IRSTI 85.93.25 https://doi.org/10.26577/be.2024-148-b2-09

A.S. Kyzdarbekova*[1], A.Z. Nurmagambetova[1], Zh.Z. Oralbayeva[1], R. Pukala[2]

[1]Al-Farabi Kazakh National University, Kazakhstan, Almaty
[2] B. Markiewicz State University of Technology and Economics, Poland, Jaroslaw
*e-mail: aseta_ks@mail.ru

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

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

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

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

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

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

А.С. Кыздарбекова[1]*, А.З. Нурмагамбетова[1], Ж.З. Оралбаева[1], Р. Пукала[2]

[1]Әл-Фараби атындағы ҚазҰУ, Қазақстан, Алматы қ.
[2]Б. Маркевич атындағы мемлекеттік технология және экономика университеті, Польша, Ярослав қ.
*e-mail: aseta_ks@mail.ru

Экологиялық аудит қоршаған ортаны жақсарту мен қорғаудың негізгі құралы ретінде

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

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

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

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

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

А.С. Кыздарбекова[1]*, А.З. Нурмагамбетова[1], Ж.З. Оралбаева[1], Р. Пукала[2]
[1]Казахский национальный университет имени аль-Фараби, Казахстан, г. Алматы
[2]Государственный технологический и экономический университет имени Б. Маркевича, Польша, г. Ярослав
*e-mail: aseta_ks@mail.ru

Экологический аудит как главный инструмент улучшения и защиты окружающей среды

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

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

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

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

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

Introduction

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

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

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

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

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

Literature review

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

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

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

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

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

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

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

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

According to Grant Ledgerwood et al. (1992): the environmental audit is a new element of corporate strategy. It is the natural result of a growing environmental consciousness that began in the 1960s and peaked in the 1990s, realizing that it is the responsibility of every firm and individual to contribute to solving global environmental problems (Wardhani I., Yunus H. A., 2017).

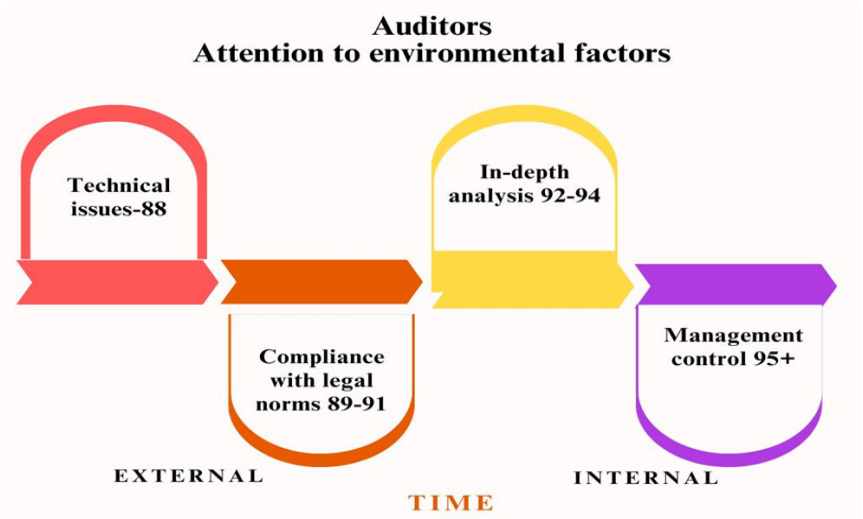

Figure 1 – Transformation of the environmental audit over time
Note – Compiled by the authors, source: (Medley,1997)

The environmental audit covers a wide range of environmental aspects, some examples include:

- emissions: assessment of air pollution, including volatile organic compounds, greenhouse gases, and other pollutants;
- water resources management: assessment of water use, wastewater production, and discharge procedures;
- waste management: the study of waste production, classification, storage, movement, and disposal;
- hazardous substances: identifying and evaluating the use, storage, processing and disposal of hazardous materials. This includes assessing compliance with chemical handling regulations such as labeling, material safety data sheets, and spill response plans (Environmental Assessment, 2022).

Methodology

Many individuals are concerned about environmental quality, and a variety of investigations have been undertaken in educational settings to investigate the elements influencing it from various viewpoints. The best known of these is the proposal and verification known as the environmental Kuznets curve (EKC) (Grossman M., Krueger B., 1995). EKC describes the link between economic growth and environmental quality as an inverted U-shaped relationship. As a result, several researchers have contributed to the investigation of various elements influencing environmental quality: foreign trade (Cole M.A., 2003), foreign investment (Abdouli M., Hammami S., 2016), industrial structure (Zhang, X.; Zheng, J.; Wang, L., 2022), technological progress (Chaudhry I.S. et al., 2022), income distribution (Mahalik, M.K. et al., 2018) and institutional structure (Mehmood U. et al., 2022).

However, as Lee H. et al. (2023) points out, economic development patterns and due to differences in industry structure, there is almost no single model that explains the relationship between a certain factor and environmental quality applied to pollutants in all regions.

Thus, the scientific writings of indigenous, Russian, and worldwide researchers as well as national and international studies addressing environmental protection concerns served as the foundation of theory and method for this research. Given the assigned variables, the comparison method, visual analysis, methodical, logical, quantifiable procedure, and depth of assessment all add to the credibility of the study's findings.

Results and discussion

The analysis of the main trends in environmental protection allowed the authors of the articles to identify the following features in Kazakhstan:

Industrialization has so far helped many societies and their economies move forward, but it has led to an effect known as a «silent spring» (Li X. and Heads, 2023).

In addition to economic growth since independence, our republic has also suffered significant damage in the form of environmental and

resource damage or heavy pollution. For example, the indicator of environmental pollution.

In the nation's metropolitan regions, and particularly in industrial districts that have stabilized and developed into industrial hubs, air pollution is turning into a major environmental concern. Urban areas account for the majority of air pollution nationwide. Most of the population in urban areas suffers from decreasing air quality, which causes the need to pay special attention to improving the situation in urban areas.

Air pollution that contains harmful components raises morbidness, which has an immediate and long-term impact on the nation's economy through higher medical expenses and decreased worker productivity. The nation's pollution regulations vastly surpass those of Europe. Therefore, it is essential to think about establishing stricter limits for emissions of dust, sulfur dioxide, and nitrogen oxide in order to enhance the quality of the air in Kazakhstan.

The National Bureau of Statistics estimates that 2314.7 thousand tons of pollutants were released into the atmosphere by stationary sources in 2022. Twenty.4% of them are solids, while the remaining 79.6% are gaseous liquids.

Nonetheless, compared to the previous year, the amount of air pollutants emitted by stationary sources fell by 3.8% this year. It is caused by the fact that in 2022 the republican organizations in the activities of enterprises, which constantly pollute the environment, capture and neutralize 93.4% of pollutants in the air.

Atmospheric emissions of substances negatively affecting the health and activity of the population and the natural environment from permanent, i.e. organized and unorganized emission sources, are the emissions of atmospheric pollutants.

Parts of the toxic gases released by stationary air infusion systems such as vents, chimneys, and aeration fixtures are considered organized permanent sources.

Now we will review the data by regions of the RoK. The main volume of pollutants was formed in Pavlodar region (724.2 thousand tons), Karaganda region (469 thousand tons).

Table 1 – Pollutant losses by regions, thousand tons

Regions	2018	2019	2020	2021	2022
By the Republic	2446.7	2483.1	2441	2407.5	2314.7
Abay region	-	-	40.7	40.9	39
Akmola region	84.5	76.7	77.2	77.3	69.5
Aktobe region	158.1	136.6	135.1	137.4	136.5
Almaty region	50.2	48.1	26.3	30.3	28.8
Atyrau region	172.3	164.5	153.9	160.3	132.1
West Kazakhstan region	48.2	41.2	30.8	26	25.8
Zhambyl region	52.1	55.8	55	55.8	52.9
Zhetysu region	-	-	19.9	17.7	13.1
Karaganda region	587.5	641.3	519	488	469
Kostanay region	124	130.5	123.4	137.9	121.4
Kyzylorda region	26	24.4	28.3	29.2	23.4
Mangistau region	65.5	64.5	72.5	75.2	78.7
Pavlodar region	709.3	721.5	723	736.1	724.2
North Kazakhstan region	75.5	74.7	76	61.2	52.7
Turkestan region	30	33.5	28.1	29	25.2
Ulytau region	-	-	108.7	81.7	105.1
East Kazakhstan region	130.7	128.8	86.5	87.2	83.3
Astana	56.4	65.1	62.4	62.2	57.7
Almaty	43	46.1	44.5	40.8	41.4
Shymkent	33.4	29.8	29.6	33.2	34.9
Note – Data from the Bureau of National Statictics					

As you can see from the table above, it can be seen where there has been a decrease in air pollutant emissions over the last 3 years. That is a decrease of 168.4 tons compared to 2019. Without a doubt, the establishment of the Republic of Kazakhstan's Ministry of Ecology, Geology, and Natural Resources in the year 2019 was the cause of this.

Let's look at the environmental costs that are applied in the manner used by entities that produce emissions of these air pollutants to reduce pollution in the environment.

The capacity of any business to establish the concept of environmental expenditures, categorize them, and compute them as a fundamental element in the logical environmental management system is a crucial move toward developing procedures for evaluating them. The thoroughness with which environmental expenses are reflected in cost accounting is critical for qualitative analysis. To solve this issue, basic guidelines for classifying environmental expenses and reflecting them in cost accounting accounts must be established.

According to investigators Hansen and Mendoza, expenditures can be classified as:

– environmental detection costs: expenses to ensure conformity with legislation and opt-in norms;

– environmental prevention costs: the expenses of efforts taken to avoid the development of waste;

– environmental external failure costs expenses incurred on tasks carried out after releasing waste into the environment;

– environmental internal failure costs expenses incurred from carrying out activities that have produced contaminants and waste that have not been discharged into the environment.

K. S. Saenko is of the opinion that the environmental procedures of a business should be taken into account in the context of nature management, i.e., in the areas of growth, the extraction process, utilization of resources from nature; adverse effects on the planet; and environmental protection operations. We believe that the generating entities should be required to pay compensation for harm to the environment. This is because the ecology is adversely impacted by the production and mining of minerals.

Environmental accounting is defined by S. M. Shapiguzov and L. Z. Shneidman as a method of keeping track of environmental protection operations with regard to the control of this topic in question. They state that a company's environmental accounting framework should have 4 key components: recording environmental expenses, recording environmental liabilities, environmental reporting, and auditing of relevant data.

Streamlining the expenditures of environmental protection and applying them to modern management accounting requirements – specifically in the context of building a cost control system–remain among the most important problems in environmental accounting research.

The ability to define the notion of environmental costs, classify them, and calculate them is critical in developing techniques for evaluating them inside any firm, as it serves as the key component in the system of logical environmental management. The thoroughness with which environmental expenses are reflected in cost accounting is critical for qualitative analysis.

K. S. Saenko carefully analyzed the categorization aspects of environmental costs, as shown in Figure 2.

In this cost categorization, expenses should be used instead of costs if the corporation settles them out of earnings.

There are variances between the phrases expenses and costs recently, regardless of the fact both are usually used in tandem.

Costs are factors used in the manufacture of items or works. Expenses are a resource utilized to create money for the present time.

The cost allocation in the RoK by Taigashinova K.T. can be introduced as follows (Figure 3).

The expense accounts under consideration are applied in all organizations of the country. It reflects the organization's financial situation, so organizations at the public and private levels of the country should include and control environmental costs in their part of expenses. This is because many foreign organizations pay much attention to environmental responsibility in the process of pilgrimage of domestic enterprises.

Further, we will consider the amount of expenses within the republic in recent years invested in environmental protection:

The Republic of Kazakhstan's business entities spent 444 billion dollars in 2022 and 417 billion dollars in 2021 on environmental conservation.

According to data for 2022, Atyrau (22.7%), Karaganda (10.3%), Aktobe (10.1%) regions allocated 191.8 billion tenge for environmental services, which is 43.1% of total environmental protection costs. This is explained by the high concentration of industrial organizations in these regions.

Classification features		Environmental cost groups	
	Employed in the manufacturing procedure		Basic and overhead expenditures
	By technique of adding to the sales expenses		Both direct and indirect expenditures
	By substance of the economy		Costs of compensating for an economic entity's negative environmental effect
	Relative to the business		Internal and external costs for preventing negative impacts and eliminating their repercussions
	In monetary terms		Capital and operational costs
	By manufacturing amenities		Cost of manufacturing networks, workplaces, regions, and facilities
	By nature utilize objects		Costs associated with environmental preservation, including air, water, soil, and perennial farms; Noise, radiation, and vibration reduction costs; Waste disposal and dump costs; Natural terrain conservation costs.
	Concerning the extent of environmental harm		Overt and covert techno genic impact costs
	By execution period		Current and advance expenses
	Through the discharge of contaminants		Specific and related environmental expenditures
	By degree of density		Expenses as compensation for a license to utilize natural resources; The costs of reproduction and environmental conservation; Expenditures including pollution levies; Expenditures in the form of other environmental fees.
	According to the contaminating level		Industrial pollution costs: - Within restrictions; - Exceeding regulations but not exceeding limits; - Exceeding defined limitations. - Fines and penalties for unexpected and unforeseen pollution incidents
	By kind of cost recuperation.		Costs associated with restoring people's health and compensating for pollution's negative impact on businesses and third parties.

Figure 2 – Classification of environmental costs according to K.S.Saenko
Note – Compiled by the authors, source: (Saenko, 2005)

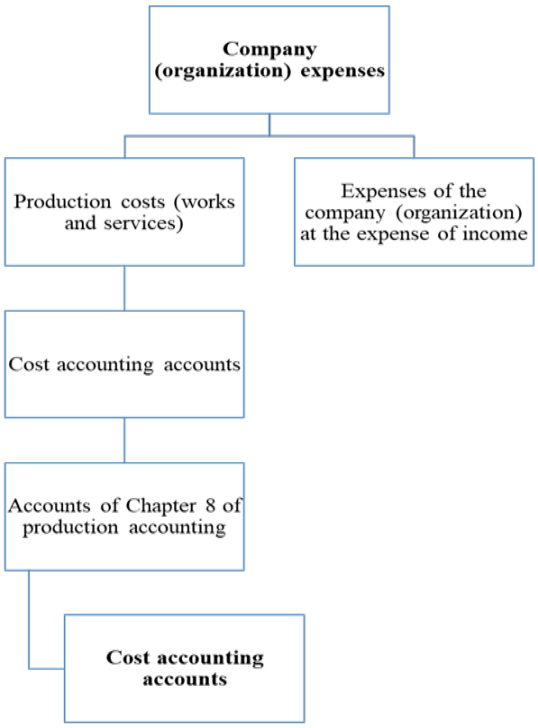

Figure 3 – Costs of production, accounts for cost accounting, accounts for expense accounting
Note – Compiled by the authors, source: (Ahmetova, 2016)

In 2022, the fraction of fixed capital investments that focused on environmental protection was 35.9% of total expenses, while current costs accounted for 64.1%. Table 2 shows the change in environmental protection expenses based on the kind of environmental protection activities:

Table 2 – Dynamics of environmental protection costs by types of environmental protection activities.

Types of activities	2020 (‘000 KZT)	2020 share, %	2021 (‘000 KZT)	2021 share, %	2022 (‘000 KZT)	2022 share, %
Total	384015734	100	416955575	100	444514269	100
Problems of atmospheric air protection and climate change	88476190	23.04	82513454	19.79	127995826	28.79
Aqaba water treatment	66978966	17.44	94165799	22.58	113096310	25.44
Waste management	73248476	19.07	90899013	21.80	107096519	24.09
Protection and rehabilitation of soil, ground, and surface waters	16180047	4.21	26808738	6.43	23695591	5.33
Reduction of noise and vibration impact	38788	0.01	94492	0.02	163944	0.04
Biodiversity and landscape conservation	6038736	1.57	2199854	0.53	3307758	0.74
Radiation safety	955709	0.25	779270	0.19	880252	
Research and development in the field of environmental protection	4502777	1.17	4921332	1.18	3479430	0.78
Other areas of environmental protection activities	127596045	33.23	114573623	27.48	64798639	14.58
Note – Data from the Bureau of National Statistics						

Table 2 shows the following arrangement of environmental protection expenses by kinds of environmental protection operations: Air protection: 28.8%, Aqaba water treatment: 25.4%, and waste management: 24.1%. Let us represent it in the format of figure 4.

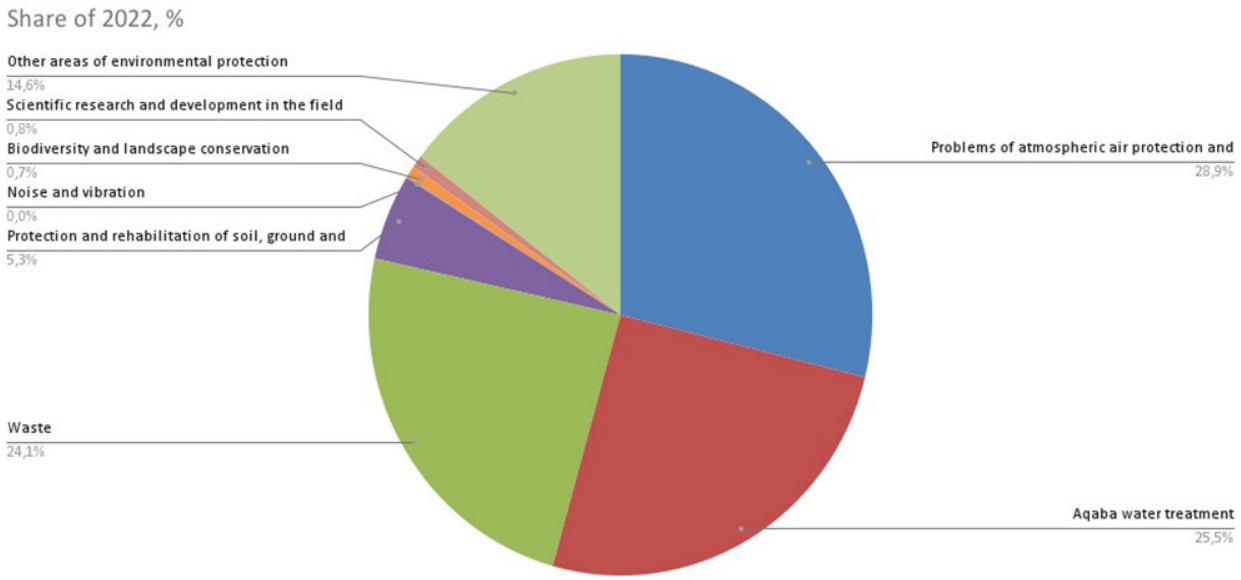

Figure 4 – Total environmental protection costs by type of environmental protection activities
Note – Data from Bureau of National Statistics

The classification of environmental protection activities – such as trash disposal, wastewater treatment, and combating climate change – determines the amount of money spent on each category of activity.

These expenses have an environmental component and are intended to safeguard the environment. In the case of conjugate (production, technical, and environmental) significance, only those are listed, where the main (primary) reason for their implementation is the objective of environmental protection.

Organizations must do their part to preserve the environment in a world that is facing environmental challenges. Conducting an audit of an organization's products, services and facilities is an important step towards achieving this goal. By ensuring environmental compliance, organizations reduce risks and adopt sustainable practices, strengthen relationships with stakeholders, and improve their environmental management systems. Environmental compliance and unwavering audit is the ultimate statement that the organization is committed to preserving our planet and positively impacting future generations.

The results of the study show that environmental audit is an important tool for improving environmental performance and reducing the negative impact on the environment. To improve the environmental situation in Kazakhstan, it is necessary:

- to develop a legal framework for environmental auditing by international standards;
- reduce and stabilize pollution volumes;
- set stricter emission standards;
- implement continuous emission monitoring systems;
- to develop methods of analysis and classification of environmental costs in companies.

Environmental audit contributes to compliance with environmental standards and risk reduction, introducing sustainable methods, strengthening relationships with stakeholders, and improving environmental management systems.

Conclusion

The outcomes of this investigation reveal that contaminating items impair every environmental category both locally and internationally by emitting hazardous contaminants into the atmosphere, leading to climatic variations, and failing to properly treat and dispose of toxic waste, all of which worsen public health and safety in the environment. Environmental audits help to reduce or prevent these damages.

An environmental audit is a useful tool that improves environmental performance and environment. That is, our article is analyzing and controlling air emissions and the environmental costs of removing air pollutants.

In addition to the legal demands of environmental audits, they may preserve money by reducing pollution remediation expenses, fines, penalties, and other regulatory requirements.

To enhance and maintain the environment, these fundamental elements must be met:

- the legal framework must align with global and national regulations, via the cooperation of state and autonomous professional regulation;
- the system of environmental audit regulation should be in line with the long-term development plans of the country;
- along with the consumption of natural resources, it is necessary to reduce and stabilize the amount of pollution;
- industrial enterprises need to install equipment for continuous measurement of atmospheric emissions, i.e. with large plants, boiler houses;
- Kazakhstan's authorized environmental protection authorities need to conduct continuous inspection and control of air pollutant emissions;
- as one of the tools for reducing air pollutant emissions by enterprises, it is necessary to control costs and expenses, display them in reports with cost accounts, and exercise supervision through environmental reports.

Financing

The study was developed within the framework of the grant financing project of the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (grant No. BR21882352 «Development of a new paradigm and concept for the development of state audit, proposals for improving the management quality assessment system and effective use of national resources»).

References

1. Abdouli M., Hammami S. (2017), Economic growth, FDI inflows and their impact on the environment: an empirical study for the MENA countries. Qual Quant 51, pp. 121–146. https://doi.org/10.1007/s11135-015-0298-6
2. Brunelli S., Murzakhmetova A., Falivena C. (2022) Environmental Auditing in Rural Areas: Current Patterns and Future Challenges in Central Asia. Sustainability, vol. 14, no 15163, pp. 3-27.
3. Cao H., Zhang L., Qi Y., Yang Z., Li X., (2022), Government auditing and environmental governance: Evidence from China's auditing system reform. Environmental Impact Assessment Review, vol.93, ISSN 0195-9255, https://doi.org/10.1016/j.eiar.2021.106705.
4. Chaudhry I. S., Ali S., Bhatti S. H., Anser M. K., Khan A. I., & Nazar, R. (2021). Dynamic common correlated effects of technological innovations and institutional performance on environmental quality: Evidence from East-Asia and Pacific countries. Environmental Science & Policy, vol.124, pp. 313-323, ISSN 1462-9011, https://doi.org/10.1016/j.envsci.2021.07.007.
5. Cole M.A. (2004), Trade, the pollution haven hypothesis and the environmental Kuznets curve: Examining the linkages. Ecological Economics, vol. 48, issue 1, pp. 71-81, ISSN 0921-8009,https://doi.org/10.1016/j.ecolecon.2003.09.007.
6. Environmental Audit. Enviropass Expertise Inc. компаниясының ресми сайты. Электронды ресурс. Қатынасу режимы: https://getenviropass.com/environmental-audit/
7. Grant Ledgerwood, et al., (1994), Environmental assessment as a real estate management protocol: London's urban design opportunity at King's Cross, Cities, vol.11, issue 3, pp. 181-194, ISSN 0264-2751, https://doi.org/10.1016/0264-2751(94)90058-2
8. Grossman M., Krueger B., (1995), Economic Growth and the Environment, The Quarterly Journal of Economics, vol.110, issue 2, pp. 353–377, https://doi.org/10.2307/2118443
9. Hillary R. (2003) Environmental Auditing: Concepts, Methods and Developments. International Journal of Auditing's, vol. 2, no 1, pp. 71–85.
10. Hunt D., Jonson C. (1995). Environmental Management System: Principles and Practice. British Library Cataloguing in Publish Data. London, p 299,
11. Jiang Q., Tan Q., (2021), National environmental audit and improvement of regional energy efficiency from the perspective of institution and development differences. Energy, vol. 217, ISSN 0360-5442, https://doi.org/10.1016/j.energy.2020.119337
12. Kayrak M. (2008), Evolving challenges for supreme audit institutions in struggling with corruption, Journal of Financial Crime, vol. 15, no. 1, pp. 60-70. https://doi.org/10.1108/13590790810841707
13. Khan T. (2020), The initiation of environmental auditing in the United States, Managerial Auditing Journal, vol. 32, no. 8, pp. 810-826. https://doi.org/10.1108/MAJ-06-2016-1393
14. Ledgerwood G., Street E., et al. (1992). The Environmental Audit and Business Strategy. A Total Quality Approach. London, Pitman Publishing, vol. 1, no 4, pp. 51-52.
15. Li H., Páez A., Liu D., (2017), Built environment and violent crime: An environmental audit approach using Google Street View. Computers, Environment and Urban Systems, vol.66, pp. 83-95, ISSN 0198-9715, https://doi.org/10.1016/j.compenvurbsys.2017.08.001.
16. Li X., Tang J., Feng C., Chen Y. (2023), Can Government Environmental Auditing Help to Improve Environmental Quality? Evidence from China. Int. J. Environ. Res. Public Health, vol. 20, pp.2770. https://doi.org/10.3390/ijerph20042770
17. Ljubisavljević S., Ljubisavljević L., Jovanović D., (2017), Environmental audit for environmental improvement and protection. Economic Themes, vol. 55, issue 4, pp.521 – 538. https://doi.org/10.1515/ethemes-2017-0029
18. Lu, H., Wei, Y., Yang, S. et al. (2020), Regional spatial patterns and influencing factors of environmental auditing for sustainable development: summaries and illuminations from international experiences. Environ Dev Sustain vol. 22, no. 1, pp. 3577–3597. https://doi.org/10.1007/s10668-019-00357-w
19. Mahalik, M.K., Mallick, H., Padhan, H. et al. (2018), Is skewed income distribution good for environmental quality? A comparative analysis among selected BRICS countries. Environ Sci Pollut Res. vol. 25, pp. 23170–23194. https://doi.org/10.1007/s11356-018-2401-8
20. Medley P. (1997), Environmental accounting – what does it mean to professional accountants? Accounting, Auditing & Accountability Journal, vol. 10, no 4, pp. 594-600.
21. Mehmood U., Tariq S., Haq Z.u., Agyekum E.B., (2022), Financial Institutional and Market Deepening, and Environmental Quality Nexus: A Case Study in G-11 Economies Using CS-ARDL. Int. J. Environ. Res. Public Health, vol. 19, no 19, https://doi.org/10.3390/ijerph191911984
22. Peršić M., Janković S. & Vlašić D. (2007), Interna revizija u sustavu zaštite i unapređenja okoliša. U: Žager, L. (Ed.) Interna revizija i kontrola (pp. 47-62). Zagreb-Poreč: Hrvatska zajednica računovođa i financijskih djelatnika -Sekcija internih revizora -Hrvatski institut internih revizora, Available at: http://bib.irb.hr/prikazirad?&rad=343201
23. Power M. (1999). The Audit Society: Rituals of Verification. Oxford University Press. Published: 19 August 1999, New York, pp.183
24. Ruban A., Rydén L. (2019). Introducing environmental auditing as a tool of environmental governance in Ukraine. Journal of Cleaner Production, vol. 212, pp. 505-514, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2018.11.059
25. Todea N, Stanciu I.C, et al. (2011). Environmental Audit, a Possible Source of Information for Financial Auditors. Annales Universitatis Apulensis Series Oeconomica, vol. 13, no 1, pp. 66-74.
26. Wardhani I., Yunus H. A., (2017), Environmental audit as instrument for environmental protection and management. The Business and Management Review, vol.9, no 2, pp. 228-232
27. Watson M., Emery R.T. (2004). Environmental Management and Auditing Systems: The Reality of Environmental Self-regulation. Managerial Auditing Journal, vol. 19, no 7, pp. 916-928.

28. Xu Z., Ying D., Liu W., (2022), Does environmental audit help to improve water quality? Evidence from the China National Environmental Monitoring Centre, Science of The Total Environment, vol. 823, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2022.153485.

29. Zhang, X.; Zheng, J.; Wang, L. (2022), Can the Relationship between Atmospheric Environmental Quality and Urban Industrial Structure Adjustment Achieve Green and Sustainable Development in China? A Case of Taiyuan City. Energies, vol. 15, no 9, pp.3402. https://doi.org/10.3390/en15093402

30. Zhao D., Huang, X. (2021), Environmental, social and governance factors and assessing firm value: valuation, signalling and stakeholder perspectives, vol. 62, no. 1, pp. 1983-2010, https://doi.org/10.1111/acfi.12849

31. Ахметова А.С. (2016), Экологиялық шығындар және оларды жіктеу. KazNU Bulletin. Economics series. 5 шығ., № 117, 313-319 б.

32. Саенко К.С. Учет экологических затрат. – М.: Финансы и статистика, 2005. – 206 с.

33. Тайгашинов К.Т. Теория и методология учета затрат и калькуляция продукции, работ и услуг: учебное пособие. – Алматы: Экономика, 2014. – 137 с.

34. Шапигузов С.М., Шнейдман Л.З. Экологический учет для предприятий/ Сборник докладов: Конференция ООН по торговле и развитию: пер. с англ. – М: Финансы и статистика, 1997. – 200 с.

35. Официальный сайт: Бюро Национальной Статистики. Агентства по Стратегическому Планированию и Реформам Республики Казахстан. Электронный ресурс. Режим доступа: [https://stat.gov.kz/ru/industries/environment/stat-eco/]

References

1. Abdouli M., Hammami S. (2017), Economic growth, FDI inflows and their impact on the environment: an empirical study for the MENA countries. Qual Quant 51, pp. 121–146. https://doi.org/10.1007/s11135-015-0298-6

2. Brunelli S., Murzakhmetova A., Falivena C. (2022) Environmental Auditing in Rural Areas: Current Patterns and Future Challenges in Central Asia. Sustainability, vol. 14, no 15163, pp. 3-27.

3. Cao H., Zhang L., Qi Y., Yang Z., Li X., (2022), Government auditing and environmental governance: Evidence from China's auditing system reform. Environmental Impact Assessment Review, vol.93, ISSN 0195-9255, https://doi.org/10.1016/j.eiar.2021.106705.

4. Chaudhry I. S., Ali S., Bhatti S. H., Anser M. K., Khan A. I., & Nazar, R. (2021). Dynamic common correlated effects of technological innovations and institutional performance on environmental quality: Evidence from East-Asia and Pacific countries. Environmental Science & Policy, vol.124, pp. 313-323, ISSN 1462-9011, https://doi.org/10.1016/j.envsci.2021.07.007.

5. Cole M.A. (2004), Trade, the pollution haven hypothesis and the environmental Kuznets curve: Examining the linkages. Ecological Economics, vol. 48, issue 1, pp. 71-81, ISSN 0921-8009,https://doi.org/10.1016/j.ecolecon.2003.09.007.

6. Environmental Audit. Enviropass Expertise Inc. компаниясының ресми сайты. Электронды ресурс. Қатынасу режимы: https://getenviropass.com/environmental-audit/

7. Grant Ledgerwood, et al., (1994), Environmental assessment as a real estate management protocol: London's urban design opportunity at King's Cross, Cities, vol.11, issue 3, pp. 181-194, ISSN 0264-2751, https://doi.org/10.1016/0264-2751(94)90058-2

8. Grossman M., Krueger B., (1995), Economic Growth and the Environment, The Quarterly Journal of Economics, vol.110, issue 2, pp. 353–377, https://doi.org/10.2307/2118443

9. Hillary R. (2003) Environmental Auditing: Concepts, Methods and Developments. International Journal of Auditing's, vol. 2, no 1, pp. 71–85.

10. Hunt D., Jonson C. (1995). Environmental Management System: Principles and Practice. British Library Cataloguing in Publish Data. London, p 299,

11. Jiang Q., Tan Q., (2021), National environmental audit and improvement of regional energy efficiency from the perspective of institution and development differences. Energy, vol. 217, ISSN 0360-5442, https://doi.org/10.1016/j.energy.2020.119337

12. Kayrak M. (2008), Evolving challenges for supreme audit institutions in struggling with corruption, Journal of Financial Crime, vol. 15, no. 1, pp. 60-70. https://doi.org/10.1108/13590790810841707

13. Khan T. (2020), The initiation of environmental auditing in the United States, Managerial Auditing Journal, vol. 32, no. 8, pp. 810-826. https://doi.org/10.1108/MAJ-06-2016-1393

14. Ledgerwood G., Street E., et al. (1992). The Environmental Audit and Business Strategy. A Total Quality Approach. London, Pitman Publishing, vol. 1, no 4, pp. 51-52.

15. Li H., Páez A., Liu D., (2017), Built environment and violent crime: An environmental audit approach using Google Street View. Computers, Environment and Urban Systems, vol.66, pp. 83-95, ISSN 0198-9715, https://doi.org/10.1016/j.compenvurbsys.2017.08.001.

16. Li X., Tang J., Feng C., Chen Y. (2023), Can Government Environmental Auditing Help to Improve Environmental Quality? Evidence from China. Int. J. Environ. Res. Public Health, vol. 20, pp.2770. https://doi.org/10.3390/ijerph20042770

17. Ljubisavljević S., Ljubisavljević L., Jovanović D., (2017), Environmental audit for environmental improvement and protection. Economic Themes, vol. 55, issue 4, pp.521 – 538. https://doi.org/10.1515/ethemes-2017-0029

18. Lu, H., Wei, Y., Yang, S. et al. (2020), Regional spatial patterns and influencing factors of environmental auditing for sustainable development: summaries and illuminations from international experiences. Environ Dev Sustain vol. 22, no. 1, pp. 3577–3597. https://doi.org/10.1007/s10668-019-00357-w

19. Mahalik, M.K., Mallick, H., Padhan, H. et al. (2018), Is skewed income distribution good for environmental quality? A comparative analysis among selected BRICS countries. Environ Sci Pollut Res. vol. 25, pp. 23170–23194. https://doi.org/10.1007/s11356-018-2401-8

20. Medley P. (1997), Environmental accounting – what does it mean to professional accountants? Accounting, Auditing & Accountability Journal, vol. 10, no 4, pp. 594-600.

21. Mehmood U., Tariq S., Haq Z.u., Agyekum E.B., (2022), Financial Institutional and Market Deepening, and Environmental Quality Nexus: A Case Study in G-11 Economies Using CS-ARDL. Int. J. Environ. Res. Public Health, vol. 19, no 19, https://doi.org/10.3390/ijerph191911984

22. Peršić M., Janković S. & Vlašić D. (2007), Interna revizija u sustavu zaštite i unapređenja okoliša. U: Žager, L. (Ed.) Interna revizija i kontrola (pp. 47-62). Zagreb-Poreč: Hrvatska zajednica računovođa i financijskih djelatnika -Sekcija internih revizora -Hrvatski institut internih revizora, Available at: http://bib.irb.hr/prikazirad?&rad=343201

23. Power M. (1999). The Audit Society: Rituals of Verification. Oxford University Press. Published: 19 August 1999, New York, pp.183

24. Ruban A., Rydén L. (2019). Introducing environmental auditing as a tool of environmental governance in Ukraine. Journal of Cleaner Production, vol. 212, pp. 505-514, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2018.11.059

25. Todea N, Stanciu I.C, et al. (2011). Environmental Audit, a Possible Source of Information for Financial Auditors. Annales Universitatis Apulensis Series Oeconomica, vol. 13, no 1, pp. 66-74.

26. Wardhani I., Yunus H. A., (2017), Environmental audit as instrument for environmental protection and management. The Business and Management Review, vol.9, no 2, pp. 228-232

27. Watson M., Emery R.T. (2004). Environmental Management and Auditing Systems: The Reality of Environmental Self-regulation. Managerial Auditing Journal, vol. 19, no 7, pp. 916-928.

28. Xu Z., Ying D., Liu W., (2022), Does environmental audit help to improve water quality? Evidence from the China National Environmental Monitoring Centre, Science of The Total Environment, vol. 823, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2022.153485.

29. Zhang, X.; Zheng, J.; Wang, L. (2022), Can the Relationship between Atmospheric Environmental Quality and Urban Industrial Structure Adjustment Achieve Green and Sustainable Development in China? A Case of Taiyuan City. Energies, vol. 15, no 9, pp.3402. https://doi.org/10.3390/en15093402

30. Zhao D., Huang, X. (2021), Environmental, social and governance factors and assessing firm value: valuation, signalling and stakeholder perspectives, vol. 62, no. 1, pp. 1983-2010, https://doi.org/10.1111/acfi.12849

31. Ahmetova A.S. (2016), Ekologiyalyқ shyғryndar zhәne olardy zhikteu. KazNU Bulletin. Economics series. 5 shyғ., № 117, 313-319 b.

32. Saenko K.S. Uchet ekologicheskih zatrat. – M.: Finansy i statistika, 2005. – 206 s.

33. Tajgashinov K.T. Teoriya i metodologiya ucheta zatrat i kal'kulyaciya produkcii, rabot i uslug: uchebnoe posobie. – Almaty: Ekonomika, 2014. – 137 s.

34. Shapiguzov S.M., Shnejdman L.Z. Ekologicheskij uchet dlya predpriyatij/ Sbornik dokladov: Konferenciya OON po torgovle i razvitiyu: per. s angl. – M: Finansy i statistika, 1997. – 200 s.

35. Oficial'nyj sajt: Byuro Nacional'noj Statistiki. Agentstva po Strategicheskomu Planirovaniyu i Reformam Respubliki Kazahstan. Elektronnyj resurs. Rezhim dostupa: [https://stat.gov.kz/ru/industries/environment/stat-eco/]

Авторлар туралы мәліметтер:

А.С. Кыздарбекова – 3 курс докторанты, «Қаржы және есеп» кафедрасы, әл-Фараби атындағы Қазақ ұлттық университеті (Алматы қ., Қазақстан, e-mail: aseta_ks@mail.ru)

А.З. Нурмагамбетова – экономика ғылымдарының кандидаты, профессор м. а., «Қаржы және есеп» кафедрасының меңгерушісі, әл-Фараби атындағы Қазақ ұлттық университеті (Алматы қ., Қазақстан, e-mail: nazhar1977@gmail.com)

Ж.З. Оралбаева – экономика ғылымдарының кандидаты, «Қаржы және есеп» кафедрасының доценті, әл-Фараби атындағы Қазақ ұлттық университеті (Алматы қ., Қазақстан, e-mail: oralbaeva_zhanar@mail.ru)

Р.Пукала – философия докторы, Ярославльдегі Бронислав Маркевич атындағы мемлекеттік технология және экономика университеті (Ярослав, Польша, e-mail: ryszard.pukala@interia.pl)

Information about authors:

A.S.Kyzdarbekova – 3rd year doctoral student, Department of Finance and Accounting, Al-Farabi Kazakh National University (Almaty, Kazakhstan, e-mail: aseta_ks@mail.ru)

A.Z.Nurmagambetova – PhD, Acting Professor, Head of the Department of Finance and Accounting, Al-Farabi Kazakh National University (Almaty, Kazakhstan, email: nazhar1977@gmail.com)

Zh. Z. Oralbayeva – candidate of economic sciences, associate professor of the Department of Finance and Accounting, Al-Farabi Kazakh National University (Almaty, Kazakhstan, e-mail: oralbaeva_zhanar@mail.ru)

R.Pukala – PhD, Bronisław Markiewicz State University of Technology and Econimics in Jaroslaw (Jaroslaw, Poland, e-mail: ryszard.pukala@interia.pl)

Received: 19 October 2023
Accepted: 06 June 2024