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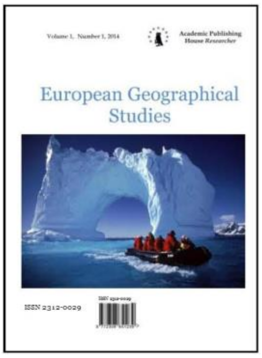

Articles and Statements

Some Aspects of Economic – Geographical View on the Sustainable Development of Mineral Resources

Jelisavka Bulatović [a, *], Goran Rajović [b]

[a] College of Textile Design, Technology and Management, Belgrade, Serbia
[b] International Network Center for Fundamental and Applied Research, Russian Federation

Abstract

Sustainable development involves meeting the needs of human societies while maintaining viable biological and physical Earth systems. To attract responsible exploration and mining, governments of mining nations will need to provide: regional – scale geo – scientific datasets as required to attract and guide future generations of exploration; resource access through multiple and sequential land use regimes, and frameworks for dealing with indigenous peoples' issues; and arrangements for consideration of mining proposals and regulation of mines that ensure responsible management of environmental and social issues. The minerals industry will need to continue to pursue advances in technologies for exploration, mining, processing, waste management and rehabilitation, and in public reporting of environmental and social performance (Lambert, 2001).

Keywords: Sustainable development, mineral resources, aspects.

1. Introduction

Modern urbanization, industrialization, transportation and communication systems are the achievements of worldwide sustainable mineral resource development and their proper utilization in various sectors. Sustainable mineral resources have played, and are still playing, a vital role in shaping the modern civilized industrial world. This means that the sustainable socio-economic infrastructure of any country is an indication of its richness in natural resources, its technological knowhow, its ability to explore and exploit mineral resources, and, finally, its wisdom in utilizing those resources properly in the development activities of the nation. In development activities, countries of the developing world are generally far behind compared with countries in the developed world. This is mainly due to a lack of adequate natural resources, properly educated human resources and good socio – economic conditions (Akhtar, 2005).

Wide – spread environmental contamination associated with historic mining in Europe has triggered social responses to improve related environmental legislation, the environmental assessment and management methods for the mining industry. Mining has some unique features such as natural background contamination associated with mineral deposits, industrial activities

* Corresponding author
E-mail addresses: jelisavka.bulatovic@gmail.com (J. Bulatović), dkgoran.rajovic@gmail.com (G. Rajović)

and contamination in the three – dimensional subsurface space, problem of long – term remediation after mine closure, problem of secondary contaminated areas around mine sites, land use conflicts and abandoned mines. These problems require special tools to address the complexity of the environmental problems of mining – related contamination. Geological knowledge on mineral resources exploration is essential and should be used for the environmental contamination assessment of mines. Also, sufficient methodological experience, knowledge and documented results are available, but harmonization of these methods is still required for the efficient spatial environmental assessment of mine contamination (see Jordan, 2009).

Assessments of undiscovered mineral resources provide a basis to help society recognize, discuss, manage, and minimize environmental impacts associated with mineral exploration and mining while maintaining or expanding mineral supplies. Quantitative assessments are essential for effective evaluation of the consequences of alternative resource-related decisions. Potential applications of the global assessment include mineral supply issues, evaluations of tradeoffs associated with mineral development, and environmental planning. The global mineral resources assessment will provide a consistent, comprehensive level of information and analysis of undiscovered global nonfuel mineral resources. The assessment results will provide all nations with a regional and global context for planning sustainable development, evaluating their known and undiscovered nonfuel mineral resources, designing new mineral exploration, anticipating and preventing environmental problems, and making land - use decisions (Hammarstrom et al, 2006).

2. Materials and Methods

The whole information volume in this article was obtained through specific methods for the selective research, respecting all its stages from the methodological point of view: identification of the researched issue, research framework delimitation, information collection, data processing, analysis and interpretation drawing up the conclusions. Research also played an important role in the article, which consisted, in the identification of other studies and articles from the international literature on the same subject (Rajović, 2013; Rajović and Bulatović, 2013). The research results are based on a series of mainly qualitative analyses, on the one hand, and on a series of logical rationales, on the other hand (Rajović and Bulatović, 2013; Basilashvili, 2016).

Analysis results and their generalizations

One of the greatest challenges facing many national governments is integrating economic activities with environmental integrity and social concerns. Therefore, on the basis that a sustainable approach to minerals development is essential to effective and continued wealth creation and poverty reduction, the industry has been challenged, particularly since 2003, to address this problem. The application of sustainable development to the industrial minerals sector is effected primarily through the application of education, technology and a proactive legal and regulatory framework to uncover new reserves, promote recycling, substitute one mineral for another, embrace cleaner technology, minimize waste generation, effectively rehabilitate disturbed lands, ensure acceptable environmental practices and minimize negative impacts on human populations (Rainford and Richards, 2008). Additionally, it involves the application of visionary management to invest the proceeds of mineral exploitation in health, education, technology, physical amenities, good governance, equity, effective environmental management and other areas of economy in a planned and sustained attempt to improve the well – being of current and future generations. Agenda 21 outlines several principles to be considered for a country to progress along a sustainable path. Those of particular significance to the minerals industry include the precautionary and the polluter pays principles, sustainable patterns of production and consumption, and the principles relating to social equity and governance (Rainford and Richards, 2008).

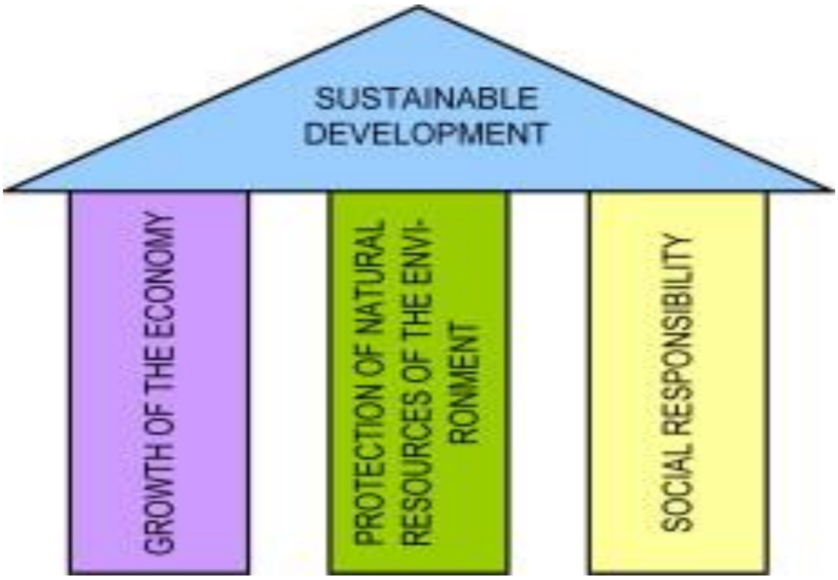

Fig. 1. Elements that create the term of "sustainable development" (Dubiński, 2013).

Thus, sustainable development is, according to Dubiński (2013) in any case, an ongoing process, and not a temporary undertaking. It has clearly defined goals and means of achieving them, in all of the above mentioned key areas by Dubrńki (2013) citing research Dubrńki et al (2007) highlights yes areas are of equal importance. Hence, the emphasis on one area usually leads to a crisis across the entire area of mining activity. Economic growth means achieving long - term sustainability both in regards to planned production volumes, and in meeting the needs of customers, as well as achieving economic efficiency obtained from the sale of the excavated mineral. Protection of natural resources and of the environment means concern for the bed and the protection of its resources by its rational acquisition, which is characterized by savings in its depletion. This also means taking measures that minimize the negative impact of the different processes related to the extraction of mineral resources on the various forms of the geological environment and natural environment on the surface. Social responsibility, taking into consideration the nature of the mining environment, this means above all ensuring safe working conditions, but also concern the social aspects of mining, including the families of miners, the mining environment (Dubiński, 2013).

The European mining industry has a long tradition providing many regions with growth and employment. However, now in the European Union, consumption of many minerals and especially metals considerably exceeds the EU mining industry's internal supply capability. In the last years, it was pointed out in many EU documents that securing reliable and undistorted access to raw materials is becoming an increasingly important factor in the EU's competitiveness and hence crucial to the success of the Lisbon Partnership for growth and jobs. Therefore, the European mining industry is faced with a major challenge which is creating appropriate ecological, economic and social conditions, referring to the idea of "growth through opportunity" (Kulczycka, 2013).

Highly industrialized countries such as those of Western Europe, which import all of their metallic mineral resources and most of their energy supplies, still produce a large proportion of their required nonmetallic mineral resources (that is, raw materials for construction and many of the industrial minerals). In Germany, for example, nonmetallic mineral resources total about 80 percent of mineral commodities consumed. The lifetime curve of nonmetallic resource production in a country shows a positive time offset relative to the curve for production of metallic resources and attains a maximum when almost all of the metal mines in that country have been abandoned (Figure 2) (Wellmer and Becker – Platen, 2000).

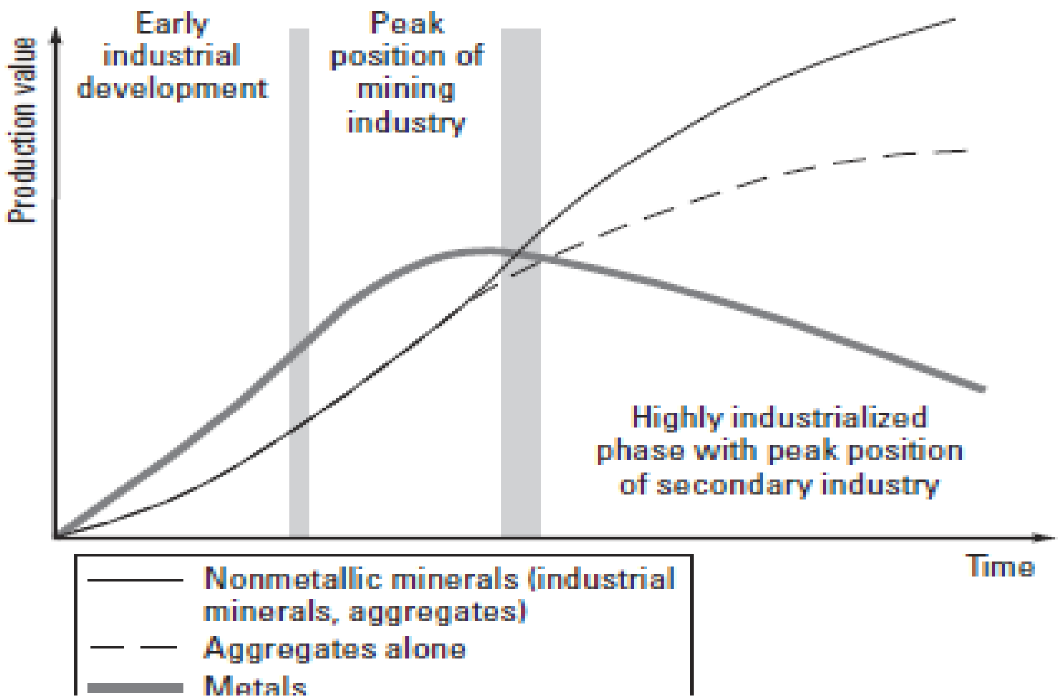

Fig. 2. Comparison of the production trends of metallic ores, industrial minerals, and aggregates in industrialized countries according to Wellmer and Becker - Platen (2000) and Wellmer and Lorenz (1999) modified from Bristow (1987).

This lifecycle applies to all mined materials including coal, industrial minerals, metals, and precious metals. It provides a framework for both understanding and managing the environmental, social and economic impacts of mining at every stage of the mining project (Table 2). Primary deposits linked to magmatic and hydrothermal REE-mineral forming processes and secondary deposits related mainly to sedimentary remobilization and weathering processes of mainly REE-bearing igneous rocks (Figure 3). Europe - wide REE mineralized belts can be recognized. Geophysical measurements applying airborne and ground magnetic, electromagnetic and gravimetric methods have been conducted across Europe on national and regional scales. They may provide valuable data and offer efficient REE exploration tools at a range of scales, but this is based more on the interpretation of the responses and signatures received from the wall and host rocks of the mineralization rather than the REE mineralization it. As yet there is limited information to show how interpretation of geophysical data may be better used to pinpoint REE mineralization (see Arvaniditis and Goodenough, 2014).

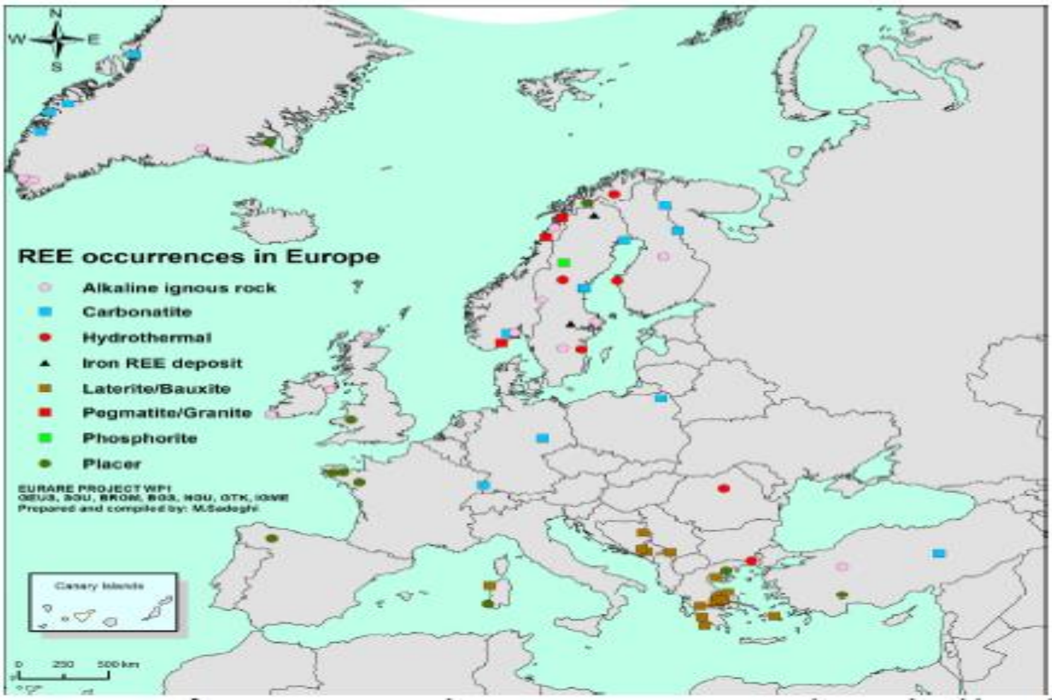

Fig. 3. Overview of major REE mineralization types in Europe and Greenland based on EURARE data and information (Sadeghi et al,2014). There is obvious exploration potential and high prospective interest for primary deposits in Greenland, the Nordic countries and the British islands, and secondary deposits in mainly NW France, Greece and west Balkans (Arvaniditis and Goodenough, 2014).

According to Tiess (2011) citing research EC (2011) highlights yes due to environmental, societal or economic reasons there are still many unexplored and unexploited resources within Europe. Europe's non – energy extractive industry is hindered by a heavy regulatory framework and competition with other land uses. In the new Communication "Tackling the challenges in commodity markets and on raw materials" published in February 2011, the Commission considers the improvement of framework conditions: defining national minerals policies/strategies; setting up land use planning policies for minerals; authorizing minerals exploration and extraction providing certainty and streamlining the administrative process. Presently, only three countries of the EU-27 – Finland, Germany and France - provide a national minerals strategy (see Table 1).

Table 1. Comparison of the raw materials strategies of Finland, Germany and France

National Mineral Strategy			
	Finland	Germany	France
Publication	Minister of Employment and Economy (2010)	Minister of Economy and Technology (2010)	Minister of State, Minister for Ecology, Energy, Sustainable Development and Sea
Minerals	Metallic, industrial and construction minerals	Metallic, industrial and construction minerals	Metallic minerals (additionally sub strategies for the other minerals)

Objectives	Three strategic objectives: Promoting domestic growth and prosperity, solutions for global mineral chain challenges and mitigating environmental Impact.	Nine objectives: e.g. Support of economy in the development of synergies through sustainable management and increased material efficiency Development of bilateral commodity partnerships with selected countries	Access to strategic metallic minerals in good conditions is needed to ensure French industry conditions of development and to enable the development of products more virtuous and more competitive
Actions	Strengthening R&D capacities and expertise. **Analysis* of the *minerals deposits potential* /discovery potential *Demand/production forecasting *Analysis of minerals industry *Improve regulatory framework	Actions are contained in the context of the objectives	Action plan focuses following issues: Improving knowledge of strategic metals Extension of geological knowledge by exploration campaigns Development of new exploration tools Recycling policy.

Source: Tiess (2011) according to Tiess (2011)

Badera (2014) citing research EC (2011) highlights yes many international and national studies have stated that there are a considerable number of mineral deposits available in Europe. In 2008 the European Commission initially accepted the new integrated strategy called the Raw Material Initiative; actual Communication from the Commission on this topic has been published in 2011. According to Badera (2014) the following key challenges of the EU mineral policy have been recognized and indicated as main pillars: (1) ensuring a fair and sustainable supply of raw materials from international markets, (2) fostering a sustainable supply of raw materials from European sources and (3) boosting greater resource efficiency and promoting recycling. In the 2nd pillar the issue of public acceptance should be considered without a doubt. One of requirements of the European mining industry is the improvement of the EU minerals knowledge database. Socio-environmental issues harmonize with the tasks of Work Package no. 3 (Knowledge management) within the Minerals4EU project (www.minerals4eu.eu) conducted within the EU 7th Framework Programme and they should become a part of the Minerals4EU knowledge data platform. Another similar 7th FP project is ProMine (www.promine.gtk.fi), including amongst others Sustainability Assessment and Exploitation. Summing up, modern approaches to social issues associated with mineral activities include strategies of bilateral communication, mediation/ negotiation, cooperation between stakeholders to a larger extent than in the past. However, it is the continuous need for extensive, in – depth social debates on mineral development projects in the European Union, as well as in Non – European countries, in both the energy and non – energy branches.

Table 2. Mining lifecycle stages and impacts at each stage

	Activities	Environmental Impacts	Social Impacts	Economic Impacts
Mineral Resource Development	Drilling, Feasibility, Mine Planning, Mine Design, Permitting	Land Disturbance, Vegetation Disturbance, Noise, Dust, Water Consumption, Energy Consumption,	Worker H&S, Community H&S	Jobs
Mine Development & Operation	Infrastructure Development, Overburden Removal or Underground Mine Construction, Ore Extraction	Land Disturbance, Noise, Dust, Asthetics, Water Consumption, Energy Consumption, Water Discharge, Air Emissions, Biodiveristy Protection, Resource Efficiency	Worker H&S, Community H&S, Capacity Building, Skills Development, Enhanced Community Services,	Jobs, Royalties, Taxes, Capital Investment
Ore Handling	Transport ROM to Plant (truck, pipeline, conveyor, other), Storage	Land Disturbance, Vegetation Disturbance, Noise, Dust, Water Consumption, Energy Consumption,	Worker H&S, Community H&S	Jobs
Processing	Crushing, Screening, Grinding, Separation, Concentration, Particle Size Fractionation, Physical or Chemical Removal of Contaminants, Drying	Waste Generation, Recovery and Reuse; Water Consumption, Contamination, Discharge and Reuse; Energy Consumption and Recovery; Air Emissions, Resource Efficiency; Noise	Worker H&S, Community H&S, Capacity Building, Skills Development, Enhanced Community Services (water, power, roads, schools, hospitals)	Jobs, Royalties, Taxes, Capital Investment
Transportation	Product to customer by rail, truck, ship.	Air emissions, Noise, Dust	Worker H&S, Community H&S	Jobs
Waste Disposal	Process and mine waste to, impounds, backfill or deep well injection	Land Surface Disturbance , Water Contamination, Aesthetics	Worker H&S, Community H&S	Jobs
Closure	Backfilling, Removal of Equipment, Removal of Buildings & Pipelines, Monitoring, revegetation	Waste Disposal, Biodiversity Protection, Water Discharge, Aesthetics	Worker H&S, Community H&S, Future Land Use	Jobs, Revenues from post mining land use (timber, agriculture etc)

Source: Kogel (***).

According to Kogel (***) citing research Cutifani (***) highlights yes how do we harness the value that mining generates and use it to not only solve real social, environmental and economic problems today but to create a better future for the next generation? The answer is not simple but there are 4 areas where the industry needs to shift or sharpen focus: (1) people affected by mining must be treated fairly and with respect; (2) mining companies must create a culture of transparency by being more inclusive in engaging with stakeholders including NGOs; (3) the industry must step up efforts to support social and economic development especially in underdeveloped countries where wealth tends to be concentrated in natural capital (minerals, oil, gas) while wealth in advanced economies tends to be concentrated in physical and human capital thus creating disparity between the two and (4) as grades decline and demand for minerals grows, the industry must change the way it operates through innovation, new technologies and new processes.

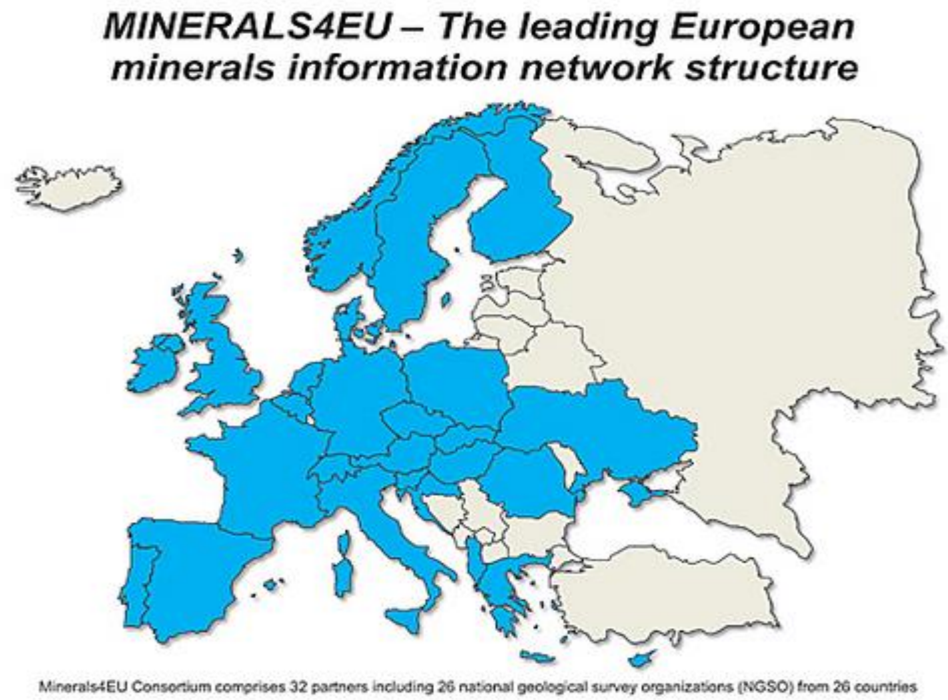

Fig. 4. Minerals4EU project – Provides tools and expertise to enhance resource efficiency and minerals supply security and supports sustainable minerals development for Europe (www.minerals4eu.eu).

The Minerals4EU project is designed to meet the recommendations of the Raw Materials Initiative and will develop an EU Mineral intelligence network structure delivering a web portal, a European Minerals Yearbook and foresight studies. The network will provide data, information and knowledge on mineral resources around Europe, based on an accepted business model, making a fundamental contribution to the European Innovation Partnership on Raw Materials (EIP RM), as key for the successful implementation of the major EU2020 policies (www.minerals4eu.eu).

Table 3. Operational Strategy – Optimal exploitation of the mineral resource

BUSINESS GOAL UNITS	OPERATIONAL STRATEGY	FOCUS AREA	TARGETS OR OUTPUTS
	The optimal exploitation of the mineral resource: The optimal exploitation of the mineral resource by effective	Exploration	Optimize the mineral resource by executing the exploration strategy / programmed.
			Develop and follow the formal exploration strategy.
		Geomodelling	Continuously update geological and grade models that add most

	exploration, the collection and processing of geological information, mine design and scheduling, risk management, grade control, mining methods and the utilization of the best available technology to continuously satisfy the plant demand in terms of ore quality and volume.		value to mine planning exercises.
		Geotechnical support	Develop system to assess the risk of slope failure versus the financial benefit that will add the most value.
			Dewater pit in accordance with LT mine plan.
			Decrease stripping ratio.
		Pit Design	Evaluate methods for optimum pit design techniques by allowing for ore grade and the maximum utilization of the mineral resource.
		Resource Exploitation	Pit Development Strategy/Resource Exploitation Strategy. Determine sensitivities for the following:
			1. Ore quality strategy,
			2. Stripping strategy,
			3. Selective mining strategy,
			4. Waste rock dumping strategy,
			5. Pit dewatering strategy,
		Mining Operations	6. Surface structures,
			7. Adjoining properties,
			8. Mining equipment strategy.
			Develop mining methods and equipment strategy for the maximum

			utilization of the ore reserve.
		Grade Control	Develop an efficient grade control system ensuring that the short term plan is followed within approved norms and the ore product grade values are produced within acceptable limits.

Source: Bender (2005).

Mineral Resource Management exists out of various functions/elements that need to be addressed for complete and thorough understanding of the whole process. Mineral Resource Management is used to optimize the integration of all system components in such a way that the whole is greater than the sum of the individual components in reaching a common goal. Customer Relationship Management and Project Management Principles enhance this process to obtain an integrated resource planning and management approach in the extraction of the mineral reserves over different time horizons to benefit all customers over the value chain (see Bender, 2005; Zhakupov et al, 2014).

Conclusion

Sustainability in general is understood in the sense of security of the planet or a country and that in relation to mineral resources is linked with security of raw material availability. On the other hand, sustainable development of mineral resources denotes ways and means in which mining should be carried out and is linked to corporate social responsibility (CSR) and certain other activities with a view to developing the areas and the peoples around mines. In a sense, the former is more security-centric while the latter is more welfare-centric (Chatterjee, 2015).

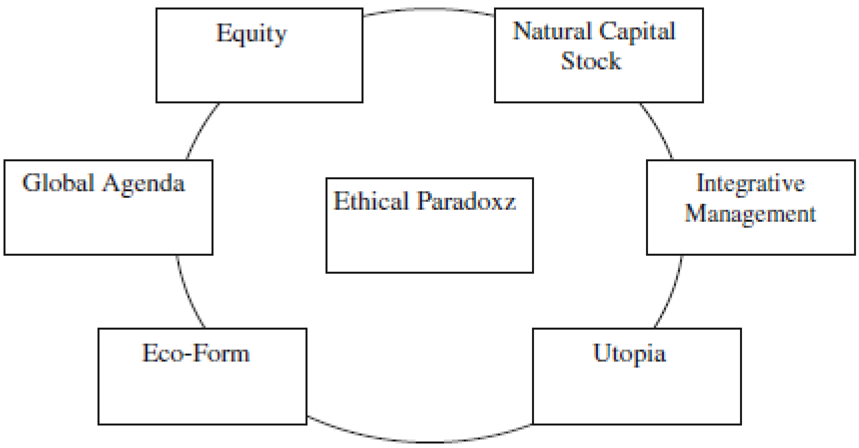

Fig. 5. A Conceptual framework for sustainable development (Jabareen, 2008)

The conceptual analysis according to Jabareen (2008) identifies seven concepts which together synthesize and assemble the theoretical framework of 'sustainable development'. Each concept represents distinctive meanings and aspects of the theoretical foundations of sustainability. In addition, they have interwoven relations as Figure 5 shows. The concept of ethical paradox rests at the heart of this framework. The paradox between 'sustainability' and 'development' is articulated in terms of ethics. In other words, the epistemological foundation of the theoretical framework of sustainable development is based on the unresolved and fluid paradox of sustainability, which as such can simultaneously inhabit different and contradictory environmental ideologies and practices. Consequently, SD tolerates diverse interpretations and practices that range between 'light ecology', which allows intensive interventions, and 'deep ecology', which allows minor interventions in nature. Jabareen (2008) nicely concludes the concept of natural capital represents the material aspect of the theoretical world of sustainability. Natural capital represents the environmental and natural resource assets of development and preservation. The theoretical framework of sustainability advocates keeping the natural capital constant for the benefit of future generations (see Stymne and Jackson, 2000; Roseland, 2000; Mozaffar, 2001; Gudkova, 2016).

Finally, according to Titon (1996) citing research Kesler (1994) and Simon (1995): At the end of the twentieth century, we are faced with two closely related threats. First, there is the increasing rate at which we are consuming mineral resources, the basic materials on which civilization depends. Although we have not yet experienced global mineral shortages, they are on the horizon. Second, there is the growing pollution caused by the extraction and consumption of mineral resources, which threatens to make earth's surface uninhabitable. We may well ponder which of these will first limit the continued improvement of our standard of living ... (Kesler, 1994). People have since antiquity worried about running out of natural resources – flint, game animals, what-have – you. Yet, amazingly, all the historical evidence shows that raw materials – all of them - have become less scarce rather than more ... Natural resource scarcity – as measured by the economically meaningful indicator of cost or price – has been decreasing rather than increasing in the long run for all raw materials, with only temporary and local exceptions ... The trend toward greater availability includes the most counter-intuitive case of all – oil ... Concerning energy in general, there is no reason to believe that the supply of energy is finite, or that the price of energy will not continue its long-run decrease forever(Simon,1995).

References

Akhtar, 2005 – *Akhtar, A.* (2005). Mineral resources and their economic significance in national development: Bangladesh perspective, *Geological Society, London, Special Publications*, *250*(1), 127-134.

Arvaniditis, Goodenough, 2014 – *Arvaniditis, N., Goodenough, K.* (2014). Unlocking the potential of Rare Earth Resources in Europe, ERES2014: 1st European Rare Earth Resources Conference|Milos|, pp. 48-56, 04-07/09/.

Badera, 2014 – *Badera, J.* (2014). Problems of the social non-acceptance of mining projects with particular emphasis on the European Union - a literature review, *Environmental & Socio-economic Studies*, *2* (1), 27 - 34.

Basilashvili, 2016 – *Basilashvili, T.* (2016). Geoecological Estimation of Water Resources and Ways to Optimization of Water Consumption, *European Geographical Studies,* 10 (2), 32-37.

Bender, 2005 – *Bender, W.* (2005). Mineral resource management principles that need to be incorporated in AngloGold Ashanti LTD east and West Africa region (Doctoral dissertation), University of Witwatersrand.

Bristow, 1987 – *Bristow, C.M.* (1987). Society's changing requirements for primary raw materials: Industrial Minerals, 233, 59 - 65.

Chatterjee, 2015 – *Chatterjee, K.K.* (2015). Sustainability and Sustainable Development of Mineral Resources. In *Macro - Economics of Mineral and Water Resources* (pp. 161-188), Springer International Publishing.

Cutifani, *** – *Cutifani, M.* (***). "The need to meet Challenges has never been Greater", Available from: http://www.csr21.org (22.09 2016).

Dubiński et al., 2007 – *Dubiński, J., Turek, M., Wachowicz, J.* (2007). Hard coal mining and the idea of sustainable development, pp. 27 - 38, Proc. Intern. Scientific Conference - School Underground Exploitation, Dniepropietrowsk.

Dubiński, 2013 – *Dubiński, J.* (2013). Sustainable development of mining mineral resources, *Journal of Sustainable Mining*, 12 (1), 1 - 6.

European Commission (EC) 2011 – European Commission (EC) (2011). Communication tackling the Challenges in Commodity Markets and on Raw Materials.

European Commission, 2011 – European Commission (2011). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – Tackling the challenges in commodity markets and on raw materials*. Brussels, 02.02.2011, COM (2011), 25 final.

Gudkova, 2016 – *Gudkova, K.N.* (2016). Identification and Ranking of Environmental Impacts Intensify Geological Processes in the Recreational and Tourist Regions of Southern Russia, *European Geographical Studies,* 12 (4), 141 -151.

Hammarstrom et al., 2006 – *Hammarstrom, J.M., Briskey, J.A., Schulz, K.J., Peters, S.G., Bawiec, W.J.* (2006). Applications of a Global Mineral - Resource Assessment for Addressing Issues of Sustainable Mineral Resource Development, pp. 703-720, In The 7th International Conference on Acid Rock Drainage (ICARD).

Jabareen, 2008 – *Jabareen, Y.* (2008). A new conceptual framework for sustainable development. *Environment, development and sustainability*, *10* (2), 179 -192.

Jordan, 2009 – *Jordan, G.* (2009). Sustainable mineral resources management: from regional mineral resources exploration to spatial contamination risk assessment of mining, *Environmental geology*, *58* (1), 153-169.

Kesler, 1994 – *Kesler, S.E.* (1994). Mineral resources, Economics and the Environment Macmillan, New York.

Kogel – *Kogel, J.E.* Sustainable Development Practices and the Minerals Industry, Available from*:* http//www.wfeo.org (19.09.2016).

Kulczycka, 2013 – *Kulczycka, J.* (2013). Sustainable production and consumption of mineral resources – introduction, *Mineral Economics*,25 (2),53 - 54.

Lambert, 2001 – *Lambert, I.B.* (2001). Mining and sustainable development: considerations for minerals supply, *In Natural resources forum*, 25, 4, 275 - 284, Blackwell Publishing Ltd.

Minerals4EUProject, 2016 – Minerals4EUProject (2016). The Minerals4EU Project, Available from: http://www.minerals4eu.eu (20.09 2016).

Mozaffar, 2001 – *Mozaffar, Q.* (2001). Sustainable development: Concepts and rankings, *Journal of Development Studies*, 3, 134-161.

ProMine, 2016 – ProMine (2016). The ProMine Project, Available from: http://www.promine.gtk.fi (21.09.2016).

Rainford, Richards, 2008 – *Rainford, O.B., Richards, R.A.* (2008). Sustainable Development and the Industrial Minerals Sector: Integrating the Principles of Sustainable Development within Jamaica's Industrial Minerals Sector, *Business, Finance & Economics in Emerging Economies*, *3* (1), 89-119.

Rajović, 2013 – *Rajović, G.* (2013). Geographical View of Mineral Resources: The Case Northeastern Montenegro, *Journal of Sustainable Development Studies,* 2 (2), 229 - 241.

Rajović, Bulatović, 2013 – *Rajović, G., Bulatović,J.* (2013). Some aspects of economic geographic views at the geological makeup: the case northeastern Montenegro, *International Letters of Social and Humanistic Sciences*, 4, 11 -21.

Rajović, Bulatović, 2013 – *Rajović, G., Bulatović, J.* (2013). Natural resources as a factor socioeconomic development: The case northeastern Montenegro, *Journal of Energy and Natural Resources,* 2 (2), 7 - 20.

Roseland, 2000 – *Roseland, M.* (2000). Sustainable community development: Integrating environmental, economic, and social objectives, *Progress in Planning*, 54 (2), 73 - 132.

Sadeghi et al., 2014 – *Sadeghi, M., Jonsson, E., Kalvig, P., Keulen, N., Goodenough, K., Deady, E., Muller, A., Eliopoulos, D., Cassard, D., Bertrand, G., Vuollo, J., Nysten, P., Bergman, T., Söderhielm, J., Arvanitidis, N.* Eurare WP1 team (2014). Rare Earth Element Resources in Europe with focus on the Nordic countries- 1st International Symposium on Development of Rare Earths, Baotou, China.

Simon, J.L. (ed), 1995 – *Simon, J.L.* (ed) (1995). The State of Humanity Blackwell. Cambridge, MA.

Stymne, Jackson, 2000 – *Stymne, S., Jackson, T.* (2000). Intra – generational equity and sustainable welfare: A time series analysis for the UK and Sweden, *Ecological Economics,* 33 (2), 219-236.

Tiess, 2011 – *Tiess, G.* (2011). EU – Minerals Policy and Indian Minerals Policy: New Paradigm and Perspectives, pp. 1- 16, 17th Convention of Indian Geological Congress and International Conference on 'New Paradigms of Exploration and Sustainable Mineral Development: Vision 2050 (NPESMD 2011).

Tiess, 2011 – *Tiess, G.* (2011). General and International Mineral Policy, Focus: Europe, published by Springer Wien New York.

Tilton, 1996 – *Tilton, J.E.* (1996). Exhaustible resources and sustainable development: Two different paradigms, *Resources Policy*, *22* (1), 91-97.

Wellmer et al., 2000 – *Wellmer, W. F., Becker–Platen, D.J.*(2000). Global Nonfuel Mineral Resources and Sustainability, Edited by Joseph A. Briskey and Klaus J. Schulz, 1-16, Proceedings of a workshop that followed the 31st International Geological Congress, Rio de Janeiro, Brazil, August 18-19.

Wellmer, Lorenz, 1999 – *Wellmer, F. W., Lorenz, W.* (1999). Von den (Edel -) Metallen zu den Nichtmetallen – Bodenschätze im Wandel ihrer volkswirtschaftlichen Bedeutung [From metals and noble metals to nonmetals – Changing economics of our land's natural resources]: Schriftenreihe der Georg-Agricola – Gesellschaft, Bochum, Georg – Agricola – Gesellschaft, 24, 97-116.

Zhakupov et al., 2014 – *Zhakupov, A.A., Musabayeva, N.M., Djanalieva, M.G.* (2014). The Natural/Resource Potential of Pavlodar Oblast for the Organization of Leisure and Tourism. *European Geographical Studies,* 4(4), 170-176.