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Kazakhstan's Environmental Policy: A Bibliometric Literature Review

Yernazar Kumar[a]*, Francis Amagoh[b]

[a] *Eurasian National University, 2 Satpayev St., Astana, Kazakhstan;* [b]*KIMEP University, 2 Abay St., Almaty, Kazakhstan*

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ABSTRACT

Environmental policy research plays a crucial role in solving environmental problems. In Kazakhstan, the study of environmental policy covers a wide range of topics, from air pollution to environmental education. The purpose of this work is to conduct a bibliometric analysis of scientific publications on environmental policy in Kazakhstan based on two sets of data from Google Scholar and OpenAlex bibliographic catalogs. The analysis was performed using VOSviewer software, systematizing publications by language, subject matter, type of source, and institutional affiliation of authors. The results show a steady increase in scientific interest in Kazakhstan's environmental policy since 2010, with peak publication activity in 2022–2024 (62, 70 and 82 publications respectively). Among the publications selected in Google Scholar, four key thematic groups stand out: research on the green economy, environmental safety and environmental protection, environmental legislation and regulatory reforms, as well as environmental education. The analysis of the OpenAlex dataset shows a similar structure of scientific interests, but with different substantive emphases: works on energy security, climate policy, post-Soviet political economy, and sustainable development predominate. Scientific articles comprise the bulk of both datasets, reflecting a sustained academic focus on research. For future research, it is recommended to conduct a deeper study on specific aspects of policy change, especially in the fields of environmental education and defining "policy change" within the context of Kazakhstan in order to better understand its implications.

KEYWORDS: Ecology, Environmental Policy, Environmental Strategy, Green Economy, Bibliometric Review, Strategic Management, Sustainable Growth.

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*** Corresponding author: Kumar Y.A.** – PhD Candidate, Eurasian National University, 2 Satpayev St., Astana, Kazakhstan, email: yernazar.kumar@kimep.kz

Экологическая политика Казахстана: библиометрический обзор литературы

Кумар Е.[a]*, Амаго Ф.[b]

[a] *Евразийский национальный университет, ул. Сатпаева 2, Астана, Казахстан;* [b] *Университет КИМЭП, ул. Абая 2, Алматы, Казахстан*

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АННОТАЦИЯ

Исследования экологической политики играют важнейшую роль в решении экологических проблем. В Казахстане изучение экологической политики охватывает широкий спектр тем: от загрязнения воздуха до экологического образования. Цель данной работы – провести библиометрический анализ научных публикаций по экологической политике Казахстана на основе двух массивов данных из библиографических каталогов Google Scholar и OpenAlex. Анализ выполнен с применением программного обеспечения VOSviewer, систематизирован по языкам публикаций, тематике, типам источников и институциональной принадлежности авторов. Результаты показывают устойчивый рост научного интереса к экологической политике Казахстана после 2010 года, где пик публикационной активности приходится на 2022–2024 гг. (62, 70 и 82 публикации соответственно). Среди публикаций, отобранных в Google Scholar, выделяются четыре ключевые тематические группы: исследования по зелёной экономике, экологической безопасности и охране окружающей среды, экологическому законодательству и регуляторным реформам, а также экологическому образованию. Анализ массива OpenAlex показывает аналогичную структуру научных интересов, но с иным содержательным акцентом: преобладают работы по вопросам энергетической безопасности, климатической политики, постсоветской политической экономии и устойчивого развития. В обоих наборах данных основную долю составляют научные статьи, что отражает устойчивую академическую направленность исследований. Для будущих исследований рекомендуется более глубокое изучение конкретных аспектов изменения политики, особенно в области экологического образования и определения «изменения политики» в контексте Казахстана, чтобы лучше понять его последствия.

КЛЮЧЕВЫЕ СЛОВА: экология, экологическая политика, экологическая стратегия, зелёная экономика, библиометрический обзор, стратегическое управление, устойчивый рост.

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*** Корреспондирующий автор: Кумар Е.** – PhD докторант, Евразийский национальный университет, ул. Сатпаева 2, Астана, Казахстан, email: yernazar.kumar@kimep.kz

INTRODUCTION

Environmental challenges have emerged as pressing global concerns, necessitating the development of comprehensive policies to mitigate not only ecological degradation but also promote sustainable development and green growth mechanisms (Runhaar, 2016). Across the globe, governments, civil society organizations, businesses, and individual citizens are increasingly collaborating to devise and implement effective environmental policies (Islam et al., 2014). These policies are inherently complex, as pointed out by numerous scholars as Wirl (1999) and Head (2025), requiring the integration of diverse stakeholder interests and a coordinated approach to achieve meaningful solutions. The case of Kazakhstan presents a particularly compelling context for studying environmental policy, given the country's unique socio-economic landscape and its reliance on natural resources.

Kazakhstan, the largest landlocked country in Central Asia, faces a "natural resource curse" dilemma, where the drive for economic growth, primarily fueled by oil and gas exploitation, conflicts with environmental sustainability goals (ADB, 2024). Since gaining independence in 1991, Kazakhstan has embarked on a journey of policy reform, aiming to strike a balance between economic development and environmental protection. The nation's environmental issues encompass a broad spectrum, including air and water pollution, waste management, climate change impact, biodiversity conservation, and the sustainable use of natural resources (Ospanova, 2014; UNECE, 2025).

Environmental governance in Kazakhstan is shaped not only by government initiatives but also by the active engagement of non-governmental organizations such as Greenwomen Kazakhstan and the Biodiversity Conservation Fund of Kazakhstan, private enterprises including Recycle Birge and Environmental Resources Management (hereinafter – ERM), and international partners such as the Central Asia Regional Economic Cooperation program (hereinafter – CAREC) and UNDP Kazakhstan.

While *Recycle Birge* conducts social events to promote awareness about waste management issues (Rhythm Foundation, 2021), ERM serves as an eco-consulting firm specialising in environmental protection and environmental auditing (ERM, 2024).

In recent decades, Kazakhstan has introduced several legislative measures to enhance its environmental framework. Notably, the Environmental Codes of 2007 and 2021 have introduced significant regulatory changes, such as the "polluter pays" principle, the "remedial" principle, and the adoption of Best-Available-Technologies (hereinafter – BAT) aimed at reducing harmful emissions (Kumar & Makhmudova, 2022). These legislative developments are complemented by large-scale national projects like the *2030 Agenda*, *Carbon Neutrality Strategy 2060*, *Green Economy Concept*, and *Zhasyl Kazakhstan*, which align with global *Sustainable Development Goals* (hereinafter – SDGs) and emphasise green energy transition, pollution control, and ecosystem restoration (UNECE, 2025).

Despite the growing body of literature addressing Kazakhstan's environmental issues, there remains a notable gap in research specifically focused on the dynamics of environmental policy change within the country. While numerous studies examine the status and effectiveness of environmental policies, fewer investigations explore how these policies evolve, adapt, or are reformed in response to internal and external pressures. Addressing this gap is critical for understanding the mechanisms driving policy transformation, especially in the context of Kazakhstan's transition to a green economy.

This paper seeks to fill this gap by conducting a comprehensive bibliometric literature review of 92 environmental policy change studies in Kazakhstan on the Google Scholar research engine. By analyzing scholarly works published in English, Russian, and Kazakh, this study aims to identify the key themes, trends, and gaps in existing research. Then, 560 research articles from the OpenAlex bibliographic catalogue covering environmental policy change studies in Kazakhstan were analysed. For the bibliometric literature analysis, the main research trends, themes, publication types, and sources of institutions are identified. The findings of this review not only contribute to the academic discourse on environmental governance but also offer practical insights for policymakers seeking to enhance the sustainability of Kazakhstan's developmental strategies.

LITERATURE REVIEW

The concept of policy change encompasses a range of theoretical perspectives and typologies, reflecting its multifaceted nature. At its core, policy change refers to modifications in the structure, objectives, or mechanisms of existing policies, often in response to evolving socio-political and environmental challenges. Scholars like Lester and Stewart (1996) described policy change as the replacement or adjustment of existing policy frameworks to accommodate new realities. This transformation can be incremental, involving gradual adjustments, or radical, characterized by comprehensive overhauls (Lindblom, 1979).

Policy change is often equated with policy innovation, where new policies emerge to address previously unrecognised issues, or policy reform, which involves revising existing policies to enhance their effectiveness. Peters & Hogwood (1985) categorize policy change into four primary types: (1) policy innovation, which introduces entirely new policy sectors; (2) policy succession, where existing policies are replaced or modified; (3) policy maintenance, focusing on adapting policies to maintain their relevance; and (4) policy termination, which involves the discontinuation of outdated or ineffective policies. Capano and Howlett (2009) further expand on this typology, identifying four patterns of policy change: cyclical change (periodic revisions without altering the status quo), dialectical change (transformative change through synthesis and conflict resolution), linear change (predictable, evolutionary shifts), and teleological change (goal-oriented transformation driven by specific policy objectives).

To explain the dynamics of policy change, several theoretical frameworks have been developed. The Advocacy Coalition Framework (hereinafter – ACF), proposed by Jenkins-Smith and Sabatier (1993), posits that policy change occurs through the interaction of coalitions that advocate for specific policy beliefs, often triggered by external shocks or shifts in the socio-political environment. This framework highlights the role of policy-oriented learning, where stakeholders adapt to changing conditions to achieve a stable coalition consensus.

The Path Dependency Theory, as articulated by Pierson (2000), emphasised the influence of historical policy decisions, which constrain future policy options. This theory suggests that policy trajectories are shaped by critical junctures and reactive sequences, leading to a lock-in effect where earlier decisions become self-reinforcing, making policy shifts challenging.

The punctuated equilibrium theory by Baumgartner and Jones (1991) argued that policy change is characterised by long periods of stability punctuated by brief episodes of significant change. This framework suggests that policy subsystems are resistant to change due to institutional inertia, with major shifts occurring only when existing structures are disrupted by political, economic, or social upheavals. Kingdon's Multiple Streams Approach (hereinafter – MSA) posits that policy change materialises when three independent streams (problems, policies, and politics) converge at a critical juncture, creating a "policy window" that facilitates transformative action. The policy stream deals with the feasibility, effectiveness, and soundness of policy solutions to the policy problem, while the politics stream is concerned with balancing public opinion and public support with the political climate by policymakers. This convergence is essential for mobilising support, aligning policy solutions with political priorities, and addressing recognised societal problems.

Environmental policy change has been extensively studied across various regions, focusing on the evolution of regulatory frameworks, technological innovations, and governance strategies. Jordan et al. (2004) and Kraft (2021) examined the global progression of environmental policies, highlighting the transition from command-and-control approaches to market-based mechanisms like emissions trading schemes. Kemp (2000) and Jaffe et al. (2002) explored the role of environmental regulations in driving technological advancements, emphasising the concept of "policy-induced innovation".

Studies on environmental policy integration, such as those by Nilsson (2005) analysed how sustainability objectives are embedded into national policy frameworks, enhancing the effectiveness of environmental governance. Regional analyses, like Calel and Dechezlepretre (2016) examination of the European carbon market, provide insights into policy diffusion and the transfer of best practices across borders. Similarly, Keeley and Scoones (2014) explored policy processes in Africa, while Tosun (2013) compared environmental policy changes in emerging democracies of Eastern Europe and Latin America.

While there is extensive research on environmental policy at the global level, studies focusing on Kazakhstan are comparatively limited. Early works by Matter (1993) and Bowers (1993) examined the legacy of Soviet-era environmental issues, particularly the impact of nuclear contamination and industrial pollution. Subsequent studies have explored the evolution of Kazakhstan's environmental governance in the post-Soviet period, including the adoption of the 2007 and 2021 Environmental Codes, which introduced comprehensive regulatory measures for pollution control and resource management.

Recent scholarship highlights Kazakhstan's efforts to transition to a green economy, driven by policies promoting renewable energy, waste reduction, and sustainable development. Kazbekova (2022) analyzed stakeholder dynamics in implementing green economy policies, revealing challenges in achieving effective collaboration between governmental and non-governmental actors. Gulbrandsen et al. (2017) examined the influence of international emissions trading systems on Kazakhstan's environmental policy, using the policy diffusion framework to assess how external models shape domestic regulations.

Bibliometric analysis work on environmental policy studies in the context of Kazakhstan has also been covered by several researchers. For instance, Meidute-Kavaliauskiene et al. (2024) conducted a bibliometric review analysis studying sustainable development goals in Kazakhstan’s academic landscape. According to the paper, the authors found that there is a lack of studies that cover the practical applications of sustainable development goals in Kazakhstan. Moreover, in terms of number of publications by academic institutions, Nazarbayev University, along with Al-Farabi Kazakh National University and Eurasian National University, are the top leaders, while Buketov Karaganda University and Abai Kazakh National Pedagogical University are ranked 13th and 14th place.

As same as Meidute-Kavaliauskiene et al. (2024) article, the article by Gafu et al. (2024) have also thoroughly examined the sustainable development goals research aspects, where the scholars analysed 7092 Scopus-indexed Kazakhstani publications for the period 2015 to 2023. The study results highlight the following three main key findings. First, from 2015 to 2023, a 10% decline in the number of publications related to sustainable development goals in Kazakhstan has been noted. Second, publications that cover sustainable development goals in Kazakhstan are less available to open access than international papers. And third, there is less academic attention directed towards sustainable development goals 1, 5, 14, and 17, unlike sustainable development goals 3, 4, 7, 8, and 10.

Another paper by Kangalakova et al. (2025) also conducted a bibliometric literature review analysis investigating the greening business aspects by looking into the Scopus database for the period from 1992 to 2024, where a total of 660 publications were examined. The scholars have also used the VOS Viewer software to conduct an in-depth analysis. Based on the research results, the scholars identified that there was a rapid growth of publications noticeable from 2019 to 2024 on greening business studies, where the United Kingdom leads in terms of the number of publications in this research field. The author also identified several key research directions for greening business aspects, namely the focus on green technologies, green financing mechanisms, and the adoption of greening mechanisms in the business sector.

Despite these contributions, there remains a notable gap in the application of policy change theories to Kazakhstan's environmental policy landscape. Most studies focus on descriptive analyses of policy outcomes rather than the underlying processes driving policy change. This review identifies a critical need for research that applies theoretical frameworks like the ACF and the MSA to the study of environmental policy dynamics in Kazakhstan.

MATERIALS AND METHODS

First, this study adopts a systematic bibliometric literature review approach to explore the landscape of environmental policy change research in Kazakhstan. The research articles were identified via Google Scholar research engine and the OpenAlex research database. First, in terms of Google Scholar, a total of 92 articles written in English, Kazakh, and Russian were used for the analysis, while 560 articles were examined from the OpenAlex bibliographic catalogue database.

By definition, a bibliometric analysis is used for uncovering emerging research trends, patterns, and helps to identify knowledge gaps (Donthu et al., 2021). For this, the VOS Viewer software program

is applied to study specifically articles covering "environmental policy change studies in Kazakhstan".

For the bibliometric literature review analysis, the most prevailing research trends, source of publication types, source of educational institutions, and main research gaps within the existing body of literature are identified. As a reference, we have used the bibliometric study approach used by Alsmadi and Alzoubi (2022) in the study on 'green economy', where the scholars investigated the publication trends and distribution of journals based on the number of journal publications. However, for this study, we have not covered the aspects regarding keywords.

The methodology involves three key phases: bibliometric literature search strategy; inclusion and exclusion criteria; data extraction and analysis; content analysis procedure; and reliability and validity.

To ensure comprehensive coverage, a structured search was conducted using Google Scholar and OpenAlex databases, which provide access to a wide array of academic articles, conference papers, and reports. The search was performed using a set of predefined keywords, namely, environmental policy change Kazakhstan, ecological policy change Kazakhstan, and environmental policy dynamics Kazakhstan. These terms were also translated and used in Russian and Kazakh to capture a broader range of sources.

The search process included articles published up to 2025, ensuring the most current research is considered. To enhance the rigour of the search, Boolean operators (e.g., OR) and truncation symbols were employed to refine search results. Additionally, reference lists of key articles were manually screened to identify relevant studies that may not have been captured through the database search.

Inclusion and Exclusion Strategy

To ensure the relevance and quality of the selected studies, specific inclusion and exclusion criteria were applied. Articles were included if they: a) focused on environmental policy studies within the context of Kazakhstan; b) were published in peer-reviewed journals, conference proceedings, or reputable academic sources; c) were available in English, Russian, or Kazakh; and d) addressed themes related to environmental studies, environmental policy dynamics, green economy, or sustainability.

Conversely, studies were excluded if they: a) focused solely on environmental issues without addressing policy aspects; b) were opinion pieces, editorials, or lacked empirical or theoretical analysis; or c) were inaccessible in full text or published in non-academic sources.

A total of 92 articles from *Google Scholar* and 560 articles from *OpenAlex* were selected for detailed analysis after applying these criteria (see Appendix 1, 2 and 3).

Data Extraction and Analysis

The selected 92 and 560 articles were systematically analysed using a content analysis framework, which involves categorising and synthesising qualitative data to identify patterns, themes, and trends. The analysis was structured around three key dimensions: (1) Year of Publication: Articles were categorized by their publication year to identify temporal trends in research focus and volume; (2) Thematic Focus: Each article was examined to determine its primary research focus, such as green growth and economy, environmental protection, legislative policy changes, and environmental education. This categorization helped in mapping the dominant areas of research within the broader theme of environmental policy change in Kazakhstan. (3) Language of Publication: To assess the accessibility and linguistic distribution of research, articles were grouped based on their language - English, Russian, or Kazakh. (4) Publication Type: Used to identify the type of publications of the articles, such as research articles, conference papers, book chapters, dissertations, thesis, blogs, or other types. And (4) *Source of Educational Institution*: This section analysed which academic or educational institutions have published how many articles. This analysis provides insights into the regional and international engagement with environmental policy issues in Kazakhstan.

Content Analysis Procedure

The content analysis for the literature review of 92 articles was conducted using a mixed-methods approach, combining qualitative and quantitative techniques. Initially, a qualitative review was performed to extract themes and insights from each article using the VOS Viewer software program. This was followed by a quantitative analysis, where the frequency of publications by year, language, and thematic focus was tabulated. Visual aids such as tables, pie charts, and bar graphs were utilized to present the data clearly and concisely.

Moreover, a deeper qualitative analysis was

conducted on a subset of studies that explicitly addressed the dynamics of policy change. These articles were further analysed using theoretical frameworks like the ACF and the MSA to understand the application of these theories in the context of Kazakhstan's environmental policies.

Reliability and Validity

To enhance the reliability of the findings, a cross-verification process was employed, where two independent ecology expert reviewers from Kazakhstan assessed the relevance and categorisation of selected articles. To find the Kazakhstani ecology experts, the social media platform *LinkedIn* was used. For the selection process, a convenience sampling method was used. Discrepancies were resolved through discussion to ensure consistency in the analysis. Additionally, this review adhered to best practices in systematic literature review methodologies, including clear documentation of search strategies, inclusion criteria, and analysis procedures, thus ensuring transparency and replicability. The independent reviews with the two Kazakhstani ecology experts were conducted online via Zoom platform, which were held in April 2025.

RESULTS

This section presents the findings of the systematic literature review, focusing on the distribution of research articles by publication year, thematic focus, and language of publication. The analysis is based on a total of 92 scholarly articles on environmental policy change in Kazakhstan, identified through a rigorous selection process. The results are organized into three subsections: (1) Publication Trends, (2) Thematic Distribution, and (3) Linguistic Analysis. Additionally, a brief comparative analysis of theoretical frameworks and visual data representation of the study is presented.

As shown in Figure 1, the thematic analysis highlights four dominant areas of research within the context of environmental policy change in Kazakhstan.

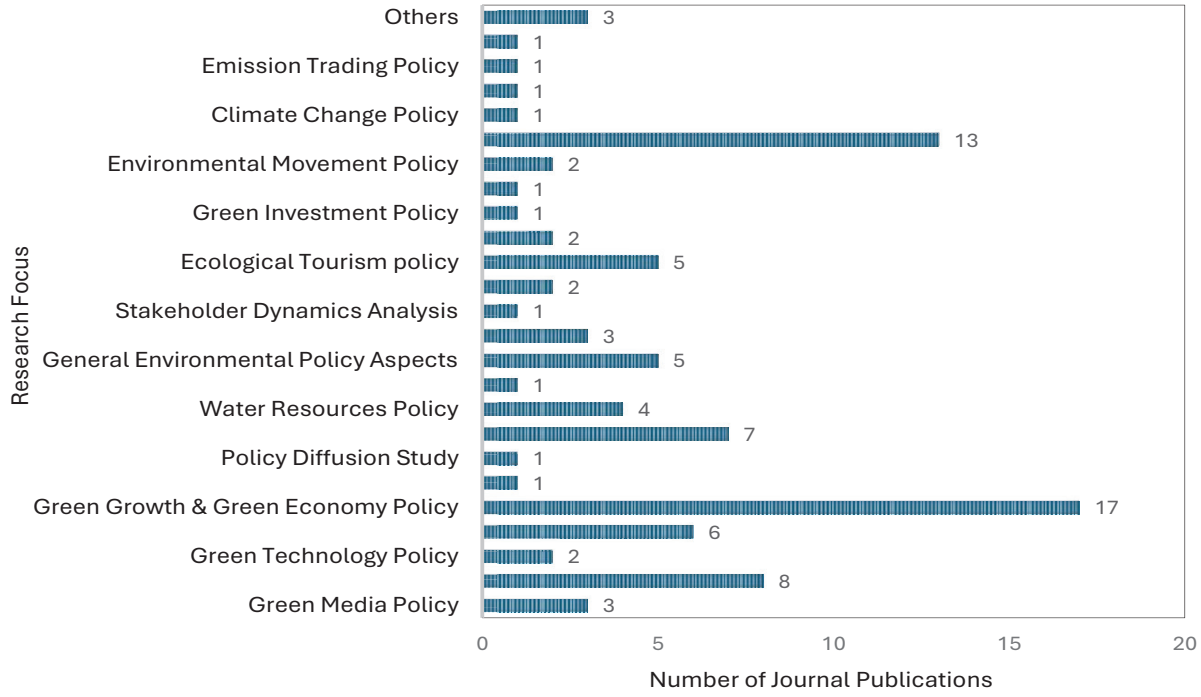

Figure 1. Thematic analysis

First, the Green Growth and Green Economy Policy thematic area accounted for the largest share of the literature, with 17 publications. Studies in this category primarily explore Kazakhstan's transition towards sustainable economic practices, focusing on green technology, renewable energy initiatives,

and the implementation of green economic strategies. Key contributors include Kozlova (2012) and Kazbekova and Kazbekov (2016), who analyzed the mechanisms for enhancing green economy development in Kazakhstan. Second, the Environmental Protection and Safety thematic area comprised of 13 publications. This theme addresses issues related to pollution control, ecosystem preservation, and safety regulations. Notable studies include Uruzgaliyeva & Usmanov (2022), who investigated the role of political mechanisms in addressing environmental security in the Caspian region, and Tastanbekova (2015), who focused on the management of protected areas in Kazakhstan. Third, the Environmental Law and Regulatory Changes thematic area included 8 publications, emphasizing the evolution of legal frameworks and regulatory policies. Researchers such as Baideldinov et al. (2013), Jangabulova and Salykhbaeva (2014) explored the impact of legal reforms on environmental governance, particularly following the adoption of the 2021 Environmental Code.

And fourth, the *Environmental Education and Awareness* thematic area can be characterized as a "growing area of interest", with six publications, highlighting the importance of educational initiatives in promoting sustainable development. Studies like Kakimova (2013) and Kumar (2022) examine the effectiveness of environmental education policies in raising awareness and fostering pro-environmental behaviors among the public.

The analysis of the linguistic distribution of the research articles reveals a relatively balanced representation across three languages, as shown below in Figure 2.

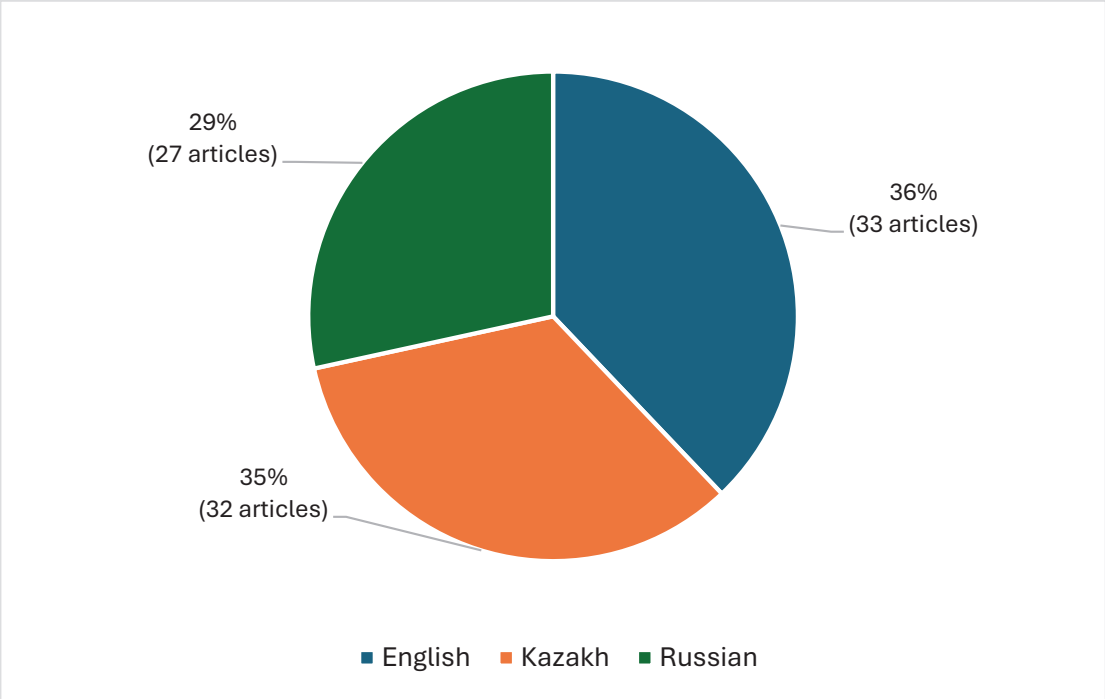

Figure 2. Linguistic analysis

The predominance of English-language publications reflects Kazakhstan's integration into the global academic discourse on environmental policy. However, the significant proportion of articles in Kazakh and Russian underscores the importance of local language research in addressing region-specific environmental challenges. Notably, studies published in Kazakh often focus on national policies, while Russian-language research tends to engage with comparative analyses involving other post-Soviet states.

First, according to the public trend analysis, most of the publications have emerged during the post-2015 period. Here, an upward rising trend can be noted, with the greatest number of publications releasing in 2022 (62 publications), 2023 (70 publications), 2024 (82 publications), and first half of 2025 (48 publications). Therefore, similar in our literature review analysis, most of the publications have emerged after 2010. The results of the analysis are shown below in Figure 3.

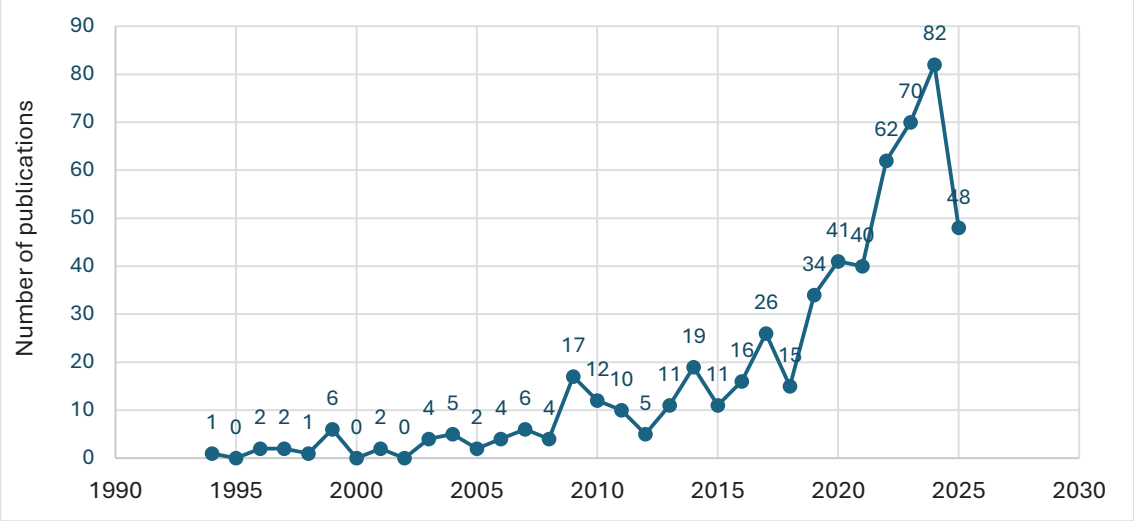

Figure 3. Publication trends (OpenAlex Data)

Second, in terms of thematic focus, which included a total of 193 topic groups, the nine most prevailing topics included the following: (1) energy security and policy; (2) energy, environment, and economic growth; (3) influence of climate on human conflict; (4) soviet & post-soviet political economy; (5) regional socio-economic development trends; (6) climate change policy and economics; (7) diverse aspects of tourism research; (8) agricultural development and environmental polices; (9) sustainable development policies.

Third, in terms of the content of the 560 research articles, the following can be pointed out. First, in terms of publication types, a significant majority of the works published were '*research articles*', followed by '*book type*', '*book chapters*', and '*other types*'. The full results see in Table 1 below.

Table 1. Publication Type Analysis

Source	Total Publications
Research Articles	442
Book Type	36
Book Chapters	23
Other Types	59

Note: compiled by the authors based on the OpenAlex database

Lastly, the institutions that have published the most research articles were Al-Farabi Kazakh National University followed by L.N. Gumilyov Eurasian National University, and Nazarbayev University. On the other hand, the highest number publications published by foreign educational institutions were by the Russian Academy of Sciences and Chinese Academy of Sciences. The full list can be seen below in Table 1.

Table 2. Source of Institution Analysis

No.	Educational Institution	Publications
1	Al-Farabi Kazakh National University	30
2	L.N. Gumilyov Eurasian National University (Kazakhstan)	12
3	Nazarbayev University (Kazakhstan)	10
4	Turan University (Kazakhstan)	9
5	D. Serikbayev East Kazakhstan State Technical University	9
6	Karaganda University of Kazpotrebsoyuz (Kazakhstan)	9

7	Astana Medical University (Kazakhstan)	9
8	Russian Academy of Sciences	8
9	Chinese Academy of Sciences	8
10	University of International Business (Kazakhstan)	8
11	Karaganda Buketov State University (Kazakhstan)	5
12	Innovative University of Eurasia (Kazakhstan)	5
13	Narxoz University (Kazakhstan)	5
14	National Academy of Sciences of the Republic of Kazakhstan	5
15	KIMEP University (Kazakhstan)	5
16	Almaty Management University (Kazakhstan)	4

Note: compiled by the authors based on the OpenAlex database

DISCUSSION

The findings of this bibliometric literature review reveal several key insights into the current state of research on environmental policy change in Kazakhstan. While there has been a notable increase in scholarly interest over the past decade, significant research gaps remain, particularly in the application of theoretical frameworks to understand the dynamics of policy change. Consequently, the study highlights the growth in environmental policy research post-2010; dominance of green economy and sustainability themes; limited application of policy change theories; language barriers and research accessibility; and implications for policy and practice.

The surge in publications after 2010 aligns with Kazakhstan's legislative milestones, such as the introduction of the Environmental Code in 2007 and its subsequent revision in 2021. These reforms have catalyzed academic inquiry into how Kazakhstan is addressing its environmental challenges within the broader context of sustainable development. The increase in research output suggests a growing recognition of the importance of environmental policy in shaping the country's socio-economic landscape. However, the predominance of descriptive studies indicates that much of the existing literature focuses on documenting policy developments rather than critically analyzing the factors driving these changes.

The thematic analysis indicates that green growth and green economy policies dominate the literature, reflecting Kazakhstan's strategic shift towards sustainable economic practices. This focus is likely driven by the government's commitment to international frameworks, such as the United Nations SDGs and the Paris Agreement. The emphasis on green economy research highlights Kazakhstan's efforts to balance economic growth with environmental sustainability, particularly through initiatives like renewable energy adoption and emissions reduction strategies. While the focus on green economy policies is commendable, it has overshadowed other critical areas of environmental policy, such as waste management, biodiversity conservation, and climate adaptation. Future research should aim to diversify the thematic focus, exploring underrepresented areas to provide a more holistic understanding of Kazakhstan's environmental policy landscape.

A critical gap identified in this review is the limited application of established policy change theories to the study of environmental policies in Kazakhstan. Despite the existence of robust frameworks like the ACF, Path Dependency Theory, and the MSA, only a handful of studies have utilized these theories to analyze Kazakhstan's policy dynamics. For instance, Kazbekova (2022) employed the policy learning theory to examine stakeholder engagement in green economy initiatives, while Gulbrandsen et al. (2017) applied the multiple streams framework to assess the diffusion of emissions trading policies. However, these applications are isolated examples rather than part of a broader trend. The underutilization of theoretical frameworks suggests that future research could benefit from a more rigorous application of policy change theories to deepen our understanding of how environmental policies are formulated, implemented, and adapted over time.

The linguistic analysis reveals a balanced distribution of research across English, Russian, and Kazakh languages, reflecting both local and international scholarly engagement. However, the accessibility of research findings may be limited by language barriers. English-language publications are more likely to reach a global audience, contributing to international discourse on environmental gover-

nance. In contrast, Russian and Kazakh publications often focus on region-specific issues and may not be widely disseminated beyond Central Asia. This linguistic divide highlights the need for more bilingual or translated research efforts to bridge the gap between local and global academic communities.

The insights gained from this review have significant implications for both policymakers and researchers. The concentration of studies on green economy policies underscores the importance of aligning Kazakhstan's national strategies with global sustainability targets. Policymakers can leverage these findings to refine their approaches, particularly by fostering collaboration between governmental agencies, NGOs, and the private sector to achieve more comprehensive and integrated environmental outcomes. Moreover, the identified research gaps suggest that future studies should prioritize exploring the dynamics of policy change, particularly in under-examined areas like environmental education, waste management, and water resources. Applying theoretical frameworks could also enhance the analytical rigor of future research, offering deeper insights into the drivers of policy evolution in Kazakhstan.

If comparing both results from *Google Scholar* and *OpenAlex* bibliometric literature reviews, the following main conclusions can be pointed out.

First, both reviews showed that most publications related to environmental policy studies have emerged during the post-2010 and post-2015 periods.

Second, in terms of thematic analysis, there is a big difference in results of these two reviews. While among the 92 articles environmental education, green economy, environmental legislation, and environmental protection were the main researched themes, among the 560 environmental articles from Open Alex the focus was more broadly covered, such as focusing on energy security, the interrelationship between the environment and economic growth, climate change, and post-soviet political economy.

Third, in terms of publication type analysis, a significant bulk of publications were published as research articles, while a small percentage from both Google Scholar and OpenAlex database were published as conference papers or book chapters. Nevertheless, one article as a blog has been uncovered in the analysis.

Lastly, in terms of source of educational institutions, the following main points can be highlighted. Most publications from both Google Scholar and OpenAlex database were published by two main Kazakhstani educational institutions: Al-Farabi Kazakh National University and Eurasian National University, followed by Karaganda Buketov University, Turan University, and Nazarbayev University. Thus, highlighting that state universities in Kazakhstan are the leading educational institutions, when it comes to publications addressing environmental policy issues in the context of Kazakhstan. Moreover, Russian academic institutions have also shown strong interest in publishing about Kazakhstani environmental policies aspects, such as Russian Academy of Sciences, Perm State University or Omsk University.

CONCLUSION

This study has undertaken a systematic literature review to examine the current state of research on environmental policy change in Kazakhstan. By analyzing 652 scholarly articles across English, Russian, and Kazakh languages via a bibliometric literature review, the paper provides a comprehensive overview of the thematic trends, theoretical applications, and research gaps within this field. The findings reveal a growing scholarly interest in Kazakhstan’s environmental policies during post-2010 and post-2015 periods, particularly following significant legislative reforms such as the Environmental Codes of 2007 and 2021. However, this increasing volume of research is largely descriptive, focusing on documenting policy developments rather than critically engaging with the underlying mechanisms driving policy change. First, the analysis indicates that research on environmental policy in Kazakhstan is predominantly centered on green growth and green economy initiatives. This reflects the country's strategic pivot towards sustainable economic development, aligning with global sustainability frameworks like the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement. While this focus on green economy policies is essential, it has inadvertently overshadowed other critical areas such as waste management, biodiversity conservation, and climate adaptation. The literature highlights the need for a more diversified research agenda that addresses these underexplored areas.

Second, a significant bulk of publications were published as research articles, while a small percentage were published as conference papers or book chapters. This points to the growing importance of research works written on different environmental themes. Third, most environmental policy-related publications from both Google Scholar and OpenAlex databases were published by the following two main Kazakhstani educational institutions, namely Al-Farabi Kazakh National University and Eurasian National University. However, universities such as Karaganda Buketov University, Turan University, and Nazarbayev University have also been active. And fourth, there is a significant lack of research publications in the field of 'environmental policy change', especially in applying various theoretical applications such as policy learning theories, path dependency theory, Hall's three-order policy change framework, or advocacy coalition framework.

All in all, the bibliometric literature review highlights both the progress made in understanding environmental policy change in Kazakhstan, while also identifying significant gaps that warrant further exploration. By addressing the research gap regarding the lack of policy change' theoretical frameworks, future research can contribute to more effective and sustainable environmental policy frameworks, supporting Kazakhstan's efforts to achieve its national and international environmental goals. Applying a 'policy change' theoretical framework helps scholars to better understand why specific environmental policies change, evolve, transform, or completely disappear over time. The integration of theoretical perspectives and a broadened research focus will not only enrich the academic discourse but also provide practical insights for policymakers striving to navigate the complexities of environmental governance in a rapidly changing world.

A significant gap identified in this review is the limited application of established policy change theories, such as the ACF, Path Dependency Theory, and the MSA. The scarcity of theoretically grounded studies suggests that much of the existing research lacks the analytical depth required to fully understand the dynamics of environmental policy change in Kazakhstan. By leveraging these frameworks, future research could provide more nuanced insights into how policies are formulated, implemented, and adapted in response to internal and external pressures. To address the identified gaps, several recommendations are proposed for future research. First, researchers should diversify their studies to include underrepresented topics such as climate resilience, ecological restoration, and transboundary environmental governance. Expanding the thematic scope would provide a more comprehensive understanding of Kazakhstan's environmental policy landscape. Second, future studies should integrate policy change theories to analyze the factors influencing environmental policy shifts in Kazakhstan. This would enhance the analytical rigor of research and contribute to a deeper understanding of the drivers of policy evolution. Third, encouraging research collaboration across languages (English, Russian, and Kazakh) and promoting the translation of key findings can enhance the accessibility of research and facilitate knowledge exchange between local and international scholars. And fourth, there is a need for more in-depth, empirical case studies and longitudinal analyses that assess the effectiveness of environmental policies over time. Such studies could provide critical insights into best practices and challenges in policy implementation, thereby contributing to more robust and adaptive environmental governance in Kazakhstan.

AUTHOR CONTRIBUTIONS

Conceptualization and theory: YK; research design: YK; data collection: YK; analysis and interpretation: FA; writing draft preparation: FA and YK; supervision: FA; correction of article: FA and YK; proofread and final approval of article: FA and YK. All authors have read and agreed to the published version of the manuscript.

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Information about the authors

***Yernazar Kumar** – PhD Candidate, Eurasian National University, Astana, Kazakhstan, email: yernazar.kumar@kimep.kz, ORCID ID: https://orcid.org/0000-0002-7181-1746

Francis Amagoh – PhD, Professor, KIMEP University, Almaty, Kazakhstan, email: famagoh@kimep.kz, ORCID ID: https://orcid.org/0000-0003-3935-3375

Авторлар туралы мәліметтер

***Кумар Е.А.** – PhD докторанты, Еуразия ұлттық университеті, Астана, Қазақстан, email: yernazar.kumar@kimep.kz, ORCID ID: https://orcid.org/0000-0002-7181-1746

Амаго Ф. – PhD, профессор, КИМЭП Университеті, Алматы, Қазақстан, email: famagoh@kimep.kz, ORCID ID: https://orcid.org/0000-0003-3935-3375

Сведения об авторах

***Кумар Е.А.** – PhD докторант, Евразийский национальный университет, Астана, Казахстан, email: yernazar.kumar@kimep.kz, ORCID ID: https://orcid.org/0000-0002-7181-1746

Амаго Ф. – PhD, профессор, Университет КИМЭП, Алматы, Казахстан, email: famagoh@kimep.kz, ORCID ID: https://orcid.org/0000-0003-3935-3375

Appendix 1

List of English language research articles on environmental policy studies

No.	English language articles (n=33)
1	Kazbekova, D. (2022). Stakeholder dynamics in environmental policy making in Kazakhstan. *Australian and New Zealand Journal of European Studies*, 14(2), 81-93. https://doi.org/10.30722/anzjes.vol14.iss2.15837
2	Nugumanova, L. & Frey, M. (2017). Environmental governance and policy in Kazakhstan. ECONSTOR, Leibniz Institute for East and South European Research, Germany, IOS Working Paper, 1-53. URL: https://www.econstor.eu/handle/10419/162149
3	Baideldinov, D.L., Kuderin, I.K., & Izbasarova, A.D. (2013). Problems of the Development of the Environmental Policy and Law in the Republic of Kazakhstan. *Nowa Polityka Wschodnia,* Poland, Book Chapter, 2(5). https://heinonline.org/HOL/LandingPage?handle=hein.journals/nowa2013&div=28&id=&page
4	Gulbrandsen, L. H., Sammut, F., & Wettestad, J. (2017). Emissions trading and policy diffusion: complex EU ETS emulation in Kazakhstan. *Global Environmental Politics*, MIT Press Direct, 17(3), 115-133. https://doi.org/10.1162/GLEP_a_00418
5	Sabonis-Helf, T. (2003). Catching Air? Climate change policy in Russia, Ukraine and Kazakhstan. Climate Policy, Taylor & Francis Online, 3(2), 159-170. https://doi.org/10.3763/cpol.2003.0319
6	Kakimova, A. (2013). Educational Policy for Sustainable Development in Kazakhstan. *Universidade Do Porto*, Dissertation Thesis, 1-24. https://www.proquest.com/openview/0cbcc879ff7fe17222a34e8366cdcf75/1?pq-origsite=gscholar&cbl=2026366&diss=y
7	Howie, P., Gupta, Sh., Park, H., & Akmetov, D. (2020). Evaluating policy success of emissions trading schemes in emerging economies: comparing the experiences of Korea and Kazakhstan. Climate Policy, Taylor & Francis Online, 20(5), 577-592. URL: https://doi.org/10.1080/14693062.2020.1751030
8	Yan, H., Lai, C., Akshalov, K., Qin, Y., Hu, Y., & Zhen, L. (2020). Social institution changes and their ecological impacts in Kazakhstan over the past hundred years. Environmental Development, Elsevier. URL: https://doi.org/10.1016/j.envdev.2020.100531
9	Kumar, Y. (2022). Local eco-activist's perspectives on environmental awareness issues in Kazakhstan. Kazakhstan Institute for Strategic Studies, 104(4), 54-82. URL: https://ecogosfond.kz/wp-content/uploads/2023/12/VZGLJaDY-MESTNYH-JeKOAKTIVISTOV-NA-PROBLEMY-JeKOLO-GIChESKOGO-PROSVEShhENIJa-V-KAZAHSTANE-1.pdf
10	Onyusheva, I., Ushakov, D., & Van, H.T. (2018). The eco-problems and green economy development in Kazakhstan: An analytical survey. International Journal of Energy Economics and Policy, 8(2), 148-153. URL: https://www.econjournals.com.tr/index.php/ijeep/article/view/6274
11	Turgel, I., Bozhko, L., Biserov, E., & Naizabekov, A. (2020). Priorities of the state environmental policy of Russia and Kazakhstan: global agenda and regional projection. Environmental and Climate Technologies, 24(1), 638-652. URL: https://doi.org/10.2478/rtuect-2020-0039
12	Abdildin, Y., Nurkenov, S.A., & Kerimray, A. (2021). Analysis of green technology development in Kazakhstan. International Journal of Energy Economics and Policy, 11(3), 269-279. URL: https://www.econjournals.com.tr/index.php/ijeep/article/view/10897
13	Saimova, Sh., Makenova, G., Skakova, A., Moldagaliyeva, A., Beisembinova, A., Berdiyarova, Zh., & Imanbekova, B. (2020). Towards a low-carbon economic sustainable development: scenarios and policies for Kazakhstan. International Journal of Energy Economics and Policy, 10(5), 638-646. URL: https://www.zbw.eu/econis-archiv/bitstream/11159/7988/1/1757029044_0.pdf
14	Alimbaev, T., Utebaeva, A., Akhmetzhanova, N., Asankanov, A. (2017). The environmental situation and the environmental movement in Kazakhstan. Karaganda Buketov University Bulletin, 85(1), 13-18. URL: https://history-philosophy-vestnik.ksu.kz/index.php/history-philosophy-vestnik/article/view/135/108
15	Kazbekov, B., & Kazbekova, Zh. (2016). Improvement of 'Green Economy' development mechanisms in Kazakhstan. International Multidisciplinary Scientific GeoConference: SGEM, Sofia, Conference Paper, 1. URL: https://www.proquest.com/openview/1a6af8d8458e3ed778a3bf9633fe0ee7/1?pq-origsite=gscholar&cbl=1536338
16	Yelshibayev, R.K. (2018). Priority tasks of economic policy of Kazakhstan while shifting to the Green Growth Model. Statistics, Accounting, and Audit, Almaty Humanitarian-Economic University, 71(4), 65-71. URL: https://elibrary.ru/item.asp?id=36782059
17	Omarova, A.T., Jazykbayeva, B.K., Orynbassarova, Y.D., & Grelo, M.F. (2018). Model of environmental governance in Kazakhstan. Karaganda Buketov University Bulletin, Buketov Business Review, 91(3), 88-96. URL: https://economy-vestnik.ksu.kz/index.php/economy-vestnik/article/view/588/530

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19	Tursynbayeva, B.Zh., Mukhambetkaliyeva, G.M., Auyesbay, K.A., & Baigabylov, N.O., (2020). National policy and the media in the formation of environmental awareness among students of Kazakhstan. Centre for Academic Social Action, Media Watch, Sage Journals, 11(3), 428-438. URL: https://doi.org/10.15655/mw_2020_v11i3_202929
20	Mitrofanskaya, Y., & Bideldinov, D. (1999). Modernizing Environmental Protection in Kazakhstan. Georgetown University Bulletin, International Environmental Law Review, 12(1), 177-206. URL: https://www.proquest.com/docview/225523799?sourcetype=Scholarly%20Journals
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23	Mukhtarova, K., & Zhidebekkyzy, A. (2015). An analysis of green technologies development in Kazakhstan: problems and perspectives. Journal of Economic Research & Business Administration, Al-Farabi Kazakh National University, 111(5), 1. URL: https://be.kaznu.kz/index.php/math/article/view/1062/1023
24	Amirbekova, D., Narbaev, T., & Kussaiyn, M. (2022). The research environment in a developing economy: reforms, patterns, and challenges in Kazakhstan. Publications Journal, MDPI Journal, 10(4), 1-19. URL: https://doi.org/10.3390/publications10040037
25	Denissova, O., Belgibayeva, A., & Suieubayeva, S. (2023). Evaluation of the effectiveness of the "Green" growth policy pursued at the regional level in the Republic of Kazakhstan. University of International Business named after K. Sagadiyev, Eurasian Journal of Economic and Business Studies, 67(4), 74-88. URL: https://doi.org/10.47703/ejebs.v67i4.302
26	Assylbekov, D., Nadeem, A., Aslam Hossain, Md., Akhanova, G., & Khalfan, M. (2021). Factors influencing green building development in Kazakhstan. Buildings, MDPI Journal, 11(12), 1-19. URL: https://doi.org/10.3390/buildings11120634
27	Khamzina, Sh.Sh., Satybaldiyeva, G.K., Boribay, E.S., Ussubaliyeva, S.D., Kildibekova, B.E., & Esengaraeva, G.E. (2023). The role of Green Media in solving environmental problems in the Republic of Kazakhstan. Rivista Di Studi Sulla Sostensibilita, 2023(1), 183-197. URL: https://www.francoangeli.it/riviste/Scheda_rivista.aspx?IDArticolo=74329
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29	Iskakov, B.M., Pyagay, A.A., Rakhimbekova, A.T. (2021). Global experience of transition to a "Green" economy. Kazakh Scientific-Research Institute of Agriculture and Land Cultivation, (2), 62-69. URL: https://scholar.archive.org/work/on3nwjto7fcsrpzuyzjejz56be/access/wayback/https://www.jpra-kazniiapk.kz/jour/article/download/472/436
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32	Obydenkova, A. (2024). Sustainable Development and Actors of Regional Environmental Governance: Eurasia at the Crossroads. In Book: Sustainable Development, Regional Governance, and International Organizations, 1st Edition, Book Chapter, Routledge Publishing. ISBN: 9781003468998.
33	Batyrbayev, N.M. (2018). Ecological education of the population as an important component of environmental policy. Journal of Actual Problems of Jurisprudence, Al-Farabi Kazakh National University, 88(4), 113-117. URL: https://elibrary.ru/item.asp?id=47424359

Appendix 2

List of Russian language research articles on environmental policy studies

No.	Russian language articles (n=27)
1	Chumachenko, T.N. (2018). O reformirovanii ekologisheskoi politikii Respubliki Kasachstan. [About reform of environmental policy of the Republic of Kazakhstan]. The National Pedagogical University named after Abai Journal. URL: https://sp.kaznpu.kz/docs/jurnal_file/file20190422061550.pdf#page=37 (In Russian).
2	Rakhimbekova, A.T. (2021). Ekologisheskaya politika i primery strategii ozelenii ekonomiki [Environmental policies and examples of greening strategies of the economy]. 2nd International Forum "Peacekeeping Potential of Islam in the development of Interfaith Relations", Stavropol, Russian Federation, Conference Paper, 166-170. URL: https://www.idnk.ru/images/nauka/konferenc/02_21.pdf#page=166 (In Russian).
3	Assanova, G.K., Adilbektegy, G.A., & Sain, E.D. (2023). Problemy ekologii v Kasachstane v perviye gody nezavisimosti [Ecological problems in Kazakhstan in the first years of independence]. Valikhanov Institute of History and Ethnology Journal, 10(4), 677-691. URL: https://doi.org/10.51943/2710-3994_2023_36_4_675-691 (In Russian).
4	Ospanova, G.K., Dosmagambetova, B.B., Darmenbaeva, A.A. (2023). Znachenie mezhdunarodnovo opita politiki razvitiiya zelyonoi ekonomiki dlya Kasachstan [The importance of international experience in green economy development policy for Kazakhstan]. Karaganda University of Kazpotrebsouz, 383-389. URL: https://elibrary.ru/item.asp?id=54119310 (In Russian).
5	Esenbekova, A.B. (2016). K probleme ustoichivovo razvitiya ekonomiki i eyo zavisimosti ot globalnovo izmenenie [To the problems of the sustainable development of the economy and its dependence on global climate change]. National Academy of Sciences of the Republic of Kazakhstan, 5(309), 302-308. URL: http://nblib.library.kz/elib/library.kz/Jurnal/%D0%94%D0%BE%D0%BA%D0%BB%D0%B0%D0%B4-05-2016/Esenbekova%20A.B.pdf (In Russian).
6	Kozlova, M.V. (2012). Zelyonaiya ekonomika kak paradigma ustochivovo razvitiya Respubliki Kasachstan [Green economy as a paradigm of sustainable development in the Republic of Kazakhstan]. Innovative University of Eurasia, Pavlodar city, (3), 61-66. URL: https://vestnik.ineu.edu.kz/files/bulletins/bulletin_2012_3(47).pdf#page=61 (In Russian).
7	Temirbekova, E.T. (2016). Perspektivy razvitiya zelyonoi ekonomiki v Kasachstane [Prospects for the development of a green economy in Kazakhstan]. Kyzylorda State University Bulletin, 40(11-2), 131-136. URL: https://elibrary.ru/item.asp?id=28090592 (In Russian).
8	Varavin, Y.V., Kozlova, M.V., & Shmakov, A.V. (2017). Ozenka ekologo-ekonomicheskovo razvitiya regionov Kasachstana i politika podderzhka zelyonoi ekonomiki na regionalnom urovne [Evaluation of Kazakhstan regions ecological and economic development and support policy of the "green" economy at the regional level]. Karaganda Buketov University Bulletin, 85(1), 61-69. URL: https://bbr.buketov.edu.kz/index.php/economy-vestnik/article/view/33 (In Russian).
9	Turkenov, T.K., Eliyrich, I.V., Talikova, G.T. (2015). Problema ekologisheskovo obrazovniya i vospitaniya detei doshkolnowo vozrasta v gosudarstvennyh normativnyh dokumentah Respubliki Kasachstan [The problem of environmental education and education of preschool children in state regulative documents of the Republic of Kazakhstan]. Academy Bolashak, Karaganda, Kazakhstan, Conference Paper, 40-42. URL: https://elibrary.ru/item.asp?id=25425878 (In Russian).
10	Aitzhanova, D.A. (2016). Ocenka faktorov i vozmozhnostej perehoda kazahstana k zelenoj ekonomike v sovremennyh uslovijah razvitija [Assessment of factors and opportunities for Kazakhstan's transition to a green economy in modern development conditions]. Institute of Economics of the Science Committee under the Ministry of Higher Education and Science of Kazakhstan, 37(1), 98-114. URL: https://elibrary.ru/item.asp?id=37000627 (In Russian).
11	Artikbaeva, G.T. (2015). Sravnitel'nyj analiz normativno-pravovyh osnov ekologicheskoj politiki v Rossijskoj Federacii i Respublike Kazahstan [Comparative analysis of normatively legal bases of ecological politics in Russian Federation and Republic of Kazakhstan]. Omsk University Bulletin, Historical Science Series, 7(3), 110-114. URL: https://cyberleninka.ru/article/n/sravnitelnyy-analiz-normativno-pravovyh-osnov-ekologicheskoy-politiki-v-rossiyskoy-federatsii-i-respublike-kazahstan (In Russian).
12	Aliyeva, G. & Laumulin, M. (2021). Transgranichnoe ekologicheskoe sotrudnichestvo kazahstana i rossii: problemy i perspektivy [Transboundary environmental cooperation between Kazakhstan and Russia: problems and Prospects]. Central Asia and the Caucasus, 22(4), 140-151. URL: https://www.ca-c.org/index.php/cac/article/view/734 (In Russian).

13	Buribayeva, Zh.A. (2024). Sovershenstvovanie gosudarstvennoj politiki respubliki kazahstan v oblasti ekologicheskoj bezopasnosti [Improving state policy of the Republic of Kazakhstan in the field of environmental safety]. Academy of Public Administration under the President of the Republic of Kazakhstan, Master's Dissertation, 1-73. URL: https://repository.apa.kz/bitstream/handle/123456789/1432/%D0%91%D1%83%D1%80%D0%B8%D0%B1%D0%B0%D0%B5%D0%B2%D0%B0.pdf?sequence=1&isAllowed=y (In Russian).
14	Ormysheva, T.A., & Akzharov, B.K. (2014). Problemy razvitija ekologicheskogo dvizhenija v Respublike Kazahstan [Problems of ecological movement development in the Republic of Kazakhstan]. Al-Farabi Kazakh National University Bulletin, International Relations and International Law Series, 65(1), 65-69. URL: https://rmebrk.kz/journals/2148/29386.pdf#page=65 (In Russian).
15	Askeyeva, G.B., & Bekeyeva, L.K. (2012). Ekologicheskaja politika obse v respublike kazahstan [Environmental Policy of OSCE in the Republic of Kazakhstan]. Eurasian National University. URL: https://geum.ru/next/art-70702.leaf-10.php (In Russian).
16	Yerkinbayeva, L.K., & Kalymbek, B. (2020). K voprosu o cifrovizacii ekologicheskoj informacii v respublike kazahstan [On the issue of digitalization of environmental information in the Republic of Kazakhstan]. Kazakh-American University Journal, 50(4), 38-42. URL: https://www.researchgate.net/profile/Nurlan-Nurseiit/publication/347926889_NOVAA_MODEL_EKONOMICESKOGO_ROSTA_V_KITAE_BUDET_LI_ONA_USPESNOJ_A_NEW_MODEL_OF_ECONOMIC_GROWTH_IN_CHINA_WILL_IT_BE_SUCCESSFUL/links/5fe775a8a6fdccdcb8074ce9/NOVAA-MODEL-EKONOMICESKOGO-ROSTA-V-KITAE-BUDET-LI-ONA-USPESNOJ-A-NEW-MODEL-OF-ECONOMIC-GROWTH-IN-CHINA-WILL-IT-BE-SUCCESSFUL.pdf#page=38 (In Russian).
17	Matveyeva, E.V. (2020). Ekologicheskaja politika postsovetskih gosudarstv v reshenii problemy global"nogo izmenenija klimata [Some aspects of environmental policy of the post-soviet states to ensuring sustainable development]. Perm State University Bulletin, Political Science Series, 1-12. URL: https://cyberleninka.ru/article/n/ekologicheskaya-politika-postsovetskih-gosudarstv-v-reshenii-problemy-globalnogo-izmeneniya-klimata.pdf (In Russian).
18	Baymbetov, N.S., & Idirisova, B.Sh. (2012). Problemy ekologicheskoj bezopasnosti Respubliki Kazahstan [Problems of environmental safety of the Republic of Kazakhstan]. Al-Farabi Kazakh National University Bulletin, Law Series, 62(2), 129-138. URL: https://rmebrk.kz/journals/1194/48691.pdf#page=129 (In Russian).
19	Lantukh, K.S., & Perevozova, O.V. (2022). Osveshhenie ekologicheskih problem v internet-smi rossii i kazahstana [Coverage of environmental issues in the online media of Russia and Kazakhstan]. South Ural State University Journal, Socio-Humanitarian Series, 22(3), 115-122. URL: https://cyberleninka.ru/article/n/osveschenie-ekologicheskih-problem-v-internet-smi-rossii-i-kazahstana (In Russian).
20	Lapteva, N.G., & Umerbaeva, R.E. (2012). Nekotorye voprosy pravogo mehanizma ekologo-informacionnoj politiki Kazahstana [Some questions of the right mechanism ecological-information policy of Kazakhstan]. KAZNU Bulletin, Law Series, 62(2), 143-146. URL: https://bulletin-law.kaznu.kz/index.php/journal/article/download/1543/1489 (In Russian).
21	Muhanova, A.T., & Aitmuhanova, D.U. (2025). Mezhdunarodnoe sotrudnichestvo v reshenii ekologicheskih problem v usloviah modernizacii: osnovniye napravleniya i perspectivy pravovo razvitiya [International Cooperation in Solving Environmental Problems in the context of Globalization: Main Directions and Prospects for Legal Development]. Kh. Dosmukhamedov Atyrau State University, 76(1), 526-536. URL: https://doi.org/10.47649/vau.25.v76.i1.44
22	Akhetova, A.A. (2017). Gosudarstvennaja politika rk v oblasti ohrany okruzhajushhej sredy: vozmozhnosti, problemy i perspektivy. o kazahstanskoj iniciative "zelenyj most" [State policy of the RK in the field of environmental protection: opportunities, problems, and prospects]. About the Kazakhstan initiative "Green Bridge"]. Astrakhan Technical State University, 283-285. URL: https://elibrary.ru/item.asp?id=30049040 (In Russian).
23	Kurmanova, A.K. & Kanatbayeva, E. (2014). Pravovoe obespechenie ekologicheskoj bezopasnosti v respublike kazahstan [Legal ensurance of environmental safety in the Republic of Kazakhstan]. Zhubanov Aktobe Regional University Bulletin, 143-148. URL: https://rmebrk.kz/journals/3270/81558.pdf#page=143 (In Russian).
24	Chichenkov, D.E. (2018). Problemy obespechenija ekologicheskoj bezopasnosti i ih reshenie [Problems of ensuring environmental safety and their solution]. Kokshetau Technical University Bulletin, 242-245. URL: http://repositsc.nuczu.edu.ua/bitstream/123456789/8459/1/%D0%9A%D0%BE%D0%BA%D1%88%D0%B5%D1%82%D0%B0%D1%83%2015.03.2018.pdf#page=242 (In Russian).

25	Akopova, E.A. (2014). Sistema organov gosudarstvennogo upravlenija v sfere ohrany okruzhajushhej sredy v respublike kazahstan [System of state management bodies in the sphere of environment in Kazakhstan]. Al-Farabi Kazakh National University, Law Series, (3), 42-51. URL: http://dx.doi.org/10.14420/ru.2014.3.6 (In Russian).
26	Smoilov, S.Zh. (2014). K voprosu o pravovom obespechenii mehanizma ekonomicheskogo regulirovanija ohrany okruzhajushhej sredy i prirodopol'zovanija v Respublike Kazahstan [On the question of legal support mechanism for economic regulation of environmental protection and natural resources in the Republic of Kazakhstan]. Al-Farabi Kazakh National University, Law Series, 69(1), 181-186. URL: https://rmebrk.kz/journals/2232/69031.pdf#page=181 (In Russian).
27	Jangabulova, A.K., & Salykhbaeva, A.T. (2014). Stanovlenie i razvitie pravovyh osnov ekologicheskoj politiki Respubliki Kazahstan [Formation and development of legal bases for environmental policy of Kazakhstan]. Al-Farabi Kazakh National University, Law Series, 70(2), 178-182. URL: https://bulletin-law.kaznu.kz/index.php/journal/article/download/273/269/ (In Russian).

Appendix 3

List of Kazakh language research articles on environmental policy studies

No.	Kazakh language articles (n=32)
1	Kapassova, G.M., Artykbayeva, G.T., Musagazhinova, A.A., & Altybasarova, M.A. (2021). Khazakhstan Respublisanin khazirgi samanghy ekologialiykh sayasatyn zhanghartu maselery[On the problem of modernizing the modern environmental policy of the Republic of Kazakhstan]. The National Pedagogical University named after Abai, Socio-Political Series, 73(1). URL: http://dx.doi.org/10.51889/2021-1.1728-8940.05 (In Kazakh).
2	Baizhumanova, A.S. (2011). Eulganyn ekologilyq madenietinin qalyptasy maselesi [The problem of the formation of personal ecological culture]. Al-Farabi Kazakh National University, Philosophy Series, 36(1), 167-170. URL: https://bulletin-philospolit.kaznu.kz/index.php/1-pol/article/download/726/702 (In Kazakh).
3	Sansyzbayeva, G.N., Ashirbekova, L.Zh., & Nurgalieva, K.O. (2018). «Jasyl» tehnologiylardyn damyy – qazaqstannyn turaqty damyynyn basym bagyty retinde [Development of "Green" Technologies as priority direction of sustainable development of Kazakhstan]. Narxoz University, Central Asian Economic Review, 3(121), 154-163. URL: https://caer.narxoz.kz/jour/article/view/260/261 (In Kazakh).
4	Maykotova, G., Abdiraman, E., & Ornykhbay, T. (2023). Qazaqstandagy ekologiylyq jyrnalistikanyn damy erekselikteri [Features of the development of environmental journalism in Kazakhstan]. Eurasian National University, Journalism Series, 144(3), 103-121. URL: https://doi.org/10.32523/2616-7174-2023-144-3-103-121 (In Kazakh).
5	Satbayeva, G.S. (2015). Turaqty damydagy ekologiylyq bilim jane tarbie [Environmental education and training for sustainable development]. National Academy of Sciences of the Republic of Kazakhstan, Agricultural Sciences Series, 2(26), 103-108. URL: https://rmebrk.kz/journals/851/89749.pdf#page=103 (In Kazakh).
6	Ensegenov, A.S. (2022). Su resustaryn basqarydagy memlekettik saysat [State policy in water resources management]. Academy of Public Administration under the President of the Republic of Kazakhstan, 1-66. URL: https://repository.apa.kz/handle/123456789/1036 (In Kazakh).
7	Satieva, M.T., & Sapabekova, D.O. (2024). «Jasyl investiziyalardy» damytudagy memlekettik retteydin roli [The role of state regulation in the development of "green investment"]. Kyrgyz National University of Zhusupa Balasagyna, 118(2), 263-268. URL: https://vestnik.knu.kg/wp-content/uploads/2024/08/%E2%84%96-2-2024.-2-%D0%B8%D1%8E%D0%BB%D1%8F.pdf#page=263 (In Kazakh).
8	Khussainova, A. (2022). Qazaqstan respublikasynyn ekologiyalyq saysaty (sayasi -quqyqtyq qyrlary) [Environmental policy of the Republic of Kazakhstan (Political and Legal Aspects)]. Kazakhstan Institute for Strategic Studies, 73(1), 6-22. URL: https://journal-kogam.kisi.kz/index.php/kd/article/download/85/52 (In Kazakh).
9	Sarkulova, G.S. (2023). Khazakhstanin Kaspiy aimaghyndaghy ekologialykh sayasaty [Environmental policy of Kazakhstan in the Caspian Region]. Agrarian Technical University named after Zhangyr Khan, Uralsk, Kazakhstan, 71(1-2), 360-369. URL: https://www.elibrary.ru/item.asp?id=65670386 (In Kazakh).
10	Nysanbayeva, A.M., & Syzdykova, G.Zh. (2021). Ortalyq aziya onirindegi transsekaralyq ozender maseleleri boiynsha ortalyq aziya elderinin su saysaty [Water Policy of the Central Asian countries on transboundary rivers in the Central Asian region]. The National Pedagogical University named after Abai, 68(1), 1-10. URL: https://doi.org/10.51889/2021-1.1728-5461.23 (In Kazakh).
11	Kyzdarbekova, A.S., Kanabekova, M.A., Nizamdinova, A.K., & Popesko, B. (2023). «Jasyl ekonomikaga» kosy jagdaiyndagy ekologiyalyq komplaens tujyrymdamasyn qoldanydagy tayuekelder jane ony damyty joldary [Concept of environmental compliance in the transition to the green economy and ways of its development]. Turan University Bulletin, 99(3), 9-22. URL: https://doi.org/10.46914/1562-2959-2023-1-3-9-22 (In Kazakh).
12	Aitkazina, M., Akisheva, N., & Karshalova, A. (2024). Zhasyl ekonomikany yntalandyru uyshyn memlekettiyk kharzhylykh retteudin innovazialykh khuraldaryn paidalanudyn aelemdyk taezherebesy[The world practice of using innovative instruments of state financial regulation to stimulate the green economy]. Eurasian National University, Economic Series, (2), 267-279. URL: https://doi.org/10.32523/2789-4320-2024-2-267-279 (In Kazakh).
13	Kumarbekuly, S. (2024). EKHTA-DA Ekoturizmdi zhusuge asyurudin yumdykh-khukhykhtykh aspektilery [Organizational and legal aspects of implementing ecotourism SPNA]. International University of Tourism and Hospitality Bulletin, 2(4), 73-100. URL: https://journal.iuth.edu.kz/index.php/main/article/download/120/103 (In Kazakh).

14	Nurtaza, G., & Byulegenova, B. (2025). Ekologialyk sayasay zhane turakhty damu: Khazakhstan ushyn mindetter men mumkindikter [Environmental Policy and Sustainable Development: Challenges and Opportunities for Kazakhstan]. Kazakhstan Institute for Strategic Studies, 85(1), 39-49. URL: https://doi.org/10.52536/2788-5860.2025.85.1.003
15	Mazhenova, Zh.A. (2013). Ekologialykh turizmnin damu tendenzialary [Progress of ecological tourism trends]. Al-Farabi Kazakh National University, Geography Series, 37(2), 86-91. URL: https://bulletin-geography.kaznu.kz/index.php/1-geo/article/download/683/569 (In Kazakh).
16	Uruzgaliyeva, M. & Usmanov, R. (2022) Kaspiy onirinin ekologialikh khaupsizdiyk maseleryn sheshedu-in sayasy tetiktery: Khazakhstan Respublikasy men Reseiy Federaziasy mysalynda [Political mechanisms for addressing environmental security issues of the Caspian region: The case of the Republic of Kazakhstan and the Russian Federation]. Kazakhstan Institute for Strategic Studies, 74(2), 78-90. URL: https://doi.org/10.52536/2788-5860.2022-2.06 (In Kazakh).
17	Teleuyev, G., Bekturganov, A., & Zhussipova, B. (2025). Zhanuarldardin khukhykhtykh rezhimnin ekologialykh zhane biozenetikalykh aspektiliery [Ecological and Biocenotic Aspects of the Legal Regime of Animals]. Eurasian National University, Law Series, 151(2), 185-197. URL: https://doi.org/10.32523/2616-6844-2025-151-2-185-197
18	Zhaxybekova, F.S. (2021). Ekologialykh khylmysktykhka kharsy kuyres zhurgizudegi khylmystykh sayasat [Criminal policy in the fight against environmental crime]. Institute of Legislation and Legal Information of the Republic of Kazakhstan, 64(1), 184-190. URL: https://vestnik.zqai.kz/index.php/vestnik/article/view/52/45 (In Kazakh).
19	Kurmanbayeva, A.B., Alimkulova, N.I., & Serikpayev, N.E. (2013). Ekologialykh khauypsizdikti khukhykhtykh khamtamaszy etudin keiybir maselery [Some legal problems of environmental safety]. Al-Farabi Kazakh National University, Law Series, 66(2), 239-243. URL: https://rmebrk.kz/journals/1200/88876.pdf#page=239 (In Kazakh).
20	Kharazhanov, M.D., Khanatov, A.K., & Ahmetova, A.Zh. (2016). Ekologialakh Khauypsizdikke khol sughatyn khylmystykh khukhykh buzyshylakhtargha kharsy kuresudinh keiybir maselery [Some problems of struggle against criminal offenses, encroaching on ecological safety]. Institute of Legislation and Legal Information of the Republic of Kazakhstan, 43(2), 47-54. URL: https://vestnik.zqai.kz/index.php/vestnik/article/view/536/521 (In Kazakh).
21	Tastanbekova, R.E. (2015). Khazakhstan Respublikasindaghy erekshe khorgalatyn tabighi aumakhtardyn khazirgi zhaghdaiyi [The current state of protected areas in the Republic of Kazakhstan]. Al-Farabi Kazakh National University, Geography Series, 41(2), 353-357. URL: https://bulletin-geography.kaznu.kz/index.php/1-geo/article/view/261 (In Kazakh).
22	Boribay, E.S., Yessimova, D.D., & Satybaldiyeva, G.K. (2024). Khazakhstandaghy ekologialykh turizmnin khazirgi damu tendenzialary [Current development trends ecological tourism in Kazakhstan]. Narxoz University, Central Asian Economic Review, 2024(1), 80-91. URL: https://doi.org/10.52821/2789-4401-2024-1-80-91 (In Kazakh).
23	Baikushikova, G.S. (2012). Ortalykh Aziya aiymaghynda ekologialiykh khaupsizdiktiy khamtamasyz etudin ontailandyru zholdary [Optimization ways of enhancing environmental security in Central Asia]. Al-Farabi Kazakh National University, International Relations and International Law Series, 59(3), 61-65. URL: https://bulletin-ir-law.kaznu.kz/index.php/1-mo/article/view/669 (In Kazakh).
24	Kuralbekova, G.A. (2021). Shyghys Khazakhstan oblysyndaghy ekologialykh bilim beru maselelery: Sayasi Taldau [Environmental education in East Kazakhstan region problems: political analysis]. Eurasian National University, Conference Paper, XVI International Scientific Conference of Students and Young Scientists “Gylym Jane Bilim – 2021”, 7005-7008. URL: https://repository.enu.kz/handle/enu/7297?show=full (In Kazakh).
25	Aitkhazy, A. (2014). “Zhasyl Ekonomikanin” damitiyudin negizy baghyttary [Main directions of development of “Green Economy”]. Eurasian National University, Conference Paper, Proceedings of the IX International Scientific Conference for students and young scholars “Science and Education – 2014”, Astana, April, 5346-5249. URL: https://ecogosfond.kz/wp-content/uploads/2023/11/Zhasyl-jekonomikany-damytudy-negizgi-ba-yttary.pdf (In Kazakh).
26	Ziyavdinova, A.K., Tleubergenova, K.A., Karmenova, N.N., Ashimov, T.T., Tokhsabayeva, M.E., Satybaldiyeva, A.U., & Mahanova, A.S. (2017). Khazakhstanda ekologialiakh turizmdy damyitu mumkindiktery men khazhettilery [Opportunities and prospects for development of ecological tourism in Kazakhstan]. Atlas Sosyal Bilimler Dergisi Ana Sayfa (Turkey), 43-47. URL: https://dergipark.org.tr/en/download/article-file/1177802 (In Kazakh).

27	Ospanova, A.K., & Zakirova, D.I. (2021). Ekologiyalikh politika v formirovanii zirkuliarnoiy ekonomiki [Environment Policy in the formation of circular economy]. Turan University Bulletin, 91(3), 180-186. URL: https://doi.org/10.46914/1562-2959-2021-1-3-180-186 (In Kazakh).
28	Dugalova, G.N. (2020). "Zhasyl ekonomikanin" mani zhane Khazakhstan Respublikasyndaghy onyn damu basymdikhtary [The meaning of the "Green Economy" and its development priorities in the Republic of Kazakhstan]. Turan University Bulletin, (1), 40-46. URL: https://vestnik.turan-edu.kz/jour/article/view/1044
29	Nurtileu, K., Serikova, A.Zh., & Tursynova, T.T. (2025). Khazakhstandagy iyshky turizmnin khazirgi damu uidisteri zhane onyn aleymettik-ekonomikalykh bolashaghy [Current development processes of domestic tourism in Kazakhstan and its socio-economic future]. International Scientific Center "Endless Light in Science', Geographical Sciences Series, 23-28. URL: https://cyberleninka.ru/article/n/aza-standa-y-ishki-turizmni-azirgi-damu-deristeri-zh-ne-ony-leumettik-ekonomikaly-bolasha-y-1
30	Alibekova, Gh.K. (2011). Ekologialykh khaupsizdik maselesy sayasi tuyrakhtylykh kepili retinde [Environmental security issue - political stability as a guarantee]. Al-Farabi Kazakh National University, Series of Philosophy, Cultural Science, and Political Science, 36(1), 51-54. URL: https://bulletin-philospolit.kaznu.kz/index.php/1-pol/article/download/673/650 (In Kazakh).
31	Dulambayeva, R.T., & Boluspayev, Sh.A. (2013). Khazakhstannin "Zhasyl" ekonomikany damiytu mumkindiktery [Prospects for the "Green" economy of Kazakhstan]. Academy of Public Administration under the President of the Republic of Kazakhstan, 38(2/3), 56-61. URL: https://repository.apa.kz/handle/123456789/227 (In Kazakh).
32	Dugalova, G.N. (2019). Zhasyl khurylstyi damytudin alemdik tazhiribesy zhane ony Kazakhstan Respublikasynda paidalanu [Global experience in the development of "Green" construction and its use in the Republic of Kazakhstan]. Narxoz University, Central Asian Economic Review, 6(129), 59-69. URL: https://caer.narxoz.kz/jour/article/view/99/100 (In Kazakh).