

MODERN LEGAL APPROACHES TO NATURAL RESOURCE MANAGEMENT: A COMPARATIVE ANALYSIS

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ABSTRACT

The deteriorating global ecological situation necessitates the search for ways to enhance legal approaches to natural resource management. Consequently, the purpose of this study is to conduct a systematic analysis of the legal regulation of this institution in Kyrgyzstan and several other countries to establish their similarities and differences. During the study, the theoretical understanding of the term 'natural resource management' was examined, which helped formulate an authorial concept and identify the societal relations affected by this legal institution. Moreover, the study highlighted and analysed its main components and classification. Furthermore, three main scientific approaches to regulating this phenomenon were evaluated, upon which the contemporary legislative trends in different countries were subsequently examined. The subsequent exploration of the subject matter involved a systematic analysis of various regulations in Kyrgyzstan that regulate issues related to the use of natural resources, providing an opportunity to conclude on the prioritisation of sustainable development principles within the country. A detailed examination of the components of natural resource management demonstrated a multitude of mechanisms, procedures, and restrictions, including legal accountability, levies, environmental assessments, and others, which shape these legal relationships. Moreover, the study assessed data provided by international organisations, which revealed a general trend towards worsening

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environmental conditions. The legal regulation of countries such as Denmark, the United States, Kazakhstan, and India was also considered, enabling a comparative analysis of Kyrgyzstan's practice with that of foreign countries, based on which differences in legislative approaches were formulated. The value of this study lies in delineating the main features of legal approaches in countries from different regions of the world in the field of natural resource utilisation, serving as an auxiliary tool for policymakers when making decisions in this area.

Keywords: Sustainable development; Limitation; Ecological efficiency index; State environmental expertise; Environmental impact assessment

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1. INTRODUCTION

Ensuring a safe environment is one of the key objectives of modern democratic states, which must be accompanied by effective current legislation, particularly in the field of natural resource management. The ongoing deterioration of the planet's condition and the emergence of new environmental issues necessitate the search for new ways to address and implement these issues into national legal systems. From this perspective, emphasis should be placed on the existing diversity of legal instruments supported by state institutions to achieve environmental improvement goals. However, considering the cultural and political specificities of different world regions, it is important to explore the procedures for the protection and exploitation of natural resources from the standpoint of various legal approaches¹. Thus, the regulation of this institution by a large number of regulations affects national practices and those of other countries, directly influencing the effectiveness of the legal system intended to address issues in this sphere. Moreover, examining the regulation methods of this phenomenon remains a problematic process, as the experience of countries that demonstrate successful environmental protection policies must be considered in context, including the objective advantages and disadvantages of different legal approaches and within the framework of geopolitical characteristics of the countries. Another problematic aspect in this area is the lack of theoretical analysis of the contemporary terminology of natural resource management in Kyrgyzstan, which negatively impacts the accurate perception of the main elements of this institution.

The importance of legal provision of the environmental control mechanism was discussed in the study by Ospanovich². The author examined issues of legal regulation of this phenomenon and highlighted the differences between the concepts of "audit" and "environmental audit," demonstrating theoretical discrepancies in this matter. On the other hand, the mentioned study overlooked other tools of legal control, including state and public environmental assessments, fees for natural resource use, and limitations, which have a direct impact on the audit procedure and were examined during this study. The existing principle of sustainable development has formulated a special approach to the regulation of natural resource management issues. This issue was examined in the study by Ismoilov³, who provided an overview of the legal and practical aspects of sustainable use of biological diversity, contributing to an enhanced

¹ Skarbøvik, E., Perovic, A., Shumka, S. & Nagothu, U.S., 'Nutrient inputs, trophic status and water management challenges in the transboundary lake Skadar/Shkodra, Western Balkans', (2014) 66(2) Archives of Biological Sciences 667-681, <<https://doi.org/10.2298/ABS1402667S>>.

² Ospanovich, J., 'Issues of Constitutional and Legal Regulation of Ecological Audit: National and Foreign Experience', (2024) 6(1) The American Journal of Political Science Law and Criminology 55-59, <<https://doi.org/10.37547/tajpslc/volume06issue01-11>>.

³ Ismoilov, U., 'International Legal Regulation of Sustainable Use of Biological Diversity', (2024) 4(3) International Journal of Law and Criminology 50-57, <<https://doi.org/10.37547/ijlc/Volume04Issue03-08>>.

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understanding of its importance in global ecological management. However, the author analysed this issue only within the framework of Central Asia, which excluded the derivation of legal approach specifics from other regions.

The implementation of various events is an important part of maintaining positive environmental stability. In this context, the study by Istamkulov and Abdikerimov⁴ examined issues of environmental protection interaction and nature conservation activities, including organisational mechanisms ensuring ecological safety. However, the results of the study indicated that educational activities and research are also identified by the Kyrgyzstan legislature as priority areas. The implementation of a natural resource management control model is also important in terms of integrating various mechanisms of legal regulation of natural resource use. For example, Akhmetova and others⁵ proposed the introduction of an environmental audit system, particularly in the area of water resources due to insufficient data on monitoring ecological-economic activities. The foundation of the study can be seen in the identified reasons for the discrepancy in existing programmes and proposed solutions to improve management decisions. However, contrary to this, similar mechanisms were identified in Kyrgyzstan (for example, assessing planned activities on the environment), which rather indicates the need for procedural improvement.

The rational use of natural resources is one of the key goals of legislation in the considered sphere⁶⁷. From this perspective, Tapin and others⁸ analysed theoretical concepts of natural resource assessment and formulated the necessity of accurate cost calculation to promote rational use of natural resources. However, the researcher did not address so-called irrational natural resource use, limiting the understanding of the negative consequences of such phenomenon. The impact of human activity on the environment is a significant factor in constructing a legal approach to natural resource management issues. In addition, it is important to note that the statistical data used in the study indicate a trend towards worsening global

⁴ Istamkulov, Z. & Abdikerimov, Z., 'The Ecological Crisis and the Challenges of Motherhood', (2023) 1(2) Bulletin of Osh State University. Law 59-65. Retrieved from: <<https://cyberleninka.ru/article/n/ekologiyalyk-krizis-zhana-any-zhe-n-n-ukuktuk-k-yg-yl-r/viewer>> accessed 23 July 2024.

⁵ Akhmetova, A.B., Akynov, D.M., Kasymkhanova, G.S., Berdimurat, N. & Saduakassova A.B., 'Environmental Audit of Water Resources of the Republic of Kazakhstan', (2024) 2(106) Bulletin of the Karaganda University. Economy Series 206-215, <<https://doi.org/10.31489/2022ec2/206-215>>.

⁶ Kuznetsov, B.N., Chesnokov, N.V., Mikova, N.M., Zaikovskii, V.I., Drozdov, V.A., Savos'kin, M.V., Yaroshenko, A.M. & Lyubchik, S.B., 'Texture and catalytic properties of palladium supported on thermally expanded natural graphite', (2003) 80 (2) Reaction Kinetics and Catalysis Letters 345-350, <<https://doi.org/10.1023/B:REAC.0000006144.22936.ac>>.

⁷ Buribayev, Y.A., Khamzina, Z.A., Suteeva, C., Apakhayev, N.Z., Kussainov, S.Z. & Baitekova, K.Z. 'Legislative regulation of criminal liability for environmental crimes', (2020) 8 (4) Journal of Environmental Accounting and Management 323-334, <<https://doi.org/10.5890/jeam.2020.12.002>>.

⁸ Tapin, D., Srailova, G. & Ospanova, G., 'Actual Problems of Economic Assessment of Natural Resources in Kazakhstan', (2022) 4 (67) Bulletin of Karaganda Economic University 44-47, <<https://doi.org/10.52445/bkeu.2022.67.4.007>>.

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environmental conditions, suggesting the adoption of legal approaches that demonstrate greater effectiveness.

Considering all this, the purpose of this study is to conduct a systematic analysis of legislation in the Kyrgyz Republic regarding natural resource management, formulating its main characteristics and comparing them with legal approaches worldwide.

2. MATERIALS AND METHODS

This study employed a comparative legal analysis to evaluate the regulations governing natural resource management in Kyrgyzstan and several foreign countries. The research focused on identifying similarities and differences in legal approaches, assessing their effectiveness, and understanding the implications for sustainable development.

The literature reviewed for this study was selected from academic journals, legal texts, and policy documents that address environmental law and natural resource management. Specific focus was placed on sources that provided insights into the legal frameworks and regulatory mechanisms in Kyrgyzstan⁹, the United States¹⁰, Denmark¹¹, India¹², and Kazakhstan¹³. Primary sources included national laws, such as the Law of the Kyrgyz Republic “On Environmental Protection”¹⁴, the Environmental Code of the Republic of Kazakhstan¹⁵, and the Clean Air Act of the USA.¹⁶ Secondary sources included academic analyses and reports from international organizations like the Yale Center for Environmental Law and Policy.¹⁷

The analysis began with a comprehensive review of the selected literature to identify the core components of natural resource management as defined by law in each country. The legal documents were analyzed using formal legal methods, focusing on the structure, content, and legal techniques. Comparative legal methods were then employed to systematically compare the regulations of Kyrgyzstan with those of the United States, Denmark, India, and Kazakhstan. Key aspects examined included property rights over natural resources, permitting systems,

⁹ ‘Land Code of the Kyrgyz Republic’, (1999), <<https://cbd.minjust.gov.kg/3-5/edition/1285814/kg>>.

¹⁰ ‘Clean Air Act of USA’, (1970), <<https://www.epa.gov/clean-air-act-overview/clean-air-act-text>>.

¹¹ Law of Denmark ‘On Environmental Protection’, (2018), <<https://www.retsinformation.dk/eli/lt/2019/1218>>.

¹² ‘Code of India on Criminal Procedure’, (1973). Retrieved from: <[Khttps://www.indiacode.nic.in/handle/123456789/16225?sam_handle=123456789/1362](https://www.indiacode.nic.in/handle/123456789/16225?sam_handle=123456789/1362)> accessed 21 July 2024.

¹³ ‘Environmental Code of the Republic of Kazakhstan’, (2021), <<https://adilet.zan.kz/kaz/docs/K210000040>>.

¹⁴ Law of the Kyrgyz Republic ‘On Environmental Protection’, (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

¹⁵ ‘Environmental Code of the Republic of Kazakhstan’, (2021). <<https://adilet.zan.kz/kaz/docs/K210000040>>.

¹⁶ ‘Clean Air Act of USA’, (1970). <<https://www.epa.gov/clean-air-act-overview/clean-air-act-text>>.

¹⁷ ‘Yale Center for Environmental Law and Policy’, (2022). <<https://epi.yale.edu/epi-results/2022/component/epi>>.

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environmental control, and mechanisms to ensure the rational use of resources, such as environmental impact assessments, limitations, and fees. In addition to the legal analysis, theoretical frameworks related to natural resource management, such as the principles of sustainable development, anthropocentric and ecocentric approaches, were applied to assess how these principles are reflected in the legislation of the studied countries.

Data for the comparative analysis were sourced from legal databases, official government publications, and reports by international organizations. The Environmental Performance Index (EPI) developed by the Yale Center for Environmental Law and Policy¹⁸ was a critical tool for assessing the environmental outcomes associated with different legal approaches. Statistical data from the EPI provided a basis for comparing the effectiveness of natural resource management practices across the selected countries. The collected data were then analyzed to identify trends and gaps in the legal regulation of natural resource management. Comparative charts and tables were used to visually present the differences in legal approaches, with particular attention to the effectiveness of environmental protection mechanisms.

3. RESULTS

3.1 The Concept of Natural Resource Use and General Approaches to its Legal Regulation

The legal regulation of public relations arising from the exploitation of natural resources and objects varies depending on different legal systems and the cultural characteristics of a particular region. Specifically, these relations fall within the scope of environmental law, predominantly encompassed by the institute of natural resource use within this field. An objective analysis of various legal approaches to issues related to natural resource use would be insufficiently thorough without forming a clear understanding of this term, which will be examined in more detail within this section.

Table 1: The importance of natural resource use in the context of key areas of public activity

<i>Area of activity affected by natural resource use</i>	<i>Ways in which natural resource use impacts this area</i>
Economic development	Natural resources such as minerals, forests, water, and fertile land are the foundation of many economic sectors, including agriculture, industry, energy, and construction. Rational use of these resources contributes to economic growth and development.
Environmental sustainability	Rational use of natural resources helps preserve biodiversity, ecosystem services, and maintain

¹⁸ Ibid

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<i>Area of activity affected by natural resource use</i>	<i>Ways in which natural resource use impacts this area</i>
	natural balance. This is crucial for preventing ecosystem degradation, climate change, and loss of biodiversity.
Quality of life and health	Clean water, air, and a healthy environment are essential for people’s health and well-being. Proper use of natural resources prevents environmental pollution, reducing disease risks and improving quality of life.
Social well-being	Natural resources are often a source of income and employment for local populations, especially in rural areas. Sustainable resource use promotes social development and poverty reduction.
Conservation of the planet’s ecological state for future generations	Rational use of natural resources ensures the preservation of these resources for future generations. It is important for future generations to have access to the same resources and ecological benefits available today.
Sustainable development	Natural resource use is a crucial component of sustainable development, which involves a balanced interaction between economic growth, social justice, and environmental protection.
Legal and institutional significance	Natural resource use is regulated by laws and norms that ensure order and fairness in the distribution and use of resources. This helps prevent conflicts and illegal exploitation of natural wealth.

Source: Developed based on Sierra and Suárez-Collad¹⁹

The importance of natural resource use lies in ensuring sustainable development and has substantial implications for many reasons, covering most areas of modern society’s activities. The most noteworthy of these are outlined in table 1.

In general terms, natural resource use refers to the process of human utilisation of natural resources to meet various needs and ensure their own

¹⁹ Sierra, J. & Suárez-Collado, Á., 'Active Learning to Foster Economic, Social, and Environmental Sustainability Awareness'. In: *Educating the Sustainability Leaders of the Future*, Cham: Springer, (2023), pp. 95-110. <https://doi.org/10.1007/978-3-031-22856-8_6>.

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livelihood.^{20,21,22} This includes mining, agriculture, forestry, fishing, water resource use, and recreational activities.²³ Natural resource use can be conditionally divided into two main categories: rational and irrational. Rational natural resource use involves exploiting natural resources to minimise negative environmental impacts and ensure their long-term preservation. This may include measures for nature conservation, ecosystem restoration, efficient resource use, and the development of environmentally friendly technologies.^{24,25} On the other hand, irrational natural resource use is the utilisation of natural resources without considering their restoration and preservation, leading to resource depletion, environmental pollution, and ecosystem degradation. Examples include excessive deforestation, water and air pollution, and land degradation due to intensive agriculture.

In legal science, natural resource use denotes the legal regulation of the use of natural resources and environmental protection, as derived from the studies of Badran et al.²⁶ and Harsya et al.²⁷ This encompasses a set of norms, rules, and principles that establish the procedure and conditions for the exploitation of natural objects such as land, water, forests, and minerals, aimed at their rational use and protection. This set of norms, rules, and principles forms a system consisting of certain components. The most important of these is natural resource use legislation, which includes laws and by-laws regulating the use of natural resources. Derived from legislation is the right of ownership and use of natural resources, which entails defining the rights and obligations of various subjects (state, legal, and physical

²⁰ Skarbøvik, E., Shumka, S., Mukaetov, D. and Nagothu, U.S., 'Harmonised monitoring of Lake Macro Prespa as a basis for integrated water resources management', (2010) 24 (3-4) *Irrigation and Drainage Systems* 223-238, <<https://doi.org/10.1007/s10795-010-9099-1>>.

²¹ Babak, V.P., Babak, S.V., Eremenko, V.S., Kuts, Y.V., Myslovych, M.V., Scherbak, L.M. & Zaporozhets, A.O., 'Monitoring the Air Pollution with UAVs', (2021b) 360 *Studies in Systems, Decision and Control* 191-225, <https://doi.org/10.1007/978-3-030-70783-5_7>.

²² Nugraha, S., 'Natural Resource Management Principles and the Role of Law in Realizing Good Development Governance', (2023) 2 (1) *Journal of Progressive Law and Legal Studies* 49-58, <<https://doi.org/10.59653/jplls.v2i01.575>>.

²³ Nurgaliyeva, A., Zhmagalieva, B., Asrepov, G., Bekniyazova, D. & Kussainov, K., 'Development of innovative processes in the field of agriculture of the Republic of Kazakhstan', (2024) 25(6) *Scientific Horizons* 141-151, <<https://doi.org/10.48077/scihor6.2024.141>>.

²⁴ Bogoliubov, V., Klepko, A., Bondar, V. & Naumovska, O. 'Providing quality drinking water to the rural population in the context of achieving the goals of sustainable development', (2023) 14(1) *Biological Systems: Theory and Innovation* 53-60, <[https://doi.org/10.31548/biologiya14\(1-2\).2023.009](https://doi.org/10.31548/biologiya14(1-2).2023.009)>.

²⁵ Mandryk, O., Stakh, M. & Sabadukha, V., 'Philosophical and methodological bases of overcoming the global environmental crisis or the foundations of eschatological methodology', (2023) 14 (1) *Ecological Safety and Balanced Use of Resources* 132-142, <[https://doi.org/10.31471/2415-3184-2023-1\(27\)-132-142](https://doi.org/10.31471/2415-3184-2023-1(27)-132-142)>.

²⁶ Badran, D.M.L., Alammari, K.S. & Abdelhady, M.A., 'The Legal Challenges in Environmental Protection and Accountability: A Study in Saudi Law', (2024) 18 (9) *Revista de Gestão Social e Ambiental* e6536, <<https://doi.org/10.24857/rgsa.v18n9-060>>.

²⁷ Harsya, R.M.K., Bhaskoro, A., Sinaga, H., Koynja, J.J. & Judijanto, L., 'Environmental Justice and Sustainable Development: Assessing Legal Frameworks for a Balanced Future', (2023) 1 (3) *Global International Journal of Innovative Research* 274-281, <<https://doi.org/10.59613/global.v1i3.38>>.

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persons) concerning natural resources.^{28,29} A separate element of this system can be identified as environmental law, which unifies all norms aimed at protecting the environment and preventing the negative impact of economic activities on nature.³⁰ This includes laws on the protection of atmospheric air, water bodies, land and forest resources, as well as the protection of wildlife and plant life.^{31,32} A specific tool of this mechanism is the licensing and permitting system, which encompasses procedures for obtaining permits for the use of natural resources, such as licenses for mineral extraction, water use, and forestry. Control and supervision form a distinct element of the natural resource use institute, signifying state control over compliance with natural resource use legislation. This includes inspections, audits, monitoring and evaluation of the environmental state, as well as measures to prevent and eliminate violations. The final component identified is the mechanism for holding individuals accountable for violating natural resource use legislation, manifested through the imposition of disciplinary, civil, and criminal sanctions for non-compliance with natural resource use norms.

Based on the above-mentioned components of the natural resource use institute, it can be said that in theory, there are three main approaches that shape state policy in the field of natural resource exploitation, namely: anthropocentric, ecocentric, and sustainable development approaches.³³ The key distinguishing feature of the anthropocentric approach is its focus on human needs, which are placed above environmental interests. The ecocentric approach, ideologically opposite to the anthropocentric approach, posits that environmental interests take precedence over human interests, based on the belief that nature has its own intrinsic value that must be protected. Regarding the sustainable development approach, its essence lies in seeking a balance between human and environmental interests. This concept is based on the need to use natural resources in a way that meets the needs of present generations without compromising the ability of future generations to meet their own needs.

²⁸ Subhoni, M., Kholmurodov, K., Doroshkevich, A., Asgerov, E., Yamamoto, T., Lyubchik, A., Almasan, V. & Madadzada, A., 'Density functional theory calculations of the water interactions with ZrO₂ nanoparticles Y₂O₃ doped', (2018) 994 (1) Journal of Physics: Conference Series 012013.

²⁹ Ladychenko, V. & Mykytiuk, A., 'Environmental rights protection in the European Court of Human Rights', (2023) 14 (4) Law. Human. Environment 24-36, <<https://doi.org/10.31548/law/4.2023.24>>.

³⁰ Poltorak, A., 'Conceptual foundations of the behavioral approach to managing the system of financial and economic security of the state', (2023) 27 (1) Ukrainian Black Sea Region Agrarian Science 9-19, <<https://doi.org/10.56407/bs.agrarian/1.2023.09>>.

³¹ Babak, V.P., Babak, S.V., Eremenko, V.S., Kuts, Y.V., Myslovych, M.V., Scherbak, L.M. & Zaporozhets, A.O., 'Models and Measures for Atmospheric Pollution Monitoring', (2021a) 360 Studies in Systems, Decision and Control 227-266, <https://doi.org/10.1007/978-3-030-70783-5_8>.

³² Lipińska, H., Lipiński, W., Shuvar, I., Korpita, H. & Shuvar, A., 'Invasive plant species and their threat to biodiversity', (2023) 14 (1) Plant and Soil Science 51-65, <<https://doi.org/10.31548/plant1.2023.51>>.

³³ Behdadfar, E. & Samaei, S., 'Environmental Challenges: Analysis, Solutions, and Modern Developments in Environmental Management' (2024). <<https://www.en.symposia.ir/PSHCONF22>>.

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Overall, “natural resource use” in jurisprudence is aimed at balancing society’s needs for natural resources with the preservation of environmental sustainability for future generations. However, as previously mentioned, approaches to the legal regulation of norms in this field may vary depending on different legal systems. Therefore, based on the established understanding of the concept of “natural resource use” within this section, these approaches will be considered below.

3.2 Analysis of the Legal Regulation of Environmental Management Issues in Kyrgyzstan

In the modern world, issues of natural resource use are becoming increasingly relevant. This is due to the growing anthropogenic impact on the environment, leading to the depletion of natural resources, ecosystem degradation, and climate change. In these conditions, law plays a crucial role in regulating relations in the field of natural resource use and ensuring the rational use of natural resources. Therewith, as a country with rich natural resources, Kyrgyzstan faces acute problems related to their rational use and environmental protection.

The status of land and natural resources located within the country’s territory is established in Article 16 of the Constitution of the Kyrgyz Republic³⁴, which states that the Kyrgyz Republic has exclusive ownership rights over the land, its subsoil, forests, pastures, water resources, airspace, flora and fauna, and other natural wealth. It is specified that the land and natural resources serve as the basis for the life and activities of the people of Kyrgyzstan, while the state apparatus exercises control and protection of these resources, aiming to preserve the unified ecological system and sustainable development of the country. This norm, in turn, outlines the general concept and orientation of the constitutional regime in the country towards a sustainable development approach in the field of natural resource use. Furthermore, according to the Constitution, there are three types of land ownership: private, state, and municipal. However, there is a restriction stating that foreign citizens and legal entities with foreign participation cannot own land on a private ownership basis. On the other hand, Article 49 of the Constitution of the Kyrgyz Republic³⁵ stipulates the right to an environmentally safe environment, the violation of which can be grounds for compensation for damage caused. Corresponding to this right is the obligation to care for the environmental surroundings, flora, and fauna, which should be implemented through careful treatment and protection of nature.

The Institute of Natural Resource Use is comprehensively regulated in the specific Law of the Kyrgyz Republic “On Environmental Protection”³⁶, with Section III entirely devoted to issues in this sphere. From the perspective

³⁴ ‘Constitution of the Kyrgyz Republic’, (1993). <<https://www.gov.kg/ky/p/constitution>>.

³⁵ Ibid

³⁶ Law of the Kyrgyz Republic ‘On Environmental Protection’, (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

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of legislative definitions, this regulation defines natural resource use as the totality of all methods of using natural resources and actions for their conservation. Article 10 of the same Law indicates that the legislation of the Kyrgyz Republic provides for two types of natural resource use: general and special. In this context, general natural resource use refers to activities that do not require special permission and can be performed by citizens without any hindrance, while special natural resource use is based on an established order and conditions sanctioned by the legislation of Kyrgyzstan. Apart from the types of natural resource use considered above in the Law of the Kyrgyz Republic "On Environmental Protection", Section III also provides special mechanisms to improve control over the exploitation of natural resources. These include limiting and fees for natural resource use, state accounting, and evaluation of natural resources. Based on the examined law, it can be asserted that the mechanisms of limiting and fees apply only to the special type of natural resource use. The first is implemented by authorised state bodies, which set limits on the maximum allowable emissions and discharges of pollutants into the environment and the limits for the disposal of industrial waste based on the environmental situation in the region.^{37,38} Moreover, depending on the object of restriction, the law provides a classification according to which there are types of limiting such as establishing maximum allowable standards for the extraction of natural resources from the environment and determining maximum allowable standards for emissions and discharges of harmful substances into the environment, as well as waste disposal. Concerning fees for natural resource use, they include various types, the most common of which are fees for the use of natural resources and environmental pollution. According to Article 15 of the Law of the Kyrgyz Republic "On Environmental Protection"³⁹, a fee for the use of natural resources is established for resource exploitation within limits and for over-limit use. The funds enter the state budget according to prescribed rules and are used for environmental protection and restoration. Notably, the payment of fees for natural resource use does not exempt users from the necessity of conducting environmental protection activities, compensating for ecological violations, and does not relieve them from liability for legal violations. The final mechanism, which includes state accounting and evaluation of natural resources, involves tracking information by special state bodies and natural resource users about the use of natural resources and secondary materials, as well as analysing their importance for socio-economic development.

³⁷ Ferreira, A.B.S., Sebastiani, R.T., Nascimento, L.D., De Oliveira, K.J., Carballo, F.P., De Sá Zarpellon, C.S., Vitaliano, F.C.B., Silva, A.P.S.E., Nascimento, G.G.D. & Almeida-Bezerra, J.W., 'Environmental Audit as a Tool for Management and Sustainability: A Qualitative Study', (2024) 18(3) *Revista de Gestão Social e Ambiental* e05896. <<https://doi.org/10.24857/rgsa.v18n3-078>>.

³⁸ Shchokin, R., Oliinyk, V., Amelin, O., Bondarenko, Y., Mazyichuk, V. & Kyslenko, D., 'Methods of Combating Offenses in the Field of Ecology', (2023) 14 (1) *Journal of Environmental Management and Tourism* 5-15. <[https://doi.org/10.14505/jemt.v14.1\(65\).01](https://doi.org/10.14505/jemt.v14.1(65).01)>.

³⁹ Law of the Kyrgyz Republic 'On Environmental Protection', (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

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The aforementioned mechanisms are the main tools in the institute of natural resource use. However, it should be noted that there are other forms of legal regulation in the field of ecology that are indirectly related to the exploitation of natural resources. For example, according to Articles 16 and 17 of the Law of the Kyrgyz Republic “On Environmental Protection”⁴⁰, any funding and implementation of works related to natural resource use is prohibited until an environmental impact assessment of the planned activity has been conducted and a positive decision from the state environmental review has been obtained. This is regulated by the specific Law of the Kyrgyz Republic “On Environmental Expertise”⁴¹. Evaluating the importance of this tool, it is pertinent to refer to Article 3 of the aforementioned law, which states that the environmental review pursues two main objectives: preventing negative impacts on public health and the environment from planned administrative, economic, and other activities; and assessing the compliance of planned projects and their implementation with environmental legislation at all stages, including preliminary consideration and the implementation process. Such legislative formulations indicate that any type of activity must be assessed by state structures for its potential harm to the ecological situation before it is directly implemented in public life.⁴² Therewith, the Law of the Kyrgyz Republic “On Environmental Protection”⁴³ provides other ways to enhance the institute of natural resource use, which are based on educational and scientific purposes, allowing for a more detailed analysis of this field in the country and familiarising citizens with the main rules of natural resource exploitation. Specifically, Article 33 states that to prevent pollution and ensure the rational use of natural resources, environmental protection activities are conducted in Kyrgyzstan. These activities are included in interstate, national, sectoral, and territorial programmes, as well as in enterprise plans and targeted environmental programmes. Moreover, according to Article 49, there is a priority for fundamental and applied research aimed at scientifically substantiated environmental protection and rational use of natural resources.

To gain a more comprehensive understanding of the legislation governing natural resource use in the Kyrgyz Republic, specific laws such as the Law of the Kyrgyz Republic “On Subsoil”⁴⁴ and the Land Code of the Kyrgyz Republic⁴⁵ were examined. These laws regulate licensing rules, exploitation, powers of state authorities, and specify primary and derivative

⁴⁰ Ibid

⁴¹ Law of the Kyrgyz Republic ‘On Environmental Expertise’, (1999). <<https://cbd.minjust.gov.kg/4-206/edition/638848/kg>>.

⁴² Jennings, S. & Le Quesne, W.J.F., ‘Integration of Environmental and Fishery Management in Europe’, (2012) 69 (8) ICES Journal of Marine Science 1329-1332, <<https://doi.org/10.1093/icesjms/fss104>>.

⁴³ Law of the Kyrgyz Republic ‘On Environmental Protection’, (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

⁴⁴ Law of the Kyrgyz Republic ‘On Subsoil’, (2018). <<https://cbd.minjust.gov.kg/111782/edition/7196/kg>>.

⁴⁵ ‘Land Code of the Kyrgyz Republic’, (1999). <<https://cbd.minjust.gov.kg/3-5/edition/1285814/kg>>.

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methods for the transfer and acquisition of property rights, among other things. However, this study focuses on the main areas of these regulations to clarify the legal approach to regulating natural resource use in the country. For example, according to Article 3 of the Law of the Kyrgyz Republic “On Subsoil,”⁴⁶ legislation in this area is based on twelve key principles, including ensuring environmental safety, effective and targeted land use, and preserving land as a natural object. Meanwhile, Article 2 of the Law of the Kyrgyz Republic “On Subsoil”⁴⁷ states that policy in this area should be based on the premise that subsoil resources are under special state protection, and the state is obliged to create safe conditions for people and the environment. These resources are to be used based on principles of openness, transparency, and rationality, as well as other foundations that demonstrate the interconnectedness of all environmental legislation, which is rooted in constitutional provisions. In this context, the Law of the Kyrgyz Republic “On Specially Protected Natural Territories”⁴⁸ was also reviewed. Article 4 of this law indicates that a system of specially protected natural territories has been established in the Kyrgyz Republic to preserve, reproduce, restore, and maintain natural processes, preserve the environmental balance and diversity of biological and landscape environments, ensure sustainable natural resource use, and conduct long-term monitoring of the biosphere. The existence of such territories on the described principle confirms the targeted nature of the legal approach based on sustainable development ideas in state policy.

The conducted analysis of the legislation revealed the vectors chosen by the state for development in the sphere of natural resource use. However, without considering public opinion, such research would be incomplete. Therefore, this study also examined the results of a public environmental review (PER) based on the opinions of over 500 residents of Bishkek and Karaganda regarding current environmental issues.⁴⁹ Prior to the review, a survey was conducted providing four options representing the main environmental problems in Kyrgyzstan and Kazakhstan: air pollution from coal burning, household waste issues, potential construction of a nuclear power plant, and the construction of the Almaty-Issyk-Kul Road.⁵⁰ As a result, nearly an equal number of respondents identified two main problems:

⁴⁶ Law of the Kyrgyz Republic ‘On Subsoil’, (2018).
<<https://cbd.minjust.gov.kg/111782/edition/7196/kg>>.

⁴⁷ Ibid

⁴⁸ Law of the Kyrgyz Republic ‘On Specially Protected Natural Territories’, (2011).
<<https://cbd.minjust.gov.kg/203262/edition/1205628/kg>>.

⁴⁹ Malikova, A., ‘Public Environmental Expertise (PEE) in Central Asia’, (2024). Retrieved from:
<https://green-ca.net/wp-content/uploads/2023/08/prezentacziya_informacziya-o-provedennoj-rabote-v-rk-po-proektu-oee.pdf> accessed 11 June 2024.

⁵⁰ Kalaganov, B., Madiyarova, A.S., Sartayeva, K.R., Kim, E.P., Apakhayev, N. & Buribayev, Y.A., ‘Legal fundamentals of the Kazakhstan’s environmental international cooperation: New vectors of legislative reforms’, (2018) 9 (7) Journal of Environmental Management and Tourism 1525-1538,
<[https://doi.org/10.14505/jemt.v9.7\(31\).16](https://doi.org/10.14505/jemt.v9.7(31).16)>.

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air pollution and household waste issues (approximately 40% each).⁵¹ The issue of constructing nuclear power plants came in third place. Based on World Health Organisation data indicating that air pollution from coal burning leads to 30% additional mortality, the problem of smog caused by coal burning in Bishkek and Karaganda was also examined. Researchers noted that, despite the state environmental review being conducted on 1300 objects in 2023, only 10 objects underwent public review. From this, it can be concluded that the public's right to access information, as regulated by the Law of the Kyrgyz Republic "On Environmental Expertise"⁵², is not fully executed, indicating a need for closer communication between state and public structures to improve the mechanism.

Based on the survey results discussed above, a specific issue related to existing environmental problems emerges, namely the question of accountability for violations in the field of natural resource use. In the Kyrgyz Republic, the most common types of liability are disciplinary, administrative, civil, and criminal. Primarily, in this context, the Code of the Kyrgyz Republic on Offenses⁵³ should be mentioned, where Section VII is dedicated to these public relations, including Chapters 23-28. These provisions regulate relations in the field of environmental safety and protection concerning veterinary and phytosanitary, radiation, ecological, sanitary, and epidemiological offences. For more serious crimes, criminal liability is provided under the Criminal Code of the Kyrgyz Republic⁵⁴, where Chapter 38, titled "Crimes against Environmental Safety and the Natural Environment," outlines dispositions and sanctions for violations directly and indirectly related to the institute of natural resource use.

3.3 Comparative Analysis of the Legal Regulation of the Natural Resource Management Institution in Kyrgyzstan and Foreign Countries

The institution of natural resource management is one of the most crucial elements of the legal system in any country. It defines the procedures for using natural resources, the rights and obligations of resource users, and measures for environmental protection. As previously determined, in Kyrgyzstan, the legal regulation of natural resource management is based on The Law of the Kyrgyz Republic "On Environmental Protection"⁵⁵ and a series of specific regulations that specify the procedures for implementing

⁵¹ Karabaeva, A., 'Specialists Presented the Results of Public Environmental Expertise of Air Quality in Kyrgyzstan and Kazakhstan', (2024). Retrieved from: <https://ekois.net/spetsialisty-predstavili-rezultaty-obshhestvennoj-ekologicheskoy-ekspertizy-kachestva-vozduha-v-kyrgyzstane-i-kazahstane/> accessed 19 June 2024.

⁵² Law of the Kyrgyz Republic 'On Environmental Expertise', (1999). <<https://cbd.minjust.gov.kg/4-206/edition/638848/kg>>.

⁵³ 'Code of the Kyrgyz Republic on Offenses', (2021). <<https://cbd.minjust.gov.kg/112306/edition/7664/kg>>.

⁵⁴ 'Criminal Code of the Kyrgyz Republic', (2021). <<https://cbd.minjust.gov.kg/112309/edition/3548/kg>>.

⁵⁵ Law of the Kyrgyz Republic 'On Environmental Protection', (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

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certain procedures and exploiting particular natural objects. However, in countries such as Denmark, India, Kazakhstan, and the USA, this institution has unique characteristics influenced by historical, geographical, economic, and other factors.

When examining this issue, it is first important to consider the annual ranking of the world's most environmentally friendly countries compiled by the Yale Center for Environmental Law and Policy.⁵⁶ This ranking assesses the environmental performance of countries by measuring their achievements in ecology and natural resource management. The assessment is based on 22 indicators, divided into 10 categories, which cover various aspects related to environmental condition and ecosystem sustainability, biodiversity conservation, climate change measures, public health, the impact of economic activities on the environment, and the effectiveness of state environmental policies. On this basis, the indicators of countries from different regions of the world were evaluated, revealing a consistent trend towards deterioration of the overall situation (Figure 1). Notably, the vast majority of the leaders in this ranking are European countries, whereas all Central Asian countries occupy positions at the lower end of the list.

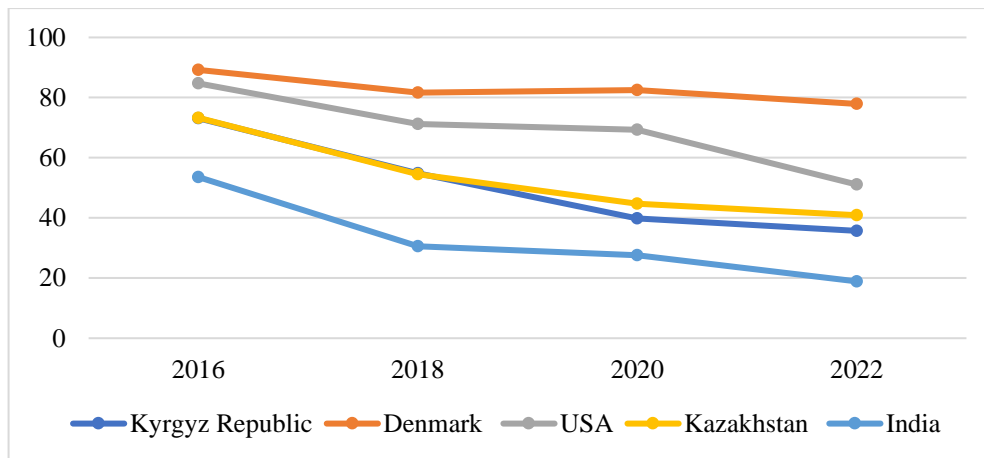


Figure 1: Comparative indicators of environmental performance index in countries from different regions of the world

Note: The maximum possible score is 100 points. *Source:* Developed based on data of Yale Center for Environmental Law and Policy⁵⁷

First and foremost, it is worth focusing on the analysis of practices applied in Denmark, as this country is considered a benchmark in combating environmental issues, as evidenced by its leading position in the aforementioned ranking. In general, natural resource management in Denmark is regulated by national regulations that consider both domestic

⁵⁶ 'Yale Center for Environmental Law and Policy', (2022). <<https://epi.yale.edu/epi-results/2022/component/epi>>.

⁵⁷ Ibid

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conditions and the country's international obligations.⁵⁸ The primary law regulating environmental safety and natural resource use in Denmark is the Law of Denmark "On Environmental Protection".⁵⁹ This law covers a wide range of issues and, unlike the Law of the Kyrgyz Republic "On Environmental Protection"⁶⁰, not only establishes legal mechanisms for addressing natural resource management issues but also regulates specific practical issues, which in most cases must be coordinated with the Minister of the Environment (hereinafter referred to as the Minister), whose powers are outlined in Chapter 2 of the aforementioned the Law of Denmark "On Environmental Protection".⁶¹ Consequently, one can speak of the specificity of the control and state accounting mechanisms. In particular, concerning the control of natural resource exploitation, according to the law, the Minister is required to establish rules for such procedures in specific areas of activity, as evidenced by the provisions of Article 8 (control over eco-labelling schemes), Article 15d (control over the designation of ecological zones), Article 51 (control over the rules for the production and composition of products), Article 9a (control over the use of budgetary funds allocated for environmental purposes), and others. Another important difference between Danish legislation and Kyrgyz legislation is the different approach to state accounting, which involves a large number of mandatory registers that are publicly accessible. For instance, the Law of Denmark "On Environmental Protection"⁶² provides for the functioning of a producer register (Article 9k), a register of persons and companies of high risk (Article 40a), a register of information on existing waste storage and management volumes (Article 46a).

Notably, in Denmark, great importance is attached to the application of preventive measures, which, in accordance with Article 73c of the Law of Denmark "On Environmental Protection"⁶³, must be enacted by polluters, whereas such provisions are not present in Kyrgyzstan. In relation to this, Section 73a of the same law highlights a distinctive approach to the mechanism of legal accountability. Specifically, this regulation establishes liability for damage in the narrow field of improper use of waste and fertilisers in agriculture (Section 73b). Another difference is that, in Kyrgyzstan, responsibility for environmental violations is primarily regulated under the Criminal Code of the Kyrgyz Republic⁶⁴ and the Code of

⁵⁸ Tsybukh, V., 'The role of natural resources in international relations in the 20th – early 21st century', (2023) 33(2) Foreign Affairs 57-64. <[https://doi.org/10.46493/2663-2675.33\(2\).2023.57-64](https://doi.org/10.46493/2663-2675.33(2).2023.57-64)>.

⁵⁹ Law of Denmark 'On Environmental Protection', (2018). <<https://www.retsinformation.dk/eli/lt/2019/1218>>.

⁶⁰ Law of the Kyrgyz Republic 'On Environmental Protection', (1999). <<https://cbd.minjust.gov.kg/218/edition/1003917/kg>>.

⁶¹ Law of Denmark 'On Environmental Protection', (2018). <<https://www.retsinformation.dk/eli/lt/2019/1218>>.

⁶² Ibid

⁶³ Ibid

⁶⁴ 'Criminal Code of the Kyrgyz Republic', (2021). <<https://cbd.minjust.gov.kg/112309/edition/3548/kg>>.

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the Kyrgyz Republic on Offences⁶⁵, whereas Denmark has a specific law, the Law of Denmark “On Environmental Damage”⁶⁶, which thoroughly addresses various offences related to natural resource management and provides a basis for assigning legal responsibility for environmental harm. Environmental damage, according to Section 7 of the Law, is defined as harm that has a significant adverse effect on maintaining the favourable status of the environment.

In the United States, natural resource management is regulated both at the federal level and by individual states, with relevant examples including the Clean Air Act of the USA⁶⁷ and the National Environmental Policy Act⁶⁸. Central to the management of natural resources are agencies that develop regulations and standards, conduct environmental impact assessments, and oversee compliance with environmental laws. Moreover, US legislation provides for extensive public involvement in decision-making processes through public hearings, comments on proposals, and participation in environmental assessments. For instance, according to subsection d of Section 1 of the National Environmental Policy Act, an environmental impact assessment is mandatory for all major projects, which includes a period for public consultation. Highlighting the main differences between these legal approaches, it can be observed that the US has a more complex and multi-tiered regulatory system, characterised by the interaction between central and federal agencies, as evidenced by Section 102 of the National Environmental Policy Act. In contrast, in Kyrgyzstan, this aspect is largely governed by centralised regulation. Furthermore, the US legislation offers broader opportunities for public participation in decision-making processes related to natural resource management, based on Section 101 of the National Environmental Policy Act, which stipulates that authorities must cooperate with the public. In Kyrgyzstan, this aspect remains underdeveloped, as further corroborated by the previously reviewed study, which highlighted the extremely low demand for public environmental expertise⁶⁹.

The legal approach in Kazakhstan is somewhat closer to that of Kyrgyzstan. The primary regulation governing natural resource management in Kazakhstan is the Environmental Code of the Republic of Kazakhstan.⁷⁰ Notably, a similarity to the Kyrgyz approach is found in Section 6 of Article 5 of the Environmental Code, where the principle of

⁶⁵ ‘Code of the Kyrgyz Republic on Offenses’, (2021). <<https://cbd.minjust.gov.kg/112306/edition/7664/kg>>.

⁶⁶ Law of Denmark ‘On Environmental Damage’, (2017). <<https://www.retsinformation.dk/eli/ta/2017/277>>.

⁶⁷ ‘Clean Air Act of USA’, (1970). <<https://www.epa.gov/clean-air-act-overview/clean-air-act-text>>.

⁶⁸ ‘National Environmental Policy Act’, (1970). <<https://www.epa.gov/nepa/what-national-environmental-policy-act>>.

⁶⁹ Karabaeva, A., ‘Specialists Presented the Results of Public Environmental Expertise of Air Quality in Kyrgyzstan and Kazakhstan’, (2024). Retrieved from: <<https://ekois.net/spetsialisty-predstavili-rezultaty-obshhestvennoj-ekologicheskoy-ekspertizy-kachestva-vozduha-v-kyrgyzstane-i-kazahstane/>> accessed 20 July 2024.

⁷⁰ ‘Environmental Code of the Republic of Kazakhstan’, (2021). <<https://adilet.zan.kz/kaz/docs/K210000040>>.

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sustainable development is identified as central to shaping state policy in this area. However, one of the distinctions from Kyrgyz legislation is Kazakhstan's mandatory maintenance of a publicly accessible register of emissions and pollutant transfers (Article 22 of the Environmental Code), reflecting the Danish approach discussed earlier. Moreover, there is a notable difference in the legal regulation of limiting mechanisms; Kazakhstan employs environmental quality standards, defined in Article 36 of the Code as the state of environmental elements based on a combination of quantitative and qualitative characteristics. In addition, Article 127 of the Environmental Code of the Republic of Kazakhstan imposes a fee for negative environmental impacts, in contrast to Kyrgyzstan's resource usage fees. According to Section 1 of the same Article, negative impacts are categorised into: emissions of pollutants into the atmosphere; discharge of pollutants into water bodies; waste disposal; and storage of sulphur in open areas. Another distinguishing feature in the natural resource management system is the regulation of specially protected areas. According to Article 3 of the Law of the Republic of Kazakhstan "On Specially Protected Natural Areas"⁷¹, the establishment of such areas is based on the principle of creating a system of specially protected natural territories as a key element of the ecological network aimed at preserving and restoring biodiversity as well as unique and typical landscapes. Thus, while in Kyrgyzstan, the functioning of these areas primarily adheres to the principle of sustainable development, in Kazakhstan, this issue is approached from an eco-centric perspective.

India's legal approach to natural resource management involves the development and implementation of regulations aimed at the management, protection, and sustainable use of natural resources. The Indian Environment (Protection) Act⁷² plays a significant role in establishing the foundation of the natural resource management institution. However, it does not specify the procedures for implementing special mechanisms and procedures. According to Section 3 of the aforementioned Act, the central government is empowered to take any actions it deems necessary or expedient for the protection and improvement of the environment, as well as for the prevention, control, and reduction of environmental pollution. From this, one can infer that the centralised management of state policy concerning public matters is evident. According to Section 6 of the Indian Environment (Protection) Act⁷³, central authorities retain responsibility for overseeing natural resource exploitation and establishing limits for pollutants. Unlike the Kyrgyz Republic, the limiting mechanism in India does not involve a classification system at the legislative level but is defined more broadly as permissible concentration limits for various environmental pollutants.

⁷¹ Law of Republic of Kazakhstan 'On Specially Protected Natural Areas', (2006).
<https://online.zakon.kz/Document/?doc_id=30063141&doc_id2=30063141#pos=4;-97.19999694824219&pos2=4;-97.19999694824219>.

⁷² 'Indian Environment (Protection) Act', (1986).
<https://www.indiacode.nic.in/bitstream/123456789/6196/1/the_environment_protection_act%2C1986.pdf>.

⁷³ Ibid

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Furthermore, Section 10 of this Act specifies that criminal liability is governed by the provisions of the Code of India on Criminal Procedure⁷⁴ or, in states where it does not apply, by relevant federal regulations. This provision suggests that a key difference between Indian and Kyrgyz legislative regulation is the federal governance structure in India, which grants greater autonomy to local entities in shaping legal policy at the local level, while still allowing for intervention by central authorities.

Notably, India and Kyrgyzstan possess different natural resources and ecosystems, which influence their management approaches. For instance, India's diverse climatic zones and biodiversity necessitate varied management strategies. Consequently, India has implemented the Indian Biological Diversity Act⁷⁵, under which the National Biodiversity Authority operates as per Article 3. This authority, which has no equivalent in Kyrgyzstan, holds monitoring and regulatory powers. No activity related to natural resource exploitation can proceed without its approval following an environmental impact assessment. Overall, India's legal approach exemplifies the challenges faced by a large, culturally and geographically diverse country in formulating effective state policy. This is reflected in the aforementioned ranking, where India has the lowest environmental performance index among 180 countries, indicating issues with the practical implementation of legislative provisions.⁷⁶

To summarise, natural resource management is a crucial component of the legislation in every country, as ensuring and maintaining a safe environment is a fundamental objective for modern democratic states. The legal approaches of countries regarding natural resource management are predominantly based on the principle of sustainable development, which seeks to balance human interests with environmental protection measures. This approach aims to preserve current opportunities, scientific achievements, and ecological stability for future generations.

4. DISCUSSION

During the study, the essence of the term "natural resource management" was examined both in its general understanding and from a legal perspective. On this basis, different approaches to the legal regulation of this phenomenon were analysed, which allowed for an assessment of the current legislative perspective in Kyrgyzstan on such issues and a comparison with the practices in countries from other regions. Despite this, natural resource management remains a relevant subject within the academic

⁷⁴ 'Code of India on Criminal Procedure', (1973). <https://www.indiacode.nic.in/handle/123456789/16225?sam_handle=123456789/1362>.

⁷⁵ 'Indian Biological Diversity Act', (2002). <<https://www.indiacode.nic.in/bitstream/123456789/2046/4/a2003-18.pdf>>.

⁷⁶ 'Yale Center for Environmental Law and Policy', (2022). <<https://epi.yale.edu/epi-results/2022/component/epi>>.

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field, and therefore it is important to compare the obtained results with existing research findings.

The concept of sustainable development was considered in this study as one of the most sought-after approaches that can establish a balance between human interests and the rational use of natural resources. This issue was also addressed by Harsya et al.⁷⁷ and Hammouri et al.⁷⁸ The former conducted a review of international agreements, national laws, and regional initiatives, and assessed the inclusiveness of legal instruments, their adaptation to environmental challenges, and the effectiveness of their implementation. The authors noted that despite progress, gaps remain in addressing cross-sectoral environmental and social issues. In the study, Hammouri et al.⁷⁹ explored the concept of sustainable development in European countries, concluding that this approach is a priority within the region. However, these studies did not fully explore the concept of “natural resource management” itself and did not consider other legal approaches beyond those based on the principle of sustainable development, which complicates a systematic examination of the subject.

The results indicated that natural resource management can be divided into rational and irrational types, which are related to the methods of exploiting natural resources. In this context, this classification aligns with the research by Behdadfar and Samaei⁸⁰, which assessed contemporary environmental problems, including climate change, air pollution, and biodiversity loss, in relation to the effectiveness of legal approaches and the innovative technologies employed to address these issues, such as renewable energy sources and air and water purification technologies.⁸¹ However, the authors did not consider some mechanisms provided by legislation, such as licensing and legal accountability, which are fundamental to the functioning of the natural resource management institution.

The research demonstrated that Kyrgyzstan has a mechanism known as the Environmental Impact Assessment (EIA), which is part of the licensing and permitting system for natural resource use. This subject was also

⁷⁷ Harsya, R.M.K., Bhaskoro, A., Sinaga, H., Koynja, J.J. & Judijanto, L., ‘Environmental Justice and Sustainable Development: Assessing Legal Frameworks for a Balanced Future’, (2023) 1 (3) *Global International Journal of Innovative Research* 274-281, <<https://doi.org/10.59613/global.v1i3.38>>.

⁷⁸ Hammouri, J.A.A., Melnyk, O., Dydiv, I., Yaremenko, O., Zhyvko, Z. & Zaverbnyj, A., ‘State Legal Policy for Planning Sustainable Development of Recreational Areas: Environmental Risk Assessment for Open Socio-Economic Systems’, (2024) 19 (4) *International Journal of Sustainable Development and Planning* 1397-1405, <<https://doi.org/10.18280/ijstdp.190417>>.

⁷⁹ Ibid

⁸⁰ Behdadfar, E. & Samaei, S., ‘Environmental Challenges: Analysis, Solutions, and Modern Developments in Environmental Management’ (2024), <<https://www.en.symposia.ir/PSHCONF22>>.

⁸¹ Rumiantseva, O.P., Shvets, D.V. & Karabut, N.O., ‘Influence of information technologies on the environment and support for green computing as a solution to ecological problems’, (2022) 54 *Journal of Kryvyi Rih National University* 159-163, <<https://doi.org/10.31721/2306-5451-2022-1-54-159-163>>.

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analysed by Silveira⁸², which considered the legal approaches of Brazil and Germany. The author conducted an analysis of internal contradictions in environmental legislation related to the planning and licensing of natural resources, including an evaluation of discretion limits, environmental impacts, compensation, alternatives, and public participation. Nevertheless, based on the results obtained, it is important to emphasise that the main instrument in this area within the Kyrgyz Republic is the conduct of state ecological expertise, which plays a decisive role in the licensing process⁸³. Meanwhile, according to Silveira⁸⁴, it can be concluded that a distinctive feature of Germany's licensing and permitting mechanism is the mandatory public participation at all stages of the Environmental Impact Assessment, whereas Brazil is noted for its particularly broad range of activities that can significantly impact the environment and must be assessed for compliance with established regulations. In this context, it is pertinent to mention the work of Ramziati and Sastro⁸⁵, which examines natural resource management from the perspective of Islamic principles. The authors' main conclusion is that Islam supports the economical use of natural resources to achieve sustainable development, rejecting the anthropocentric approach that prioritises human needs. This correlates with the methods studied in Kyrgyzstan, where legislative solutions to natural resource management issues are based on legal norms that consider both human interests and the extraction of minerals with minimal environmental damage.

Legal accountability is a substantial component of regulating natural resource management, as it deters potential violations and enables the imposition of sanctions on offenders. This issue was the subject of the study by Alkassaabeh and Al-Zoubi⁸⁶, which analysed the legal foundations of environmental protection through the lens of Jordanian legislation. The findings of this study suggest that Jordan has similar forms of legal accountability as those in Kyrgyzstan, including criminal, administrative, civil, and disciplinary liabilities. However, in addition to these, Jordan also recognises collective responsibility, which underscores the importance of the involvement of both state institutions and civil society in preventing and controlling environmental violations. In this context, it is also pertinent to

⁸² Silveira, P.G., 'Comparative Analysis and Results for the Resolution of Internal Conflicts in Land-Use Planning and Environmental Licensing of Renewable Energy Projects' (Springer, 2022).

⁸³ Kyshakevych, B., Maksyshko, N., Voronchak, I. & Nastoshyn, S., 'Ecological and economic determinants of energy efficiency in European countries', (2023) 26 (8) *Scientific Horizons* 140-155, <<https://doi.org/10.48077/scihor8.2023.140>>.

⁸⁴ Silveira, P.G., 'Comparative Analysis and Results for the Resolution of Internal Conflicts in Land-Use Planning and Environmental Licensing of Renewable Energy Projects' (Springer, 2022).

⁸⁵ Ramziati, R. & Sastro, M., 'Natural Resource Management and Sustainable Development in Islamic Perspective', (2023) 3 *Proceedings of Malikussaleh International Conference on Law, Legal Studies and Social Science (MICoLLS)* 58-72, <<https://doi.org/10.29103/micolls.v3i-.322>>.

⁸⁶ Alkassaabeh, F.Y. & Al-Zoubi, M.A.K., 'Legal Frameworks for Facing Environmental Pollution Crimes: A Comparative Study of Jordanian Legislation and International Agreements', (2024) 12 (4) *Journal of Law and Sustainable Development* e3565, <<https://doi.org/10.55908/sdgs.v12i4.3565>>.

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mention the study by Bint-E-Basar and Tasnim⁸⁷, which explores the concepts of environmental liability and environmental justice through the example of Bangladesh. The authors conclude that, given the numerous environmental issues, establishing an effective legal accountability mechanism is crucial for creating a healthy living environment and ensuring societal well-being. Therewith, the findings indicate that legal accountability is only one tool in ensuring a safe environment; this mechanism should be used in conjunction with other legal constructs such as licensing, state registration, and more.

An important aspect of natural resource management is the interaction between various governmental structures and their communication with the public. In this regard, the study by Oh⁸⁸ analysed the existing legal powers and financial structure related to natural resource management between the central government and public organisations in South Korea, and identified several institutional issues. The analysis of these results reveals that, in Kyrgyzstan, there is a low level of involvement by non-governmental organisations, as evidenced by the extremely limited number of public assessments compared to state assessments. Such data indicate the ineffectiveness of educational initiatives and a lack of public interest. This thesis is supported by Oh⁸⁹, in which the author concludes that active public participation impacts the effectiveness of legal mechanisms aimed at improving the environmental situation.

Control over the exploitation of natural resources ensures the proper preservation of environmental potential and safety⁹⁰, and thus constitutes an integral part of state policy in natural resource management. In this context, the study by Badran and others⁹¹ was examined, which analysed the legal mechanisms related to environmental protection and accountability in Saudi Arabia, considering the regulatory framework and practical challenges. Comparing the findings of Badran and others⁹² with the present study, it can be argued that a common distinguishing feature in the legal approaches of both countries is the significance of mandatory environmental impact assessments. At the same time, legal regulation of state instruments such as limiting and levying charges for natural resource use remains largely inadequate in Saudi Arabia.

⁸⁷ Bint-E-Basar, K.T. & Tasnim, K.S., 'Environmental Management and Justice System in Bangladesh: Issues and Legal Framework', (2024) 10 (1) Journal of Asian and African Social Science and Humanities 46-57, <<https://doi.org/10.55327/jaash.v10i1.322>>.

⁸⁸ Oh, K., 'Understanding the Legal and Financial Structure of Environmental Policy and the Role of Local Governments', (2024) 3 (1) Journal of Public Choice 49-72, <<https://doi.org/10.55795/jpc.2024.3.1.049>>.

⁸⁹ Ibid

⁹⁰ Buzhyn, O., 'Environmental safety management – Classification method of solid combustible fossils', (2023) 14 (1) Ecological Safety and Balanced Use of Resources 33-42, <[https://doi.org/10.31471/2415-3184-2023-1\(27\)-33-42](https://doi.org/10.31471/2415-3184-2023-1(27)-33-42)>.

⁹¹ Badran, D.M.I., Alammari, K.S. & Abdelhady, M.A., 'The Legal Challenges in Environmental Protection and Accountability: A Study in Saudi Law', (2024) 18 (9) Revista de Gestão Social e Ambiental e6536, <<https://doi.org/10.24857/rgsa.v18n9-060>>.

⁹² Ibid

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Legislation in the field of natural resource management, as in any other domain, is based on specific principles that guide state policy and the further development of the legal approach.⁹³ In this context, the role of principles was evaluated in the study by Nugraha⁹⁴, which clarified that legislative improvement should consider the use of natural resources and its impact on the environment, preventing harm and reducing ecological risks. The author emphasised the need to focus on the conservation and prudent use of resources in development, ensuring fair management supported by an environmental legal system. While it is difficult to disagree with these conclusions, it should be added that the specifics of natural resource management also necessitate the consideration of principles such as ensuring environmental safety and targeted land use, as well as openness and rationality, which should be ensured by the state.

Thus, it can be stated that natural resource management is a crucial part of state policy, which requires a complex and comprehensive approach to legal regulation. An analysis of the practices in Kyrgyzstan and other countries indicates that legislative practices emphasise a sustainable development approach, which considers a compromise between human interests and measures to ensure a safe environment. Moreover, the increasing trend in environmental problems caused by human activity creates the need to find and establish more effective mechanisms for addressing these issues, which should be implemented at the legislative level.

5. CONCLUSIONS

The deterioration of the planet's ecological condition is an urgent issue, particularly influenced by anthropogenic factors, which underscores the importance of establishing a legal framework for the exploitation of natural resources. The analysis of this subject revealed a lack of a systematised theoretical approach to the core terminology associated with natural resource management. A more detailed examination of the field led to two conclusions: first, that natural resource management should be viewed from the perspective of classification, dividing it into rational and irrational usage; and second, that there are three primary legal approaches to regulating this institution: anthropocentric, ecocentric, and sustainable development.

Further analysis of the legal regulation of public relations in the area of natural resource management in the Kyrgyz Republic demonstrated that national legislation prioritises a sustainable development approach. This should be understood as the implementation of state policy in this area based

⁹³ Malchyk, O., 'The modern state of regulatory and legal support for plant protection and its improvement in the context of legislative activity', (2024) 15 (1) *Law. Human. Environment* 53-69. <<https://doi.org/10.31548/law/1.2024.53>>.

⁹⁴ Nugraha, S., 'Natural Resource Management Principles and the Role of Law in Realizing Good Development Governance', (2023) 2 (1) *Journal of Progressive Law and Legal Studies* 49-58, <<https://doi.org/10.59653/jplls.v2i01.575>>.

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on effective mechanisms and procedures that ensure the highest possible level of environmental safety, while minimally restricting human needs. Among other things, Kyrgyz legislation employs legal instruments such as limitation, natural resource use fees, state accounting, environmental impact assessment, and legal accountability. It was also noted that public environmental expertise is underutilised, indicating a lack of interest among the general population in addressing environmental issues.

A subsequent comparative analysis of various legal practices in natural resource management revealed a global trend towards worsening environmental conditions, as evidenced by the studied environmental performance index indicators. Comparing Kyrgyz practice with the legal approaches of Denmark and the USA showed that there are notable differences in environmental policies between these countries. Denmark is characterised by the use of highly specific legislative mechanisms, while the USA exhibits a notably high level of communication between government authorities and the public. In comparison with Kazakhstan, differences were observed in the approaches concerning financial instruments and monitoring systems. Meanwhile, the example of India highlighted that cultural and geographical diversity significantly complicates the establishment of a singularly effective legal policy in the field of natural resource management.

Future research could focus on the impact of climate change and technological innovations on the legal regulation of environmental legislation.

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AUTHORS' DECLARATION AND ESSENTIAL ETHICAL COMPLIANCES

Authors' Contributions (in accordance with ICMJE criteria for authorship)

<i>Contribution</i>	<i>Author 1</i>	<i>Author 2</i>	<i>Author 3</i>	<i>Author 4</i>	<i>Author 5</i>
Conceived and designed the research or analysis	Yes	No	Yes	No	No
Collected the data	Yes	Yes	No	No	No
Contributed to data analysis and interpretation	No	No	No	No	Yes
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Research involving human bodies or organs or tissues (Helsinki Declaration)

The author(s) solemnly declare(s) that this research has not involved any human subject (body or organs) for experimentation. It was not a clinical research. The contexts of human population/participation were only indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) or ethical obligation of Helsinki Declaration does not apply in cases of this study or written work.

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