreeing with these, we understand that environmental accounting is not only accounting for environmental fees and obligations, but also consideration as a system for accounting for environmental protection costs and compensation for damage caused.

Kozhukhova, O. S. summarizes in her work «environmental accounting is an integrated system designed to collect, register, process, evaluate, summarize and reflect information on environmental costs, contingent assets, reserves and liabilities of entities and other environmental data necessary for managing and determining the environmental potential of a company and ensuring environmental safety» (Kozhukhova, 2012). This author comprehensively examines the environmental report, including contingent liabilities and reserves recognized by entities for negative environmental impacts. We consider it appropriate to include contingent liabilities and reserves in the environmental report. The fact is that according to IFRS 37 «Provisions, Contingent Liabilities and Contingent Assets», it is indicated that the contingent liabilities of an organization include their liabilities arising from past events that depend on the implementation of future actions («Provisions, Contingent Liabilities and Contingent Assets», 2015)

Consequently, they are the costs of eliminating illegal environmental damage. Reimbursement of both leads to the outflow of resources with economic benefits, regardless of the future actions of the organization. Similarly, the organization recognizes the alleged obligation to cover the costs of decommissioning an oil production or nuclear power plant if the organization is obliged to eliminate the damage caused to the environment.

As a result of our research work, we found that there are the following obstacles to the development of environmental reporting:

- lack of a law that fully regulates environmental accounting;
- lack of specific methods for organizing environmental accounting;
- difficulties in assessing environmental costs and insufficient attention to them by economic entities;
- transparency of information in organizations;
- lack of analysis methods based on the specifics of services that have a negative impact on the environment;
- environmental protection measures of subjects are limited only to the calculation and payment of tax obligations.

The main objects of environmental accounting, it must take into account all the processes of the organization for environmental protection. We believe that environmental accounting should be established in connection with certain regulatory documents that can be regulated by law, as well as general accounting.

As a result of the conducted research, we decided to pre-define the objects of environmental accounting (Picture 2).

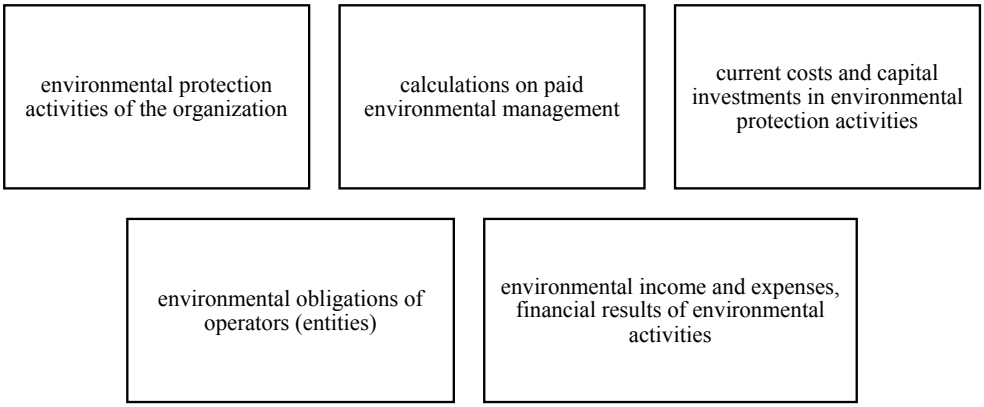

Figure 2 – Objects of environmental accounting
Note – scheme was compiled by the authors

Kazakhstan enterprises' most of the costs of compensation for losses for negative environmental impacts are considered as indirect costs. Sometimes organizations include expenses as expenses of such a period as part of administrative expenses. We believe it is correct that general environmental costs should be considered as overhead costs in the accounting policy of the organization and be attributed to the cost of work and services of products in accordance with the methodology for allocating indirect costs.

Therefore, in order to account for the current costs associated with environmental services, we propose subsection 8410 «Overhead costs» to organize analytical accounting for the following cost items through a special interim account «8410.1 – Environmental costs» (Picture 3).

The classification of these listed costs, taking into account the latest requirements of IFRS for environmental costs related to environmental protection, is considered very important.

A well-established classification of total environmental costs is not fully represented in accounting practice. The reason for this is that the negative environmental impact of industrial enterprises varies. After reviewing the cost classification prepared by the U.S. Environmental Protection Agency, you can clarify what determines the degree and interest of the organization in using the information. This agency offers the following areas of environmental protection:

- environmentally significant raw materials and energy costs;
- potential hidden costs that are reflected in accounting, but as a component of overhead costs;
- conditional costs that arise in the future period, i.e. contingent assets and contingent liabilities;
- reputational costs.

In domestic accounting practice, it is much easier to organize expenses related to environmental protection according to the following items:

- costs of extraction of natural resources, exploration and development of planned territories;
- costs associated with the organization of environmental infrastructure;
- possible costs associated with the regulation of environmental protection systems (monitoring, taxes and emission payments);
- expenses related to environmental audit and preparation of environmental reports, etc.
- contingent costs, including penalties, fines, compensation for damage to the natural environment, preparation and development of production facilities.

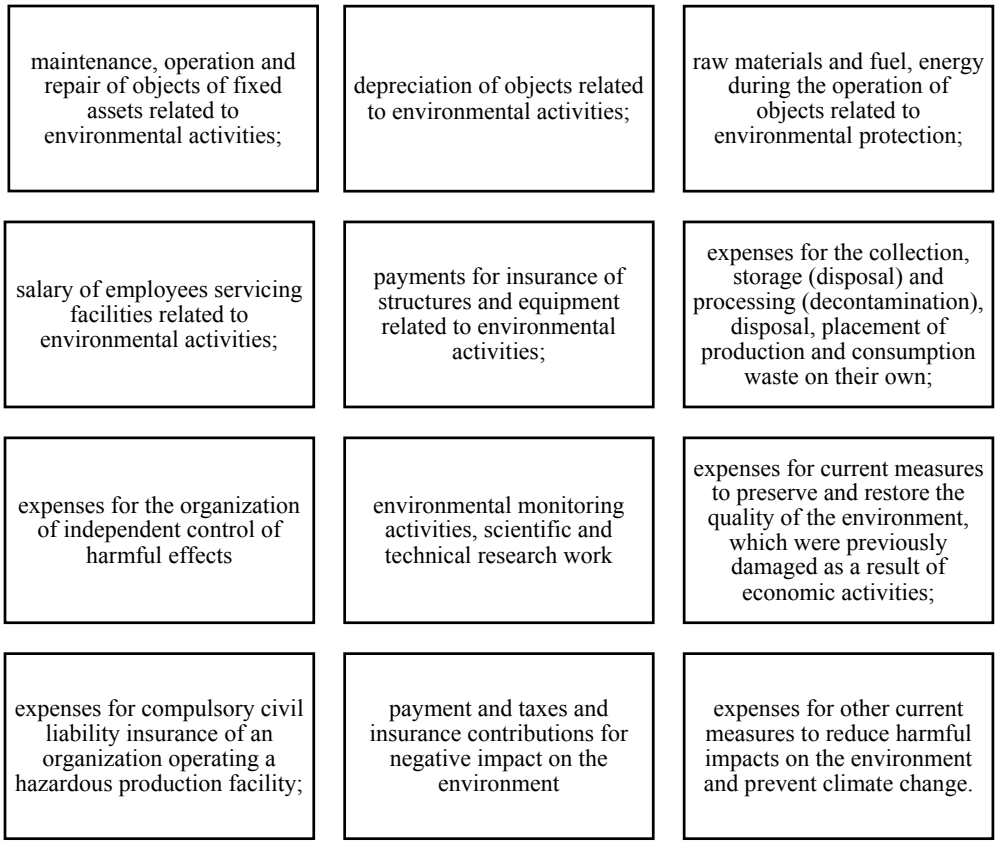

Figure 3 – Analytical classification of environmental costs
Note – scheme was compiled by the authors

Therefore, as a result of the conducted research, we propose to organize the accounting of environmental costs using the following methods:

1) calculation of «cost-production»;

2) calculation of material flow costs;

3) accounting for environmental costs by type of activity;

4) accounting for environmental costs over the life cycle.

«Calculation of cost-production». According to this method, the consumption of materials is compared with the consumption of raw materials and refers to the comparison of the total volume of manufactured products with the amount of materials consumed.

«Calculation of material flow costs». According to this method, environmental costs are considered in parallel not only with the expenditure of materials, but also with the organizational structure. In this method, the accounting of the physical amount of material costs and related costs is carried out in parallel. Accounting for material costs on this issue is divided into three categories:

- materials;
- system costs;
- transportation or disposal of waste.

This method is aimed at saving material costs in the organization and allows you to spend all the costs of the enterprise for a long time.

«Accounting for environmental costs by type of activity». According to this method, the internal expenses of the organization are classified by cost centers and carriers.

«Accounting for environmental costs in the life cycle». Accounting for environmental costs according to this method allows you to carry out from the beginning to the end of the production process in relation to the production of a particular product.

So, summing up our scientific article on the problems of environmental costs and the organization of environmental accounting, the Russian researcher Khan, F. noted that «environmental accounting is an important strategy that makes business ecnomically successful and leads to the Future Through Environmental Protection. Environmental

accounting-protects against risks, helps to identify companies as responsible guardians of the environment. Therefore, in the development of all sectors of the economy, this will become regulatory criteria and strategic choices on the way to stability and long-term success through the adoption of paragdima» (Khan, 2024). Continuing this author's point of view, we believe that environmental protection and Prevention of harm in general, the calculation and mandatory introduction of environmental costs into business entities is an urgent problem today.

Conclusion

As a result of the conducted research, considering the main directions of the organization of environmental accounting in economic entities, we came to the following conclusions:

1) the author's recommendations on environmental costs and environmental accounting related to environmental protection are given.

2) the need and objects of individual environmental accounting, reflecting assets, liabilities, income and expenses related to their compensation for negative environmental impacts.

3) in accounting, classifications of cost items are proposed to correctly reflect environmental costs in accounting.

4) the methods of organization of accounting for environmental costs are proposed.

We believe that the results of this research work on the organization of environmental accounting provide many possible opportunities for business entities in solving theoretical and practical problems of organizing cost accounting related to environmental protection.

In conclusion, there is a need to include in the General Accounting legislation the requirements for the mandatory organization of environmental accounting in order for the organization to reflect information on environmental costs in its accounting. At the same time, the main problem of today should be the need for accountants to systematize important information in the correct calculation of costs allocated to environmental protection measures.

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МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ АВТОНОМНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ

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14. 11. 2023
№ 15-05-1/150

С 75-летием образования факультета!

Сегодня Высшая школа экономики и бизнеса КазНУ имени аль-Фараби – хранитель лучших традиций экономического образования в Казахстане. Выпускниками факультета являются выдающиеся ученые, руководители крупных предприятий. В приоритете всегда были и остаются подготовка высококвалифицированных специалистов и приверженность научным ценностям. Мы гордимся плодотворным сотрудничеством между нашими факультетами в сфере учебной, исследовательской и научной деятельности.

Студенты ВШЭиБ КазНУ имени аль-Фараби принимают участие в инновационных исследованиях, международных конкурсах, конференциях, организованных Экономическим факультетом РУДН имени Патриса Лумумбы. Успешно развивается двудипломное образование между факультетами по специальностям «Международная логистика», «Международный маркетинг», «Международная торговля», «Международный менеджмент», «Управление международными проектами». Образовательная активность студентов двух университетов также реализуется через обучение в рамках Зимней школы и расширение академической мобильности обучающихся.

Реализованы крупные совместные научные проекты - «Маркетинговое обеспечение промышленно-технологической кооперации компании России и Казахстана», «ENUNEDU – Интеграция высшего образования и корпоративного сектора в новой социальной среде», предоставившие возможность взаимодействия предприятий в сфере промышленного развития на основе маркетинговых технологий, а также открытия инновационных центров предпринимательства в образовательной сфере.

В рамках нашего сотрудничества развивается «институт приглашенных профессоров» между факультетами, Ваш профессорско-преподавательский состав – постоянные участники международных форумов, конференций, научных стажировок.

Мы надеемся на дальнейшую совместную деятельность между университетами в сфере организации учебного процесса и научных исследований.

Желаю коллективу Вышей школы экономики и бизнеса Казахского национального университета имени аль-Фараби дальнейшего процветания, смелых проектов, новых достижений, новых открытий и новых побед на благо экономического образования и науки!

С уважением,
Проректор по международной деятельности РУДН им. Патриса Лумумбы ***Ефремова Л.И.***

UNIVERSIDADE FEDERAL DE SANTA CATARINA
CAMPUS UNIVERSITÁRIO REITOR JOÃO DAVID FERREIRA LIMA - TRINDADE
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To whom it may concern in **Al-Farabi Kazakh National University**

On behalf of the Federal University of Santa Catarina, Brazil, I am delighted to congratulate the Higher School of Economics and Business on reaching its 75th anniversary of dedicated serviceand excellence.

Throughout the years, your faculty has demonstrated remarkable dedication to fostering innovation, critical thinking, and leadership skills among your students in Kazakhstan. The impact of your collective efforts is evident in the successes of your graduates, who have gone on to make significant contributions to the business world.

I want to take a moment to express my sincere appreciation for the privilege and pleasure it has been to work with the Higher School of Economics and Business at Al-Farabi Kazakh National University since 2020.

Teaching both undergraduate and doctoral students in the fields of marketing, supply chain, and academic writing, as well as supervising Ph.D. students, has been an enriching experience. Witnessing the growth and enthusiasm of the students has been truly rewarding, and I feel fortunate to be a part of their academic journey.

Moreover, my role as a researcher in projects funded by the Ministry of Education of Kazakhstan has been a source of great professional fulfillment. The opportunity to contribute to meaningful projects and collaborate with esteemed colleagues has added depth to my academic and research endeavors.

I am grateful for the support and collaborative spirit within the faculty, which has made these years not only productive but also enjoyable. I look forward to continuing our shared commitment to excellence in education and research in the years to come.

Warm regards,

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Federal University of Santa Catarina

АВТОРЛАРҒА АРНАЛҒАН АҚПАРАТ

Авторлар болуы мүмкін:

- докторанттар, жетекшісімен соавторлықта;
- ғылыми дәрежесі бар тұлғалар;
- ғылыми-педагогикалық қызметпен айналысатын тұлғалар.

Магистранттармен бірлескен авторлықтағы мақалалар жариялауға жіберілмейді.

ҚазҰУ Хабаршысы. Экономика сериясында материалдарды жариялау Open Journal System, онлайн жіберу және рецензиялау жүйесі арқылы жүзеге асырылады.

Корреспонденция авторы журналға жариялау үшін ілеспе хат ұсынуға міндетті.

Авторларға қойылатын талаптар: Редакциялық коллегия журналдың ғылыми бағыттары бойынша бұрын жарияланбаған мақалаларды қабылдайды. Мақала журналдың функционал сайтына жүктеу арқылы ғана (Open Journal System) электронды форматта (doc, .docx, .rtf форматында) қабылданады. Шрифт кеглі – 12 (аңдатпа, түйін сөздер, әдебиеттер тізімі – 10, кесте мәтіні – 9-11), шрифт – Times New Roman, мәтін беттің ені бойынша тегістеу арқылы теріледі, аралығы – бір, абзац бойынша шегініс – 0,8 см, шеттері: үстіңгі және астыңғы – 2 см, сол және оң жақ – 2 см. Сурет, кесте, графика, диаграмма және т.б. мәтін ішінде нөмір және атаумен белгіленеді (мысалы, 1-сурет – Сурет атауы) және және ескерту түрінде дереккөз көрсетіледі (мысалы, Ескерту – ... дереккөзі негізінде автормен құрастырылған). Суреттердің, таблица, графика мен диаграммалардың саны мақала көлемінің 20% -нан (кейбір жағдайда 30%) артық болмауы керек. Мақала көлемі (атауы, авторлар бойынша ақпарат, аңдатпа, түйін сөздер, әдебиеттер тізімін қоспағанда) әлеуметтік және гуманитарлық бағытта 3 000 сөзден кем емес, 7 000 сөзден артық емес болуы шарт.

Мақаланы жариялау үшін ақы төлеу тәртібі мен құнын «Қазақ университеті» баспасы белгілейді және оны рецензенттер мен ғылыми редактор мақұлдағаннан кейін автор жасайды.

Мақала құрылымы: Бірінші бет: Бірінші жол – ҒТАХР нөмірі, мәтін беттің сол жақ шетімен тегістеледі, қаралау шрифт. Мақала автор(лар)ы – аты-жөнінің бірінші әріптері және тегі, жұмыс істейтін орны (аффилиация), қала, мемлекет, e-mail, ORCID ID – орыс, қазақ және ағылшын тілдерінде жазылады. Авторлар туралы ақпарат қалыпты шрифтті кіші әріптермен жазылып, беттің ортасында тегістеледі.

Мақала атауы (Тақырып) мақаланың мәні мен мазмұнын көрсетіп, оқырманның назарын аудару керек. Тақырып қысқа әрі ақпараттық, жаргондар мен аббревиатурасыз жазылуы тиіс. Тақырыптың орташа ұзындығы 5-7 сөз (кей жағдайда 10-12 сөз). Мақаланың тақырыбы орыс, қазақ және ағылшын тілдерінде берілуі керек. Тақырып қаралау шрифтті кіші әріптермен, беттің ортасымен тегістеледі. Аңдатпа көлемі – 150 сөзден кем емес, 300 сөзден артық емес орыс, қазақ, ағылшын тілдерінде жазылады.

Аңдатпа құрылымында келесі ақпарат міндетті түрде болуы керек: Зерттеу тақырыбы бойынша кіріспе сөз; Ғылыми зерттеудің мақсаты, негізгі бағыттары мен идеялары; Жұмыстың ғылыми және практикалық маңыздылығы бойынша қысқа ақпарат; Зерттеу әдістемесі бойынша қысқа ақпарат; Ғылыми зерттеудің негізгі нәтижелері, талдау және түжырымдама; Жүргізілген зерттеу жұмысының маңыздылығы (аталған жұмыстың ғылымның сәйкес саласына енгізген үлесі); Жұмыс қорытындысының практикалық маңыздылығы.

Түйін сөздер/сөз тіркестері – орыс, қазақ, ағылшын тілдерінде 3-5 сөз аралығында.

Кіріспе келесіде берілген негізгі элементтерден тұрады: Таңдалған тақырыптың негіздемесі; тақырып өзектілігі мен зерттеу проблемалары. Таңдалған тақырыптың негіздемесінде алдыңғы зерттеушілердің тәжірибелері негізінде проблемалық жағдайдың (зерттеу жұмыстарының жоқтығы, жаңа зерттеу нысанының пайда болғаны және т.б.). бар екендігі айтылады. Тақырыптың өзектілігі аталған зерттеу нысанының қойылған сұрақтарға толық жауаптардың болмаған жағдайда, тақырыптың теориялық және практикалық маңыздылығы арқылы дәлелденіп жалпыға ортақ мүдде арқылы анықталады. Жұмыстың нысанын, пәнін, мақсаттарын, міндеттерін, тәсілдерін, әдістер, гипотезасын анықтау. Зерттеудің мақсаты тезисті дәлелдеумен, яғни зерттеу тақырыбын автор таңдаған аспектімен көрсетумен байланысты.

Әдебиеттерге шолу бөлімінде – зерттеу тақырыбы бойынша ағылшын тілінде шетелдік авторлардың іргелі және жаңа еңбектер (кемінде 15 жұмыс), оларды ғылыми үлесі түрғысынан талдау, сондай-ақ сіздің мақалаңызда толықтырылған зерттеу кемшіліктері беріледі.

Әдістеме – материалдар мен жұмыс барысының сипаттамасынан, сондай-ақ қолданылатын әдістердің толық сипаттамасынан тұруы керек.

Нәтижелер мен Талқылау бөлімінде сіздің зерттеу нәтижелеріңізді талдауы және талқылауы беріледі. Зерттеу барысында алынған нәтижелер туралы қорытынды беру арқылы негізгі мәні айқындалады. Бұл мақаланың маңызды бөлімдерінің бірі болып саналады. Онда жұмысыңыздың нәтижелерінің талдауы және алдыңғы жұмыстармен, талдаулармен және түжырымдамаларымен салыстыру арқылы сәйкес нәтижелерді талқылау беріледі.

Қорытынды – жұмыстың осы кезеңдегі нәтижелерін жалпылау және қорытындылау; автор алға қойған түжырымның растығын және алынған нәтижелерді ескере отырып, ғылыми білімнің өзгеруі туралы автордың қорытындысын растау. Қорытынды абстрактілі болмауы керек, оларды ұсыныстарды немесе одан әрі жасалатын жұмысты сипаттай отырып белгілі бір ғылыми саладағы зерттеу нәтижелерін жалпылау үшін қолдану керек.

Пайдаланылған әдебиеттер тізімі немесе библиографиялық тізім жаратылыстану және техникалық бағыттарға кем дегенде 15 атаулардан тұрады, ал ағылшын тіліндегі жалпы атаулар саны 50%-дан кем болмауы керек. Егер сілтемелер тізімінде кириллицада берілген еңбектер болса, сілтемелер тізімін екі нұсқада ұсыну қажет: біріншісі – түпнұсқада, екіншісі – романизацияланған алфавитте (транслитерация – translit-online.ru).

Әлеуметтік және гуманитарлы бағыттағы мәтіндерде дәйексөз келтірілген сілтемелер жұмыстың бірінші авторы, шыққан жылы: бет нөмір(лер)і жақша ішінде көрсетіліп беріледі. Мысалы, (Залесский, 1991: 25). Әдебиеттер тізімінде бір автордың бір жылда жарық көрген бірнеше жұмысы келтірілген жағдайда, шыққан жылдың түсына «а», «б» және т.б. әріптерді қосып жазу керек. Мысалы, (Садуова, 2001а: 15), (Садуова, 2001б, 22). Мақала жариялау құны – 2000 теңге / бет

ИНФОРМАЦИЯ ДЛЯ АВТОРОВ

Авторами могут быть:

- докторанты, совместно с руководителем;
- лица, имеющие ученую степень;
- лица, занимающиеся научно-педагогической деятельностью.

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Требование для авторов: Редакционная коллегия принимает ранее неопубликованные статьи по научным направлениям журнала. Статья представляется в электронном формате (в форматах .doc, .docx, .rtf) посредством ее загрузки через функционал сайта журнала (Open Journal System); Кегль шрифта – 12 (аннотация, ключевые слова, литература – 10, текст таблиц – 10), шрифт – Times New Roman, выравнивание – по ширине текста, интервал – одинарный, абзацный отступ – 0,8 см, поля: верхнее и нижнее – 2 см, левое и правое – 2 см; Рисунки, таблицы, графики, диаграммы и др. представляются непосредственно в тексте с указанием нумерации, заглавия (Например, Рис. 1 – Название рисунка) и источника в виде примечания (Например, Примечание – составлено автором на основе источника …). Количество рисунков, таблиц, графиков и диаграмм не должно превышать 20% от всего объема статьи (в некоторых случаях до 30%); Объем статьи (без учета названия, сведений об авторах, аннотации, ключевых слов, библиографического списка) должен составлять не менее 3 000 слов и не превышать 7 000 слов.

Порядок оплаты и стоимость за публикацию статьи устанавливается издательским домом «Қазақ университеті» и производится автором после одобрения рецензентами и научным редактором.

Структура статьи Первая страница: Первая строка – номер МРНТИ, выравнивание – по левому краю, шрифт – полужирный; Автор(ы) статьи – Инициалы и фамилия, ученая степень, звание, место работы (аффилиация), город, страна, e-mail, ORCID ID – на русском, казахском и английском языках. Сведения об авторах представляются обычным шрифтом строчными буквами, выравнивание – по центру;

Название статьи (Заголовок) должно отражать суть и содержание статьи и привлекать внимание читателя. Название должно быть кратким, информативным и не содержать жаргонизмов или аббревиатур. Оптимальная длина заголовка – 5-7 слов (в некоторых случаях 10-12 слов). Название статьи должно быть представлено на русском, казахском и английском языках. Название статьи представляется полужирным шрифтом строчными буквами, выравнивание – по центру;

Аннотация объемом не менее 150 и не более 300 слов на русском, казахском и английском языках. Структура аннотации включает в себя следующие обязательные пункты: Вступительное слово о теме исследования; Цель, основные направления и идеи научного исследования; Краткое описание научной и практической значимости работы; Краткое описание методологии исследования; Основные результаты и анализ, выводы исследовательской работы.

Ключевые слова/словосочетания – количеством 3-5 на русском, казахском и английском языках;

Введение состоит из следующих основных элементов: Обоснование выбора темы; актуальность темы или проблемы. В обосновании выбора темы на основе описания опыта предшественников сообщается о наличии проблемной ситуации (отсутствие каких-либо исследований, появление нового объекта и т.д.).

Актуальность темы определяется общим интересом к изученности данного объекта, но отсутствием исчерпывающих ответов на имеющиеся вопросы, она доказывается теоретической или практической значимостью темы.

Определение объекта, предмета, целей, задач, методов, подходов, гипотезы и значения вашей работы. Цель исследования связана с доказательством тезиса, то есть представлением предмета исследования в избранном автором аспекте.

В секции обзор литературы – должны быть охвачены фундаментальные и новые труды по исследуемой тематике зарубежных авторов на английском языке, анализ данных трудов с точки зрения их научного вклада, а также пробелы в исследовании, которые Вы дополняете в своей статье.

Методология – должны состоять из описания материалов и хода работы, а также полного описания использованных методов.

В разделе Результаты и Обсуждение – приводится анализ и обсуждение полученных вами результатов исследования. Приводятся выводы по полученным в ходе исследования результатам, раскрывается основная суть. И это один из самых важных разделов статьи. В нем необходимо провести анализ результатов своей работы и обсуждение соответствующих результатов в сравнении с предыдущими работами, анализами и выводами.

Заключение – обобщение и подведение итогов работы на данном этапе; подтверждение истинности выдвигаемого утверждения, высказанного автором, и заключение автора об изменении научного знания с учетом полученных результатов. Выводы не должны быть абстрактными, они должны быть использованы для обобщения результатов исследования в той или иной научной области, с описанием предложений или возможностей дальнейшей работы.

Список используемой литературы, или Библиографический список состоит из не менее 15 наименований, и из общего числа наименований на английском языке должно быть не менее 50%. В случае наличия в списке литературы работ, представленных на кириллице, необходимо представить список литературы в двух вариантах: первый – в оригинале, второй – романизированным алфавитом (транслитерация – translit-online.ru).

Ссылки на цитируемые работы в тексте даются в скобках, с указанием первого автора работы, год издания: номер страниц(-ы). Например, (Залесский, 1991: 25). Стоимость публикации – 2000 тенге/страница

INFORMATION FOR AUTHORS

The authors can be:

- doctoral students, together with the supervisor;
- persons with an academic degree;
- persons engaged in scientific and pedagogical activities.

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The requirement for authors: The editorial board accepts previously unpublished articles on the scientific directions of the journal. The article is submitted in electronic format (in the formats .doc, .docx, .rtf) ONLY by downloading it through the functionality of the journal's website (Open Journal System); Font size – 12 (abstract, key words, literature – 10, text of tables – 9-11), font – Times New Roman, alignment – width of text, interval – single, indented margin – 0,8 cm, margins: upper and the bottom – 2 cm, left and right – 2 cm. Figures, tables, graphs, diagrams, etc. are presented directly in the text indicating the numbering, title (For example, Fig. 1 – Name of the figure) and the source as a note (For example, Note – compiled by the author based on the source ...). The number of figures, tables, graphs and diagrams should not exceed 20% of the total volume of the article (in some cases up to 30%); The volume of the article (excluding the title, information about authors, abstract, keywords, references) must be at least 3,000 words and not exceed 7,000 words;

Authors in a mandatory order should indicate in a covering letter in the Open Journal System or the Editorial Manager that the article / manuscript has never been published anywhere, and that the article does not contain borrowed text fragments from other works without reference to them.

Structure of the article: First page: First line – IRSTI number (international rubricator of scientific and technical information), alignment – left, font – bold. Author(s) of the article – Initials and surname, place of work (affiliation), city, country, e-mail, ORCID ID. Information about authors is represented in ordinary type in lowercase letters, alignment in the center. The title of the article should reflect the essence and content of the article and attract the reader's attention. The title should be short, informative and not contain jargons or abbreviations. The optimal length of the title is 5-7 words (in some cases 10-12 words). The title of the article is shown in bold in lowercase letters, alignment – in the center. Abstract – at least 150-300 words.

The structure of the annotation includes the following obligatory items: Opening remarks about the research topic, purpose, main directions and ideas of scientific research, brief description of the scientific and practical significance of the work, brief description of the research methodology, main results and analysis, conclusions of research work, the value of the research carried out (contribution of this work to the relevant field of knowledge).

Keywords – 3-5 words.

Introduction consists of the following main elements: Justification of the choice of topic; relevance of the topic or problem. In substantiation of the choice of topic based on the description of the experience of predecessors, the presence of a problem situation (the absence of any research, the emergence of a new object, etc.) is reported.

The relevance of the topic is determined by the general interest in the knowledge of this object, but the lack of comprehensive answers to the questions, it is proved by the theoretical or practical significance of the topic.

In the literature review section, fundamental and new works on the subject matter of foreign authors in English should be covered (at least 15 works), analysis of the given works in terms of their scientific contribution, as well as research gaps that you supplement in your article.

Methodology should consist of a description of the materials and the progress of the work, as well as a complete description of the methods used.

In the Results and Discussion section an analysis and discussion of the research results you received is provided. The conclusions on the results obtained during the study are given, the main essence is revealed. And this is one of the most important sections of the article. It is necessary to analyze the results of their work and discuss the relevant results in comparison with previous works, analyzes and conclusions.

Conclusion – synthesis and summarizing the work at this stage; confirmation of the truth of the statement put forward by the author, and the author's conclusion on the change of scientific knowledge, taking into account the results obtained. Conclusions should not be abstract, they should be used to summarize the results of research in a particular scientific field, with a description of the proposals or opportunities for further work.

References consists of at least 15 titles, and from the total number of titles in English must be at least 50%. style of the list of references – American Psychological Association (http://www.apastyle.org/). The list of references is presented in alphabetical order, and ONLY those works that are cited in the text. References to cited works in the text are given in brackets, indicating the first author of the work, year of publication: the number of pages. For example, (Zalessky, 1991: 25). Publication cost – 2000 tenge/page

МАЗМҰНЫ – CONTENTS – СОДЕРЖАНИЕ