



**INTERNATIONAL COMPETITION
„KARST UNDER PROTECTION –
GIFT FOR THE FUTURE GENERATIONS”
AS A PART OF THE EDUCATIONAL STRATEGY
“ProKARSTerra – Edu”**

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Abstract

Wide distribution of Karst and its increasing economic, social and environmental importance make topical the problems of sustainable development on these territories. Solving them is closely related to the role and place of the Karst topic in Education and its potential for intra-disciplinary connections. Targeting these aims an Educational “**ProKARSTerra - Edu**” strategy has been developed. It envisages using real conditions in protected karst territories to introduce new forms of integration between modern sciences (the Concept of Karst Geosystems) and the Educational system (Lifelong Learning).

This paper presents the International competition “**Karst under Protection - Gift for the Future Generations**”, which is a part of the pilot educational strategy ProKARSTerra-Edu, aiming at attracting young people from different countries to expand their knowledge about this sensitive natural environment and its problems. The competition is a Bulgarian initiative and has been held twice (2005 and 2012). 107 participants in total from 10 countries in Europe and Asia took part in 5-competition categories (Including pupils, Teachers, University students and Nature lovers). The exhibition of winning works, judged by an International Jury, was organized with the support of UNESCO as a traveling one, exhibiting works in Bulgaria and abroad.

The paper discussed this initiative’s effectiveness, difficulties in organizing it and its future. The third edition of this competition is planned for 2015, within an International Scientific-applied forum “Protected Karst Territories – Education and Training”. The competition is in line with one of the initiatives (supported by UNESCO) to proclaim International Year of Karst.

Karst is wide spread in Bulgaria and in the World as a whole. It is not only a phenomenon and tourist attraction, but there are serious socio-economic and educational dimensions around it, as it forms specific environments inhabited by people. However, everywhere karst issues still stand aloof from the interests of the government and society. Our research shows that over 60% of the Bulgarian respondents in protected karst areas are not familiar with the karst phenomenon and its features even though these are territories where they live and use under different forms. The question arises as to the importance of training and education concerning karst science and the use of karst environments.

THE „ProKARSTerra” MODEL AND ITS „ProKARSTerra-Edu” EDUCATIONAL MODULE

For over 20 years the Institute of Geography (today Department of Geography in NIGGG-BAS) carry out research and experimental work in representative karst territories, developing research infrastructure there and specialized databases, which offer good potential for Karstologic education. This work was funded by The Bulgarian Science Fund, through a series of research projects. In the period 2009-2013 two serious research projects on karst were developed, with strong educational emphasis. Researchers from 5 countries and different institutions took part, such as: scholars and specialists from academic institutes and such, working at protected territories in Bulgaria (National Institute for Geophysics, Geodesy and Geography – BAS, Institute of Information Technologies – BAS, Institute for Space and Solar-Terrestrial Research – BAS, Directorate of Nature Park “Shumen Plateau”, Shumen); from the Czech Republic (Nuclear Physics Institute - AS CR, Prague, Institute of Geonics - AS CR, Dep. of Environmental, Brno, Administration of Moravský kras Protected landscape area); from Poland (University of Silesia, Faculty of Earth Sciences, Sosnowiec); from Albania (ITA Consult, Tirana); from Japan (Faculty of Education, Yamaguchi University и Akiyoshi-dai Museum of Natural History, Quasi-National karst park Akiyoshi).

Special attention is given to protected karst areas, 4 of which are model territories for long-term karst research in Bulgaria. They have special status and infrastructure, making them suitable for educational purposes. In the course of many years of scientific research in Bulgaria a methodological model for study and management of protected karst areas has been developed, named „ProKARSTerra”. The „ProKARSTerra” model has an integral part, named „ProKARSTerra-Edu”. It is a strategy for active educational work in the field of karst and sustainable development of karst sites and territories.

This strategy is aimed at:

- Maintenance and further development of research infrastructure in model protected karst areas, using the most advanced research technologies;
- Development of a multipurpose educational program for training in Karstology; creating conditions for integration of the study of karst geosystems with the modern educational concept “Lifelong Learning”(http://ec.europa.eu/education/pub/pdf/general/eqf/broch_bg.pdf)

In particular the strategy involves several aspects of development:

- Development of specialized information centers (including virtual ones) and scientific educational trails in model protected karst areas for different types of field training and demonstration („in situ”) and e-learning.
- Development and approbation of specialized educational materials about karst, including e-learning packages in GIS environment.
- Organizing and setting up an international network „University in Karst”, based on specialized multi-purpose infrastructure in model protected karst areas. For laying its foundation already researchers from different countries are contributing, with varying degree of participation. The most active participants

include: researchers from the Bulgarian Academy of Sciences, from the Czech Academy of Sciences and Yamaguchi University, Japan; specialists from the Administration of Moravský kras Protected landscape area, The Cave Administration of the Czech Republic, and Akiyoshi-dai Museum of Natural History, Quasi-National karst park Akiyoshi, Japan.

- Design, construction, testing and maintenance of a specialized module „ProKARSTerra-Edu” within the organized e-network „ProKARSTerra”, based in Bulgaria.
- Issuing of specialized scientific and methodological online journal „e-ProKARSTerra” with an international editorial board. It will consist of three parts: research, management, education (materials will be published in several languages).
- Promoting the results and seeking opportunities to set up a specialized national/international scientific and educational center on karst (based on the „ProKARSTerra” strategy), which should generate and distribute international initiatives.

The „ProKARSTerra-Edu” strategy includes an international Art competition entitled „Karst under protection – gift for the future generations”.

THE COMPETITION

This contest is devoted exclusively to education and aims to cover both students of different age groups and University students and teachers, as well as naturalists interested in karst. Knowledge of karst and karst problems, refracted through the soul and emotion of the participants and presented through advanced art tools and techniques imply not only creation of original works, but also continued interest in Karstology in all its aspects.

The idea for the competition arose about the First International Conference in Bulgaria, dedicated to protected karst territories: “Protected karst territories - conditions, problems, perspectives” (18-21 October 2005, Shumen, Bulgaria). The contest was included into the Conference program. At a special ceremonial session prizes were awarded to the winners and the best works were officially presented at an exhibition in the city of Shumen, later in other Bulgarian cities. Information about this competition was published in the Bulgarian journal “GEOgraphy’21”, as well as in the specialized Internet site, developed for the Conference. (<http://www.prokarstterra.bas.bg/karst2005>).

The second contest was held in 2012 and was also associated with a large international scientific forum: „Protected karst territories - monitoring and management” (16-20 September, Shumen, Bulgaria, <http://www.prokarstterra.bas.bg/forum2012>). This forum stated in its resolution that this competition deserves high praise and it should become traditional.

The third edition will be held in 2015 in Bulgaria again. It will be a part of the next big scientific/practical conference “Protected karst territories-education and training”.

This Art competition on Karst thematic is a Bulgarian initiative. The main organizers are the Institute of Geography at the Bulgarian Academy of Sciences (since 2010 Department of Geography NIGGG-BAS) and the Foundation Center of Karstology “Vladimir Popov”. The second edition was held under the auspices of the Bulgarian Academy of Sciences and UNESCO. The competition motto was the same as the Conference motto: „*Protected karst territories, bridges to the future*”.

The competition is held in five seasoned categories:

1. For pupils:

1.1. Up to 12 years old:

— *Drawing or work with natural materials*

- 1.2. Over 12 years old:
— *Poster / Card or multimedia presentation / Video*
2. For teachers:
— *My unusual lesson*
3. For students:
— *Scientific essay or multimedia presentation*
— *Art Installation*
4. For nature lovers, photographers:
— *Composition (3 to 5 photos)*

Traditionally, competition works are evaluated by an International jury. For jury members prominent researchers and educators are invited, people who are united around the idea of more active involvement of karst in education. The interdisciplinary nature of karst brings together professionals from various fields of science, art and education and this is an important condition for objective assessment.

INTERNATIONAL JURY

2005:

Professor **Wieczeslaw ANDREJCZUK**, Dr.Hab. – **Chairman** (Geographer, Faculty of Earth Sciences, University of Silesia, Poland), Associate professor **Yoshihisa NAKANO**, PhD (Artist, Yamaguchi University, Japan), **Petar STEFANOV** (Geographer, Institute of Geography – BAS, Foundation Center of Karstology "Vladimir Popov" and "Geographic Education" review, Bulgaria), **Darina IVANOVA** (Biologist, Directorate of Nature Park "Shumensko Plateau", Shumen, Bulgaria), **Daniel DIMOV** (Painter, Shumen, Bulgaria)

2012:

Professor **Yoshihisa NAKANO**, PhD – **Chairman** (Artist, Yamaguchi University, Japan), RNDr. **Petr ZAJICHEK** (Geologist, Photographer, Cave Administration of the Czech Republic), **Pavla DVORSKÁ** (Artist, Teacher, Czech Republic), Associate professor **Dilyana STEFANOVA**, PhD (Geographer, NIGGG-BAS, Bulgaria), Associate professor **Todorka KRUSSTEVA**, PhD (Geographer, University of Shumen, Bulgaria), **Krassto TERZIEV** (Artist, Sofia, Bulgaria), **Khristo KICHIKOV** (Geographer, Teacher, Gabrovo, Bulgaria)

Evaluation criteria on which the jury assesses the competition works are carefully discussed and unifies:

- Originality of the idea realized with this work (Creative achievement)
- Knowledge of Karst
- Artistic value
- Emotionality
- Technical skills (Technique)
- Professional autonomy in making

In the first competition the judges made their choice directly at the exhibition of the submitted works. Winners were announced at the official opening of the exhibition. In the second edition of the competition in which the participants were far more, the rating changed. The job in coordinating the jury work was a step in the establishment of an international network for karst and led to valuable experience. Assessment tables were developed, containing the above stated criteria, and uploaded into a special module of the Forum web site <http://www.prokarstterra.bas.bg/forum2012> (developed on a specialized server MSSQL

„ProKARSTerra”. All contest works were uploaded there, such as digital copies of pictures, photographs, posters, art installations, multimedia presentations and videos.

Each jury member got a pass-word for access to the competition works and evaluation tables, so that he/she could do evaluation online. All evaluation tables – filled in and personally signed by the jury members were processed by Professor Yoshihisa Nakano (Yamaguchi University, Japan), to derive the competition winners. Consequently, the winning works list was discussed in details by the jury. The official announcement of winners happened on September 15 in Shumen, during a ceremonial session of the scientific forum which preceded the exhibition opening.

In the **first contest** held in 2005 participants from Bulgaria, Japan and Scotland (UK) offered works. The International jury awarded 6 prizes (3 first, 2 second and 1 third) and 1 encouraging prize. First prize in the category for pictures was Kurumi Tawara (Japanese pupil from Shuho Cho, Yamaguchi prefecture). The prize for poster went to the Bulgarian pupil Nikolina Georgieva from Chepelare. Among teachers for the most interesting lesson about karst first prize was awarded Val Vannet of Dunee, Scotland (UK).

Honorary Diploma for outstanding participation in the competition was awarded to a group of children from Shuho Cho elementary school (Japan), including: Toshihiro Ueyama, Yoichi Katayama and Mayu Sato for the composition “Phantom in Karst”, which was also shown at the exhibition.

The second edition of the competition already had 107 participants from 10 countries: Armenia, Bulgaria, Croatia, Czech Republic, Estonia, Kazakhstan, Latvia, Lithuania and Japan. They presented 104 works in total. Originality, sincerity and compelling emotion were the main features of most of the works. This made the job of the International jury very difficult, especially in the category of pictures.

14 works were awarded: 5 first prize, 4 second prize and 5 with third prizes; another 13 participant received encouraging prizes. Most awards won the children from Kazakhstan (4), followed by Croatia and Bulgaria (by 3) and Japan and Lithuania (by 2). In the exhibition 35 were additionally included, winning the jury recognition. For the second time Professor Nakano and his students from the Yamaguchi University took part, presenting an original exhibition “Phantom in Karst II”.

For Grand prize for creative achievement the jury nominated four competition works by 4 different categories. After processing the results, convincingly headed out the mural “Karst cave” (category “Work with natural materials”) developed by Amina Mushtakova (10 Age) and Nariman Abdigapparov (11 Age) from the UNESCO associated school “BEST” (Republics of Kazakhstan). They are the first winners of the Grand Prix of this contest and receive an invitation to be honored at the Forum in Shumen, Bulgaria in September 2012.

First prizes were awarded to:

- **Alisa Nikishina**, Unesco associated school "BEST", Almaty, Republic of Kazakhstan – Category Drawing: „*Cave painting*”);
- **Evelina Mikoleiko**, Gymnázium "A. Mickevicha", Vilnius, Lithuania - Category Videoclip: „*Protected karst areas – Bridges to the Future*” (she was also awarded with the special prize of the Organizing committee);

- **Nina Pivcevic**, Institute of Mineralogy and Petrology, Faculty of Science, University of Zagreb, Croatia - Category University Students - Multimedia presentations: "*Geochemical mechanisms of carbonate equilibrium in the system CO₂ - H₂O - CaCO₃*";
- **Smiljana Baran**, teacher, Antuna Mihanovica elementary school Dubecka 5, Zagreb, Croatia - Category My unusual lesson: *Project „KARST”*;
- **Reneta Valkova**, teacher of English, 137 Secondary school “Angel Kanchev”, Sofia, Bulgaria - Category My unusual lesson: Film “*Zemen Gorge and Its Karst Pearl Polska Skakavitsa*”.

The prize pool for the second edition of the competition was provided by the Bulgarian Ministry of Education and Science.

ANALYSIS OF THE COMPETITION RESULTS

The main objective of this competition is to attract the attention of a wide range of students and adults, teachers and naturalists to the characteristics of karst geosystems, the specific environment they create, their importance as economic resources, their aesthetic value and contemporary problems. But in fact, it achieved much wider objectives, concerning the education of young people in love for their homeland, development of research interests, expanding knowledge of how to live environmentally friendly. Karst is a unique natural phenomenon and because it is multifaceted and interdisciplinary, it is still mysterious, with lots of “white spots” (i.e. unknown caves), which excite the imagination of young people and their investigative spirit. And this competition is a challenge for them... and their teachers and parents.

With the two editions of the competition we gained good experience in organizing this event. In 2005 participants from 3 countries showed up, while in 2012 a lot of participants registered from 10 countries. This is a result from more effective promotion and successful coordination among organizers, participants and jury members. We hope the next edition in 2015 to have even more wide representation and public response.

The competition regulations were also further developed. The second edition allowed a wider range of expressions, materials and technologies. The quickly development of IT technologies and their impact on the young people was taken into account and the respective ways of expression such as multimedia presentations, video-clips, etc. were offered. After the second competition it became clear, that there is a high interest to the category “Pictures”, for which age limitation turned out to be disappointing. This requires envisaging some corrections in the competition rules to make this category assessable to participants from different age groups.

Careful analysis of the entries shows that most of the authors have mastered deep knowledge about karst, according to their age group. Particularly impressive is the fact that small children perceive karst manifestations as elements of environmental systems much more easily and naturally. The drawings of Japanese children are indicative in this respect: they depict caves and their inhabitants in close connection with the surface karst. This is an example how through the competition the geo-system character of our World is understood, refracted through the karst specifics.

It is important to note, that many of the participating children have been attracted to the idea to learn more about karst through this competition. For example, in her presentation during the Award ceremony in Shumen in 2012 the Grand Prize winner Amina Mushtakova said that

her first encounter with karst and caves happened along her participation in this contest. Other children (the Japanese group) have also received special training including field trips in order to develop competent art works.

Analyzing the works it becomes clear that their authors are excited not only by the aesthetic features of the specific karst environment. Many of them demonstrate competent knowledge about human activities in these areas. For example, some young Japanese artists depicted the annual burning of the grass on the karst plateau Akiyoshi – an old tradition there.

It turns out that the competition is particularly important for young people living in karst areas. Karst is a part of their homeland, and the better they know, the more they get fond of their birthplace and proud of its karst phenomena. So the language of art, which is fundamental in this competition, becomes invaluable and powerful tool to foster love for the homeland. But while this language is a tool for communication, it develops also understanding and respect for nature and people of other places in the world, because through the competition young people learn that karst is not typical of their native land only. This provokes their curiosity and wish to compare.

The competition provides an opportunity for international contacts of young artists and chances to learn, albeit virtually, to compare their own level of knowledge with new friends around the World (Vanet, 2006).

The international competition „Karst under protection – gift for future generations” contributes greatly to teaching about karst not only the participating children and youth, but also their teachers, a wide range of artists, public figures and journalists. Not least the families of the children learned a lot about karst phenomena. Participation and competition results are also a measure of good work of teachers (Vanet, 2006).

There is another interesting effect of the competition: the enthusiasm of students in mastering knowledge about karst often fascinated their teachers, who had no attitude to karst problems before. A typical example is Professor Y. Nakano from the Yamaguchi University (Japan), who “discovered” the karst of Akiyoshi in relation to the 2005 competition and subsequently connected more closely his professional work with this natural phenomenon.

PROSPECTS FOR DEVELOPMENT OF THE COMPETITION

The organizers aim:

- To expand the number of participants and the number of countries participating in the contest. This may be achieved through better promotion of the “ProKARSTerra” web site and its educational module „ProKARSTerra-Edu”, where all information about the competition would be uploaded. Such information can be offered also through the scientific/practical e-journal „e-ProKARSTerra”, and through different international forums and meetings. The already established contacts should be also used for wider involvement of schools around the world, associated with UNESCO.
- To improve the methods of assessment through discussion with an even wider range of specialists in different areas of karst, art and pedagogy.
- To look for more opportunities to display in different countries the exhibitions of award-winning works, seeking for the support of international organizations. Along a UNESCO supported project a traveling exhibition was organized after the second competition.

- To seek new and more effective forms of work with people who are important for the involvement of children into the competition, basically teachers. For this purpose, possibilities for thematic workshops and traveling seminars (with field discussions) have been considered. They will take place within the International network “University in Karst”, based on the multi-purpose infrastructure already developed in some model protected karst territories. Such a seminar will be held in November 2013, within the already mentioned UNESCO-supported project. An initiative is currently discussed with the Bulgarian Ministry of Education, Youth and Science about holding an international seminar for teachers, who would like to take part in the Third edition of this competition (2015).
- In a strategic plan, the competition may become a basis for creating a dedicated virtual network “Children of Karst”, conceived as a module in the educational strategy “ProKARSTerra-Edu”. In this network young participants will establish contacts and acquaintances, will exchange ideas and experience, and will make suggestions. The network itself can be maintained by the young people themselves and it will promote the competition.
- As new, more original and effective form of award can be discussed, such as organizing for winners specialized expeditions in protected model karst territories.
- After the competitions contacts with the distinguished authors should be continued, in order to maintain and deepen their interest in Karst. Relevant forms for their involvement in the specialized network and their participation in “ProKARSTerra-Edu” should be developed.
- A possibility to raise this competition to the level of **Karst Olympics** may be considered.

The Organizing committee hopes that it may find understanding and involvement of the Karst and Education IGU commissions, for the promotion of the “ProKARSTerra-Edu strategy” and the „*Karst under protection – gift for the future generations*” competition.

The educational initiatives discussed above and the results from the competition have been shared with the participants of the 16th International Congress of Speleology (16th ICS) in Brno, Czech Republic (July 21-28, 2013). We expect that the International Union of Speleology (UIS) will also help in promoting karst education. We believe that realization of the “ProKARSTerra-Edu” strategy is possible if International collaboration is in place, because karst is not only national, but also international phenomenon.

CONCLUSION

The International competition **”Karst under protection - gift for the future generations”** contributes much to attract a wide range of young people to explore karst, to get insight into the characteristics and problems of this specific environment, it offers them a chance to communicate through the language of art and knowledge of the karst phenomena. It is well worth the efforts of all of us who are professionally connected to Karstology, to continue to draw their attention to this field and render our expertise, and provoke their initiative and creativity.

ACKNOWLEDGMENTS

We express our sincere gratitude to the people who contributed to the organization of this competition for their hard work.

We thank all contestants for their interesting works and the compelling emotion expressed in them. We sincerely hope that karst will continue to inspire them.

We owe special thanks to all members of the International Jury for their responsibility and high professionalism evaluating the competition works.

Part of the results we used were obtained in the framework of the International research project DO 02.260/18.12.2008 “*Development of an experimental model of complex modeling for sustainable development and management of protected karst territories*”, supported by the Bulgarian National Science Fund. A part of the proposed educational ideas have been discussed at the International scientific-practical conference “*Protected karst territories – monitoring and management*” (16-20 September 2012, Shumen, Bulgaria) and have been included as initiatives in the final resolution of the forum (<http://www.prokarstterra.bas.bg/forum2012/>). Their development has been supported by UNESCO through an approved project in the Program for participation 2012-2013 „*proKARSTerra - integration between the research concept of Karst geosystems and educational concept “Lifelong Learning” (on the example of model protected karst areas)*”.

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