

## SUPER-COMPACT STRUCTURES OF QUALITY STANDARDS FOR HEALTH AND SECURITY IN THE SUSTAINABLE DEVELOPMENT OF A MINING BASIN IN ROMANIA

Ramona Roşcanu Beloiu<sup>1</sup>, Ioan I. Gâf-Deac<sup>2</sup>, Mvongo Mvodo Charles Rostand<sup>3</sup>, Jamal Khamis<sup>4</sup>, Al. A. Burian<sup>5</sup> & Ioan P. Scutelnicu<sup>6</sup>

<sup>1</sup>Research Scholar, Romgermed, Bucharest, Romania

<sup>2</sup>Research Scholar, INCE Costin Kiritescu, Romanian Academy, USH, Bucharest, Romania

<sup>3</sup>Research Scholar, ÉNS Polytechnique de Yaoundé, République du Cameroun, Cameroun

<sup>4</sup>Research Scholar, Ministry of Health, Damascus, Syria

<sup>5</sup>Research Scholar, University of Petrosani, Romania

<sup>6</sup>Research Scholar, Romanian Geological Institute, Bucharest, Romania

Received: 12 Feb 2020

Accepted: 14 Feb 2020

Published: 29 Feb 2020

### ABSTRACT

*The article presents a synthesis of resources in different internationally areas (Europe, Africa, Middle East, Romania), physical map and positioning of the Carboniferous Basin Jiu Valley in Romania, and it is noted that the general economic development, with the declared objective for sustainability, is difficult, following some anthropic mining situations that affect the environment. The authors talk about the need for quality change, its reconceptualization in mining areas. They believe that it is time to identify forms of quality conversion, and not so much a conventional description, only of finding, or statistics, about its content and levels, especially in the mining / post-exploitation areas. The quality conversion in the Carboniferous Basin of the Jiu Valley can be highlighted, in context, by reporting the matrices of the stated parameters to field standards, in the eco-system for the studied mining area. "The new economy for the Jiu Valley Carboniferous Basin," according to the authors, must be "the post-mining economy reborn." The competitiveness given by the conversion of quality and the conversion to a new quality is important, but under the conditions of digitalization. The typing of the tangible, intangible and operational sub-structures is applied in the mining constructions in the area and in the organization of the different mining production lines, based on 3 main functions: the engineering - intra / economic function, the engineering - Trans / intra / social function, and the engineering - intra / communicative function.*

**KEYWORDS:** Coal Resources, Environment, Efficiency, Quality Conversion, New Post-Exploitation Economy

### INTRODUCTION

The information and the data of discovery of the mineral and energetic raw materials in the geosphere, are useful to a certain stage of development of the human society. With their help, is elaborated the inventory of interest expressions for the exploitation and capitalization of natural resources.

Essential natural resources (water, air) maintain life, and basic ones (mineral, energy resources) are commonly used / utilized in communities for production and consumption.

## Synthesis of Resources in Different Internationally Areas

### Natural Resources in Europe

The mineral and energy accumulation structures are the geological ones.

In Northern Europe, the most significant deposits of solid mineral substances are hercinic in the Platform / Area of Russia - (Precambrian), in plains and plateaus with Fe deposits (Krivoirog, Kursk, - Ukraine); [5], coal (Donetsk Basin - Ukraine, Pechora - in the Russian Federation); crude oil, bauxite and manganese ores.

The Scandinavian Peninsula is a mountain unit with a Precambrian and Caledonian plateau with Fe mines (Kiruna - Sweden), Cu, Ni, Zn mines.

The hercinic geological unit also includes the Ural Mountains with platinum deposits, Au, Fe, brown coal, bauxite, diamond, crude oil, NaCl, etc.

In addition to the listed substances, the Alpine-Carpathian orogeny has granite, marble, sulfur, mineral waters, etc. (Scutelnicu, I.P., 2017), [12]

The North Sea and the Black Sea (Burian, A.A., 2010) [2] have hydrocarbons (oil, natural gas, hydrates).

### Natural Resources in the Middle East

The Middle East is one of the richest regions in the world. More than two thirds of the world's oil reserves are concentrated in Middle Eastern fields (61 %). [9] The richest oil countries are Iran, Iraq, Kuwait and Saudi Arabia. The current reserves of natural gas are found, in proportion of 40 %, in the Middle East.

### Natural Resources in Africa

Africa is one of the total world resources, in Africa there are: 97 % copper; 60 % diamond; 57 % gold; 50 % cobalt; 49 % platinum; 41 % vanadium; 32 % manganese; 23 % uranium and phosphate; 14 % oil. [11]

The main exporters of resources from Africa are: Oil: Nigeria, Angola, Gabon, Congo (Brazzaville), Ghana, Equatorial Guinea, Chad, Cameroon, Ivory Coast, Libya, Senegal, Sudan; Gases: Algeria, Mozambique, Angola, Equatorial Guinea, Libya, Nigeria; Precious metals (gold, silver, platinum): South Africa, Tanzania, Ghana, Guinea Conakry, Mali; Coal: Mozambique, South Africa; Precious stones (diamonds): Angola, Zimbabwe, Botswana, R.D. Congo, Namibia, South Africa, Sierra Leone; Metals (copper, iron, bauxite, zinc): R.D. Congo, Guinea Conakry, Namibia, South Africa, Zambia; Uranium: Namibia, Niger.

### Natural Resources in Romania

Romania has an area of 238,397 km<sup>2</sup> (is the twelfth-largest country in Europe) and, as a whole, it has mineral and energy resources (coal) throughout the national territory, but unevenly spread. [1]. (Figure 1)

Figure 1 shows the most significant areas of oil extraction are in the Romanian Plain (Braila, Ploiesti, Targoviste, Pitesti, Gavanu-Burdea), Sub Carpathians (in Curburii Sub Carpathians, Moldova Sub Carpathians, Getici Sub Carpathians), Getic Plateau (Dâmbovită - Olt Region), the Arad-Timișoara, North of Oradea areas.

Natural gas is divided into: 1) methane gas / CH<sub>4</sub> (on the territory of Transylvania, in the Transylvanian Plain, the Plateau of Tarnavelor, and Sub Carpathians of Tarnavelor) and 2) associated gases (from wells - oil deposits).

There is also methane gas from coal deposits, geothermal energy and so on. [11]

Nuclear fuels (uranium) are exploited in Romania in the Eastern Carpathians, Apuseni Mountains, Anina Mountains.

Hard coal in the Carboniferous Basin of Jiu Valley, in the open mining perimeters, has determined the formation of socio-economic communities in the area. (Figure 2)

Figure 2 shows (1 = Lonea, 2 = Lonea Pilier, 3 = Petrila Sud, 4= Petrila, 5 = Livezeni, 6 = Sălătruc, 7 = Dâlja, 8 = Iscroni, 9 = Aninoasa, 10 = Vulcan, 11 = Paroșeni, 12 = Lupeni, 13 = Lupeni Sud, 14 = Bărbăteni, 15 = Uricani, 16 = Valea de Brazi, 17= Câmpu lui Neag)

Hydro-energy refers to water energy. The installed power of the hydroelectric plants in Romania is 5,700 MW, at a hydropower potential of 8,000 MW (5,900 MW are from the inland rivers, 80% in the mountain areas).

The coal is classified according to the calorific power in: 1) superiors (anthracite and hard coal - the case of exploitation of the hard coal resources in the Carboniferous Jiu Valley Basin) and 2) lower ones (brown coal, lignite, peat).

According to Trans-Electrica Romania ([www. Transelectrica.ro/](http://www.Transelectrica.ro/) web / tel / system-energetic-national) [22] (2018), the participation of coal in the production of electricity in Romania is, on average, 25–30 %.

For example, from the actual statistical data, taking the values of one day, in the National Energy System the structure of electricity production is: 28.53 % coal (2,191 MW), 25.57 % hydrocarbons (1,964 MW), 23.96 % hydro (1,840 MW), 17.37 % nuclear (1,334 MW), 2.08 % wind (160 MW), 1.76 % photovoltaic (135 MW), 0.73 % biomass (56 MW), with a total of 7,651 MW.

The consumption, on the statistically mentioned day, was 8,988 MW, with an exchange balance of 1,337 MW.

Petrosani urban / mining micro-region (Jiu Valley) is the place for obtaining metallurgical coke and coal for power plants; because of the inefficiency some mines are currently closed, others, with perspective, are relatively modernized.

Other energy sources in Romania are: 1) geothermal in the Western Plain; 2) solar energy in the Romanian Plain and the Black Sea coastal area; 3) wind energy in the Dobrogea area, the Romanian Plain and the mountain area.

It is observed that Romania has favorable conditions regarding its energy security, by having energy resources for different cycles, integrated in its own industrial sectors.

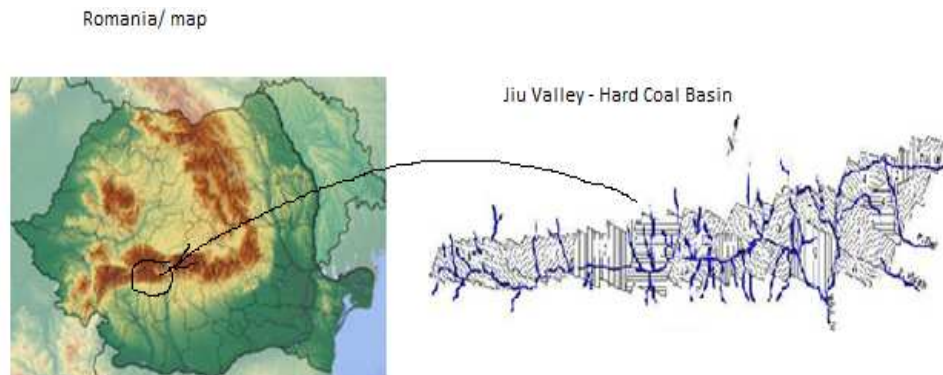
The general economic development, with the declared objective for sustainability, is difficult, following some anthropic mining situations that affect the environment.

In this framework, the most powerful environmental pollutants come from the energy and mining industries.

The ecological impact has effects on the overall quality in the community through negative changes or transformations, on a smaller or larger scale, with an effect on the health of the inhabitants, disturbing the flora, fauna, soil, air, water, climate and local landscape. [15]

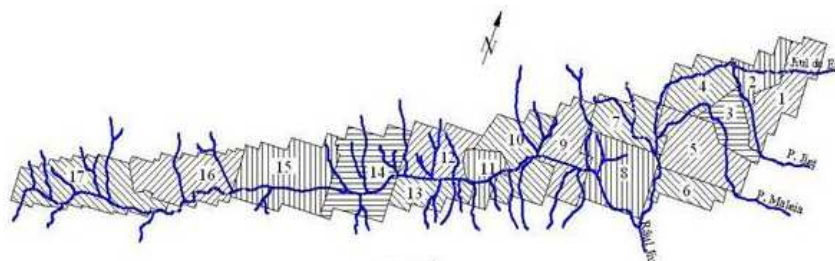
The research of quality for health and safety in the sustainable development of a mining basin in Romania is an example of a new approach, based on the identification of "quality conversion", not necessarily only through the traditional pursuit of reaching a level of regional quality.

In fact, these are aggregate actions to reach a "new quality".



**Figure 1: Romania - Physical Map and Positioning of the Carboniferous Basin Jiu Valley.**

Source: org / wiki / Geography\_of\_Romania, processing R.R Beloiu, 2018 [1, 19]



**Figure 2: Romania-The Mining Perimeters For The Exploitation of the Hard Coal Fields / Carboniferous Basin Jiu Valley.**

Source: Processing Beloiu, R.R., University of Petroșani, 2018.

## METHODOLOGY

### The Need for Quality Change, It's Re Conceptualization in Mining Areas

Usually, in a mining basin there is a concern for quality assurance, in general, in a common, classic, traditional econometric and technological context.

However, we consider that it is time to identify forms of quality conversion, and not so much a conventional description, only of finding, or statistics, about its content and levels, especially in the mining / post-exploitation areas.

The proposed new approach refers to the need to change the quality, to re-conceptualize it, because based only on standards, programs, subjective, short-term, randomized decisions, etc., it is not possible to include sustainability as a whole.

Sustainability is a higher goal, above and beyond the goal of achieving a satisfied, recognized quality.

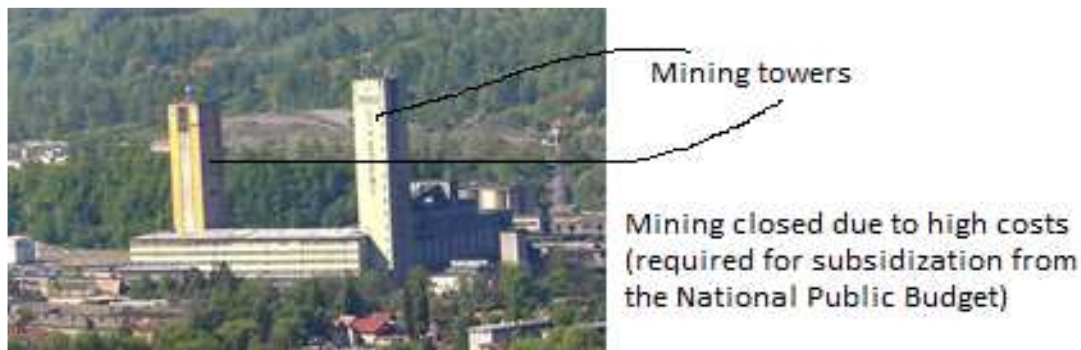
This approach is inter- and trans-disciplinary, and leads to the identification of some directions, recommendations and proposals for the re-conceptualization of quality in order to generate the sustainable development of the Jiu Valley, where the Carboniferous Hard Coal Extraction Basin is found, in Romania. [7]

For more than 30 years, the political, technical, economic, strategic and tactical decision-makers have failed to establish and put into practice a development model of the Jiu Valley mining area, in comparable terms to the

development already registered by Romania in its territory, as a whole, as a member country of the European Union. (Figure 3)

Figure 3 shows the conversion of quality, in this exemplary case, in the Carboniferous Jiu Valley Basin, can be highlighted by bringing together decision-making, technical, technological and managerial matrices in a balance model, with weights of the activities and results desired in a sustainable regime for the studied mining area.

Therefore, there is a need to develop super-compact structures of quality standards for health and safety in the sustainable development of this mining basin in Romania.



**Figure 3: The Surface Infrastructure Of The Livezeni Mining Company, Entered Into Restructuring / Closure (In The Jiu Valley Carboniferous Basin) Due To The Inefficiency Of Underground Coal Extraction.**

Source: Beloiu R.R., Processing, 2018

### **Interpretation of the Physical-Chemical Processes that Influence the Post-Exploitation, Distribution and Circulation of Polluting Compounds of Mining Origin**

In this context, it is necessary to define the directions for processing the quality conversion of the technical, technological (mining), productive and social-economic systems related to the researched area.

The interpretation of the physical-chemical processes that influence the post-exploitation, distribution and circulation of the chemical compounds of mining origin is influenced by the restructuring of the extractive mining sector, the demographic and professional decrease, the signals of local biophysical and biochemical damages, the deterioration of the sanitary and human health, etc. becoming the matrix parameters of anthropology / zonal quality.

The quality conversion in the Carboniferous Basin of the Jiu Valley can be highlighted, in context, by reporting the matrices of the parameters stated to standards in the field, in the eco-system for the studied mining area.

We recall that in 1947, a World / Global Federation was established in Switzerland with the name of the International Organization for Standardization (ISO). This entity was / is made up of national standardization bodies from 140 states. [17]

In fact, the mission of this organization is to define / ensure quality by developing standardization and regulated activities, agreed upon, agreed by ISO members.

The results of the activity of the *International Organization for Standardization* (ISO) refer to agreements, decisions, conventions, etc., which are published in International Standards.

We have found that, at present, in Romania in the mining field, general standards are not completely applicable, as all Romanian standards are quasi-optional (or "voluntary").

However, the observance of certain standards becomes compulsory through the decision of the national authorities or as an effect of the provisions in the (commercial) economic contracts.

As such, organizations, including the Hunedoara Energy Complex, which comprises the Jiu Valley Carboniferous Basin, adopt appropriate management systems for mining / post-exploitation, recognizing that the business environment is already characterized by more and more informed and motivated customers, which demand better and cheaper conventional mining products / products.

Business partners with mining products and services have increasingly demanding contractual requirements.

We also note that the quality management systems in Romania are applied based on the standard SR EN ISO 9001: 2001, which is the Romanian version of the English text of the European standard EN ISO 9001: 2000, which, in turn, has adopted, without modification, the international standard ISO 9001: 2000. [16]

We consider that for the Carboniferous Basin the Jiu valley, mainly, the aggregated elements for a complex system of conversion of the standardization of quality are components of the quality system in the field of health and security of the use of natural resources in conditions of sustainability.

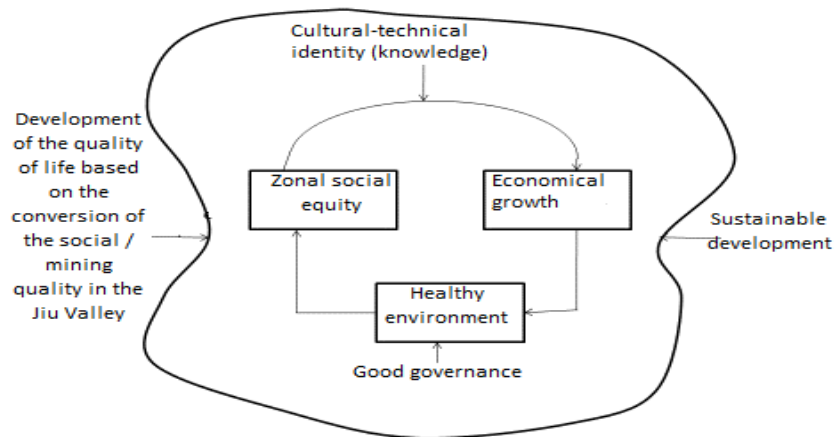
In fact, no official Quality / Quality Standard is contrary to the idea / concept of sustainability.

Some proposals for the management of the conversion of the environmental quality for the mining / post-exploitation situation in the Carboniferous Jiu Valley Basin refer to the harmonization of the links between: 1) cultural-technical identity (knowledge), 2) good governance, for the circuit a) zonal social equity, b) economic growth and c) healthy environment.

Basically, we come to a reality / conception that refer to: 1) a better development of the quality of life based on the conversion of the social / mining quality in the Jiu Valley and, as such, measures are being taken for 2) sustainable development. (Figure 4)

Figure 4 shows example, for post-exploitation mining lands (released by technical / technological mining tasks) the evolutions and trends in the management of the conversion of the quality of the environment, safety and health at work in the Jiu Valley area refer to:

- conservation, - increasing soil / soil fertility, soil protection, water against pollution from mining processes,
- the use of nutrients from the soil or from the dispersed mineral / organic fertilizers,
- soil fertility management on post-mining land,
- Reduction of the areas occupied by the tailings dumps in the researched territory, etc.



**Figure 4: The Concept of Sustainable Development in the Case of Exploitation and Exploitation of the Hard Coal-Type Resources in the Carboniferous Basin of Jiu Valley**  
Source: R.R. Beloiu, 2018

## RESULTS AND DISCUSSIONS

### The New Economy and the New Systemically Proposed Quality for the Jiu Valley Carboniferous Basin

"The new economy for the Jiu Valley Carboniferous Basin", in our opinion, must be "the post-mining economy reborn".

The post-exploitation mining, technical and business decision-makers (managers) need a macro-vision for the studied territory.

Our recommendation, in context, to formalize the New Zonal Economy and the New Quality, is based on the fact that the information technologies ensure the increased quality, productivity, which determines a new general quality for economic development (outputs), as it is strategically and tactically programmed. (Gâf-Deac, I.I., 2010) [8]

For the situation of the exploitation and capitalization of the hard coal resources in the Jiu Valley Carboniferous Basin, the communication and the information technologies must become, in conjunction, the main force, which will determine the meaning of the economic growth based on quality.

From the specialized literature, we note that *Weinstein, L.B.*, (1997) [13] made a list of the role / attributes of the New Economy, in general view, and these can be found applicable, by particularization, also in the Jiu Valley (as such, by generalization, and in any other mining basin under restructuring).

For the mining and post-exploitation industrial infrastructures can be found directions of action, conversion or restructuring, such as:

- the increases can be provided by the mining / post-mining units and the horizontal companies;
- the qualitative and dimensional growth of the local economy / post-exploitation without major damages due to financial deficits (sub-financing, inflation, etc.) must be foreseen;
- the continuous self-restructuring of the operating systems must take place in the active mining perimeters, in order to increase the efficiency and productivity;

- the exploitation / post-exploitation structures, respectively the local economy (from the Jiu Valley) are consolidated with the help of new quality, new technologies and investment capital of private and public origin, or through public-private partnerships;
- the functioning of the Jiu Valley economy, based on a new quality, should not register excessive public or private debts;
- In the mining and post-mining units and in the horizontal companies, the budget balance must be maintained.

Krugman, P., and Obstfeld, M., (1997) [10] point out that the New Economy is an "alternative answer" to the fundamental question of the XX / XXI century regarding the differences of perspective between the centralized (decentralized) and the decentralized economy..

Zandi, M., (1998) [14] shows in his research that "the new economy adjusts more quickly to exogenous shocks and does not cause situations that cause the recession of the external environment of companies".

Friedman, D., (1995) [4] states that in a New Economy project (such as the New Economy in the Jiu Valley), there are at least three "types of economies": 1) engineering / quality / innovative economy; 2) the bureaucratic economy / quality; 3) provincial economy / quality.

We consider that the major danger for the situation of the exploitation and exploitation of coal resources in the Jiu Valley Basin is the stay in the bureaucratic economy, or in the provincial economy, because the decision makers are still conservative, resistant to change, especially qualitative.

Therefore, the conversion of quality, respectively the conversion to a new quality, can put the coal industry, respectively the local / local economy, on the line of the innovative economy.

As such, it is important to take steps towards the new innovative mining economy.

On the other hand, it is necessary: 1) a new industrial diversity and 2) a new capacity of adaptation of all, by the conversion of quality, respectively by the conversion to a new quality, to generate endogenous, not only exogenous dependencies (dependence on others).

The new economic environment proposed by quality conversion favors the emergence of the "new company" (implicitly of the innovative mining company), in local coordinates.

If until now, the coal extraction sector in the Jiu Valley Coal Basin was considered to be the main one, it is recognized that its growth throughout the year has been dependent on the strategies or sub-strategies of the national system in the field.

Now, the competitiveness given by the conversion of quality and the conversion to a new quality is important, but under the conditions of digitalization.

Castells, M., (1996) [3] points out in his assertions that the "business networks" predominantly manifest in the New Economy.

We notice that in the mining / post-mining industry, the situation of "industry / dual economy" manifests itself, which shows the existence of many small and medium-sized companies that tend to become large, double or multiple specialized.



In close connection with the mining industrial field, relying on the conversion of quality, respectively on the conversion to a new quality, in the Jiu Valley Carboniferous Basin, there are highlighted transformation processes, such as:

- adaptation / re-adaptation of the area to the optimal model of development based on a new quality;
- quality conversions, respectively the conversion to a new quality, by re-allocating and re-distributing material resources and technical talent / human resources;
- increasing the number of small and medium-sized companies;
- the emergence of markets based on recycling and material recycling (mining industry and circular economy);
- formation and expansion of enterprise networks and increase of spaces for digitized mining and economic production flows;
- Re-engineering and re-configuring the material base of enterprises.

In the immediate context, we propose the emergence of a "new management", which will reduce the uncertainties and ensure the opening of a new type of communication between workers and managers, respectively between mining producers and customers. [6]

Now a "new flexibility" is needed, materialized by: 1) new relationships and relationships between small and medium-sized companies; 2) the formation by the companies of the strategic alliances.

Our opinion is that the hierarchical organization, currently practiced in the Jiu Valley mining companies, will lose ground in favor of horizontal organization, in the network.

All the above aspects / measures, in fact, are found in a super-compact structure of quality standards for Health and Safety, of sustainable development of the Jiu Valley Mining Basin - Romania.

### **Standardization, Activity in Direct Relation with Quality Assurance / Quality Conversion**

Standardization for the researched area is a regulation tool, offering recommendations for relationships between individuals, organizations and structures.

The typing of the tangible, intangible and operational sub-structures is applied in the mining constructions in the area and in the organization of the different mining production lines, based on 3 main functions:

- **The Engineering:** intra / economic function expressed by: launching the information about the mining products and their quality (coal-type energy coal); dissemination of information on techniques, technologies, raw materials and framework methods of mining; increasing the productivity of underground work and reducing the cost price; ensuring the prescribed level of quality of mining production.
- **The Engineering:** trans / intra / social function, which emphasizes the assurance / guarantee of the necessary ones for the employees by carrying out the Security policy of the life and health of the population, the care for the environment and the protection / safety of the work in the exploitation activities.

- **The Engineering:** intra / communicative function, resulting from the dynamics of the informational base referring to matrices of terminologies, classifiers, operating methods, conventional symbols, etc., ensuring the understanding and harmonization with the international / global mining practices.

From the systematization carried out by us (Beloiu, R.R., 2017) [1] it follows that in the Jiu Valley Carboniferous Basin meets the application of 98 standards (families ISO 9000 / ISO 9001, ISO 9002, ISO 9003, ISO 9004), [16] respectively ISO 8402- Vocabulary. [18]

By the principle of integration, they were adopted in Romania under the formulas: SR ISO 8402-1995, [20] SR ISO 9000-1995 et al. / SR = Romanian Standard). [21]

In an overview, the ISO 9000 standard clarifies the concepts regarding quality, the relationships between concepts and has recommendations for the selection and use / operation of ISO 9000 series standards, for their main purposes, namely: 1) external quality assurance (ISO 9001, ISO 9002, ISO 9003); 2) internal quality assurance (ISO 9004).

## CONCLUSIONS

The scientific and technical advance in the general productive-reproductive economic and local society system offers alternatives for the exploitation of the natural / energy resources existing in the Jiu valley Carboniferous Basin, in Romania and in Europe in ever-increasing rates and volumes. In this context, implicitly, the exploitation of natural / mineral resources, energy, causes negative imbalances on the life and the general social activity, essentially on the quality of life. Natural energy resources are "long-term material assets", they are means of existence. In fact, they are material / tangible or quasi-tangible elements, existing in the studied environment that can be used biologically, being nutritional, geochemical, energetic, and genetic.

As the development in the Jiu Valley Carboniferous Basin, we consider that it must be passed to a structured qualitative growth, in which the factors of economic efficiency have a central weight and contribute to achieving sustainable economic development in the scientifically investigated area.

The problem of natural / energy resources and their quality is global.

The case study from the Jiu Valley Carboniferous Basin confirms that between the geological and industrial / mining evaluation, there are manifestations / inter-conditioning, even quasi-conditioning regarding the procedural quality. As such, there are quality restrictions that do not allow an existing deposit potential to necessarily become an industrial geological, capitalization potential.

## REFERENCES

1. *Beloiu Ramona, - Mining Technologies, Related Communication, University of Petrosani, 2017*
2. *Burian, A.A., – The legal basis of modern management of natural resources, Scientific Communication, International Meeting SIMPRO 2010, University of Petrosani, October 2010*
3. *Castells, M., - The Rise of the Network Society, - Blackwell, Oxford, 1996*
4. *Friedman, D., - The Fate of a Nation, Los Angeles, August 20, 1995*

5. Gâf-Deac, I.I., - *National and regional strategies regarding the use of natural resources in Europe and Central Asia, Scientific Papers International Interdisciplinary Scientific Symposium SIMPRO UNIVERSITY 2005, Integration in the European area of research, Vol. Ecology and rehabilitation of the areas affected by the processing of resources and materials, Universitas Ed., 2005, pp. 69-75, (ISBN 973-8260-91-4)*
6. Gâf-Deac, I.I., - *National and regional strategies regarding the use of natural resources in Europe and Central Asia, Scientific Papers International Interdisciplinary Scientific Symposium University SIMPRO 2005, Integration in the European area of research, Vol. 2005*
7. Gâf-Deac, I.I., - *Research on the specific commitment of the Romanian economy in clusters based on natural resources, - Third Edition of International Conference «Economic Growth in Conditions of Internalization», Academy of Sciences of Moldova, Ministry of Economy and Commerce of the Republic of Moldova, Institute of Economy, Finance and Statistics, International Center for Economic Reforms Researches, Chisinau, September 4-5, 2008, Republic of Moldova*
8. Gâf-Deac, I.I., - *The new economy between knowledge and risk, Infomin Ed., Deva, 2010*
9. Khamis Jamal, - *Oil exploitation in Syria, Related Communication, University of Petrosani, 2017*
10. Krugman, P., Obstfeld, M., - *International Economics: Theory and Policy, - Addison Wesley, 1997*
11. Mvongo Mvodo Charles Rostand - *Renewable resources in Jiu Valley, Romania, - Related Communication, University of Petrosani, 2017*
12. Scutelnicu, I.P., - *The new economy - the economy of geology, University of Petrosani, 2017*
13. Weinstein, L.B., - *Welcome to the New Economy, - Perspectives, December, no.12 / 1997*
14. Zandi, M., - *Musing on the Now Economy Regional Financial Review, March, 1998*
15. \* \* \*; - *Directive no. 1407/2002 / EC regarding the subsidization of the activities of exploitation and exploitation of the energy oil.*
16. \* \* \*; - *families ISO 9000 / ISO 9001, ISO 9002, ISO 9003, ISO 9004*
17. \* \* \*; - *International Organization for Standardization (ISO)*
18. \* \* \*; - *ISO 8402-Vocabular*
19. \* \* \*; - *org/wiki/Geography\_of\_Romania, 2018*
20. \* \* \*; - *SR ISO 8402-1995*
21. \* \* \*; - *SR=Standard Român*
22. \* \* \*; - *www. transelectrica.ro/web/tel/ sistemul- energetic-national*

