DOI: *10.25515/PMI.2018.1.27*

UDC 378.1

ON ENHANCEMENT OF COOPERATION BETWEEN UNIVERSITIES FOR IMPLEMENTATION OF THE PROGRAM «SUSTAINABLE DEVELOPMENT–2030»

Punsalmaagiin OCHIRBAT[1], **Bavuu CHINZORIG**[2]
[1] *Mongolian State University of Science and Technology, Ulan Bator, Mongolia*
[2] *Mining Institute of Mongolian State University of Science and Technology, Ulan Bator, Mongolia*

The article is focused on one of the pressing issues of our time – the international training of qualified personnel in higher education institutions with the aim of developing a stable economic system of the state, the main elements of which are interrelated stages of economic activity (exploration, prospecting, extraction, processing, and use of mineral resources). The question of the contribution and role of universities of different countries cooperating in the sphere of sustainable development of this sector is considered. The necessity of practical solution of this task for the implementation of UNESCO's program «Sustainable Development – 2030» is determined. In this relation, the concept of «sustainable development», its philosophical, scientific-theoretical and cultural aspects are considered, the special significance of the connection between the sustainable development of society and its individual fragments with modern education is emphasized. It is stated that education, in the context of sustainable development, should be anticipating, advancing and open. Given the current trends in higher education, it is possible to mention the work carried out by the Mining Institute of the Mongolian State University of Science and Technology in the direction of international cooperation.

***Key words*:** sustainable development, higher education, university, mineral resources, UNESCO, Mongolia

***How to cite this article*:** Ochirbat P., Chinzorig B. On Enhancement of Cooperation Between Universities for Implementation of the Program «Sustainable Development – 2030». Zapiski Gornogo insituta. 2018. Vol. 229, p. 27-30. DOI: 10.25515/PMI.2018.1.27

Introduction. One of the main indicators of the welfare of society is the efficient use of mineral resources at any stage of its development. Even in ancient times it was known that the wealth is accumulated not at the expense of super profits, but at the expense of cost reduction. This statement underlies the definition of sustainable development, which states that the modern generation must meet its demand without compromising the needs of future generations [1-4, 7, 8].

Undoubtedly, the subject, who extracts, performs primary and further processing of resources to get the finished product, is a person who is an expert in this field, capable of making decisions taken in accordance with the principle of sustainable development [10-12]. In this regard, sustainable development is not only a matter of national and regional development, but is of great importance on global scale, where one of the key factors is the personnel development.

The proof of this postulate are three main directions that demonstrate the importance of human resources as a special economic category capable of making scientifically based complex solutions. However, it should be noted that at present the world tendency is characterized by one-sided understanding of the principles of a comprehensive solution, which leads to conclusions limiting the possible development, that subsequently cause incorrect actions. In order to arrive at an unambiguous solution to this problem, the higher education institutions engaged in the training of engineers and technicians in the field of mineral resources sector need to cooperate and share experience in the following three areas: taking into account the field of study, the training profile (major), and creation of the joint research fund and its financial support system.

Methods of research. In the process of studying the problem of enhancing cooperation in the sphere of training of professional personnel in the areas of exploration, prospecting, mining, extraction, processing and use of mineral resources aimed at ensuring the sustainable development of society, a number of scientific methods were used: descriptive, analytical, comparative, prognostic [5, 6, 9-13].

Areas and results of research. Higher education institutions training specialists in the field of mineral resources can unite to conduct joint scientific research in the interests of sustainable development. Mongolia can serve as an example of such cooperation, which in 1992 took part in the world forum «Rio-92». Mongolia supported the main ideas and principles of the forum, which were reflected in the 1998 program of the development of the Mongolian state in the XXI century

DOI: *10.25515/PMI.2018.1.27*

«MR-21». For effective implementation of the program, comprehensive studies are carried out, which have achieved certain results. Thus, scientists and researchers of the Center for Ecology and Sustainable Development of the Mongolian University of Science and Technology organized 13 scientific and practical conferences and published 337 reports on the following areas:

- effective use of critical (limited) mineral resources;
- adjasement to climatic and ecological changes (desertification and warming: reduction of their influence);
- environmental and climate changes;
- environmental impact of mining industry;
- issues of mineral resources management.

Currently the work is being carried out to introduce the results of these studies into certain normative and legal acts and methodological documents of the relevant ministries and executive authorities. In addition, there was established the interaction of graduate students and undergraduates with mining companies and enterprises in the field of joint solution of theoretical and practical problems based on the results of scientific research work.

The key factor for sustainable development of the mining and processing industry is the effectiveness of management system, that is why it seems necessary to expand the production function as follows:

$$Q = P(KLPEM),$$

where K – capital; L – labor; P – reserves and resources; E – ecology; M – management.

According to Keynes's theory, productivity is ensured by employment and investment as an opportunity for infinite growth, but it does not take into account the possibility of reducing the utilization rate of resources and measures to ensure environmental balance, which is a very limiting factor. However, the management indicators for maximum performance and efficiency at minimum costs are calculated as the main performance controllers.

It is assumed that in conditions of sustainable development, the principle of «win-win» situation can be implemented, i.e. «without risk of loss».

Thus, it is possible to share the results of many research works aimed at solving actual practical issues, as well as studies of the laws of society and nature. In this context, it is worth mentioning that, at the moment, the joint project of the Mongolian University with the Akita, Kyushu and Tohoku universities (Japan), Columbia University and the University of Zurich has been successfully implemented.

All the mentioned research universities have common idea of sharing experiences and conducting joint research projects that determine the vector of development of the mineral and raw materials sector. This trend plays an important role in the implementation of the program «Sustainable Development – 2030».

The process of studying sustainable development differs in various countries. The most important issue is the development of a training program for specialists who are able to adapt quickly and achieve good results in the relevant field of research. The Mining and Geological Institute of the Mongolian University of Science and Technology in 2004 developed a training program within the framework of the program «Sustainable Development 1: Stable Functioning of the Mineral Resources Complex», more than 900 bachelors are being trained within this program and 2928 graduates received a degree.

In some countries, training in sustainable development occurs within the framework of certain major courses, while others have developed specialized subjects in this field. Currently, there is a set of favorable factors for the creation of common training standards based on the experience of different universities, as well as the creation of uniform standards for the training of employees for large multinational companies. An example of this is the joint doctoral program «1 + 1 + 1» of the Moskovsky National Research Technological University named after N.E. Bauman, Freiberg Mining Academy and the Australian National University.

DOI: 10.25515/PMI.2018.1.27

Within the framework of joint activities with the Saint-Petersburg Mining University, each academic year at least two students successfully complete bachelor's, master's and postgraduate studies. A joint program «3 + 2», developed by the Freiberg Mining Academy, is also being implemented. It should be noted that there is a possibility to have joint short-term and long-term training in universities of China and Russia. All this is an example of successful experience and the foundation for further advancements in this field.

Therefore, the main goal in this direction is to create conditions for such activities as acquisition of education in the field of sustainable development of the mining industry, conduction of research and development work, organization and holding of scientific and practical meetings, conferences, discussions and projects on identifying pressing issues, sustainable development of environment, mineral resources and other industries.

Such tasks as the establishment of strategic academic units, the development of education standards, the creation of a team of teachers competent in the sphere of sustainable development of mining management, the development of a training and methodological complex, the creation of research centers, the provision of working conditions, and the search for sources of financing were accomplished.

Main results. At the Institute of Mining Engineering of the Mongolian University of Science and Technology, the emeritus doctor of the Saint-Petersburg Mining University, Professor P.Ochirbat, established a working group for sustainable development in the sphere of mining management, he also founded the Center for Sustainable Development and Ecology under his leadership. Annually in the Institute of Mining Engineering they train bachelor's (60-70 persons) and master's degree (14 persons) students, and 2-3 students receive an academic degree in the field of «sustainable development».

About 30 scientific and research articles, as well as more than 10 educational and methodical papers were published on the subject of sustainable development of the mining industry and climate change issues.

Each country develops its own programs within the framework of «Sustainable Development – 2030». At the moment, the most important area is the establishment of a single university research center in the field of mineral resources, the creation of a joint working group, the definition of the level of implementation of the concept of sustainable development, the analysis of strengths and weaknesses, and the development and systematic implementation of a joint program in the future. All of the above can create conditions for sustainable development, identify general trends in the level of international development of the mineral resource area and provide mining companies with industry specialists at the global level, and introduce the concept of a public license. To solve the issue of financing, it is necessary to take into account the objectives of the program «Sustainable Development – 2030».

Conclusion. The results of our research allow us to draw the following conclusions:

1. It seems necessary to train professional personnel taking into account the results of sectoral studies, as well as by providing a comprehensive analysis of the concept of sustainable development in mining universities and institutes, focusing on the characteristics of society and the economy, not only paying attention on the environment and ecology issues.

2. There is a need to modernize the education complex, as well as to establish a single center for joint activities of international universities, institutes in the direction of improving the quality of study within the framework of the program «Sustainable Development – 2030».

3. There are conditions for the development of common standards and models for sustainable development, as well as for the implementation of joint activities and the solution of the financing support for research activities by creating a working group.

REFERENCES

1. Introduction to the theory of sustainable development: A course of lectures. Otv. red. N.M.Mamedov. Moscow: Stupeni, 2002. 238 p. (in Russian).

2. Veber A.B. Sustainable development. Globalistics: Encyclopedia. Moscow: Raduga, 2003. 1061 p. (in Russian).

DOI: *10.25515/PMI.2018.1.27*

3. Danilov-Danil'jan V.I. Transition to sustainable development as a scientific problem. Science and Education for Sustainable Development. Moscow: MGADA, 2006, p. 20-24 (in Russian).

4. Danilov-Danil'jan V.I. Sustainable development (theoretical and methodological analysis). Jekonomika i matematicheskie metody.2003. Vol. 39. N 2, p. 123-135 (in Russian).

5. Kostina T.I. The origins of education for sustainable development. Science and Education for Sustainable Development. Moscow: MGADA, 2006, p. 7-10 (in Russian).

6. Mamedov N.M. Culture, ecology, education. Moscow: Izd-vo RJeFiA. 1996. 51 p. (in Russian).

7. Mamedov N.M. Philosophical, scientific-theoretical and culturological preconditions for sustainable development. Science and education in the interests of sustainable development. Moscow: MGADA, 2006, p. 11-19. (in Russian).

8. Markovich D.Zh. Socio-ecological aspect of sustainable development. Science and education for sustainable development. Moscow: MGADA, 2006, p. 33-37 (in Russian).

9. Ochirbat P., Chinzorig B. Education for sustainable development in Mongolia. Gornyj informacionno-analiticheskij bjulleten' (special'nyj vypusk). 2008. N 1, p. 241-248 (in Russian).

10. Ochirbat P., Bajasgalan Sh., Chinzorig B. Education for sustainable development. Ulan Bator, 2004.

11. Ochirbat P. Sustainable Development and Applied Ecology. Ulan Bator, 2004.

12. Farell R.V., Papagiannis D. Education for life support. Encyclopedia of life support systems. Knowledge on sustainable development. Moscow: Izd. Dom Magistr-Press, 2005. Vol. 1, p. 686-707. (in Russian).

13. Ursul A.D. Concept of advanced education and sustainable development. Science and Education for Sustainable Development. Moscow: MGADA, 2006, p. 180-187. (in Russian).

***Authors*: Punsalmaagiin Ochirbat,** *Doctor of Economics*, *Professor*, *pobmongolia@magic.net* (*Mongolian State University of Science and Technology*, *Ulan Bator*, *Mongolia*), **Bavuu Chinzorig,** *Doctor of Engineering Sciences*, *Director*, *chinzorigb@must.edu.mn* (*Mining Institute Mongolian State University of Science and Technology*, *Ulan Bator*, *Mongolia*).

The paper was accepted for publication on 15 July, 2017.