

ISSN 2518-1467 (Online),
ISSN 1991-3494 (Print)



«ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ

«ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫ» РҚБ

Х А Б А Р Ш Ы С Ы

ВЕСТНИК

РОО «НАЦИОНАЛЬНОЙ
АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН»

THE BULLETIN

OF THE ACADEMY OF SCIENCES
OF THE REPUBLIC OF
KAZAKHSTAN

PUBLISHED SINCE 1944

5 (411)

SEPTEMBER – OCTOBER 2024

ALMATY, NAS RK

БАС РЕДАКТОР:

ТҮЙМЕБАЕВ Жансейіт Қансейітұлы, филология ғылымдарының докторы, профессор, ҚР ҰҒА құрметті мүшесі, Әл-Фараби атындағы Қазақ ұлттық университетінің ректоры (Алматы, Қазақстан)

ҒАЛЫМ ХАТШЫ:

ӘБІЛҚАСЫМОВА Алма Есімбекқызы, педагогика ғылымдарының докторы, профессор, ҚР ҰҒА академигі, Абай атындағы ҚазҰПУ Педагогикалық білімді дамыту орталығының директоры (Алматы, Қазақстан), **Н = 3**

РЕДАКЦИЯ АЛҚАСЫ:

САТЫБАЛДЫ Әзімхан Әбілқайырұлы, экономика ғылымдарының докторы, профессор, ҚР ҰҒА академигі, Экономика институтының директоры (Алматы, Қазақстан), **Н = 5**

САПАРБАЕВ Әбдіжапар Жұманұлы, экономика ғылымдарының докторы, профессор, ҚР ҰҒА құрметті мүшесі, Халықаралық инновациялық технологиялар академиясының президенті (Алматы, Қазақстан), **Н = 6**

ЛУКЪЯНЕНКО Ирина Григорьевна, экономика ғылымдарының докторы, профессор, «Киево-Могилян академиясы» ұлттық университетінің кафедра меңгерушісі (Киев, Украина), **Н=2**

ШИШОВ Сергей Евгеньевич, педагогика ғылымдарының докторы, профессор, К. Разумовский атындағы Мәскеу мемлекеттік технологиялар және менеджмент университетінің кәсіптік білім берудің педагогикасы және психологиясы кафедрасының меңгерушісі (Мәскеу, Ресей), **Н = 4**

СЕМБИЕВА Ләззат Мыктыбекқызы, экономика ғылымдарының докторы, Л.Н. Гумилев атындағы Еуразия ұлттық университетінің профессоры (Нұр-Сұлтан, Қазақстан), **Н = 3**

АБИЛЬДИНА Салтанат Қуатқызы, педагогика ғылымдарының докторы, профессор, Е.А.Бөкетов атындағы Қарағанды мемлекеттік университеті педагогика кафедрасының меңгерушісі (Қарағанды, Қазақстан), **Н = 3**

БУЛАТБАЕВА Күлжанат Нурымжанқызы, педагогика ғылымдарының докторы, профессор, Ы. Алтынсарин атындағы Ұлттық білім академиясының бас ғылыми қызметкері (Нұр-Сұлтан, Қазақстан), **Н = 2**

РЫЖАКОВ Михаил Викторович, педагогика ғылымдарының докторы, профессор, Ресей білім академиясының академигі, «Білім берудегі стандарттар және мониторинг» журналының бас редакторы (Мәскеу, Ресей), **Н=2**

ЕСІМЖАНОВА Сайра Рафихевна, экономика ғылымдарының докторы, Халықаралық бизнес университетінің профессоры, (Алматы, Қазақстан), **Н = 3**

«Қазақстан Республикасы Ұлттық ғылым академиясы РҚБ-нің Хабаршысы».

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» РҚБ (Алматы қ.). Қазақстан Республикасының Ақпарат және коммуникациялар министрлігінің Ақпарат комитетінде 12.02.2018 ж. берілген

№ 16895-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік.

Тақырыптық бағыты: *әлеуметтік ғылымдар саласындағы зерттеулерге арналған.*

Мерзімділігі: жылына 6 рет.

Тиражы: 300 дана.

Редакцияның мекен-жайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., тел.: 272-13-19

<http://www.bulletin-science.kz/index.php/en/>

© «Қазақстан Республикасының Ұлттық ғылым академиясы» РҚБ, 2024

ГЛАВНЫЙ РЕДАКТОР:

ТУЙМЕБАЕВ Жансеит Кансеитович, доктор филологических наук, профессор, почетный член НАН РК, ректор Казахского национального университета им. аль-Фараби (Алматы, Казахстан)

УЧЕНЫЙ СЕКРЕТАРЬ:

АБЫЛКАСЫМОВА Алма Есимбековна, доктор педагогических наук, профессор, академик НАН РК, директор Центра развития педагогического образования КазНПУ им. Абая (Алматы, Казахстан), **Н = 3**

РЕДАКЦИОННАЯ КОЛЛЕГИЯ:

САТЫБАЛДИН Азимхан Абылкаирович, доктор экономических наук, профессор, академик НАН РК, директор института Экономики (Алматы, Казахстан), **Н = 5**

САПАРБАЕВ Абдижапар Джуманович, доктор экономических наук, профессор, почетный член НАН РК, президент Международной академии инновационных технологий (Алматы, Казахстан), **Н = 6**

ЛУКЪЯНЕНКО Ирина Григорьевна, доктор экономических наук, профессор, заведующая кафедрой Национального университета «Киево-Могилянская академия» (Киев, Украина), **Н = 2**

ШИШОВ Сергей Евгеньевич, доктор педагогических наук, профессор, заведующий кафедрой педагогики и психологии профессионального образования Московского государственного университета технологий и управления имени К. Разумовского (Москва, Россия), **Н = 4**

СЕМБИЕВА Лязат Мыктыбековна, доктор экономических наук, профессор Евразийского национального университета им. Л.Н. Гумилева (Нур-Султан, Казахстан), **Н = 3**

АБИЛЬДИНА Салтанат Куатовна, доктор педагогических наук, профессор, заведующая кафедрой педагогики Карагандинского университета имени Е.А.Букетова (Караганда, Казахстан), **Н=3**

БУЛАТБАЕВА Кулжанат Нурымжановна, доктор педагогических наук, профессор, главный научный сотрудник Национальной академии образования имени Ы. Алтынсарина (Нур-Султан, Казахстан), **Н = 3**

РЫЖАКОВ Михаил Викторович, доктор педагогических наук, профессор, академик Российской академии образования, главный редактор журнала «Стандарты и мониторинг в образовании» (Москва, Россия), **Н=2**

ЕСИМЖАНОВА Сайра Рафихевна, доктор экономических наук, профессор Университета международного бизнеса (Алматы, Казахстан), **Н = 3**

«Вестник РОО «Национальной академии наук Республики Казахстан».

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Собственник: РОО «Национальная академия наук Республики Казахстан» (г. Алматы).
Свидетельство о постановке на учет периодического печатного издания в Комитете информации Министерства информации и коммуникаций и Республики Казахстан № **16895-Ж**, выданное 12.02.2018 г.

Тематическая направленность: *посвящен исследованиям в области социальных наук.*

Периодичность: 6 раз в год.

Тираж: 300 экземпляров.

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, ком. 219, тел. 272-13-19

<http://www.bulletin-science.kz/index.php/en/>

© РОО «Национальная академия наук Республики Казахстан», 2024

EDITOR IN CHIEF:

TUIMEBAYEV Zhansait Kanseitovich, Doctor of Philology, Professor, Honorary Member of NAS RK, Rector of Al-Farabi Kazakh National University (Almaty, Kazakhstan).

SCIENTIFIC SECRETARY:

ABYLKASSYMOVA Alma Esimbekovna, Doctor of Pedagogical Sciences, Professor, Executive Secretary of NAS RK, President of the International Academy of Innovative Technology of Abai Kazakh National Pedagogical University (Almaty, Kazakhstan), **H = 3**

EDITORIAL BOARD:

SATYBALDIN Azimkhan Abilkairovich, Doctor of Economics, Professor, Academician of NAS RK, Director of the Institute of Economics (Almaty, Kazakhstan), **H = 5**

SAPARBAYEV Abdizhapar Dzhumanovich, Doctor of Economics, Professor, Honorary Member of NAS RK, President of the International Academy of Innovative Technology (Almaty, Kazakhstan) **H = 4**

LUKYANENKO Irina Grigor'evna, Doctor of Economics, Professor, Head of the Department of the National University "Kyiv-Mohyla Academy" (Kiev, Ukraine) **H = 2**

SHISHOV Sergey Evgen'evich, Doctor of Pedagogical Sciences, Professor, Head of the Department of Pedagogy and Psychology of Professional Education of the Moscow State University of Technology and Management named after K. Razumovsky (Moscow, Russia), **H = 6**

SEMBIEVA Lyazzat Maktybekova, Doctor of Economic Science, Professor of the L.N. Gumilyov Eurasian National University (Nur-Sultan, Kazakhstan), **H = 3**

ABILDINA Saltanat Kuatovna, Doctor of Pedagogical Sciences, Professor, Head of the Department of Pedagogy of Buketov Karaganda University (Karaganda, Kazakhstan), **H = 3**

BULATBAYEVA Kulzhanat Nurymzhanova, Doctor of Pedagogical Sciences, Professor, Chief Researcher of the National Academy of Education named after Y. Altynsarın (Nur-Sultan, Kazakhstan), **H = 2**

RYZHAKOV Mikhail Viktorovich, Doctor of Pedagogical Sciences, Professor, academician of the Russian Academy of Education, Editor-in-chief of the journal «Standards and monitoring in education» (Moscow, Russia), **H = 2**

YESSIMZHANOVA Saira Rafikhevna, Doctor of Economics, Professor at the University of International Business (Almaty, Kazakhstan), **H = 3**.

Bulletin of the National Academy of Sciences of the Republic of Kazakhstan.

ISSN 2518-1467 (Online),

ISSN 1991-3494 (Print).

Owner: RPA «National Academy of Sciences of the Republic of Kazakhstan» (Almaty). The certificate of registration of a periodical printed publication in the Committee of information of the Ministry of Information and Communications

of the Republic of Kazakhstan **No. 16895-Ж**, issued on 12.02.2018.

Thematic focus: *it is dedicated to research in the field of social sciences.*

Periodicity: 6 times a year.

Circulation: 300 copies.

Editorial address: 28, Shevchenko str., of. 220, Almaty, 050010, tel. 272-13-19

<http://www.bulletin-science.kz/index.php/en/>

© National Academy of Sciences of the Republic of Kazakhstan, 2024

BULLETIN OF NATIONAL ACADEMY OF
SCIENCES OF THE REPUBLIC OF KAZAKHSTAN
ISSN 1991-3494
Volume 5. Number 411 (2024), 318–329
<https://doi.org/10.32014/2024.2518-1467.843>

UDC 06.71.63

A.M. Yessirkepova, R.K. Niyazbekova, D.M. Makhmud, 2024.
South Kazakhstan University named after M. Auezov, Shymkent, Kazakhstan.
E-mail: Dinara.Makhmud@aeuzov.edu.kz

RESEARCH OF THE ACTIVITIES OF PEASANT FARMS IN KAZAKHSTAN IN THE CONTEXT OF EFFECTIVE ENERGY CONSUMPTION

Yessirkepova Altyn Makhmudovna – Doctor of Economic Sciences, Professor, Department of Economics, South Kazakhstan University named after M. Auezov, Shymkent, Kazakhstan, e-mail: essirkepova@mail.ru, ORCID: <https://orcid.org/0000-0002-5028-238X>;

Niyazbekova Roza Kalmanbayevna - Doctor of Economic Sciences, Professor, Department of Economics, South Kazakhstan University named after M. Auezov, Shymkent, Kazakhstan, e-mail: roza.niyazbekova@gmail.com, ORCID: <https://orcid.org/0000-0001-6666-0456>;

Makhmud Dinara Marlenkyzy – Master of Economic Sciences, Doctoral Candidate, Department of Economics, South Kazakhstan University named after M. Auezov, Shymkent, Kazakhstan, e-mail: Dinara.Makhmud@aeuzov.edu.kz, ORCID: <https://orcid.org/0009-0005-6737-903X>.

Abstract. Some of the concepts that can be identified with agriculture in Kazakhstan include farmers and livestock breeders. Nowadays, the concept of agriculture is inextricably linked with the concepts of efficient energy consumption and "green" farming, thus there is a need to improve the use of renewable energy sources. Ensuring the efficient use of energy has advantages in the form of lower production costs and social benefits in the form of reducing carbon dioxide emissions to a level that does not harm the environment, in support of sustainable development of agricultural regions.

The purpose of the article is to analyze the impact of the use of renewable energy sources on the development of peasant farms. It is planned to identify factors related to renewable energy sources in terms of agricultural development, profitability, and their impact on the environmental component. In this context, an analytical comparison of installed renewable energy capacities and indicators of reducing the cost of CO₂ emissions due to energy-efficient technologies of the new generation was carried out.

Keywords: renewable energy sources, farms, energy consumption, economic efficiency, reduction of CO₂ emissions, simple linear regression.

The article was carried out within the framework of the funded project: IRN AP23487689 «Development of economic-mathematical model of increasing efficiency of natural resources utilization in agriculture of Turkestan region preventing climatic changes».

А.М. Есиркепова, Р.К. Ниязбекова, Д.М. Махмуд, 2024.

М. Әуезов атындағы Оңтүстік Қазақстан университеті,
Шымкент, Қазақстан.

E-mail: *Dinara.Makhmud@aeuzov.edu.kz*

ТИІМДІ ЭНЕРГИЯ ТҰТЫНУ КОНТЕКСІНДЕ ҚАЗАҚСТАНДАҒЫ ШАРУА ҚОЖАЛЫҚТАРЫНЫҢ ҚЫЗМЕТІН ЗЕРТТЕУ

Есиркепова Алтын Махмудовна – экономика ғылымдарының докторы, профессор, М. Әуезов Оңтүстік Қазақстан университеті, Шымкент, Қазақстан, e-mail: *essirkepova@mail.ru*, ORCID: <https://orcid.org/0000-0002-5028-238X>;

Ниязбекова Роза Калманбаевна - экономика ғылымдарының докторы, профессор, М. Әуезов Оңтүстік Қазақстан университеті, Шымкент, Қазақстан, e-mail: *roza.niyazbekova@gmail.com*, ORCID: <https://orcid.org/0000-0001-6666-0456>;

Махмуд Динара Марленқызы – экономика ғылымдарының магистрі, докторант, М. Әуезов Оңтүстік Қазақстан университеті, Шымкент, Қазақстан, e-mail: *Dinara.Makhmud@aeuzov.edu.kz*, ORCID: <https://orcid.org/0009-0005-6737-903X>.

Аннотация. Қазақстандағы ауыл шаруашылығымен сәйкестендіруге болатын кейбір тұжырымдамаларға фермерлер мен малшылар жатады. Қазіргі уақытта ауыл шаруашылығы ұғымы тиімді энергия тұтыну және "Жасыл" экономика ұғымдарымен тығыз байланысты, сондықтан жаңартылатын энергия көздерін пайдалануды жақсарту қажет. Энергияны тиімді пайдалануды қамтамасыз ету ауылшаруашылық аймақтарының тұрақты дамуын қолдау үшін көмірқышқыл газының шығарындыларын қоршаған ортаға зиян келтірмейтін деңгейге дейін төмендету түріндегі өндіріс шығындарын төмендету әлеуметтік артықшылықтарға ие.

Мақаланың мақсаты жаңартылатын энергия көздерін пайдаланудың шаруа қожалықтарының дамуына әсерін талдау. Атап айтқанда, ауыл шаруашылығын дамыту, рентабельділік және олардың экологиялық құрамдас бөлікке әсері тұрғысынан жаңартылатын энергия көздеріне байланысты факторларды белгілеу жоспарлануда. Осы тұрғыда ЖЭК-тің белгіленген қуаттары мен жаңа буынның энергияны үнемдейтін технологиялары арқылы CO₂ шығарындыларының төмендеу көрсеткіштері бойынша аналитикалық салыстыру жүргізілді.

Түйін сөздер: жаңартылатын энергия көздері, шаруа қожалықтары, энергия тұтыну, экономикалық тиімділік, CO₂ шығарындыларын азайту, қарапайым сызықтық регрессия.

Мақала қаржыландырылатын жоба шеңберінде орындалды: ЖТН АР23487689 «Климаттық өзгерістерді алдын алу үшін Түркістан облысы ауыл шаруашылығында пайдаланатын табиғи ресурстардың тиімділігін арттырудың экономикалық-математикалық моделін әзірлеу».

А.М. Есиркепова, Р.К. Ниязбекова, Д.М. Махмуд, 2024.

Южно-Казахстанский университет им. М. Ауэзова, Шымкент, Казахстан.

E-mail: Dinara.Makhmud@auuezov.edu.kz

ИССЛЕДОВАНИЕ ДЕЯТЕЛЬНОСТИ КРЕСТЬЯНСКИХ ХОЗЯЙСТВ В КАЗАХСТАНЕ В КОНТЕКСТЕ ЭФФЕКТИВНОГО ЭНЕРГОПОТРЕБЛЕНИЯ

Есиркепова Алтын Махмудовна – доктор экономических наук, профессор, Южно-Казахстанский университет им. М. Ауэзова, Шымкент, Казахстан, e-mail: essirkepova@mail.ru, ORCID: <https://orcid.org/0000-0002-5028-238X>;

Ниязбекова Роза Калманбаевна – доктор экономических наук, профессор, Южно-Казахстанский университет им. М. Ауэзова, Шымкент, Казахстан, e-mail: roza.niyazbekova@gmail.com, ORCID: <https://orcid.org/0000-0001-6666-0456>;

Махмуд Динара Марленкызы – магистр экономических наук, докторант, Южно-Казахстанский университет им. М. Ауэзова, Шымкент, Казахстан, e-mail: Dinara.Makhmud@auuezov.edu.kz, ORCID: <https://orcid.org/0009-0005-6737-903X>

Аннотация. Некоторые из концепций, которые можно отождествить с сельским хозяйством в Казахстане, включают фермеров и животноводов. В нынешнее время понятие сельского хозяйства неразрывно связано с концепциями эффективного энергопотребления и «зеленым» хозяйством, таким образом, существует необходимость в улучшении использования возобновляемых источников энергии. Обеспечение эффективного использования энергии имеет преимущества в виде снижения производственных затрат и социальную выгоду в виде снижения выбросов диоксида углерода до уровня, не наносящего ущерба окружающей среде, в поддержку устойчивого развития сельскохозяйственных регионов.

Целью статьи является анализ влияния использования возобновляемых источников энергии на развитие крестьянских хозяйств. В частности, планируется установить факторы, связанные с возобновляемыми источниками энергии, с точки зрения развития сельского хозяйства, рентабельности и их влияния на экологическую составляющую. В этом контексте было проведено аналитическое сравнение установленных мощностей ВИЭ и показателей снижения затрат на выбросы CO₂ за счет энергоэффективных технологий нового поколения.

Ключевые слова: возобновляемые источники энергии, крестьянские хозяйства, энергопотребление, экономическая эффективность, снижение выбросов CO₂, простая линейная регрессия

Статья выполнена в рамках финансируемого проекта: ИРН АР23487689 «Разработка экономико-математической модели повышения эффективности использования природных ресурсов в сельском хозяйстве Туркестанской области, предупреждающей климатические изменения»

Introduction

The rationale for selecting the research directions is based on the existing need to enhance the efficiency of energy use in Kazakhstan's peasant and farming households. Against the backdrop of global climate change and increasing demands on countries, including Kazakhstan, to meet environmental commitments, the use of renewable energy sources in the agricultural sector is becoming a priority. Agriculture is heavily reliant on traditional energy sources, particularly hydrocarbons, making it highly sensitive to fluctuations in energy prices and, moreover, to any energy crisis.

This is due to the fact that Kazakhstan's peasant households face high electricity costs, limited access to renewable energy sources (Smagulova, et al., 2022), and are vulnerable to new weather conditions. Consequently, renewable energy sources can be considered an effective solution to achieve energy security goals and reduce carbon dioxide emissions in agriculture, aligning with the global decarbonization process. However, Kazakhstan faces challenges such as the limited availability of renewable energy sources in rural areas (Kabdullov, 2024), insufficient awareness among farmers about these energy technologies, and restricted funding to implement energy-efficient measures.

The aim of this study is to discuss the potential prospects for the use of renewable energy sources and the improvement of energy consumption efficiency in Kazakhstan's peasant and farming households. The research will examine the relationship between the level of energy independence in farming households and the growing interest in renewable energy sources, assess the economic feasibility of employing energy-efficient technologies in the country's agricultural sector, and offer practical recommendations for their further development.

Materials and main methods

Literature review

The analysis of renewable energy utilization in agriculture is being actively implemented in several countries, yet this topic is most relevant for Kazakhstan, as the demand for energy is growing, and it is necessary to minimize the negative environmental impact. These methods should be considered from an international perspective, as the experience of other countries, when properly applied, can be utilized in Kazakhstan's agricultural sector.

In the study titled «Understanding Farmers' Intentions and Willingness to Adopt Renewable Energy Technologies» (Elahi, et al. 2022), the authors sought to determine how readily farmers in Pakistan utilize photovoltaic water pumps. The primary focus was on the social feasibility of the technology and the willingness of farmers to pay a premium for clean electricity. The results showed that younger farmers with higher levels of education and income were more likely to adopt renewable energy, while others refrained, mainly due to financial constraints and limited awareness of the benefits of renewable energy. Such conclusions may be significant for Kazakhstan, as it appears that farmers might similarly face challenges in financing and understanding the advantages of renewable energy. Government

intervention through support programs and awareness-raising initiatives is required to expand knowledge and encourage farmers to adopt small-scale renewable energy technologies.

In the work «The role of research and development in green economic growth through renewable energy development» (Fang, et al., 2022), the authors examined the impact of renewable energy research and development (R&D) on the economic growth of South Asian countries. The study found that industrial growth and technological advancement are key factors in reducing CO₂ emissions and fostering economic growth through the integration of renewable energy. However, research on renewable energy adoption conducted in European countries could also be applied to others; for instance, Kazakhstan could benefit from the predominant implementation of renewable energy on agricultural lands. This would not only help limit emissions but also contribute to the development of rural areas through a green economy.

According to a study titled «Assessment of environmental sustainability: identifying the relationship between CO₂ emissions and agricultural and renewable energy consumption» (He, 2024), traditional farming practices increase emissions, while renewable energy, conversely, reduces emissions and ensures sustainable development. As a country facing similar challenges in agriculture and energy, Kazakhstan could benefit from South Korea's successful experience in implementing renewable energy in the agricultural sector to reduce emissions and improve environmental conditions.

In the article titled «Renewable energy sources and sustainable agriculture: a review of indicators» (Bathaei, et al, 2023), the authors devote significant attention to renewable energy-based agricultural production and its potential minimal negative environmental impact. They also emphasize the importance of using modern methods for assessing the efficiency of renewable energy in sustainable agriculture. It would be beneficial for farmers and various governmental bodies to have new and more precise sustainability indicators that reflect the impact of renewable energy sources on Kazakhstan's agricultural sector.

In their article «Rational use of Agricultural land in Kazakhstan» (Yelemessov, et al., 2022) analyze the institutional frameworks for the effective use of agricultural land in Kazakhstan's multicultural economy. According to the authors, there is a serious issue regarding the organization of sustainable and competitive land use when forming rational land management. In the context of a developing land market, ensuring a high level of commodity production and sufficient profitability becomes a key task. The article also notes that improving land use efficiency in farms with different forms of ownership depends on increasing labor productivity, optimizing economic regimes, and maximizing the use of internal reserves.

In the article «Sustainable Development Agriculture in the Republic of Kazakhstan» (Tokbergenova, 2018) an author analyzes issues related to the sustainable development of Kazakhstan's agricultural sector, with the authors focusing on problems associated with ensuring sustainability in agriculture. The diversity of natural and climatic conditions, as well as the availability of extensive

pasturelands in desert and semi-desert regions, has made traditional agriculture an indispensable means of ensuring the country's food security.

Finally, the study titled «Renewable energy sources and sustainable agriculture» (Aldhshan, et al. 2021), discusses the importance of renewable energy in ensuring sustainable agriculture globally. This article also describes various methods for assessing extraterrestrial solar radiation and determining optimal locations for photovoltaic farms. These methods can also be applied to identify potential areas for the development of solar power plants in Kazakhstan, particularly in the southern and western regions, which appear to have the highest potential for utilizing solar resources.

Analysis

The global economy is experiencing a substantial rise in demand for energy and associated services, driven by the necessity to support socio-economic development and improve the population's quality of life. Energy supply is a fundamental component for meeting citizens' basic needs, such as lighting, heating, cooking, and access to communication, as well as for enhancing production capacity (Kaygusuz, 2007).

However, the growing reliance on fossil energy sources like coal, oil, and gas is contributing to a rapid increase in greenhouse gas emissions, which negatively impacts the environment (Van Ruijven, et al, 2009). Economic structures and the selection of fuel and energy resources directly influence the volume of these emissions.

Kazakhstan, as one of the countries with high greenhouse gas emissions per unit of GDP, faces the necessity to transition to renewable energy sources (RES) for heat and electricity production, alongside improvements in energy efficiency. These measures are regarded as key tools to mitigate the adverse effects on the climate and the environment (Wang, et al, 2024).

Thus, data were collected to compare the levels of agricultural activity and energy consumption over the period from 2014 to 2022 (Kim, 2021) (Medieva, et al., 2024). Second-order polynomial interpolation sums were employed to estimate the coefficients. There is an abundance of additional data for 2014 and 2020, and the coefficients for these years were calculated based on the given data sets. This method proves effective for applied analysis, particularly when high data recovery speeds are required, as well as for coordinating and stabilizing growth, taking into account their nonlinear nature.

For example, cross-analysis and linear regression procedures were used to study the efficiency of renewable energy sources in meeting various household needs. An economic efficiency analysis was thus conducted, based on the cost savings from gas consumption and the reduction of CO₂ emissions, enabling a forecast for the coming years.

Interpolation of RES capacity:

$$P(x) = a \times x^2 + b \times x + c \quad (1)$$

Where:

$P(x)$ – the desired capacity in year x ;

a, b, c – coefficients calculated based on data from 2014 and 2021.

For further research, we will also require the functions of simple linear regression:

$$Y = \beta_0 + \beta_1 \times X + \varepsilon \tag{2}$$

Where:

Y – the dependent variable;

X – the independent variable;

β_0, β_1 – the parameters we seek;

ε – the error (noise) not explained by the model.

And correlation:

$$r = \frac{\sum(X_i - \bar{X}) \times (Y_i - \bar{Y})}{\sqrt{\sum(X_i - \bar{X})^2 \times \sum(Y_i - \bar{Y})^2}} \tag{3}$$

Where:

X_i, Y_i – values of the variables;

\bar{X}, \bar{Y} – mean values of the variables;

r – correlation coefficient.

Thus, polynomial interpolation (1) allowed us to calculate data for each year between 2014 and 2021, as well as 2022. However, the growth in capacity and the reduction in emissions vary due to the nonlinear nature of the function (see Table 1).

Table 1. Results of polynomial interpolation for 2015-2022

Year	Installed Capacity (MW)	CO ₂ Reduction (tons)	Cost Savings (\$)	Regional Capacity (MW)	Technological Efficiency (MW)
2014	100,0	200,0	150,0	120,0	130,0
2015	126,7	254,3	196,4	162,9	164,3
2016	157,3	316,9	253,7	212,6	205,7
2017	192,0	387,7	312,9	268,0	206,8
2018	230,7	466,9	372,9	329,1	310,0
2019	273,3	401,3	433,7	396,0	372,9
2020	320,0	650,0	495,4	468,6	503,6
2021	500,0	850,0	700,0	400,0	520,0
2022	553,3	964,3	790,7	485,7	587,1

Now, based on the available data, we will utilize the method of simple linear regression (2) to identify the relationship between the variables (see Figure 1).

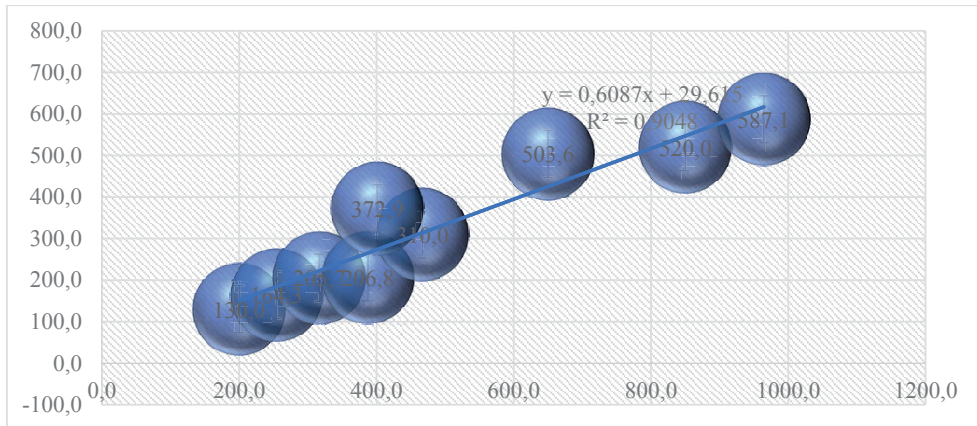


Figure 1. Simple Simple Linear Regression between CO₂ Reduction (tons) and Technological Efficiency (MW) based on the results of polynomial interpolation

Based on the regression, the linear regression function for our analysis is as follows:

$$Y = 0.6087x + 29.615 \tag{5}$$

Next, to verify the existing function, we should conduct a forecast function and the equation of the line (see Figure 2).

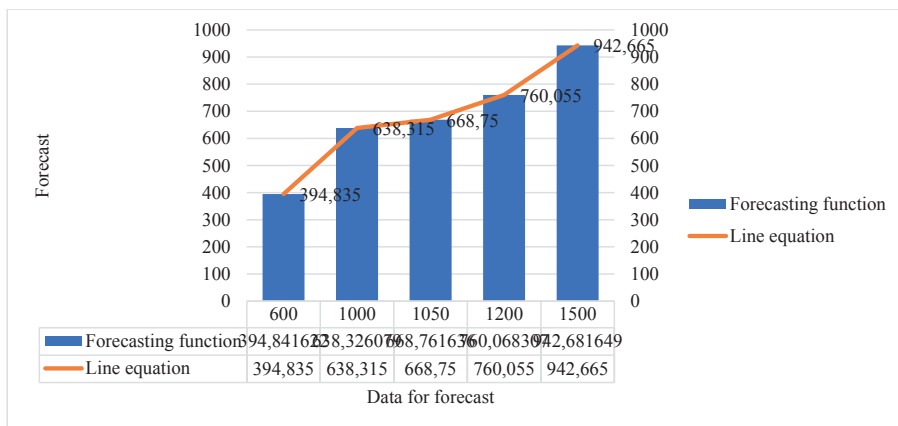


Figure 2. Forecast Function and Line Equation for CO₂ Reduction (tons) and Technological Efficiency (MW)

Now, we will identify the correlation using formula (3) for each parameter from Table 1 in relation to technological efficiency of RES (see Figure 3).

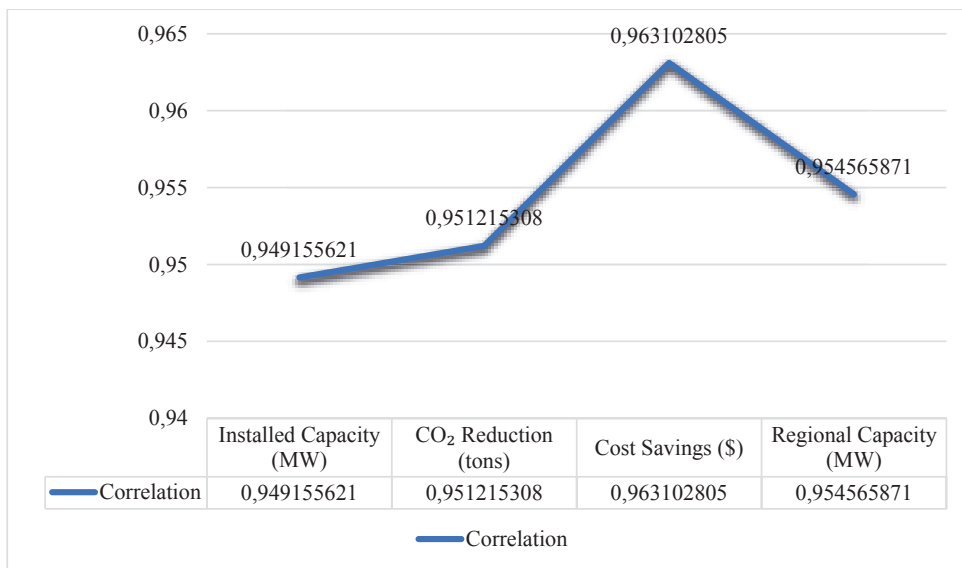


Figure 3. Correlation between Technological Efficiency (MW) and Installed Capacity (MW), CO₂ Reduction (tons), Cost Savings (\$), Regional Capacity (MW)

The findings of the study revealed a high correlation (>0.94) between all the variables examined. Thus, it can be concluded that improvements in one indicator will inevitably lead to an increase in another. However, it is also important to note that even the presence of a positive relationship does not guarantee overall strong performance. For instance, the Republic of Kazakhstan is among the leading countries in terms of per capita carbon dioxide emissions, yet the proportion of the state budget allocated to financing environmentally significant technologies pales in comparison to the top 50 GDP-ranked countries. Based on this, we conclude that the country needs to focus on enhancing governmental support and fostering technological progress through funding the development and implementation of new efficient renewable energy sources.

The concepts of a "green economy," "green" growth, and sustainable development have brought together representatives of international organizations, government bodies, and civil society in response to recent global crises. "Green" growth aims to simultaneously achieve economic growth while addressing climate change, costly environmental degradation, and inefficient use of natural resources. In this regard, the development of the "green economy" agenda is seen as a comprehensive approach to overcoming the triple crisis: economic, energy, and environmental. Currently, the world is paying particular attention to issues of sustainable development and "green" growth. International organizations such as the United Nations, OECD, and the World Bank are actively working in this direction. The driving force of globalization is the modernization and transition of the global economy, particularly in industrially developed countries, to a new technological paradigm. This shift, alongside the

qualitative renewal of the technological base, increasing production efficiency, and enhancing the competitiveness of the economy, is aimed at improving the quality of life and living conditions. Globally, the economic policy of "green" growth was officially adopted by the Organization for Economic Cooperation and Development (OECD) in 2009 as a strategic direction for the long-term (up to 2030) and more distant (up to 2050) development of all its member states (Porfiryev, 2013).

Despite the constraining effects of the crisis in the short- and medium-term outlook (until 2020), the importance of the "green" sector of the economy, particularly in the domain of clean energy, is expected to intensify. According to various forecasts, over the next 20–25 years, the vast majority of G20 nations are anticipated to witness rapid growth and a substantial increase in the share of the "green economy," with an emphasis on the development of environmentally sustainable energy sources (Chernomorova, 2016).

In Kazakhstan, the exploitation of renewable energy sources (RES) remains limited despite the considerable potential for their expansion. Nonetheless, the nation is making significant strides toward sustainable development, as evidenced by its ratification of the Paris Agreement in 2016 (The Law of the Republic of Kazakhstan dated November 4, 2016). This agreement seeks to establish a national action plan aimed at addressing climate change and supporting the reduction of carbon emissions in the economy.

A reduction in Kazakhstan's carbon footprint could be achieved by substituting coal with cleaner energy sources such as natural gas and renewable energy. In addition to enhancing air quality, this transition fosters an environment conducive to attracting investments in the "green" economy.

Results

The analysis of the data revealed that the integration of renewable energy technologies in Kazakhstan's agricultural enterprises has a beneficial effect on both economic and environmental efficiency. The reduction of CO₂ emissions, alongside significant cost savings, not only enhances the resilience of agricultural enterprises but also contributes to their long-term development. Polynomial interpolation demonstrated its efficacy in forecasting data in the absence of information for specific years, while correlation and linear regression methods corroborated the positive relationship between the advancement of RES and improvements in economic performance.

Discussion

Speaking about the efficiency of the use of renewable energy sources in agriculture conducted in other countries, it can be stated that there is a high potential for reducing CO₂ emissions, improving energy efficiency and energy costs. Otherwise, following the examples of Pakistan, South Korea and other countries, given the great potential of Kazakhstan in the development of solar and wind energy sources, it is possible to try to implement specific strategies for the development of the agricultural

sector related to renewable energy sources. Based on the current state of affairs, it is possible to outline in advance several initial guidelines for the constant promotion of peasant farms in the field of renewable energy sources. First of all, attention should be paid to the concept of state support, since the further continuation of subsidy and support programs in the field of renewable energy sources will promote the use of new energy-saving technologies. This applies even more to areas that have a relatively higher probability of using solar and wind energy. Secondly, it is necessary to subsidize the development of technologies by providing financing for the development of new efficient sources of renewable energy. Based on interpolation and regression methods, energy consumption and yields can be predicted to help farmers plan resource use to avoid or minimize risks that reduce farm profitability.

Conclusion

The study also suggested to increase farmers' awareness of the potential to utilize renewable energy sources, as well as to implement new energy efficient technologies. This means the need for state support in form of subsidies as well as education programs and other strategies aimed at increasing the adoption of modern technologies in agriculture.

The application of the obtained findings is within the proposal of measures and further agricultural commercialization to expand RE use in the farms with better energy performance and immune against the extrinsic economic and environmental shocks. The possibilities for further research in this direction are the investigation of economic efficiency of different types of renewable sources of energy for farms, and the creation of models of state encouragement and funding that might contribute to the implementation of sustainable technologies in the sphere of agriculture.

References

- Aldhshan S. R. S. et al. Energy consumption and spatial assessment of renewable energy penetration and building energy efficiency in Malaysia: A review //Sustainability. – 2021. – T. 13. – №. 16. – C. 9244. DOI: 10.3390/su13169244 (in Russ.).
- Bathaei A., Štreimikienė D. Renewable energy and sustainable agriculture: Review of indicators // Sustainability. – 2023. – T. 15. – №. 19. – C. 14307. DOI: 10.3390/su151914307
- Chernomorova T. V. ACTIVITIES OF THE UNITED NATIONS AND OTHER INTERNATIONAL ORGANIZATIONS IN THE FIELD OF PROMOTING THE "GREEN ECONOMY" MODEL //"Green Economy" as a global development strategy in the post-crisis world. – 2016. – No. 2016. – pp. 58-106 (in Russ.).
- Elahi E., Khalid Z., Zhang Z. Understanding farmers' intention and willingness to install renewable energy technology: A solution to reduce the environmental emissions of agriculture //Applied Energy. – 2022. – T. 309. – C. 118459. DOI: 10.1016/j.apenergy.2021.118459
- Fang W., Liu Z., Putra A. R. S. Role of research and development in green economic growth through renewable energy development: empirical evidence from South Asia //Renewable Energy. – 2022. – T. 194. – C. 1142-1152. DOI: 10.1016/j.renene.2022.04.125
- He Y. Evaluating Environmental Sustainability: The Role of Agriculture and Renewable Energy in South Korea //Agriculture. – 2024. – T. 14. – №. 9. – C. 1500. DOI: 10.3390/agriculture14091500
- Kabdullov M. H. IMPROVING THE ENERGY EFFICIENCY OF THE HOUSING SECTOR IN THE CONTEXT OF THE FORMATION OF A LOW-CARBON ECONOMY IN KAZAKHSTAN. - 2024.

Kaygusuz K. Energy for sustainable development: key issues and challenges //Energy Sources, Part B: Economics, Planning, and Policy. – 2007. – T. 2. – №. 1. – C. 73-83. DOI: 10.1080/15567240500402560

Kim N. The renewable energy market in Kazakhstan: potential, challenges and prospects //Review, objectives and conclusions of the study.-2021.–slide. – Vol. 5 (in Russ.).

Law of the Republic of Kazakhstan dated November 4, 2016 No. 20-VI SAM «On ratification of the Paris Agreement». Information and legal system of the NPA of the Republic of Kazakhstan:URL: <https://adilet.zan.kz/rus/docs/Z1600000020> (in Russ.).

Medieva G.A. et al. Analysis of the possibility of introducing various renewable energy technologies, including heat supply, cooling and hot water supply (HW) in different geographical areas, taking into account the resource potential. The UNDP-GEF project "Reducing the risks of investing in renewable energy sources". Available at the link: <http://surl.мы/мемнеп> (in Russ.).

Porfiriev B. «Green» Economy: Realities, prospects and limits of Growth (Carnegie Working Materials) / Carnegie Moscow Center. – 2013. – April. – URL: http://carnegieendowment.org/files/WP_Porfiriev_web.pdf (in Russ.).

Smagulova S. et al. Prospects for digitalization of energy and agro-industrial complex of Kazakhstan //International Journal of Energy Economics and Policy. – 2022. – T. 12. – №. 2. – C. 198-209. DOI: 10.32479/ijeeep.12859

Tokbergenova A., Kiyassova L., Kairova S. Sustainable Development Agriculture in the Republic of Kazakhstan //Polish Journal of Environmental Studies. – 2018. – T. 27. – №. 5. DOI: doi.org/10.15244/pjoes/78617

Van Ruijven B., Van Vuuren D. P. Oil and natural gas prices and greenhouse gas emission mitigation //Energy Policy. – 2009. – T. 37. – №. 11. – C. 4797-4808. DOI: 10.1016/j.enpol.2009.06.037

Wang J., Azam W. Natural resource scarcity, fossil fuel energy consumption, and total greenhouse gas emissions in top emitting countries //Geoscience Frontiers. – 2024. – T. 15. – №. 2. – C. 101757. DOI: 10.1016/j.gsf.2023.101757

Yelemessov S., Zhildikbayeva A. RATIONAL USE OF AGRICULTURAL LAND IN KAZAKHSTAN //Journal Baltic Surveying. – 2022. – T. 17. DOI: 10.22616/j.balticsurveying.2022.17.006

CONTENTS**PEDAGOGY**

E.T. Adylbekova, N.F. Sarsenbieva, K.M. Kulzhataeva WAYS OF EFFECTIVE IMPLEMENTATION OF ELECTRONIC RESOURCES IN THE EDUCATIONAL PROCESS.....	5
A.A. Azatbakyt, A.M. Kartayeva, A.T. Tamayev ANALYZING AND TEACHING THE PSYCHOLOGY OF CHARACTERS IN THE STORIES OF M. AUEZOV.....	20
L.S. Dzhumanova, A.S. Sagindykova, G.M. Kadyrova FORMATION OF STUDENTS' TEXT READING COMPETENCE IN GERMAN LANGUAGE LESSONS.....	32
D.M. Zharylgapova, A.A. Almagambetova, U.A. Abitayeva DEVELOPMENT OF COMPETENCES OF STUDENTS IN TEACHING PHYSICS BY USING COMPUTER MODELS.....	45
G.G. Ibragimov, A.P. Mynbaeva, K.Zh. Saparbayeva DEVELOPMENT OF ESSAY WRITING SKILLS OF PUPILS BASED ON THE ART OF RHETORIC.....	62
R.Zh. Ismanova, G.K. Akhmetova SPEECH THERAPY AND THE BASICS OF NEUROPSYCHOLOGY.....	79
L. Kazykhankyzy, D. Babakhanova FUTURE ENGLISH TEACHERS' USE OF SELF-REGULATED LEARNING STRATEGIES IN DEVELOPING LANGUAGE PROFICIENCY.....	96
B.D. Karbozova, M. Imankulova, A. B. Shormakova FORMATION OF CREATIVE THINKING SKILLS IN THE STUDY OF THE KAZAKH LANGUAGE.....	109
G.T. Kurbankulova, A.S. Stambekova WAYS TO PREPARE FUTURE PRIMARY EDUCATION TEACHERS FOR INSTILLING NATIONAL VALUES IN THE STUDENTS.....	120
G. Kozhasheva, A.A. Bazhi, M.I. Yesenova, L. Nassir METHODOLOGICAL APPROACHES TO ASSESSING STUDENTS' ACADEMIC ACHIEVEMENTS IN MATHEMATICS IN THE CONTEXT OF DIGITALIZATION OF EDUCATION.....	134

U.S. Marchibayeva

DEVELOPMENT OF ADAPTIVE PHYSICAL CULTURE AND SPORTS IN THE EDUCATIONAL SYSTEM OF THE REPUBLIC OF KAZAKHSTAN: PEDAGOGICAL CHALLENGES AND RESEARCH PROSPECTS.....148

R.Zh. Mrzabayeva, N.M. Abdulkadyrov, G.U. Akhmetshina

INCREASING SUBJECT COMPETENCE AT THE BERLIN CONGRESS ON OTTO VON BISMARCK'S POLITICAL POSITIONS IN RELATION TO THE OTTOMAN EMPIRE.....165

A.N. Omarov, O. Kozhabergen, G.R. Kurmasheva

PRACTICE-ORIENTED TEACHING OF STUDENTS AT THE UNIVERSITY.....185

A.A. Seitaliyeva, N.T. Shyndaliyev, A.Sh. Barakova

TRAINING OF FUTURE TEACHING STAFF IN THE CONTEXT OF DUAL EDUCATION.....197

G. Tanabayeva, A. Boranbayeva

WAYS TO DEVELOP THE VOCABULARY OF CHILDREN WITH INTELLECTUAL DISABILITIES OF PRESCHOOL AGE THROUGH FAIRY TALES.....210

A.K. Urazova, G. A. Tuyakbaev, K.T. Kudaibergenova

EFFECTIVE METHODS OF TEACHING THE EPISTOLOGICAL HERITAGE OF ABDILDA TAZHIBAEV.....227

G. Utemissova, A. Alimbekova, A. Bulshekbayeva

THE RELATIONSHIP BETWEEN CYBERBULLYING AND AGGRESSIVE VICTIMIZATION.....241

Sh.Sh. Khamzina, A.M. Utilova, T.Zh. Shakenova

EFFECTIVENESS OF THE MENTORING SYSTEM IN SCHOOLS.....257

ECONOMICS

G.Y. Amalbekova, A.N. Narenova, S.B. Nauryzkulova

GLOBAL POULTRY MARKET: CURRENT DEVELOPMENT TRENDS AND EXPORT POTENTIAL OF KAZAKHSTAN.....276

K.T. Auyezova, Zh.M. Bulakbay, A.A. Zhakupov

PROJECT MANAGEMENT IN THE STRATEGIC PLANNING OF ENERGY INDUSTRY ENTERPRISES.....295

A.Yelubayeva, Ceslovas Christauskas INCREASING THE HUMAN RESOURCES POTENTIAL OF STATE AUDIT BODIES AS A BASIS FOR IMPROVING THE EFFICIENCY AUDIT MECHANISM.....	307
A.M. Yessirkepova, R.K. Niyazbekova, D.M. Makhmud RESEARCH OF THE ACTIVITIES OF PEASANT FARMS IN KAZAKHSTAN IN THE CONTEXT OF EFFECTIVE ENERGY CONSUMPTION.....	318
Sh.A. Zhumadilla, M.R. Sikhimbayev, D.R. Sikhimbayeva STATE REGULATION OF SUBSOIL USE OF THE REPUBLIC OF KAZAKHSTAN: ECOLOGY AND INNOVATIONS.....	330
A.S. Karbozova, A.Z. Bukharbayeva, G.B. Duzelbaeva THEORETICAL ASPECTS OF THE ECONOMIC MECHANISM OF AGRICULTURAL PRODUCTION MANAGEMENT.....	345
T. Kuangaliyeva, Zh. Yerzhanova, G. Mukasheva SHEEP BREEDING IN KAZAKHSTAN: CHALLENGES OF MODERN DEVELOPMENT.....	359
A. Makenova, A. Oralbayeva, A.Kizimbayeva SUSTAINABLE DEVELOPMENT OF RURAL AREAS OF KAZAKHSTAN: CURRENT STATE.....	374
J.K. Romazanov, T.J. Niyazov, T.A. Karipov PROSPECTS FOR THE DEVELOPMENT OF THE CREDIT MARKET N KAZAKHSTAN.....	389
L.M. Shayakhmetova, A.M.Kurmanov, S.T. Aitimova IMPROVEMENT OF OCCUPATIONAL SAFETY IN THE REPUBLIC OF KAZAKHSTAN: ASSESSMENT OF PROFESSIONAL RISKS AND STRATEGIES FOR ACCIDENT INSURANCE IN THE WORKPLACE.....	401

МАЗМҰНЫ

ПЕДАГОГИКА

Э.Т. Адылбекова, Н.Ф. Сарсенбиева, К.М. Құлжатаева ЭЛЕКТРОНДЫҚ РЕСУРСТАРДЫ ОҚУ ҮДЕРІСІНЕ ТИІМДІ ЕНГІЗУ ЖОЛДАРЫ.....	5
А.А. Азатбақыт, А.М. Картаева, А.Т. Тамаев М. ӘУЕЗОВ ӘНГІМЕЛЕРІНДЕГІ КЕЙІПКЕР ПСИХОЛОГИЯСЫН ТАЛДАП ОҚЫТУ.....	20
Л.С. Жұманова, А.С. Сағындықова, Г.М. Қадырова НЕМІС ТІЛІ САБАҚТАРЫНДА СТУДЕНТТЕРДІҢ МӘТІНДІ ОҚУ ҚҰЗЫРЕТТІЛІГІН ҚАЛЫПТАСТЫРУ.....	32
Д.М. Жарылғапова, А.А. Алмагамбетова, У.А. Абитаева КОМПЬЮТЕРЛІК МОДЕЛДЕРДІ ПАЙДАЛАНУ АРҚЫЛЫ ФИЗИКА ПӘНІН ОҚЫТУДА БІЛІМ АЛУШЫЛАРДЫҢ ҚҰЗЫРЕТТІЛІКТЕРІН ҚАЛЫПТАСТЫРУ.....	45
Г.Г. Ибрагимов, А.П. Мыңбаева, Қ.Ж. Сапарбаева ШЕШЕНДІК ӨНЕР НЕГІЗІНДЕ ОҚУШЫЛАРДЫҢ ЭССЕ ЖАЗУ ДАҒДЫЛАРЫН ДАМЫТУ.....	62
Р.Ж. Исманова, Г.К. Ахметова ЛОГОПЕДИЯ ЖӘНЕ НЕЙРОПСИХОЛОГИЯ НЕГІЗДЕРІ.....	79
Л. Қазыханқызы, Д. Бабаханова БОЛАШАҚ АҒЫЛШЫН ТІЛІ МҰҒАЛІМДЕРІНІҢ БІЛІМ АЛУДА ӨЗІН-ӨЗІ РЕТТЕУ СТРАТЕГИЯЛАРЫН ПАЙДАЛАНУ АРҚЫЛЫ ТІЛДІК ҚАБІЛЕТІН ДАМЫТУ.....	96
Б.Д. Карбозова, М. Иманқұлова, А.Б. Шормақова ҚАЗАҚ ТІЛІН ОҚЫТУ БАРЫСЫНДА ШЫҒАРМАШЫЛЫҚ ОЙЛАУ ДАҒДЫСЫН ҚАЛЫПТАСТЫРУ.....	109
Г.Т. Курбанқұлова, Ә.С. Стамбекова БОЛАШАҚ БАСТАУЫШ БІЛІМ ПЕДАГОГТЕРІН ОҚУШЫЛАРДЫ ҰЛТТЫҚ ҚҰНДЫЛЫҚҚА БАУЛУҒА ДАЯРЛАУ ЖОЛДАРЫ.....	120

Г.О. Кожашева, А.А. Бажи, М.И.Есенова, Л. Нәсір
 БІЛІМ БЕРУДІ ЦИФРЛАНДЫРУ ЖАҒДАЙЫНДА ОҚУШЫЛАРДЫҢ
 МАТЕМАТИКА ПӘНІНЕН ОҚУ ЖЕТІСТІГІН БАҒАЛАУДЫҢ
 ӘДІСТЕМЕЛІК ТӘСІЛДЕРІ.....134

Ұ.С. Марчибаева
 ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ БІЛІМ БЕРУ ЖҮЙЕСІНДЕ
 БЕЙІМДІК ДЕНЕ ШЫНЫҚТЫРУ МЕН СПОРТТЫ ДАМУЫ:
 ПЕДАГОГИКАЛЫҚ МІНДЕТТЕР МЕН ЗЕРТТЕУ БОЛАШАҒЫ.....148

Р.Ж. Мрзабаева, Н.М. Абдукадыров, Г.У. Ахметшина
 БЕРЛИН КОНГРЕСІНДЕ ОТТО ФОН БИСМАРТІҢ ОСМАН
 ИМПЕРИЯСЫНА ҚАТЫСТЫ САЯСИ ҰСТАНЫМДАРЫ ТУРАЛЫ ПӘНДІК
 ҚҰЗІРЕТТІЛІКТІ АРТТЫРУ.....165

А.Н. Омаров, О. Қожаберген, Г.Р. Құрмашева
 УНИВЕРСИТЕТТЕ БІЛІМ АЛУШЫЛАРДЫ ТӘЖІРИБЕГЕ БАҒЫТТАП
 ОҚЫТУ.....185

А.А. Сейталиева, Н.Т. Шындалиев, А.Ш. Баракова
 ДУАЛДЫ БІЛІМ БЕРУ ЖАҒДАЙЫНДА БОЛАШАҚ ПЕДАГОГИКАЛЫҚ
 КАДРЛАРДЫ ДАЯРЛАУ.....197

Г.Т. Танабаева, А.Р. Боранбаева
 МЕКТЕП ЖАСЫНА ДЕЙІНГІ ЗЕРДЕ БҰЗЫЛЫСТАРЫ БАР БАЛАЛАРДЫҢ
 СӨЗДІК ҚОРЫН ЕРТЕГІЛЕР АРҚЫЛЫ ДАМУЫ ЖОЛДАРЫ.....210

А.К. Уразова, Ғ.Ә. Тұяқбаев, К.Т. Құдайбергенова, А. Жолмаханова
 ӘБДІЛДА ТӘЖІБАЕВТЫҢ ЭПИСТОЛЯРЛЫҚ МҰРАСЫН ОҚЫТУДЫҢ
 ТИІМДІ ӘДІСТЕРІ.....227

Г.У. Утемисова, А.А. Алимбекова, А.И. Булшекбаева
 КИБЕРБУЛЛИНГ ПЕН АГРЕССИВТІ ЖӘБІРЛЕНУШІНІҢ МІНЕЗ-
 ҚҰЛҚЫНЫҢ ӨЗАРА БАЙЛАНЫСЫ.....241

Ш.Ш. Хамзина, А.М. Утилова, Т.Ж. Шакенова
 МЕКТЕПТЕРДЕГІ ТӘЛІМГЕРЛІК ЖҮЙЕНІҢ ТИІМДІЛІГІ.....257

ЭКОНОМИКА

Г.Е. Амалбекова, А.Н. Наренова, С.Б. Наурызқұлова
 ӘЛЕМДІК ҚҰС ЕТІ НАРЫҒЫ: ҚАЗІРГІ ДАМУ ТЕНДЕНЦИЯСЫ ЖӘНЕ
 ҚАЗАҚСТАННЫҢ ЭКСПОРТТЫҚ ӘЛЕУЕТІ.....276

К.Т. Ауезова, Ж.М. Бұлақбай, А.А. Жакупов
ЭНЕРГЕТИКА САЛАСЫНДАҒЫ КӘСПОРЫНДАРДЫ СТРАТЕГИЯЛЫҚ
ЖОСПАРЛАУДАҒЫ ЖОБАЛАРДЫ БАСҚАРУ.....295

А. Елубаева, Чесловас Кристаускас
МЕМЛЕКЕТТІК АУДИТ ОРГАНДАРЫНЫҢ КАДРЛЫҚ ӘЛЕУЕТІН
АРТТЫРУ ТИІМДІЛІК АУДИТІНІҢ ТЕТІГІН ЖЕТІЛДІРУ НЕГІЗІ
РЕТІНДЕ.....307

А.М. Есиркепова, Р.К. Ниязбекова, Д.М. Махмуд
ТИІМДІ ЭНЕРГИЯ ТҰТЫНУ КОНТЕКСІНДЕ ҚАЗАҚСТАНДАҒЫ ШАРУА
ҚОЖАЛЫҚТАРЫНЫҢ ҚЫЗМЕТІН ЗЕРТТЕУ.....318

Ш.А. Жұмадилла, М.Р. Сихимбаев, Д.Р. Сихимбаева
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНЫҢ ЖЕР ҚОЙНАУЫН ПАЙДАЛАНУДЫ
МЕМЛЕКЕТТІК РЕТТЕУ: ЭКОЛОГИЯ ЖӘНЕ ИННОВАЦИЯЛАР.....330

А.С. Карбозова, А.Ж. Бұхарбаева, Г.Б. Дузельбаева
АУЫЛШАРУАШЫЛЫҒЫ ӨНДІРІСІН БАСҚАРУДЫҢ ЭКОНОМИКАЛЫҚ
МЕХАНИЗМІНІҢ ТЕОРИЯЛЫҚ АСПЕКТІЛЕРІ.....345

Т. Куангалиева, Ж.Ержанова, Г. Мукашева
ҚАЗАҚСТАНДАҒЫ ҚОЙ ШАРУАШЫЛЫҒЫ: ҚАЗІРГІ ЗАМАНҒЫ ДАМУ
МӘСЕЛЕЛЕРІ.....359

А.А. Макенова, А.К. Оралбаева, А. Кизимбаева
ҚАЗАҚСТАННЫҢ АУЫЛДЫҚ АУМАҚТАРЫНЫҢ ТҰРАҚТЫ ДАМУЫ:
ҚАЗІРГІ ЖАҒДАЙЫ.....374

Ж.К. Ромазанов, Т.Ж. Ниязов, Т.А. Карипов
ҚАЗАҚСТАННЫҢ КРЕДИТТІК НАРЫҒЫН ДАМУ
ПЕРСПЕКТИВАЛАРЫ.....389

Л.М. Шаяхметова, А.М. Курманов, Ш.Т. Айтимова
ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДА ЕҢБЕКТІ ҚОРҒАУДЫ ЖЕТІЛДІРУ:
КӘСПТІК ТӘУЕКЕЛДЕРДІ БАҒАЛАУ ЖӘНЕ ӨНДІРІСТЕГІ ЖАЗАТАЙЫМ
ОҚИҒАЛАРДАН САҚТАНДЫРУ СТРАТЕГИЯСЫ.....401

СОДЕРЖАНИЕ

ПЕДАГОГИКА

Э.Т. Адылбекова, Н.Ф. Сарсенбиева, К.М. Кулжатаева СПОСОБЫ ЭФФЕКТИВНОГО ВНЕДРЕНИЯ ЭЛЕКТРОННЫХ РЕСУРСОВ В УЧЕБНЫЙ ПРОЦЕСС.....	5
А.А. Азатбакыт, А.М. Картаева, А.Т. Тамаев АНАЛИЗ И ОБУЧЕНИЕ ПСИХОЛОГИИ ПЕРСОНАЖЕЙ РАССКАЗОВ М. АУЭЗОВА.....	20
Л.С. Джуманова, А.С. Сагиндыкова, Г.М. Кадырова ФОРМИРОВАНИЕ КОМПЕТЕНЦИИ ЧТЕНИЯ ТЕКСТОВ СТУДЕНТАМИ НА ЗАНЯТИЯХ НЕМЕЦКОГО ЯЗЫКА.....	32
Д.М. Жарылгапова, А.А. Алмагамбетова, У.А. Абитаева РАЗВИТИЕ КОМПЕТЕНЦИЙ ОБУЧАЮЩИХСЯ В ПРЕПОДАВАНИИ ФИЗИКИ ПУТЕМ ИСПОЛЬЗОВАНИЯ КОМПЬЮТЕРНЫХ МОДЕЛЕЙ.....	45
Г.Г. Ибрагимов, А.П. Мынбаева, К.Ж. Сапарбаева РАЗВИТИЕ НАВЫКОВ НАПИСАНИЯ ЭССЕ У УЧАЩИХСЯ НА ОСНОВЕ ИСКУССТВА РИТОРИКИ.....	62
Р.Ж. Исманова, Г.К. Ахметова ЛОГОПЕДИЯ И ОСНОВЫ НЕЙРОПСИХОЛОГИИ.....	79
Л. Казыханкызы, Д. Бабаханова ИСПОЛЬЗОВАНИЕ СТРАТЕГИЙ САМОРЕГУЛИРОВАНИЯ В РАЗВИТИИ ЯЗЫКОВОГО МАСТЕРСТВА БУДУЩИМИ УЧИТЕЛЯМИ АНГЛИЙСКОГО ЯЗЫКА.....	96
Б.Д. Карбозова, М. Иманкулова, А.Б. Шормакова ФОРМИРОВАНИЕ НАВЫКОВ ТВОРЧЕСКОГО МЫШЛЕНИЯ ПРИ ИЗУЧЕНИИ КАЗАХСКОГО ЯЗЫКА.....	109
Г.Т. Курбанкулова, А.С. Стамбекова СПОСОБЫ ПОДГОТОВКИ БУДУЩИХ ПЕДАГОГОВ НАЧАЛЬНОГО ОБРАЗОВАНИЯ К ФОРМИРОВАНИЮ У УЧАЩИХСЯ НАЦИОНАЛЬНЫХ ЦЕННОСТЕЙ.....	120

Г.О. Кожашева, А.А. Бажи, М.И. Есенова, Л. Насир
МЕТОДИЧЕСКИЕ ПОДХОДЫ К ОЦЕНКЕ УЧЕБНЫХ ДОСТИЖЕНИЙ
УЧАЩИХСЯ ПО МАТЕМАТИКЕ В УСЛОВИЯХ ЦИФРОВИЗАЦИИ
ОБРАЗОВАНИЯ.....134

У.С. Марчибаева
РАЗВИТИЕ АДАПТИВНОЙ ФИЗИЧЕСКОЙ КУЛЬТУРЫ И СПОРТА В
ОБРАЗОВАТЕЛЬНОЙ СИСТЕМЕ РЕСПУБЛИКИ КАЗАХСТАН:
ПЕДАГОГИЧЕСКИЕ ВЫЗОВЫ И ПЕРСПЕКТИВЫ ИССЛЕДОВАНИЙ...148

Р.Ж. Мрзабаева, Н.М. Абдукадыров, Г.У. Ахметшина
ПОВЫШЕНИЕ ПРЕДМЕТНОЙ КОМПЕТЕНЦИИ О ПОЛИТИЧЕСКИХ
ПОЗИЦИЯХ ОТТО ФОН БИСМАРКА В ОТНОШЕНИИ
ОСМАНСКОЙ ИМПЕРИИ НА БЕРЛИНСКОМ КОНГРЕССЕ.....165

А.Н. Омаров, О. Кожаберген, Г.Р. Курмашева
ПРАКТИКО-ОРИЕНТИРОВАННОЕ ОБУЧЕНИЕ СТУДЕНТОВ
В УНИВЕРСИТЕТЕ.....185

А.А. Сейталиева, Н.Т. Шындалиев, А.Ш. Баракова
ПОДГОТОВКА БУДУЩИХ ПЕДАГОГИЧЕСКИХ
КАДРОВ В УСЛОВИЯХ ДУАЛЬНОГО ОБРАЗОВАНИЯ.....197

Г.Т. Танабаева, А.Р. Боранбаева
СПОСОБЫ РАЗВИТИЯ СЛОВАРНОГО ЗАПАСА ДЕТЕЙ С
НАРУШЕНИЯМИ ИНТЕЛЛЕКТА ДОШКОЛЬНОГО ВОЗРАСТА
ЧЕРЕЗ СКАЗКИ.....210

А.К. Уразова, Г.А. Туякбаев, К.Т. Кудайбергенова
ЭФФЕКТИВНЫЕ МЕТОДЫ ПРЕПОДАВАНИЯ
ЭПИСТОЛОГИЧЕСКОГО НАСЛЕДИЯ АБДИЛЬДЫ ТАЖИБАЕВА.....227

Г.У. Утемисова, А.А. Алимбекова, А.И. Булшекбаева
ВЗАИМОСВЯЗЬ КИБЕРБУЛЛИНГА И АГРЕССИВНОГО ВИКТИМНОГО
ПОВЕДЕНИЯ.....241

Ш.Ш. Хамзина, А.М. Утилова, Т.Ж.Шакенова
ЭФФЕКТИВНОСТЬ СИСТЕМЫ НАСТАВНИЧЕСТВА В ШКОЛАХ.....257

ЭКОНОМИКА

Г.Е. Амалбекова, А.Н. Наренова, С.Б. Наурызкулова
МИРОВОЙ РЫНОК МЯСА ПТИЦЫ: СОВРЕМЕННЫЕ ТЕНДЕНЦИИ
РАЗВИТИЯ И ЭКСПОРТНЫЙ ПОТЕНЦИАЛ КАЗАХСТАНА.....276

К.Т. Ауезова, Ж.М. Булакбай, А.А. Жакупов ПРОЕКТНОЕ УПРАВЛЕНИЕ В СТРАТЕГИЧЕСКОМ ПЛАНИРОВАНИИ ПРЕДПРИЯТИЙ ЭНЕРГЕТИЧЕСКОЙ ОТРАСЛИ.....	295
А. Елубаева, Чесловас Кристаускас ПОВЫШЕНИЕ КАДРОВОГО ПОТЕНЦИАЛА ОРГАНОВ ГОСУДАРСТВЕННОГО АУДИТА КАК ОСНОВА СОВЕРШЕНСТВОВАНИЯ МЕХАНИЗМА АУДИТА ЭФФЕКТИВНОСТИ.....	307
А.М. Есиркепова, Р.К. Ниязбекова, Д.М. Махмуд ИССЛЕДОВАНИЕ ДЕЯТЕЛЬНОСТИ КРЕСТЬЯНСКИХ ХОЗЯЙСТВ В КАЗАХСТАНЕ В КОНТЕКСТЕ ЭФФЕКТИВНОГО ЭНЕРГОПОТРЕБЛЕНИЯ.....	318
Ш.А. Жумадилла, М.Р. Сихимбаев, Д.Р. Сихимбаева ГОСУДАРСТВЕННОЕ РЕГУЛИРОВАНИЕ НЕДРОПОЛЬЗОВАНИЯ РЕСПУБЛИКИ КАЗАХСТАН: ЭКОЛОГИЯ И ИННОВАЦИИ.....	330
А.С. Карбозова, А.Ж. Бухарбаева, Г.Б. Дузельбаева ТЕОРЕТИЧЕСКИЕ АСПЕКТЫ ЭКОНОМИЧЕСКОГО МЕХАНИЗМА УПРАВЛЕНИЯ СЕЛЬСКОХОЗЯЙСТВЕННЫМ ПРОИЗВОДСТВОМ.....	345
Т. Куангалиева, Ж. Ержанова, Г. Мукашева ОВЦЕВОДСТВО КАЗАХСТАНА: ВЫЗОВЫ СОВРЕМЕННОГО РАЗВИТИЯ.....	359
А.А. Макенова, А.К. Оралбаева, А. Кизимбаева УСТОЙЧИВОЕ РАЗВИТИЕ СЕЛЬСКИХ ТЕРРИТОРИЙ КАЗАХСТАНА: СОВРЕМЕННОЕ СОСТОЯНИЕ.....	374
Ж.К. Ромазанов, Т.Ж. Ниязов, Т.А. Карипов ПЕРСПЕКТИВЫ РАЗВИТИЯ КРЕДИТНОГО РЫНКА КАЗАХСТАНА.....	389
Л.М. Шаяхметова, А. М. Курманов, Ш.Т. Айтимова СОВЕРШЕНСТВОВАНИЕ ОХРАНЫ ТРУДА В РЕСПУБЛИКЕ КАЗАХСТАН: ОЦЕНКА ПРОФЕССИОНАЛЬНЫХ РИСКОВ И СТРАТЕГИИ СТРАХОВАНИЯ ОТ НЕСЧАСТНЫХ СЛУЧАЕВ НА ПРОИЗВОДСТВЕ....	401

Publication Ethics and Publication Malpractice in the journals of the National Academy of Sciences of the Republic of Kazakhstan

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct (http://publicationethics.org/files/u2/New_Code.pdf). To verify originality, your article may be checked by the originality detection service Cross Check <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www: nauka-nanrk.kz](http://www.nauka-nanrk.kz)

ISSN 2518–1467 (Online),

ISSN 1991–3494 (Print)

<http://www.bulletin-science.kz/index.php/en>

Директор отдела издания научных журналов НАН РК *А. Ботанқызы*

Редакторы: *Д.С. Аленов, Ж.Ш. Әден*

Верстка на компьютере *Г.Д. Жадыранова*

Подписано в печать 29.05.2024.

Формат 60x881/8. Бумага офсетная. Печать - ризограф.

46,0 п.л. Тираж 300. Заказ 5.