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RAW MATERIALS POLICY – LEGAL AND EDUCATIONAL ASPECTS

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Abstract. The article is devoted to the legal aspects of creating a raw materials policy in Poland, based on European Union solutions and pedagogical aspects related to the process of raw materials education. The authors attempt to analyze new legal solutions being prepared in the legislative process and point to the need for action in the field of education and training in the area under analysis. The authors conclude that without a solid educational foundation, society will not have reliable knowledge about the need to develop and implement raw materials policy.

Keywords: raw materials policy; raw materials education; education for sustainable development.

INTRODUCTION

The creation of raw materials policy, both in the European Union and at the national administration level, is primarily linked to current international politics. The war in Ukraine, instability in the Middle East, and tensions between China and the United States pose a threat to the supply of critical raw materials necessary for economic development. Perhaps paradoxically, thanks to this situation, the European Union has "matured" to the point of creating a legal framework for raw materials policy.

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Raw materials policy is inextricably linked to a wide range of sustainable development issues, yet it is a topic that is virtually unknown among the general public. It is difficult to find any activities related to promoting these issues among the public. It seems that the issue of education and upbringing in this regard will play a key role in the possible success of raising public awareness and deepening reflection on the dependence on raw materials in the sustainable development of the country, Europe, and the world. Regardless of what we call it – raw materials education, geological education – it is essential. On the other hand, the upbringing dimension is also important, because future generations must receive an education from us on which they will base their lives and actions, including in the direction of caring for critical national raw materials.

The issue of aspects related to the implementation of Poland's raw materials policy has not yet been the subject of in-depth research in either the legal or pedagogical fields. The literature on the subject includes publications that address this issue, but from an economic and political science perspective [Baldasarre and Carrara 2025; Haneklaus 2025; Tröster, Papatheophilou, and Küblböck 2024]. Aspects linking the issue of raw materials policy with sustainable development appeared in doctrine [Szewczak 2022], although it was only in the following years, when the legislative process moved in this direction, that the scientific community became interested in this issue. It is worth noting the outline of the issue of raw materials education [Galos 2025; Kot-Niewiadomska and Ruszkowski 2025], which is undoubtedly a key element of the analyzed process.

The research conducted in this article includes, in its theoretical part, an analysis of issues relevant to educational and upbringing tasks in the area of state raw materials policy. The analytical part of the legal analysis will identify legal provisions related to the implementation of state raw materials policy by public entities, in particular those concerning educational issues.

The aim of this article is to conduct a theoretical and legal analysis of issues related to raw materials education in relation to its functioning in the system of sustainable regional development. The research hypothesis is that the failure to introduce raw materials education processes and to include raw materials issues in the human education process will not result in the successful creation, development, and implementation of raw materials policy, especially in Poland. This may result in difficulties in the functioning of the state at the national and international level, and the legislative process may remain slowed down for a long period of time. The analysis of the proposed research platform was carried out using the dogmatic-legal method, the monographic method, and, to a lesser extent, the historical method.

1. RAW MATERIALS POLICY

The European Union has stepped up its efforts to ensure security of raw materials in view of the difficult geopolitical situation in Europe and worldwide. The European Parliament and the Council of the European Union emphatically state that: "Current knowledge of raw material deposits and mapping of their distribution in the Union dates from a time when securing supplies of critical raw materials for the development of strategic technologies was not considered a priority. The lack of up-to-date geological information on critical raw materials in the Union could hamper the development of extraction projects, thereby undermining efforts to reduce supply risks and ensure the functioning of the internal market. In order to collect and update information on areas of accumulation of critical raw materials, Member States should, where appropriate, taking into account geological conditions, develop national programs for mapping areas for the general exploration of critical raw materials and major minerals that are extracted together."[1]

That is why the European Union has decided to issue a legal act regulating raw materials policy. The aim of the regulation is to improve the functioning of the internal market by establishing a framework to ensure that the Union has access to secure, resilient, and sustainable supplies of critical raw materials, including by promoting sustainability, efficiency, and circularity throughout the value chain (Recital 42, Article 1(1)). Certainly, the above-mentioned actions of the European Union should be considered highly desirable in the current geopolitical situation. From a legal point of view, it is also important that these actions will be integrated at the EU level, which will result in greater efficiency of their scope.

The regulation provides an exhaustive list of strategic and critical raw materials. Strategic raw materials are defined as raw materials, including those in unprocessed form, obtained at any stage of processing and being a by-product of other extraction, processing, or recycling processes: bauxite/aluminum oxide/aluminum, bismuth, boron – metallurgical grade, cobalt, copper, gallium, germanium, lithium – in the standard required for batteries, metallic magnesium, manganese – in the standard required for batteries, graphite – in the standard required for batteries, nickel – in the standard required for batteries, platinum group metals, rare earth metals for the production of permanent magnets (Nd, Pr, Tb, Dy, Gd, Sm, and Ce), metallic silicon, metallic titanium, tungsten (Recital 42, Article 3(1)). Critical

[1] Recital 42 of the Regulation of the European Parliament and of the Council on establishing a framework to ensure a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020 [hereinafter: Recital 42], https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CONSIL:PE_78_2023_REV_1 [accessed: 23.11.2025].

raw materials are defined as raw materials, including those in unprocessed form, obtained at any stage of processing and as by-products of other extraction, processing, or recycling processes: antimony, arsenic, bauxite/aluminum oxide/aluminum, barite, beryllium, bismuth, boron, cobalt, coking coal, copper, feldspar, fluorite, gallium, germanium, hafnium, helium, heavy rare earth metals, light rare earth metals, lithium, magnesium, manganese, graphite, nickel – in the standard required for batteries, niobium, phosphate rock, phosphorus, platinum group metals, scandium, metallic silicon, strontium, tantalum, metallic titanium, tungsten, vanadium (Recital 42, Article 4(1)). The above presentation is not included in this article for the purpose of polemics, but only for informational and educational purposes, so that the reader has complete clarity regarding the subject matter of the analyzed area. From Poland's point of view, two raw materials seem to be the most important at present: copper (as we are the world's leading producer) and coking coal (which may prove to be a "salvation" for our difficult situation in the hard coal mining sector).

When talking about Poland's raw materials policy, we are undoubtedly referring to the strategic document that was adopted by the Council of Ministers in 2022.[2] At that time, the adoption of the above document was considered important because "the deadline for adopting the state's raw materials policy was the last one that allowed for the rapid adaptation of regulations to the concept of the state's raw materials security. On the other hand, the war in Ukraine caused a partial interruption of activities developing the raw material security system in the regions. It should be noted that this objective relates to two important issues, namely the time frame – 2050 – and access to both domestic and imported raw materials" [Dziadzio 2022, 563-65]. The time frame of 2050 seems relatively distant from a legislative point of view. However, a distant deadline carries the risk of postponing certain necessary changes to a later date, which may not bring the expected results. The scope of the subject matter, indicating the direction of raw material procurement, points, on the one hand, to the urgent need to verify national resources and the responsibility of public administration in this area, and, on the other hand, the need to import, and thus to establish directions for strategic cooperation in Europe and worldwide [Szewczak 2022, 231]. At the same time, when conducting an extended analysis of the problem, it should be pointed out that there are certain deficits in the area of shaping the state's raw materials policy. For example, in the aspect raised, one can point to the lack of institutional mechanisms ensuring the participation of the healthcare sector, which is important for society, in consultations on raw materials security. While detailed methodologies for risk assessment and strategic

[2] Resolution No. 39 of the Council of Ministers of 1 March 2022 on the adoption of the 'State Raw Materials Policy', M.P. item 371.

reserves have been developed for industry and energy, no such instruments exist for healthcare. In this area, interdisciplinary research teams combining expertise in geology, engineering, medicine, and public health should be established to provide the knowledge necessary for the development of an integrated raw materials policy and sustainable development of the state. This process should be supervised by the relevant public administration authorities. Until now, Poland has reacted to supply crises rather than anticipating them and building resilience mechanisms. An example of this is the lack of national strategic reserves of raw materials critical to the medical sector, whereas such reserves exist for oil and gas. There are also no procedures in place for long-term disruptions in the supply of materials essential to the functioning of key medical infrastructure. This state of affairs was reflected in the COVID-19 pandemic, which showed how quickly and unexpectedly threats can arise in global supply chains, leading to shortages in areas such as healthcare (access to ventilators, which are manufactured using rare earth metals, among other materials) [Kamprowski 2021, 214-32]. Therefore, the relationship between raw materials policy and health protection is an area of growing strategic importance, which has so far remained outside the mainstream of both raw materials planning and health policy in Poland. It is worth emphasizing that health protection falls within the broad concept of strategic and critical raw materials [Radwanek-Bąk 2016, 252]. This is particularly important in the context of deepening geopolitical instability, the concentration of critical raw material supply chains, and the accelerated digital and technological transformation of medicine. Integrating these two policy areas requires both institutional and instrumental changes, as well as a fundamental transformation of health and raw materials education.

Without going beyond the scope of this paper, let us try to take a synthetic look at the geopolitical conditions that have changed over the last three years. First, Poland is a frontline country in the ongoing war in Ukraine. Secondly, Poland is preparing for the difficult process of transforming its coal mining sector. Thirdly, Poland is seeking support from the European Union for its energy transition, for which the issue of critical raw materials is extremely important.

Following legal action by the European Union, legislative measures were introduced in individual member states, including Poland – Draft Act of August 29, 2025 on ensuring access to raw materials for the domestic economy, including critical raw materials.[3] According to the draft law, "the Council of Ministers shall adopt, by way of a resolution, and update at least once every five years, the State Raw Materials Policy" (Article 4(1)).

[3] See https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Flegislacja.rcl.gov.pl%2Fdocs%2F%2F2%2F12401805%2F13154229%2F13154230%2Fdokument735681.docx&wdOrigin=BROWSELINK [accessed: 23.11.2025].

The objective of the State Raw Materials Policy is to ensure the country's raw materials security by securing adequate access to raw materials, both domestic and foreign, in a manner that promotes environmental protection and the country's energy security, as well as the implementation of the principle of sustainable development. The State Raw Materials Policy includes, in particular: a) an assessment of the situation regarding the management of mineral deposits and raw materials, b) priority areas for state action in the field of geology and mineral resources, c) a forecast for individual raw materials, covering a period of not less than 10 years, d) a list of raw materials that are key to the national economy (Article 4 of the draft law). If this bill is passed, we will see the beginning of a process that will prepare our country for future economic challenges (it is already difficult to imagine further economic development without critical raw materials).

The above draft law specifies the tasks of the minister responsible for the environment, acting with the assistance of the Chief Geologist of the Country, which include in particular: 1) preparing a draft State Raw Materials Policy and updating it, in consultation with the minister responsible for energy resources management; 2) initiating and coordinating activities related to the implementation of the State Raw Materials Policy; 3) preparing proposals for new legal and economic solutions in the field of the State Raw Materials Policy; 4) initiating information and education activities in the field of the State Raw Materials Policy; 5) monitoring the implementation and functioning of solutions developed in the State Raw Materials Policy (Article 5 of the draft law).

Of the tasks listed above, the most important for the purposes of this analysis is the initiation of educational activities in the field of raw materials policy. It is worth noting here that the Earth Resources Management Council has been operating for over a year, and its tasks include supporting geological and raw materials education.

2. RAW MATERIALS EDUCATION

The topic of raw materials education has really developed over the past year, due to legal acts that have come into force or are being drafted in the area of raw materials security, as well as due to the dynamic geopolitical situation. However, it should also be remembered that raw materials education is part of broadly understood environmental education, or more specifically, education for sustainable development.

Let us take a moment to look at the activities of the new Council for Earth Resource Management, which has prepared two important working documents concerning: proposals to modify the core curriculum for primary schools in the subject of geography (natural sciences) and an initiative

to create a priority program called Geological Education, which would be established within the National Fund for Environmental Protection and Water Management. Among the main proposals in the document was the need to emphasize the importance of mineral resources for the country's economic development (including in terms of energy transition), sustainable production of these raw materials from domestic primary (mineral deposits) and secondary sources, as well as adequate information about Poland's geological potential in terms of such production [Galos 2025]. The above proposals were also prepared on the basis of a survey conducted by the aforementioned Council among students of universities offering geological studies. The answers indicated in the survey show the reasons for this situation, including: the core curriculum for geography in secondary schools, gaps or outdated knowledge presented in textbooks, media trends presenting an incorrect or distorted image of geologists, and, what is often overlooked in the media and in discussions on the subject, the issue of finding employment after graduation [Kot-Niewiadomska and Ruszkowski 2025]. The above studies were conducted in academic circles, which are certainly interested in creating and developing new fields of study in line with labor market demand, and issues related to raw material security are undoubtedly interesting. However, apart from the creation of new fields of study and focusing on teaching standards in higher education in individual scientific disciplines, even in the context of the deficits in raw materials policy in healthcare described in this study, it should be emphasized that students of medicine and public health do not receive knowledge about the substances used in medical technologies, their raw material dependencies, or the geopolitical conditions of access to key materials.[4] Therefore, at the higher education level, it is necessary to introduce interdisciplinary educational modules combining the perspectives of medical, geological, engineering, and management sciences. However, it is worth paying attention to the educational process as a whole in this procedure.

Therefore, when discussing educational issues, we cannot overlook the aspect of upbringing. This is, of course, a long-term process, as it requires multi-generational organic work to create a special "civic code," one element of which should be caring for our own raw material resources, which guarantee the country's economic development.

Starting from the beginning, the family plays an important role in the process of upbringing, especially integral upbringing. Saint John Paul II defined upbringing as "above all, the gift of humanity – a two-way gift. Parents

[4] Regulation of the Minister of Science of 10 October 2024 amending the regulation on the standards of education preparing for the profession of a physician, dentist, pharmacist, nurse, midwife, laboratory diagnostician, physiotherapist and paramedic, Journal of Laws item 1514.

bestow their mature humanity on the newborn, who in turn bestows on them all the newness and freshness of humanity that he brings into the world." John Paul II's references to man and his functioning in the world are references to integral education [Rynio 2010; Idem 2013]. Integral education should include education for sustainable development, including issues related to the Earth's raw materials. These issues are part of the overall concept of personalistic pedagogy.

When attempting to identify the most important characteristics of personalistic pedagogy, the following should be noted: a) "education is understood as an important factor in efforts to promote the 'personal universe,' b) the highest goal of education is to enable the subject (the student) to take control of their own development process, c) understanding education as 'maieutics of the person' (awakening the person in the pupil), the pupil is not considered an object or thing to be filled with anything, nor is he a being to be trained, but a person who needs to be 'awakened', d) the pupil is the first and fundamental factor in education, the educator is merely a cooperator, a collaborator in this work; this is a position that clearly emphasizes the realistic nature of the educational relationship, clearly opposing its idealistic interpretation, e) in essence, it supports the aspirations manifested in the movement of so-called New Schools movement, which also recognizes errors in the form of naturalistic reductionism, f) as a person, the pupil is not the property of either the family or the state, and no one is granted hegemony in this regard on the basis of any aspect, g) the importance and role of school is affirmed, highlighting its tasks alongside other educational institutions; the connection between teaching and upbringing is emphasized here; the concept of a 'neutral school' is criticized and rejected, h) the content of school education should be integral humanism, i.e. not only literary or artistic, but also scientific and technical, i) the educational function of the family is confirmed and defended, without concealing the manifestations of the crisis affecting the family, and the dangers associated with authoritarianism that may occur in family upbringing are recognized, j) respect for the 'mystery of the child' is emphasized, as the child becomes a person under the influence of multiple stimuli from various educational institutions in this process" [Nowak 2003]. One of the key dimensions of personalistic pedagogy is caring for the student, which seems to be fundamental in the process of creating education for sustainable development based on resource education.

It should be noted that an integrated approach must take into account several specific requirements: a) "firstly, consideration of the complexity and multifaceted nature of education. Education is a fact inherent in human life, in the complexity and diversity of human existence, both physical and spiritual, rooted in the past, occurring in the present, and projecting

into the future; b) secondly, the anthropological nature of education. We understand the reality of education as one of the many forms of human expression. At the level of becoming, education cannot be approached in absolute terms as a transition from one act to another, but as a process of moving from positive desires to their realization, c) thirdly, openness to the religious and spiritual dimension. Religious education opens people up to reality far more and reaches deeper into the inner layers of their personality than other areas of education, such as civic, political, or moral education, are able to do. It prepares individuals not only to engage with these areas, but also to acquire a general vision of the world and to shape their worldview" [Rynio, Braun, Jeziorański, and Szewczak 2015].

In summary, it must be said that the educational process is of key importance in the perspective of several decades, which may determine the economic future of our country. Integral education must include environmental issues, in particular those related to sustainable development and, consequently, raw materials. Failure to apply these elements will mean that no legislative or political processes will raise public awareness.

CONCLUSION

The issue presented, combining the legal aspects of raw materials policy with the pedagogical dimension of raw materials education, is a pioneering one, aimed at making political decision-makers and citizens aware of the need for joint action. At present, we do not know what the near geopolitical future will bring, when and how the war in Ukraine will end, in what direction China's economic expansion will go, how the United States will behave, and finally, whether the European Union, shaken by crises – migration, financial, demographic, and political – will survive. All these factors mean that every country should take action as soon as possible to secure its own future. Raw materials policy is one such key area.

From a legal perspective, it is necessary to introduce legal solutions that will allow for the development of raw materials education, both in schools and universities. While the higher education sector seems to be responding to market needs, education policy does not cover this area. It seems that raw materials education should become a key element of the educational process.

From an educational point of view, it seems necessary to continue and promote personalistic pedagogy and integral education in terms of raw material education, which is key to the development of this policy.

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