

Article

Environmental Auditing in Rural Areas: Current Patterns and Future Challenges in Central Asia

Sandro Brunelli ^{1,*}, Anel Murzakhmetova ¹ and Camilla Falivena ^{2,*}¹ Department of Management and Law, University of Rome Tor Vergata, 00133 Roma, Italy² CERGAS–SDA Bocconi School of Management, Government Health and Non for Profit Division, 20136 Milan, Italy

* Correspondence: brunelli@economia.uniroma2.it (S.B.); camilla.falivena@sdabocconi.it (C.F.)

Abstract: Environmental audit (EA) is a systematic process of collecting and objectively evaluating information, whether certain environmental activities are in compliance with audit standards, criteria, and control systems. Due to the former use of the Soviet Union regime, Central Asia, with vast resources and a growing population, is still confronting a number of environmental issues. The increasing number of businesses in Central Asian countries has an impact on the local environment and the population's health. As a response, EA is one of the instruments that businesses may use to improve their environmental performance, protect nature, and ensure public-health safety. This paper, after providing a scoping review concerning the academic literature, investigates, by using secondary data, the current trends and challenges in practical application of EAs in five Central Asian countries. Our findings point out a list of shortcomings in applying the EA tools in Central Asia, which mainly derive from implementation, legislative, and resource gaps. Thus, the road towards a concrete implementation of EA is still far from being achieved. The study ends with some pieces of advice for EA policy makers and opens up avenues for future research, which can also be applied outside Central Asia.

Keywords: environmental audit; sustainability; central Asia; environmental issues; rural areas; public health



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1. Introduction

Nowadays, there is a number of environmental issues, such as global warming, climate change, and pollution, the level of which is steadily increasing due to factories and industries. This is a reason for many people-related issues, such as health, mental, social, and economic capacity of the human being [1]. The chemicals and lack of waste management by industries is a danger for people, animals, and plants. Furthermore, the public-health emergency raised by the COVID-19 pandemic has represented an additional “last call” towards the enforcement of policy and measures able to effectively contrast and countervail current and/or potential dangerous behavior of humans.

The government is a powerful authority, which can regulate the legislation on environmental protection for such industries. However, there is a need for regular inspections, which can help prevent environmental issues. Subsequently, there is an urgent need for a tool, such as Environmental Audits (hereafter EAs), which can check industry activities and how they are influencing natural resources, such as air, water, and land. It is an important and highly responsible process, which ensures the continuous development of environmental control.

Environmental Auditing is a concept with a history starting from the 1970s in the United States, which evolved into a tool that covers a wide range of issues towards increasing the environmental responsibility of businesses. Although there is no clear definition of the “EA” term, it is commonly described as a systematic process of collecting and objectively evaluating information, whether certain environmental activity is in compliance with

audit conditions, criteria, and control systems [2]. In order to perform EAs, it is required to analyze and monitor the activities carried out by the organizations, which helps to control the level of pollution and the overall protection of the environment. EA provides senior managers with key data regarding the risk areas and the status of strategic objective achievement. The audit conducted according to all the characteristics of an effective EA can define whether the company is facing regulatory non-compliance, poor management, or control. Poor environmental management and control lead to negative impacts on both the environment and the company, including its facility, costs, and reputation [3].

In developed countries, the development of environmental auditing and environmental management has become to address environmental issues. Several standards related to environmental auditing have been adopted since the beginning of the 1990s. For example, at the national level, British standards BS7750 were adopted in March 1992 and the ISO 14000 series in the European Union were adopted in April 1995 [2]. Despite the existence of the environmental auditing concept for 50 years, there are challenges in implementing EAs in developing regions. Furthermore, in developing countries, such as those in Central Asia, it is a relatively new trend in the auditing sphere. Due to its novelty, there have been some challenges regarding fully implementing environmental auditing. These challenges include a lack of best practices, lack of motivation and information, economic development level, and perception of companies. Organizations located in Central Asia are generally not interested in environmental auditing and do not have enough knowledge on its practical application. Hence, there is ample space for further research on environmental auditing application issues in Central Asia since it will bring many future prospects for economic development.

This paper contributes to the worldwide and Central Asian debate on environmental auditing in two ways:

First, by filling a knowledge gap on EA in Central Asia. Several contributions were brought from scholars related to EAs. However, few studies published in non-leading academic journals are focused on EAs in Central Asia. Balginova et al. [4] describes the problems and prospects for the development of EA in Kazakhstan; Tovma and Kudysheva [5] debated the challenges of implementing international standards on EAs in Kazakhstan; Ermekbayeva et al. [6] discussed the EA tool as a way of solving environmental issues in the oil and gas sector in Central Asia. However, the above-mentioned authors tackled the existing challenges on EA implementation only in Kazakhstan by referring only to a few specific sectors. Accordingly, this paper aims to collect and summarize the current literature landscape of EA worldwide, by developing a scoping review on the theme.

Second, Central Asia has major environmental consequences from the past uses of the Soviet Union's industrialization activities and there is a need for a tool, such as environmental auditing, to improve the environmental condition of all its rural areas [7]. Central Asian countries are rich in resources and they were major suppliers of raw materials during the Soviet Union regime. The lands of Central Asian countries have been used for nuclear testing since the 1940s, which led to a fragile ecosystem and poor health of the population. Between 1949 and 1989, 456 nuclear tests were conducted at Kazakhstan's Semipalatinsk Test Site. In addition, the large usage of cotton crops and water resources for many years led to soil irrigation, environmental pollution, and degradation of the Aral and Caspian Sea [7]. Therefore, an assessment of current practices and prospects would serve as a baseline for further developments at both policy and practical levels. To pursue this end, an extensive analysis of secondary data in all the five Central Asian countries is performed.

In light of preambles reported, the paper is organized as follows: Section 2 is devoted to the foundation of an EA, definitions, and benefits. Section 3 draws out the research questions and methodologies employed. Section 4 and its subparagraphs provide the academic literature review regarding EA in the private sector. Section 5 and its subparagraphs cover the analysis of the EA trends in Central Asian countries, by resuming their level of economic development, natural resources, environmental issues, and laws and regulations.

Section 6 relates evidence achieved with the current literature and opens up avenues for further research.

2. Foundations of Environmental Auditing

The definition of the term EA varies widely among authors and lacks a clear definition, leading to readers' confusion [2]. It is a composed word, which refers to a wide range of activities. Environmental auditing commonly refers to an internal audit in the private sector to show a company's executive managers and investors that the company operates in compliance with regulatory requirements [8].

The commonly used definition of EA is provided by the International Chamber of Commerce (ICC), which states the following:

“Environmental Auditing is a management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by:
(i) facilitating management control of environmental practices;
(ii) assessing compliance with company policies, which would include meeting regulatory requirements”. [9]

ICC suggests that EAs are used for internal management purposes rather than for public use. In comparison to the ICC definition, the definition provided by the U.S. Environmental Protection Agency (EPA) is more specific. The EPA issued a policy statement, where it defined environmental auditing as following:

“It is a systematic, documented, periodic, and objective review of facility operations and practices related to meeting environmental requirements”. [10]

The definition provided by EPA clarifies the performer of the audit, which is a “regulated entity”, while the definition of ICC does not define the audit performer.

The International Standards Organization (ISO) also suggests its own definition of Environmental Auditing as part of ISO 14000 series standards on Environmental management:

“A systematic, documented, periodic, and objective review of environmental operations, management systems, performance, or practice, carried out through a rigorous process of obtaining and evaluating evidence regarding a verifiable objective or assertion about an environmental matter, to ascertain the degree of correspondence with established criteria and then communicating the findings to the appropriate recipient”. [11]

In contrast to the ICC and EPA definitions, ISO stresses the word “objective” in the definition, which points out the independence and fairness of the EA.

The definition provided by Hillary [2] is also accurate and unique: *“it is a systematic, documented, periodic and objective checking process of a company's environmental performance against pre-set standards”.*

Environmental auditing should not be confused with other terms. According to Hillary [2], environmental auditing is not an environmental review, which is a baseline study that must be completed before Environmental Management Systems (EMSs) and associated EA programs can be established. Environmental auditing is not an Environmental Impact Assessment (EIA), which is another tool used before the project starts to see its potential impact on the environment. In contrast, the EA is a tool used when a project already exists.

Environmental auditing could help as a monitoring system for governments to monitor if firms are accomplishing environmental guidelines as a benchmark for obtaining a better urban environment. Standards and guidelines used to conduct EAs depend on the sector of the audited entity. While in the public sector, the standards and guidelines on conducting environmental auditing are provided commonly by the International Organization of Supreme Audit Institutions (INTOSAI) community [12], in the private sector, the commonly used international standards are provided by ISO.

Terms, such as EMS, environmental performance, environmental auditing, environmental labeling, and Life Cycle Assessments (LCAs) are all covered by the ISO 14000 family of standards, which gives specifications and guidance for several environmental management disciplines. ISO 14001—Environmental Management Systems—is the most frequently used out of the ISO 14000 series, which can be applied to any organization, regardless of whether it is private or public.

To sum up, the concept and activities related to EA vary depending on the type of EA, the sector of the company being audited, and standards and guidelines. Unlike financial audits, EA's legal basis, frequency, methodology, performer of the audit, and access to results of the audit vary depending on the audit type (internal or external audit), standards, laws, and regulations (Table 1).

Table 1. Differences between financial and EAs.

| | Financial Audits | EAs |
|-----------------------------------|---|---|
| Legal basis | Mandatory by law | Classified as: voluntary and mandatory (depends on the standards, laws and regulations) |
| Frequency | Yearly | Organization's choice (depends on external or internal EA) |
| Performed by | External auditor | External staff in case of external EA. Internal staff in case of internal EA. |
| Methodology | Based on adopted Auditing Standards (mainly ISA or their domestic version) | Varies |
| Access to the audit report | Publicly available | Few audits are publicly available. |
| Liability | Auditors are partially liable for audit reports in terms of its transparency and objectiveness. | EAs have no external liability implications, with a few exceptions that are negotiated between the auditor and the auditee. |

Source: Authors' elaboration.

When it comes to EA in the private sector, it is essential to focus on the independence, trust, and capability of the auditing function. There are three main ways of conducting EAs with reference to the audit performer:

1. Self-audits.
2. Hiring and training internal staff.
3. Audit conducted by a third party, external to the entity.

The first way of performing the audit (self-audit) requires trust and teamwork. Operational workers and managers, who are required to have a wide understanding and knowledge of policies related to environmental matters, conduct it.

The second way is via training already existing employees. The audit is commonly monitored by the management committee, which has the power to consider several issues, such as: to interpret government regulations, revise the protocols on audit, training of the internal audit staff, make sure there are no conflicts of interest, and reviewing the "adequacy" of recommendations provided as a result of the audit.

By using the third way, the audit is conducted by external consultants. These are the benefits of hiring external consultants to a company:

- No pressure on the internal staff in terms of additional responsibilities.
- Possession of better experience and expertise in the EA area.
- Ability to provide better recommendations on action plans, since they might have already had the same experience in a similar sector/industry.
- Ability to conduct an objective and independent audit, since they do not have any connections with the company.

In this study, the focus is on external EAs conducted on private entities.

3. Designing the Enquiry on Environmental Auditing: Research Questions and a Two-Step Methodology

To dive into the issue of environmental auditing, the research questions we want to address are:

1. What is the landscape about environmental auditing provided so far from academic scholars? What does the literature say regarding the issue in Central Asia?
2. What are the current trends of EA in Central Asia with regard to the private sector?
3. What are the similarities/differences in emerged EA tools and techniques between Central Asian countries?
4. What are the ways of improving the EA in Central Asia based on the best practices of developed economies?

To address these research questions, we decided to perform a two-step methodology. First, we explored the issue of environmental auditing development by developing a scoping review, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (hereafter, PRISMA) protocol extension elaborated by Tricco et al. [13]. Then, after carefully analyzing the emerging literature, we made extensive use of secondary data to address research questions 2, 3, and 4. More in depth, laws and regulations on EAs in Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, and Turkmenistan were carefully reviewed. This helps to understand the state of the art and the level of development of EAs in each country. Then, we provided a comparative analysis among countries and, finally, the evidence is used as a base to answer the research question on similarities/differences in emerging EA tools and techniques between Central Asian countries and the very last, concerning the methods of improving EA in the future.

4. Literature Background on Environmental Auditing

By using the PRISMA protocol extension [13], we decided to undertake the journey into the literature on environmental auditing by using and combining different sources. To this end, we used both Web of Sciences (WOS) and Business Source Complete (within the EBSCO database) by looking for keywords, such as “assurance”, “EMS audit”, “ISO”, “private sector”, “listed”, “firms”, “companies”, “businesses”, “enterprises”, “external”, “eco-audit”, “sustainability”, “environmental disclosure”, “disclosure quality”, and “environmental performance”, in a combined manner, at the same time, placing the primary keyword “Environmental audit” OR “Environmental auditing” into the abstract. The main goal of using the above keywords was to find all the articles related to EAs in the private sector. The search resulted in 1118 articles: 201 articles in Web of Sciences and 917 articles in EBSCO.

Furthermore, inclusion and exclusion were defined to orient the selection of the most significant articles. These criteria concern:

- Time: the timeframe is unlimited. Such a choice is consistent with the evolution of environmental auditing landscape, which has historically seen up- and downtrends in its development throughout the world;
- Language: only articles published in English were included;
- Source: to ensure high quality in the studies, we kept only papers published in peer-reviewed journals, with some minor additions due to the relevance found by adding, as a searching resource, Google Scholar. As a consequence, books, book chapters, abstracts, conference proceedings, and reports were mostly excluded.

In this way, the number of articles was shortened to 450 results: 189 on Web of Sciences and 261 on EBSCO. Then, by filling the keywords “environmental audit” OR “independent environmental auditing” into the title of the articles selected, there were, in total, 194 results: 93 on Web of Sciences and 101 on EBSCO. Finally, by removing the duplicated articles and selecting the most relevant sources to the topic of EA in the private sector, the final sample included 30 articles. In addition to that, since we were narrowly looking at EA practices and trends in the specific area of Central Asia, four articles related to environmental auditing in

Kazakhstan were found, by adding, as a last database, Google scholar. As a result, the final sample was composed of 34 articles.

There are different topics, which were judged relevant to effectively outline the literature landscape. Thus, we identified two main thematic issues:

1. EA trends in the private sector, which contain three sub-thematic areas, namely:
 - a. Determinants of frequency of EAs;
 - b. Positive impacts of EAs on industries;
 - c. Integration of internal and external EAs to increase the firm's market value.
2. The Role of accountants and financial auditors in environmental auditing, with a sub-thematic area concerning the (scarce) literature on developments in the EA profession in Central Asia.

4.1. EA Trends in the Private Sector

In today's world, there are several environmental issues, such as pollution, global warming, natural disasters, loss of biodiversity, ocean acidification, deforestation, etc., that threaten present and future generations. One of the critical issues, the climate change issue, has become urgent and we must take immediate action to address it [14]. Thus, in order to solve the environmental issues, there is a need for policies and consequent actions aimed at mitigating current impacts or preventing the worst ones.

The rise of environmental auditing started in the private sector in the 1970s due to enforcement of environmental laws. One of the first companies to be environmentally audited was the Allied Signal company by Arthur D. Little, which is currently known as Honeywell International.

In an organizational context, EA takes a significant role. It is not a simple analysis of what the main deficiencies of the organization are, as it is also a means of continuous improvement [15]. The audit defines the current compliance status of the company and provides an assurance to the board of directors regarding the environmental, health, and safety aspects.

Smith [15] showed that EA was a great tool for continuous improvement in the case of the Allied Signal Company operating in three sectors: automotive, aerospace, and engineered materials. The company created its own internal EA program in the 1970s.

4.1.1. Determinants of Frequency of EAs

Continuous improvement through Environmental Auditing can be pursued by following four steps: planning to meet the compliance goals; implementing the compliance plan; collecting the information on audit compliance; reporting the EA results and again planning to meet the compliance goals. The external EAs should be conducted on a frequent basis, so that they will bring continuous improvement for entities. However, the pioneering research of Smith [15] left open an important question: which factors influence the frequency of EAs?

In the chemical manufacturing industry, Earnhart and Leonard [16] discovered a link between a company's organizational structure and the frequency of EAs. They made a survey based on firms with different organizational structures: the listed and non-listed firms, firms based in the United States, and firms based in other countries. EAs appeared to be performed less frequently by publicly held companies than by privately held ones. It is an interesting discovery because the authors compared it to other authors' findings, such as Arimura et al. [17], Jones [18], and Dasgupta [19], which revealed a reverse correlation: publicly held companies had a stronger tendency to implement EAs and management practices than privately held companies. Concerning the location matter, authors found that U.S.-based companies less frequently performed EAs than non-U.S.-based companies. The authors also considered other factors that have an impact on the frequency of EAs, such as geographical scope of operations, size, federal inspections, and law enforcements. In the end, the wider a company's geographical coverage, the more EAs the company conducts. While there is a positive correlation between corporations with more U.S. facilities and

the frequency of EAs undertaken, there is a negative correlation between larger facilities and the frequency of EAs conducted. Federal inspections have a negative impact on audit frequency, whereas federal penalties have a positive impact. Finally, the enforcement of law has a positive influence on the number of EAs conducted.

Bae and Seol [20], who investigated the association between implementation of EA programs and organizational features of S&P 500 companies, provided similar observations. The results were collected from 192 firms during the 1998–2003 period. The research results can be summarized as follows:

- Companies in environmentally sensitive industries are more likely to disclose environmental information.
- The majority of firms (48.3%) carry out EAs every two or more years.
- A minority (24.5%) describe their audit programs as “EAs”, whereas the rest consider it as environmental, health, and safety (EHS) audits.
- Eighty-six percent of the firms follow ISO 14001 standards, which include the review of the firm’s EMS.
- Companies that have EA programs have higher revenues than those that do not.

4.1.2. Positive Impacts of EAs on Industries

There are numerous examples of the positive influence of EAs on organizations in various industries, as noted by Bae and Seol [20].

Goodall [21] describes the positive impact of EA tools on British tourism companies. The author explains that such a fast-growing industry as tourism continues consuming resources and producing waste. It is important to adopt mandatory EAs to protect the environment. The study shows that the adoption of EAs will lead to positive results for firms in the tourism industry. For example, in 1993, British Airways’ efficient resource utilization and effective waste minimization led to cost savings from less usage of fuel and less carbon dioxide emissions. Another example the improved corporate image of Ramada International since they positioned themselves as a “hotelier of environmental integrity” in 1992. This position of Ramada International helped to provide easier access for funds and establish better business developments. The research showed that EAs help to achieve marketing advantages for firms since there is evidence that consumers tend to buy from environmentally friendly companies more than others. Visvanathan et al. [22] conducted research on EA in a rice cracker factory in Thailand. The factory was facing environmental issues, which negatively influenced Efficient Treatment Plant (ETP) operations. The main problem to be solved was poor waste management due to the rice cracker production process, such as soaking, cooking, and washing. The production process led to a waste of water, noise, high temperature, and dust. The study was focused on solving the issue with the use of a multimedia EA and a guideline published by the United Nations Environment Programme—United Nations Industrial Development Organization (UNEP-UNIDO). The EA identified the possibility of a 25% reduction in water consumption by reusing the water, segregation of waste, and solids recovery. The EA helped to increase not only the operational efficiency of ETP but also to bring economic advantages. The model of EA used in Thai rice cracker factories has contributed by implementing it in Central Asian industrial companies for cleaner production.

The EA, according to Gedam et al. [23], is a vital success factor in the automotive industry’s adoption of sustainability practices. The research conducted in the Indian market between 2019 and 2020 revealed that top management support and EAs for suppliers are the two most significant critical success factors to prioritize, implying that by addressing these issues first, automotive manufacturers may be able to better proceed with the adoption of sustainable practices. In addition to that, other success factors relevant to organizational human resource management (e.g., corporate culture, environmental training, rewards, and incentives) will also have a favorable impact on sustainable practice adoption as a result of emphasizing these two variables. In China, a pilot EA referred to as Environmental Responsibility Audit (ERA) was launched in 2014. Zeng et al. [24] analyzed a sample

of 18,032 publicly traded Chinese firms on the SHSE and SZSE between 2011 and 2017 to define the impact of pilot ERA on listed firms' environmental investments. The term "environmental investments" refers to investments that are made in environmentally friendly businesses. The results showed that pilot ERA had a positive impact on publicly traded firms' environmental investment. Based on the results, the authors suggested implementing mandatory EAs through government intervention. The authors demonstrate the essential role of the government in forming the company's environmental behavior in emerging economies. The establishment of required EAs reduces the risk of greenwashing and encourages businesses to make significant progress towards their environmental goals. Mandatory EA improves the credibility of environmental reporting and decreases the risk of selective disclosure from a signaling standpoint. As a result, it sends out strong signals about a company's environmental initiatives and performance.

Several articles in the literature stated a positive correlation between EA and environmental disclosure quality of publicly traded enterprises, in addition to the benefits of EAs on various sectors [25–27]. Environmental disclosure quality is measured using indicators that specify whether the disclosure discusses environmental policies, quantifies environmental impact, establishes formal targets, or is subject to external EAs. Brammer and Pavelin [25] used a sample of 450 publicly traded firms in the United Kingdom to investigate the factors that influence the quality of environmental disclosure. The quality of environmental disclosure is found to be high when external auditors are present. The authors analyzed three standards: Business in the Environment (BIE), Global Reporting Initiative (GRI), and Association of Chartered Certified Accountants (ACCA), all of which indicate that publicly disclosed environmental information should be "Auditable", which means that external/internal auditors should be able to verify the report's reliability. As a result, the environmental disclosure quality is high in companies that conduct EAs. Similarly, research conducted by Baalouch et al. [26] finds a positive correlation between the environmental disclosure quality and external EA in publicly listed companies of Société des Bourses Françaises (SBF120) over the 2009–2014 period. In France, Article 225 of the Grenelle Act II requires listed firms to comply with the requirement of third-party verification of disclosed information in order to guarantee credibility. It is a response to public pressure over the insufficient validity and accuracy of environmental data. Further findings show that mandatory external EAs had a positive impact on environmental disclosure quality. On the same wavelength, Marwa et al. [27] covering a period from 2012 to 2017 using a sample of 81 listed companies in France, found that EAs specifically conducted by BIG 4 firms increase the quality of environmental disclosure. Therefore, EAs conducted by external/third parties are beneficial for publicly listed firms because they increase the reliability, transparency, and quality of the publicly disclosed environmental information.

4.1.3. Integration of External and Internal EAs to Increase the Firm's Market Value

The research from Lee et al. [28] discusses the relevance of internal EA and its role in continuously improving companies. Based on a survey of 266 manufacturing firms in Japan during the period of 2010–2013, the authors found that companies that implemented EAs have 9% greater firm value than companies that have not. The results of Lee et al. (2016) were consistent with Bae and Seol [20]. However, the authors found a positive correlation between internal EAs and firm value when external third-party assurance is involved. Internal EAs are implemented to ensure compliance with environmental regulations for internal purposes, while third-party assurance is conducted to ensure that a company's environmental disclosures are compliant with environmental accounting norms and regulations. The authors suggest that corporate managers should support the implementation of stricter environmental and sustainable reports, along with EAs, as a part of financial reporting. They also recommend that policy makers implement EAs via mandatory and/or voluntary frameworks, such as Global Reporting Initiative (GRI) and the Integrated Reporting (IR) framework. They describe the importance of EAs and third-party assurance in helping investors, shareholders, stakeholders, and a company's

main decision makers to evaluate the company's value, since EA gives more confidence and trust in the company's future prospects.

As mentioned by Lee et al. [28], the combination of internal EA and external third-party assurance is critical to potentially increase a firm's market value. Aslam et al. (2020) also emphasizes the positive influence of the integration of external EAs with internal environmental management practices (EMS audit) in improving environmental performance, which, in turn, improves the market one (Figure 1). The research by Aslam et al. [29], conducted between 2007 and 2018, statistically verified the favorable impact of the above-mentioned integration of publicly listed companies (S&P 500 companies). To sum up, the authors highlight the importance of adoption of EMS internally by firms and conduct external EAs, as required by ISO 14001 standards.



Figure 1. Integration of external and internal EAs and the potential positive consequences on the firm's market value. Source: Authors' elaboration.

The role of ISO 14001 in external environmental auditing has been mentioned by a number of authors [29–32]. They highlight ISO 14001 standards as a tool towards a continuous improvement, which is a key point of environmental auditing mentioned by Smith [15].

Ljubisavljević et al. [32] conducted research on increasing environmental improvement and protection via the use of EA tools. The best practices in developed countries, such as China, Finland, and Austria, have shown that installing an EMS internally and complying to ISO 14001 standards play a significant role in performing internal and external EAs. However, the author warned about possible collateral effects of reporting EAs, namely:

- Publicly disclosing environmental reports can lead to potential negative reactions from external users.
- Implementation and reporting of EAs impose high costs on the firm.
- Procedures for execution and reporting are inconsistent.

Switzer and Ehrenfeld [30] state that the goal of third-party ISO 14001 registration is to provide objective confirmation to interested outsiders that a company has an EMS in place that is "suitable" for its needs. The authors refer to the interview of Patrick Aurrichio, IBM ISO 14001 program manager, who explained the importance of an external environmental auditor by saying: "You can tell people that we have a beautiful baby, but it doesn't really mean anything until someone else agrees". The ISO 14001 certification and third-party EAs bring benefits to the company in the following ways [31]:

- It demonstrates the company's compliance with environmental laws and regulations, environmental commitment, and innovative focus;
- It improves environmental management performance, reduces the future liability costs, and attracts new customers and business partners;
- It brings continuous improvement in EMS of the company.

Taking together the viewpoints expressed by scholars, it is possible to resume a fundamental framework aimed at improving environmental performance and boosting the market value for listed companies by integrating internal and external EAs via ISO 14001 standards application (Figure 2).

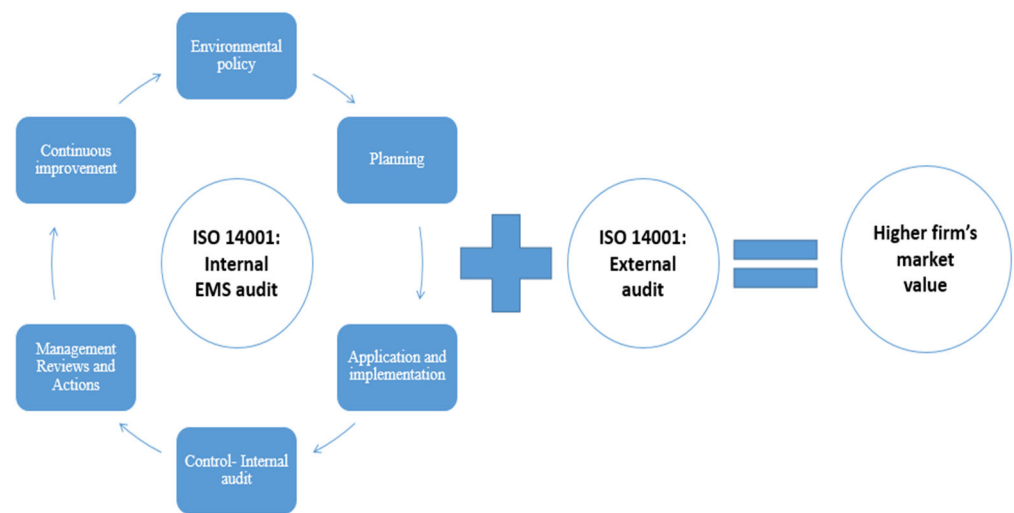


Figure 2. ISO 14001: integration of internal and external EAs. Source: Authors' elaboration.

There are plenty of scholars viewing the mandatory EAs or strengthening the legislation on EAs as a positive aspect and opportunity for better environmental performance. However, especially until the last decade, some scholars have viewed mandatory EAs as a threat and pressure on firms. They discussed the incentives of firms to establish environmental auditing programs and the role of environmental legislation [33–35]. Elliott and Patton [33] investigated whether enterprises in highly regulated industries are more likely than those in less regulated industries to review their environmental performance. The authors divided the firms as firms operating potentially hazardous processes (PHPs) and firms operating non-hazardous processes (NHPs) in the engineering sector. The survey was based on 106 U.K. firms, out of which 41 were publicly listed companies. The researchers were surprised to find that NHPs (61%) were conducting more EAs than PHPs (53%). In both PHPs and NHPs, the majority of companies conducting EAs were large companies. Therefore, the firms being environmentally regulated tend to have a lower incentive to conduct EAs. Moreover, highly regulated sectors' environmental reviews were of poorer quality and scope than less regulated companies. Khanna and Anton [34] examined incentives that drive a sample of Standard & Poor's 500 companies to adopt environmental management practices, including EAs. The survey conducted in 1994–1995 confirmed the hypothesis of the authors that EAs have been implemented due to environmental legislation and regulatory pressures.

There is a pressure on firms to conduct EAs in the United Kingdom [35]. Compliance with environmental legislation and regulation is viewed as a threat, which is one of the main driving factors for firms to implement EA programs.

Xiaomei [36] suggests the use of ISO 14001 standards by Chinese listed firms and adoption of environmental auditing to review the disclosed environmental reports. The author recommends that the Chinese government should use a “command-and-control” approach to increase companies' environmental performance. Since the legislation is not enough, the author proposes to use an “incentive” approach to persuade enterprises to adopt environmental reporting systems and eventually impose punitive measures on those who fail to disclose environmental data or have poor environmental management. Similarly, Elliott and Patton [33] suggest policy makers create a “carrot-and-stick” approach, where “carrot” emphasizes the actual business benefit to an environmentally responsible firm and “stick” refers to legislation and market forces that set the parameters.

It is not right to say that only high regulation imposed by the government on EAs is the sole cause for the low demand on EAs among private-sector firms. There are other challenges and barriers for firms on the way to fully implementing EAs. The authors describing the challenges in EA implementation are Thompson and Wilson [37]. They describe EAs in theory and practice based on Canada's experience. According to a survey

in 1991, 57 companies out of 75 in the private sector implemented environmental auditing programs. There are the following challenges and barriers to EA implementation with reference to the private and public sectors in Canada:

- Cost, which is commonly higher during the first audit than follow-up audit;
- Fear of employees being affected by the audit results;
- Fear of penalties and legal issues due to non-compliance of the audited company;
- Fear of the company to receive adverse publicity;
- Not knowing whether the audit will bring benefits to the company;
- Companies consider their current environmental activities to be satisfactory and unwilling to be audited;
- No willingness to know the existing problems since the company, in the case of being informed by the auditing company, has to take corrective actions. Otherwise, in case of an accident, a court may accuse them, since the company should have solved the problem beforehand.

However, the authors found that in implementing external EA, the advantages outweigh the disadvantages, which are the following:

- It increases the image and reputation of firms in the private sector;
- It ensures high reliability of the EA reports;
- It reduces the risk of non-compliance with environmental regulations and legislation;
- It reduces the risk of conflicts caused by false environmental information;
- It facilitates the establishment of an internal environmental auditing program;
- It accelerates the process of investors' corporate decision-making.

To sum up, the literature review on EA trends in the private sector demonstrated that EA is a tool for continuous improvement of the firm. Several industries have benefited from the usage of EA programs, such as higher market value, higher revenues, and better environmental disclosure quality. Based on the amount of research, the integrated framework of internal and external EA has been suggested with the implementation of ISO 14001 standards. ISO 14001 standards were the most mentioned type of standards in the literature review. Overall, 16 articles found during the journey into the literature on EA make reference to EA standards, such as ISO 14001, GRI, BS 7750, ISAE 3, AA1000, and Thai standards. However, the majority, particularly 75% of authors, highlighted the application of ISO 14001 standards. Therefore, further analysis on EA trends in Central Asia will consider the statistics on the number of ISO 14001 certificates issued per country.

4.2. Role of Accountants and Financial Auditors in Environmental Auditing

A study by Chiang and Lightbody [38] explores one of the important factors in adopting an effective EA, which is the involvement of financial auditors. The results showed that in a period of 10 years (from early 1990s to early 2000s), there was an increase in companies' adoption of environmental management practices due to financial auditors' involvement. They made a survey of 200 auditors, who were members of ICANZ. It was found that only 18 respondents or 16% were conducting an EA due to a lack of demand and expertise. Demand can be increased with the help of strengthening the governmental regulations and legislation on environmental protection, while the expertise of an accountant in the EA field could be improved by acquiring technical skills. This shows that organizations such as ICANZ play a role in joining the minds of accountants into one, helping them to use their knowledge and develop EA disciplines. Therefore, it is important to involve accountants and financial auditors in implementing quality EAs.

Similarly, the research conducted by Dixon et al. [39] noted the necessary characteristics of environmental auditors and the role of financial auditors in conducting EAs. It is important to have more professionals conducting EAs due to the increasing level of environmental issues. It is a new challenge for financial auditors, since they were not qualified in EAs. Following that, authors conducted research on the role of financial auditors in minimizing environmental issues and discovered that they play a critical role.

However, financial auditors can take part in EAs partly and with the help of environmental engineers, lawyers, and other specialists. Based on their research, the authors recommend adjusting accounting education by adding environmental issues, technical, and analytical skills necessary for performing EAs. In addition to that, they suggest providing guidance on environmental costs, disclosures, reporting, and standards, which will contribute in increasing the knowledge of financial auditors in environmental issues, which, in turn, will increase the demand for EAs. In addition, the authors add that if EAs were mandatory and required by law, then the number of companies requesting environmental auditors' service would increase.

Lenciu et al. [40] conducted research on the involvement of financial auditors in an EA in Romania. The research was based on the results of a survey collected from the 276 auditors of The Chamber of Financial Auditors of Romania. The majority of respondents (53%) stated that local companies give limited importance to environmental matters. Despite their desire to participate in such missions (74%), few Romanian financial auditors participate in the certification of sustainable reports, environmental balance sheets, or other EAs (8%). The authors found reasons for such a low involvement in EAs by financial auditors in Romania, which are the following:

- 61% of respondents chose "lack of guidelines and standards related to EA".
- 58% responded that there is a lack of technical skills required for conducting EA.

The authors state the importance of financial auditors in EA where an audit has a financial nature, such as environmental costs, debts, and provisions. The authors suggest implementing a mandatory general framework and teamwork between auditors, accountants, and scientists in conducting EAs.

Philippe and Ignace [41] also provide arguments on the role of external auditors and accountants in conducting effective EAs. The authors discuss the similarities and differences in EAs and financial audits. They argue that external accountants and auditors can play a vital role in EAs due to the following arguments:

- Since both environmental and financial audits are focused on checking the control systems, external auditors can contribute to EAs;
- Code of ethics is another reason why external auditors can conduct EAs, since it has the same principles as being objective, professionally competent, and independent.

The only difference between the two audits is that EAs are less regulated. Therefore, authors propose going towards integrated audits by creating multidisciplinary teams, including financial auditors, scientists, and engineers. This would lead to a contribution by financial auditors, providing an objective and independent evaluation of systems, while engineers and scientists would provide technical expertise on understanding the company's operations and their consequences on the environment.

Lightbody [42] discusses the relevance of accountants in participating in EAs and raises the issue of "audit theory gap" in Australia. The author points out the relevance of accountants in EAs by showing the similarities between the functions of environmental auditors and financial auditors. However, there are only a few accountants involved in environmental auditing. The author discusses the survey conducted to identify the skills and knowledge of internal and external environmental auditors in New Zealand and Australia. The survey results indicate that, out of 57 respondents', external EAs were carried out by people specialized mainly in biological science (30), legal issues (15), and civil engineering (12). There were only three respondents who conducted EAs with the help of external accountants, which shows the limits of accountant engagement in environmental auditing. One of the reasons behind the above-mentioned low number of engagements by accountants was "audit theory gap", which refers to a lack of courses related to environmental auditing in university programs. The author suggests that closing the knowledge gap for accountants would promote the role of accountants in EA.

The Limperg Institute in the Netherlands published a document called "Milieu en accountant" on the topic of the role of accountants [43]. It addressed three main questions:

- (1) Is environmental auditing the domain of a traditional independent auditor?
- (2) How can a registration system be set up to record pollutants and what are the permissible tolerances for such records?
- (3) Can a financial auditor issue an opinion on a company's environmental report?

The authors conclude that both financial and EAs are mutually relevant to each other. Financial auditors play a significant role in training environmental auditors and implementing EAs in companies. Similarly, the environment is a highly important topic in the field of financial auditing. However, the authors suggest that EAs should not be conducted by financial auditors. In contrast, they should be carried out by a highly qualified environmental auditor, who possesses a knowledge in the “*design of accounting systems and internal controls, including the methods and techniques used to measure and verify variables*” [43].

Power [44] also describes the overlapping skills of financial and environmental auditors. Environmental auditing requires the involvement of multidisciplinary specialists, such as engineers, biochemists, lawyers, etc. However, the role of accountants did not get enough attention in the EA. Accountants are essential in conducting internal EAs because they can assist with important issues, such as financial data verification, cost-benefit analysis, proper recording of necessary environmental information, and the effects of investments in environmental protection [32]. Similar to Blokdiik and Driehhuizen [43], Power [44] argues that accountants could contribute to many aspects of EAs and should have a coordinating role in EAs. He suggested three primary strategies for establishing accountants and accounting skills in the environmental auditing field:

- To establish the similarity between accounting know-how and environmental auditing.
- To establish environmental auditing as a distinct body of knowledge at the top of the environmental auditing skill base.
- To subordinate the claims of other professional groups.

Taking together the viewpoints on the role of financial auditors and accountants in the EA implementation, we can draw the conclusion that they are essential in the EA field and there is a need for considering the factors influencing or creating a barrier for accountants and auditors to engage in EAs (Figure 3).

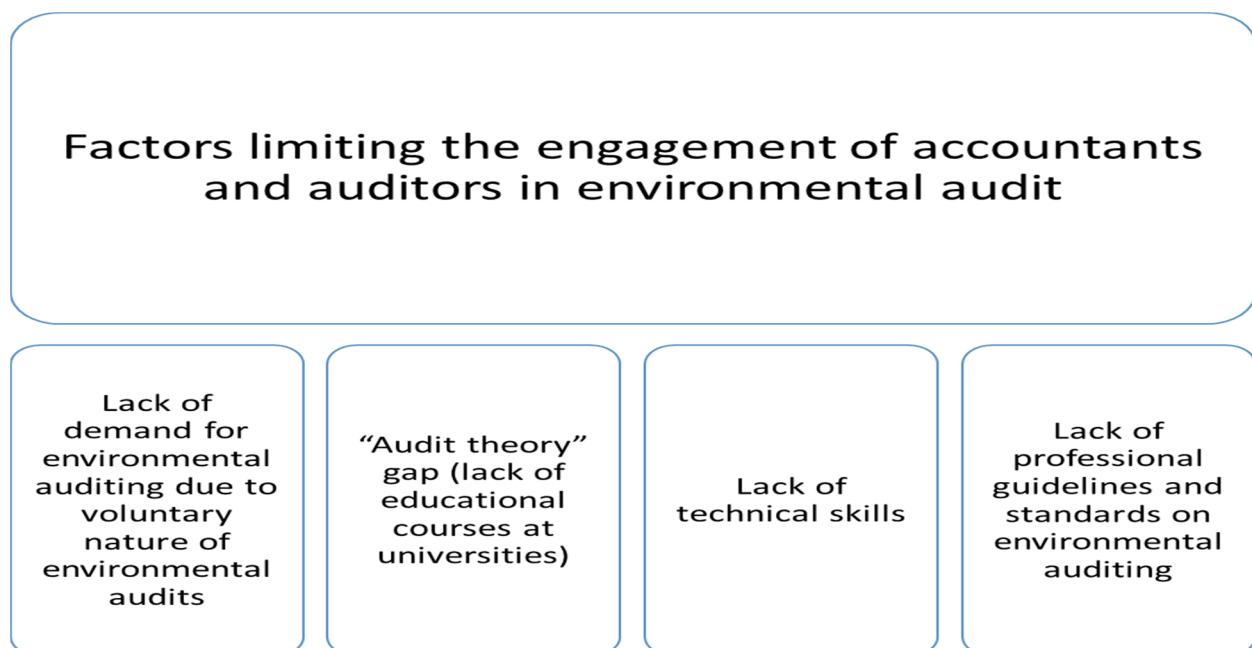


Figure 3. Factors limiting the engagement of accountants and auditors in EA. Source: Authors' elaboration.

Emerging Trends in EA in Central Asian Countries

The research conducted by Angelini [7] describes the main environmental issues and economic overviews of each of the Central Asian countries. The author states that five Central Asian countries are having negative consequences on their ecosystem due to nuclear testing, large-scale irrigation from cotton crops, which led to the degradation of the Aral and Caspian Sea, improper mining, and excessive resource exploitation. Consequently, each of these five countries, with rich nature and reserves, ends up having a wide range of environmental problems. These environmental issues are not only having an impact on individual countries, they are also a potential threat for transboundary pollution. The author lists the following issues:

- Soil erosion, degradation of seas, rivers, and lakes which are highly relevant in Kazakhstan, Turkmenistan, and Uzbekistan;
- Air pollution, which is a result of industrialization, is common in Kazakhstan and Tajikistan;
- Increasing levels of water pollution in Tajikistan, Turkmenistan, and Uzbekistan;
- High demand for water, especially in Kyrgyzstan, Tajikistan, Uzbekistan, and Turkmenistan.

Ermekbayeva et al. [6] state the emerging environmental issues in the Caspian Sea due to the oil and gas sector in Kazakhstan. The author discusses not only the same issues as Angelini [7] but adds the solution of coping with those issues via EA usage. She recommends using existing laws on environmental protection, EA, and learning from the best practices of foreign countries. Similarly, Tovma and Kudysheva [5] expressed concerns on ecological problems coming from the oil and gas sector in Kazakhstan and recommended using legislative norms and ISO 14000 standards. The authors mentioned the benefits of implementing international standards in Kazakhstan, such as:

- Decrease in the waste disposal cost;
- Distribution cost reduction;
- Reputation and image improvement for inspectors, people, consumers, and potential investors;
- Less usage of energy and saving materials.

However, Tovma and Kudysheva [5] also mention that there are potential challenges in implementing international standards in Kazakhstan.

Balginova et al. [4] agree on implementing and spreading the usage of EA to improve the ecological situation. The authors describe the EA as an assessment and evaluation of activities and operations of organizations and entrepreneurs to make sure of the existence of an appropriate environmental management and protection from adverse impacts. In addition, the activities and operations should comply with national legislation on environmental protection. They suggest ensuring the companies' awareness of environmental issues, tightening the rules, and setting strict penalties for violations of law. They provided an example based on an international experience in the Czech Republic, where the penalties may vary from USD tens to millions.

In conclusion, the challenges faced while implementing EA are common, not only for developing economies but also for developed ones as well. The above-mentioned authors discuss and recognize the urgency in solving the ecological issues faced by Central Asian countries. The main solutions provided by researchers were quite similar since they suggested using international standards, such as ISO 14000, legislative norms in EA and environmental protection, and learning from international experiences on implementation of EA. However, there are some challenges in implementing a relatively new type of audit in Central Asia. Therefore, in the next sections, by making an extensive usage of secondary data, we point out the state of the art in developing EA practices in the five Central Asian countries selected.

5. The Concept of Environmental Auditing in Central Asia

Since the research's aim is to define the emerging trends and future prospects of EA in Central Asia, it is necessary to understand how far it has developed there. Accordingly, we provide a general overview on geographical, economic, and environmental conditions in each Central Asian country (indicated in Figure 4), alongside all the available information concerning the degree of implementation of EA.



Figure 4. The five Central Asian countries investigated. Source: Authors' elaboration.

5.1. EA in Kazakhstan

Kazakhstan, among all the Central Asian countries, is the largest and it is the ninth-largest country in the world, with a total surface area of 2.7 million square kilometers. It has a population of 19.378 million people and shares borders with the following countries: Kyrgyzstan, Russian Federation, China, Turkmenistan, and Uzbekistan.

Economic development grew rapidly in Kazakhstan, especially between 2000 and 2006, changing from a lower-middle income to an upper-middle-income country. However, after the financial crisis of 2008, the GDP growth had a sharp decline from 8.9% to 1.2% in 2009 [45]. There was a significant growth in GDP of 7.4% by 2010, followed by positive trends until 2013. Then, the country suffered three years of recession. However, starting from 2017, the country has been slowly recovering. Several foreign direct investments have been implemented in the country successfully. For example, during 2007 and 2016, 71% of investments in Central Asian countries were in Kazakhstan.

According to World Bank [46] data, it has one of the lowest population densities in the world. Its GDP level increased by 2.3% at the beginning of 2021 due to household consumption, support from new fiscal measures, and easing COVID-19 restrictions. The inflation rate went up due to an increase in food price, which caused demonstration events in Almaty and other major cities, such as Shymkent and Atyrau, in January 2022.

Kazakhstan is rich in its resources of oil, gas, minerals, and water reserves. However, currently, it is facing environmental issues, including radiation, biodiversity loss, increased waste, water, and air pollution, which have a negative impact on local people's health. To tackle the environmental issues, Kazakhstan adopted the Environmental Code in 2007 [47], which has been modified many times during the period of 2007–2017. The Code addressed

the regulation of greenhouse gas, waste management, and EA. EA is included and regulated by the Environmental Code of Republic of Kazakhstan (RK), under chapter nine.

According to the Code of EA of RK, EA was described as a licensed business activity, in which environmental auditors and environmental auditing organizations conduct EAs. An EA is conducted by analyzing the reliability of reporting on the audited entities' environmental impact, assessing the state of the production and technological process, personnel qualifications and preparedness, conducting special studies and laboratory measurements to determine the audited entity's real contribution to environmental pollution, and ensuring compliance with environmental rules and regulations.

There are two types of EAs in Kazakhstan:

1. Mandatory, which is applicable in the case of:
 - a. Construction of strategic, transboundary, and environmentally hazardous facilities;
 - b. Documentation of environmental damage caused by individuals and legal entities;
 - c. Detection of systematic inconsistencies in individual and legal enterprise reporting documentation related to environmental issues, the actual development of environmental impact;
 - d. Legal entity's reorganization, in which an entity is a nature user;
 - e. Bankruptcies of strategic, cross-border, and environmentally harmful legal organizations.
2. Voluntary, which can be undertaken by any other company that is willing to conduct an EA for its own purposes, the results of which remain confidential.

The EA is conducted in line with the EA plan, which is developed by the environmental auditor and agreed upon by the client and the audited business. There is a Chamber of Environmental Auditors, which unites all the environmental auditors of the country. It is a non-profit, independent, professional, and self-governing institution, formed to represent and preserve environmental auditors' rights and legitimate interests. The Chamber of Environmental Auditors accepted the standard form of the EA plan, which is recommended for use. All the reports on mandatory EAs are sent to the Committee.

Legal entities and individuals have a right to get licenses on conducting EAs issued by the Committee of Environmental Regulation and Control. The validity of the license is unlimited. There must be at least two environmental auditors in the organization providing EA services. Partnerships between environmental auditors, EA organizations, and audited entities are established through an agreement in compliance with Kazakhstani law.

The company being audited is responsible for the reliability and truthfulness of documents and other information provided to auditors. In addition, the audited company should be aware of the consequences of breaking the liabilities stated in the agreement contract.

According to an environmental performance review conducted by UNECE [45], the number of mandatory audits was no more than 100 in Kazakhstan in 2017. This is a very small number, since the detected number of environmental violations was 3498 in 2017. This shows that the EA tool was not widely used by companies in the country.

The main problem of EA inefficiency in the country is that it fails to achieve its goal of preventing environmental violations and damage. There are no incentives for a company to conduct a voluntary audit. EA is required only when a violation has already happened. Furthermore, due to the absence of formal structures in place to assess whether a firm has implemented the audit's recommendations, the audit does not drive the company to take environmental-protection measures.

Another issue and loophole in the EA legislation is the lack of provisions addressing conflicts of interest and environmental auditors' responsibilities. Chapter nine of the Environmental Code of RK does not refer to the consequences of reporting unreliable information or providing wrong recommendations to the audited company by the environmental auditor. Therefore, it results in less transparent data on the environmental performance of companies in the country.

As noted, scholars highlight the main use of two international standards and systems to conduct EAs, namely ISO 14000 and Eco-Management and Audit scheme (EMAS). It was found that EMS is not widely used in the country. However, although the national standard ST RK ISO 14001–2006 was introduced under the name “Environmental Management Systems-Requirements and user guidelines”, it is mostly used by international companies. Figure 5 shows that the highest number of ISO 14001 certificates was issued in 2009 (294). Unfortunately, after 2009, the numbers began declining, ranging between 122 and 152.

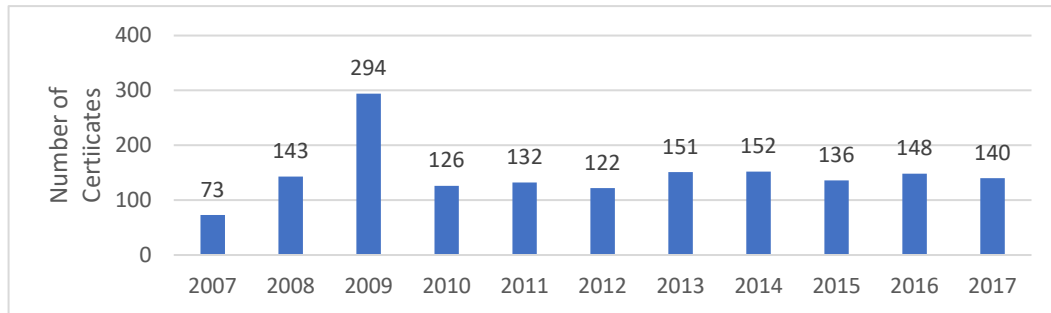


Figure 5. ISO 14001 certificates during the period 2007–2017. Source: Authors’ elaboration.

This evidence witnesses the low demand for the use of ISO 14001 and the certification is not perceived as a tool able to increase the competitiveness of companies.

To conclude, at the moment, the concept of EA is present in theory, but it does not serve a proper function in preventing violations of environmental legislation and there should be steps taken to increase the application of EA, both by the Chamber of Environmental Auditors and government.

5.2. EA in Kyrgyzstan

Kyrgyzstan borders Kazakhstan, China, Uzbekistan, and Tajikistan. It has a population of 6.6 million people. The total area of the country is equal to 198 thousand square kilometers, 3.6% of which is covered by water. The country lies at the crossroads of two massive mountain ranges, the Tien Shan and the Pamir, and high mountains cover roughly 65% of its land area. Only roughly one-eighth of the country is below 1500 m and more than half of Kyrgyzstan is above 2500 m. The longest river, Naryn, with a length of 807 km, flows into Uzbekistan through Fergana Valley, where it links up with other major rivers of Kara Darya. Then, it forms into Syr Darya, which flows into the Aral sea. Currently, the Aral Sea basin is an environmental disaster since it is disappearing rapidly due to drastic climate change. The Aral Sea environmental crisis is affecting all the Central Asian countries in terms of socio-economic, health, and environmental conditions.

Important economic resources in the country are agriculture and livestock. Over 80% of people in rural regions of the country are agricultural landowners. The agricultural sector contributed to GDP with a share of 35.3% and hired 55% of the country’s labor force [48]. Since the agricultural sector takes a significant role in the country’s economy, it is also a major water-consuming sector. The water management is poor due to a lack of well-maintained infrastructure for water distribution. Other issues faced by the country are soil erosion, salinization, water pollution, and air pollution. The real GDP level fell by 0.7% in the first half of 2021 due to a decrease in the production of gold, which was equal to −29% [49]. The inflation rate had also increased from 9.7% to 14% by August 2021, due to an increase in prices for food and fuel.

Since 1999, Kyrgyzstan’s government has changed and it brought the adoption of new environmental protection and sustainable-development frameworks. The Parliament adopted the Environmental Code in 2009 [50], which addressed the following aspects:

- Environmental policy and planning;
- Environmental impact assessment;
- Eco-audits, which are EAs;
- Environmental data and public access to them;
- Eco-labelling;
- Monitoring of environmental conditions;
- Environmental quality standards and acceptable levels of produced emissions and noise;
- Economic tools and financing to protect the environment;
- Cooperation with foreign countries.

Chapter 17 of the Environmental Code of Kyrgyzstan relates to EA. It states that an EA is conducted by an independent expert to review the company's environmental performance, in order to prevent and eliminate violations of environmental legislation and to define the potential risk of environmental pollution caused by the company's past activities. It is conducted by legal entities that are willing to carry out EAs at their own expense or legally raised funds. The process of implementing an EA is established by the Republican Specially Authorized State Body for Environmental Protection of Kyrgyzstan.

Similarly to Kazakhstan, Kyrgyzstan has two types of audits: mandatory and voluntary. The terms of defining the type of the audit are similar to Kazakhstani law.

The main goals of EA are identifying, analyzing, and evaluating the environmental condition, its degradation, and living condition of the local population, which are directly linked to the enterprise's activity. It serves as a tool used to review the impact of a company's activities on the environment and, based on that, to decide on further enterprises' operations. Based on the results of the audit, the company will continue working in the same way as before or will need reconstruction/modernization/liquidation of separate facilities or all facilities.

EA includes the following steps:

1. To indicate the main purpose of EA, which can be a government requirement, funding purposes, investor, or public requirement;
2. To select the EA company, which has a valid license;
3. To develop an EA plan with timing and use of audit results.

It is worthwhile to note that each member of the EA team is responsible for the consequences of EA recommendations. The results of an audit should be available to the public, while, in Kazakhstan, it is publicly available only in the case of a mandatory audit.

Overall, the Environmental Code of the Republic of Kyrgyzstan is similar to Kazakhstani legislation. However, there are fewer articles included in the Code of Republic of Kyrgyzstan as standards of EAs, EMAS, the description of environmental auditors, licensing of environmental auditors, and formation of EA reports.

According to the latest survey provided by ISO [51], the data show that between 2007 and 2017, the number of ISO 14001 certificates issued in the country was very low, ranging between zero and four. It is a very poor result in comparison to Kazakhstan.

5.3. EA in Uzbekistan

Uzbekistan is a country with various resources, such as natural gas, oil, silver, and gold. It has a population of 34.2 million people [52], which is the largest among Central Asian countries.

One of the main environmental issues faced by a country is water availability and its quality, which causes political tensions between neighboring countries. As noted, the Aral Sea shrinkage led to an increase in salt and chemical pesticides that had a huge impact on people and the stability of the region. Due to a 50% decrease in size of the Aral Sea since the 1960s, it has been hard on the agricultural and fishing sector, which left 60,000 people unemployed. Its recent economic developments showed an increase, which can be seen by GDP growth of 6.2% in 2021. In addition to that, its inflation level fell to 11% in 2021 from 14.7% in 2020 and the unemployment rate also fell to 10.5% in 2021. Even though the pandemic hit the country's economy hard, it is slowly recovering.

The legal frameworks adopted by the country are easily accessible for the public via governmental websites [53]. In 2013, the Law on Environmental Control was adopted, which addresses the following topics as inspections as a mean of control, SEE (Social, Environmental, and Ethical), and EA. EA legislation was drafted in March 2021 and enforced one year later (in March 2022). Subsequently, it is not widely applied in the country and perceived as a tool for self-monitoring of environmental compliance. According to the environmental performance review in 2020 by UNECE [54], there are no examples of companies carrying out EAs. There were a few companies owned by private individuals who conducted EMS audits.

Although the government is trying to engage the public in decision making on environmental legislation, there are challenges in implementing the tools into practice, including EAs as well.

The country's Code on EA clarifies some details regarding the types of audits. Mandatory EAs are carried annually on enterprises with medium- or high-risk impact on the environment. In contrast, voluntary audits are conducted on enterprises with low- or insignificant-risk impact on the environment and they are only conducted at the request of a client company. It has to be noted that the results of both audits are confidential and cannot be published without the consent of the client company.

There is also a separate article on standards of EA, which states that environmental auditors are welcome to use both national and international standards on carrying out the EAs.

To have a right to conduct EAs in Uzbekistan, it is necessary to meet the following conditions:

- Environmental auditor should be a resident of Uzbekistan.
- Environmental auditors should possess a relevant educational background.
- Environmental auditors should have at least three years of work experience in environmental protection or related areas.
- Environmental auditors should have a certificate as a qualified environmental auditor.

EA organizations must have at least four employees for whom the EA organization is the main place of work. The reports on EA must be strictly confidential and have to be stored for at least five years.

The Code on EA of Uzbekistan is different from the frameworks adopted by Kazakhstan and Kyrgyzstan in that it is more detailed and focused on making sure that environmental auditors are aware of their responsibilities and the consequences of actions taken. It is stated by law that the EA organization is responsible for any damage caused by a false EA conclusion. An EA report written without an EA procedure or based on the results of an EA that does not match the substance of the documents received and analyzed by the environmental auditor is deemed to be purposefully deceptive. Losses, including lost profits, incurred by the EA's customer as a result of the audit's poor quality or inappropriate conduct are entitled to compensation to the extent defined by law.

Even though the Code is not yet producing effects, the number of ISO 14001 certificates issued by the country, on average, is the second highest among Central Asian countries. According to the Survey of ISO [51], the number of certificates issued between 2007 and 2017 was ranging from 5 to 25 per year.

5.4. EA in Tajikistan

Tajikistan is a country located in the south east of Central Asia, with a total land area of 143 thousand square kilometers. It is bordered by Kyrgyzstan, China, Uzbekistan, and Afghanistan. The major area of Tajikistan, precisely 93%, is covered by mountains, leaving half of the territory above 3000 m [55]. Its population increased rapidly between 2005 and 2014 from 6.8 to 9.5 million people [56]. The country's economy is dependent on the production of aluminum, electricity, and cotton. The export income in 2013 was generated mainly from aluminum (57%) and the rest from cotton and electricity. The high dependence

on the above-mentioned three resources made the country more vulnerable to variations in global prices on commodities.

Following the emergence of COVID-19, the population's social and economic well-being worsened dramatically. In 2021, the economy started recovering rapidly, but the country is still in a worse situation than the economic conditions before the pandemic outbreak. Tajikistan's significant sensitivity to climate change and natural disasters adds to the country's economic management challenges. Natural- and climate-related disasters cost the economy USD 1.8 billion between 1992 and 2016, affecting nearly seven million people.

Overall, the main environmental issues in the country are water pollution and land degradation. Subsequently, there should be actions taken to save the natural resources of the country and one of the actions taken was legislation. The law on Environmental Protection was adopted in 2011 [57], which included legislation on EA. As for other Central Asian regions, it is a novelty for Tajikistan.

According to the law on EA of the country, EA consists of the analysis of adequacy and costs of economic activities, country's legislation, and its regulatory documents of environmental protection and natural resources. The description of the term "EA" is different from other Central Asian countries, since it addresses the concept at a country level, but not at a business level. It is performed by both legal entities and individuals, which possess licenses on carrying out the EA issued by the authorized body for state regulation of EA. In addition to that, foreign environmental auditors and EA organizations are allowed to conduct audits in the territory of the Republic of Tajikistan.

The purpose of the EA is:

- To assist business entities in establishing their environmental policy;
- To determine the priorities for the implementation of preventive measures aimed at ensuring compliance with established environmental requirements;
- To implement a tool used for enhancing effective regulation on nature management and ensuring sustainable development.

The main objectives of the EA are:

- To substantiate the enterprise's environmental strategy and policy;
- To define the priorities while planning the environmental activities of an enterprise and other possibilities of implementing them;
- To review the compliance of business entities' performance with legislation on environmental protection;
- To increase the efficiency of regulations on an entity's impact on the environment;
- To reduce accidental risks and pollution of the environment.

There are two types of EA:

1. Voluntary, which is carried out by an audit organization or individual at the request of a client company.
2. Mandatory, which is carried out by an audit organization, which is requested by public authorities. The decision on conducting an EA is made by the Government of Tajikistan.

Similar to the Chamber of Environmental Auditors in Kazakhstan, there is an authorized body for state regulation of EAs assigned by the Government of Tajikistan, which is responsible for several activities. The activities include:

- To develop and implement normative legal acts and standards on conducting EAs;
- To maintain the register of individuals and legal entities conducting EAs;
- To determine the requirements for auditors' qualifications;
- To issue licenses;
- To conduct certification of environmental auditors, the time validity of which is unlimited;
- To ensure international cooperation.

It is interesting to note that the legislation includes the article on “Cancellation of qualification certificate of environmental auditor”. It states that in the case of an environmental auditor deliberately issuing false EA conclusions or even without conducting any audit, the auditor will lose its certificate. Subsequently, Tajikistani law also addresses the importance and increases the awareness of the auditors to provide a transparent, independent, and objective audit report.

Overall, the law refers to a wide range of topics, as in other Central Asian countries. However, it does not specify the adopted standards on implementing EAs. The country’s economic development is quite low and poor, which has an impact on the level of development of EAs in the country.

According to survey results obtained by ISO [51], Tajikistan issued the lowest number of ISO certificates in comparison to the other four countries in Central Asia. There are no data on the number of certificates between 2007 and 2012. During 2013–2014, only two certificates were issued. During 2015–2016, the number of certificates increased up to four. Despite the low results, the number increased to 14 ISO certificates in 2017, which might be a good start for Tajikistan.

5.5. EA in Turkmenistan

Turkmenistan borders the Caspian Sea, Iran, Afghanistan, Uzbekistan, and Kazakhstan. It is a landlocked country with a territory of 488 thousand square kilometers. The population has increased steadily since 1991, from 3.7 million to 5.8 million people in 2019 [58].

Its main natural resources are oil and gas, the scope of which varies from one to another source, since there are seven oil and gas regions. According to the World bank [58], the country’s gas reserves are considered to be the fourth largest in world rankings, which is roughly ten percent of global reserves. In addition to cotton and natural gas, the country has other resources useful in the chemical and construction sector, such as petroleum, iodine, bentonite clays, cement, and sulfur.

The country’s GDP level had a significant increase from USD 2.905 billion in 2000 to USD 45.231 billion in 2019 [58]; private-sector development has been constrained by tight administrative regulations and the state sector’s dominant role in economic activity. Despite the expansion of the private sector’s share of the economy, the economy and the formal labor market are still dominated by public-sector and state-owned monopolies. Foreign direct investment (FDI) is still scarce outside of the oil sector.

To boost private-sector development and achieve medium- and long-term national development goals, the government must open the economy, improve the business regulatory environment, accelerate the corporatization and privatization of state-owned enterprises (SOEs), and invest more heavily in human capital.

Currently, the country is facing the aridity of the region, one example being the largest sand deserts, Kara-Kum desert, and low water resources. The poisoning of the soil and groundwater by agricultural chemicals and pesticides are Turkmenistan’s main environmental problems. Furthermore, agriculture (mostly monoculture of cotton and uncontrolled discharge of agricultural drainage water) and industrial activities are damaging the water basins. Finally, while public services (such as electricity, gas, and water) are frequently free, they are not always provided to the entire population.

Despite the rapid economic progress of the country, lately, the country has experienced pressure on natural resources and unsustainable use of resources. Meanwhile, the adoption of legislation on environmental protection has also been slow and not fully complete. The law on Environmental Protection was included in the Constitution, which was established in 1991. However, it was outdated and lacked a lot of provisions [59], requiring methodical upgrading of appropriate sustainable development plans and environmental policies at the national level.

Currently, Turkmenistan has a special law on “EA”, adopted as of 2 March 2019 [60]. Article one of the law states that environmental auditing entails an independent, compre-

hensive, and documentary assessment of an entity's compliance with legal requirements, norms, documents, and standards in the environmental-protection field. In addition, it takes into consideration the international standards and norms as well for carrying out EAs.

The goal of an EA is to improve environmental protection and safety actions, as well as avoid and mitigate the environmental impact of economic and other operations. The main objectives of EA are the following:

- To analyze and evaluate the firm's compliance with environmental protection and environmental safety requirements in the conduct of economic and other activities;
- To evaluate the efficiency, completeness, and validity of environmental protection and environmental safety measures implemented by the environmentally audited firm;
- To identify and define environmental problems at the environmentally audited firm.

The main objects of EAs are: enterprises, factories, economic facilities, or certain categories of their activities. The Act specifies the qualifications of environmental auditors and auditing firms. An environmental auditor is a person who engages in entrepreneurial operations without founding a legal business and holds the required license. As a full-time employee of an EA organization or under a civil law contract with the organization, the environmental auditor can carry out tasks autonomously. Higher education, qualifications, and practical experience in the field of environmental protection, safety, and standards, according to which EAs are conducted (at least five years), are obligatory for environmental auditors. In addition to that, auditors must attend special training in order to gain skills and obtain an "environmental auditor" certificate issued in accordance with international standards with validity for a five-year period. An EA organization should have at least three full-time environmental auditors, where only an eco-auditor can be the company's CEO. The share of the founders (shareholders) of an EA organization, who are full-time environmental auditors, in the authorized capital of a business company, joint venture, or closed joint-stock company, in total, must be at least 51%. Under article 28 of the EA law, with the exception of circumstances where the Cabinet of Ministers of Turkmenistan decides to perform an EA by international EA firms, an EA can only be carried out by Turkmen residents.

There are two types of EAs in Turkmenistan:

1. Voluntary;
2. Mandatory.

Both types of audits can be conducted either in a form of full EA where the auditor reviews the overall environmental impact of the client company or in the form of specialized EA where the auditor verifies the impact on specific components of the environment of a client company.

The types of audits are classified into two articles according to the law. This part is more specific and detailed in comparison to the legislation of the other four Central Asian countries. Mandatory audits are conducted under the following conditions:

- There is an environmental certification of processes, products, works, and services;
- There is a rebuilding, modernization, or re-profiling of industrial businesses and facilities that have a significant environmental impact;
- There is a formation of individual or joint ventures on the basis of state-owned production businesses and facilities with an environmental impact;
- There is a mandatory state environmental insurance of facilities;
- The firm is carrying out ecologically hazardous activities and there is a presence of an operation of environmentally hazardous facilities, which are included in the list.

Mandatory EAs are conducted on a yearly basis or once every three years for preparation of reports and concluding the contract of mandatory state environmental insurance of entities. The frequency of mandatory audits depends on the objects of the audit, the facility, and its activities included in the list of hazardous activities. The first audit must be a full audit, then the following two years' mandatory EA takes the form of a specialized

EA. The law also states that the environmental auditors are responsible for the reliability and completeness of the EA report and its conclusion. Finally, the law adopted includes a wide range of topics with complete descriptions. However, since the EA is a new concept for the market, it has not been applied much in practice.

According to the ISO [51], the number of ISO 14001 certificates issued by Turkmenistan is extremely low, ranging between zero and five during the 2007–2017 period.

6. Discussion: Still Far from Proper EA Implementation

It is undoubtable that there is a tight connection between economic development and EA development. Since all Central Asian countries were part of the former Soviet Union, the resources of those countries have been highly used and this led to environmental issues. One of the major issues was that Kazakhstan was used for nuclear tests during the Soviet Union regime [61]. There were 468 nuclear tests conducted in East Kazakhstan between 1949 and 1989, which led to a worsening of the ecosystem in the country. In addition, high industrialization, cotton production, and mining led to Aral and Caspian Sea degradation.

According to World Bank data, only Kazakhstan and Turkmenistan are classified as upper-middle-income countries, while the rest take the status of lower-middle-income countries. Looking at the GDP per capita (Figure 6), the most developed economy among the five countries is Kazakhstan, which reached its peak in 2013 (USD 13,890). However, it has been decreasing and reached USD 9812 by 2019, which is still the highest GDP per capita in comparison to other countries. Turkmenistan takes second place by GDP per capita level, reaching its peak in 2014 (USD 7962). The country's economy has faced a recession as well and reached USD 7612 GDP per capita by 2019. Uzbekistan is third in the ranking, which reached USD 1784, while Kyrgyzstan and Tajikistan are the lowest in the ranking, reaching USD 1374 and USD 890 GDP per capita (see Figure 5).

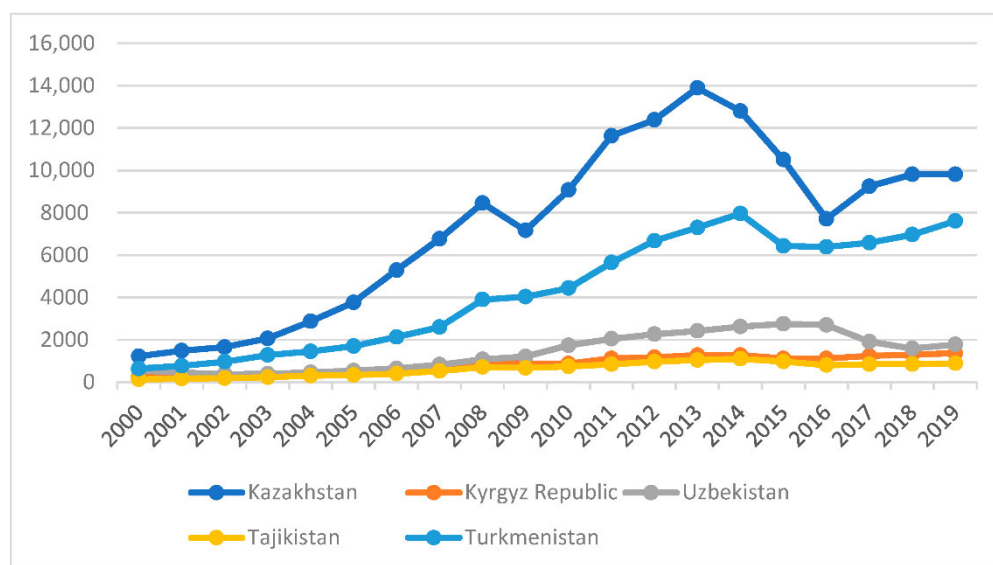


Figure 6. GDP per capita in USD of Central Asian countries between 2000 and 2019. Source: Authors' elaboration based on publicly available data from World Bank.org.

Economic development affects a country's level of sustainable development and taking actions on environmental concerns. As noted, Kazakhstan is the most developed country among Central Asian countries and the highest number of ISO 14001 certificates has been issued in this country.

Environmental issues raised the awareness of countries to adopt legislation on environmental protection, including regulations on EA. The concept of EA is a novelty and laws on EA were adopted the earliest in the Republic of Kazakhstan (RK) in 2007 and the latest in Uzbekistan in 2021.

It is interesting to see the overall picture of articles included in the Code of EA per country to compare the legislation among countries [47,50,53,57,60]. Table 2 shows that all countries had the same articles, except Kyrgyzstan, lacking a large number of articles. The most detailed and thoroughly described legislation was in Turkmenistan. All the countries except Kazakhstan note the responsibilities of environmental auditors and EA organizations on providing reliable data. It leads to misinformation and non-transparent data of environmental performance from the company. It is desirable for the law to strengthen the consequences of providing false information, especially in countries with a high level of corruption.

Table 2. Comparison of articles on EA among the 5 Central Asian countries.

| Article Name | KAZ | KGZ | UZ | TJK | TKM |
|---|-----|-----|----|-----|-----|
| EA concept | + | + | + | + | + |
| Environmental auditing activity | + | | + | + | + |
| Audit procedure | + | + | | + | + |
| EMAS | + | | + | | |
| Environmental auditor | + | | + | + | + |
| Environmental auditing organization | + | | + | + | + |
| Chamber of Environmental Auditors | + | | + | + | + |
| Issuance of a license | + | | + | + | + |
| EA contract agreement | + | | + | + | + |
| EA report | + | | + | + | + |
| Standards of EA | + | | + | | + |
| Rights of environmental auditors and EA organizations | + | + | + | + | + |
| Responsibilities of environmental auditors and EA organizations | + | + | + | + | + |
| EA Insurance | + | | + | | + |
| Certification of environmental auditors | + | + | | + | + |
| Responsibility of environmental auditors and EA organizations | + | | + | + | |
| Restriction of the right to conduct an EA | + | + | + | + | + |
| Rights of the audited entity | + | + | + | + | + |
| Responsibilities of the audited entity | + | + | + | + | + |
| Responsibility of the audited entity | + | | | | |

Source: Authors' elaboration based on the Codes of EA of Central Asian countries. KAZ—Republic of Kazakhstan; KGZ—Republic of Kyrgyzstan; UZ—Uzbekistan; TJK—Tajikistan; TKM—Turkmenistan. + appears when the feature or the information is present.

In addition to the comparison of legislation on EA between countries, we may consider the statistics on the number of ISO 14001 certificates issued per country (Figure 6). ISO 14001 certificates are widely obtained in developed countries in East Asia and the Pacific (54% of all ISO 14001 issued in 2017) and Europe (35% of all ISO 14001 issued in 2017). Figure 7 shows that the highest number of ISO 14001 certificates was issued in Kazakhstan, which is also the most developed economy in Central Asia. The ranking among countries is the following for 2017: Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan, and Kyrgyzstan.

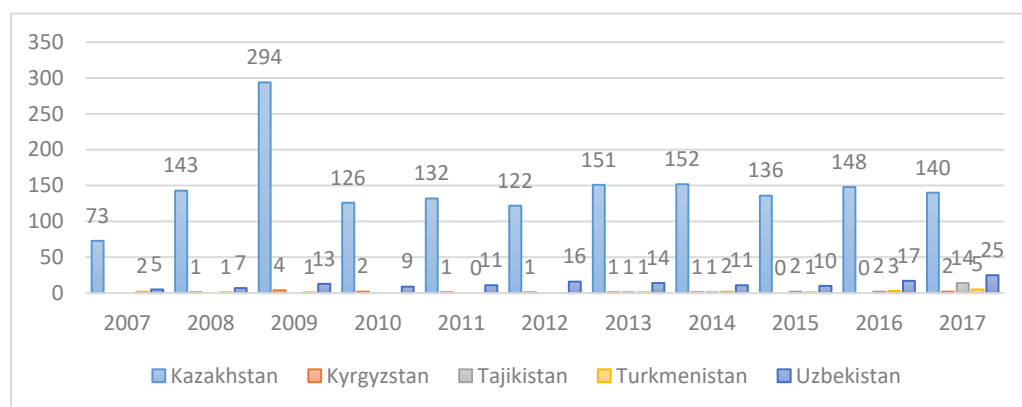


Figure 7. Number of ISO 14001 certificates issued in Central Asian countries between 2007 and 2017. Source: Authors' elaboration and based on the data from ISO Survey 2020.

7. Concluding Remarks and Avenues for Future Research

After the extensive journey in the field of environmental auditing, we detect that ample spaces for further research and professional developments exist for both scholars and practitioners. A series of issues stressed in the literature [38–40] about the necessity for financial auditors to acquire skills and knowledge in the environmental audit and assurance areas are even more acutely felt now. This induced impetus in the audit profession might, therefore, represent a last desired *stimulus* for improving environmental auditing procedures worldwide. On the same wavelength, as demonstrated by some good pieces of empirical investigations over the past few years [20,28,29], it is no longer a secret that good environmental auditing practices alongside well-structured external auditing procedures would benefit the firm's overall performance.

No less important for the policy-making decision process is to define if and to what extent EAs should be mandatory or not and for whom. The new strand of literature not explored in this paper about the establishment of a new and shared set of sustainability standards could be the opportunity to settle the issue. Finally, concerning the Central Asian region, the population health conditions, the high pollution, and the tremendous usage of natural sites and resources in the past are all indicators for not quitting the process undertaken in the field of environmental auditing. At last, as demonstrated by the COVID-19 pandemic, pollution and unhealthy places, especially in rural and urban areas, might represent an undesirable booster of sickness and illness among populations.

Taking together all the evidence achieved, it is warmly recommended to continue with investments in the area at all levels: institutional, professional, and academic.

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