

## **ENVIRONMENTAL EDUCATION IN PROTECTED AREAS. CASE STUDY FROM BIHOR COUNTY, ROMANIA**

**Dorina Camelia ILIEȘ\***

University of Oradea, Department of Geography, Tourism and Territorial Planning,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: iliesdorina@yahoo.com

**Ștefan BAIAS**

University of Oradea, Department of Geography, Tourism and Territorial Planning,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: baias\_stefan@yahoo.com

**Raluca BUHAȘ**

University of Oradea, Department of Sociology,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: ralubuhass@gmail.com

**Alexandru ILIEȘ**

University of Oradea, Department of Geography, Tourism and Territorial Planning,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: ilies@uoradea.ro

**Grigore Vasile HERMAN**

University of Oradea, Department of Geography, Tourism and Territorial Planning,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: grigoreherman@yahoo.com

**Ovidiu GACEU**

University of Oradea, Department of Geography, Tourism and Territorial Planning,  
1 University st., 410087 Oradea, Bihor, Romania, e-mail: gaceu@yahoo.com

**Răzvan DUMBRAVĂ**

PH.D. candidate, University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University st., 410087 Oradea, Bihor, Romania, e-mail: razvid@yahoo.com

**Florin Miron MĂDUȚA**

PH.D. candidate, University of Oradea, Department of Geography, Tourism and Territorial Planning, 1 University st., 410087 Oradea, Bihor, Romania, e-mail: fmaduta@uoradea.ro

**Abstract:** Environmental education activities should be organized in order to protect the nature and to increase population awareness in this sense. The present paper aims to achieve this objective, by using Valea Roșie Nature 2000 tourist map in print and digital form as an instrument for environmental education activities. These types of graphical and cartographic materials can be efficient means for transmitting information to pupils/students, tourists etc. Also, it can contribute to school curriculum improvement in a moment when many educational institutions have eliminated or drastically reduced environmental education classes and activities.

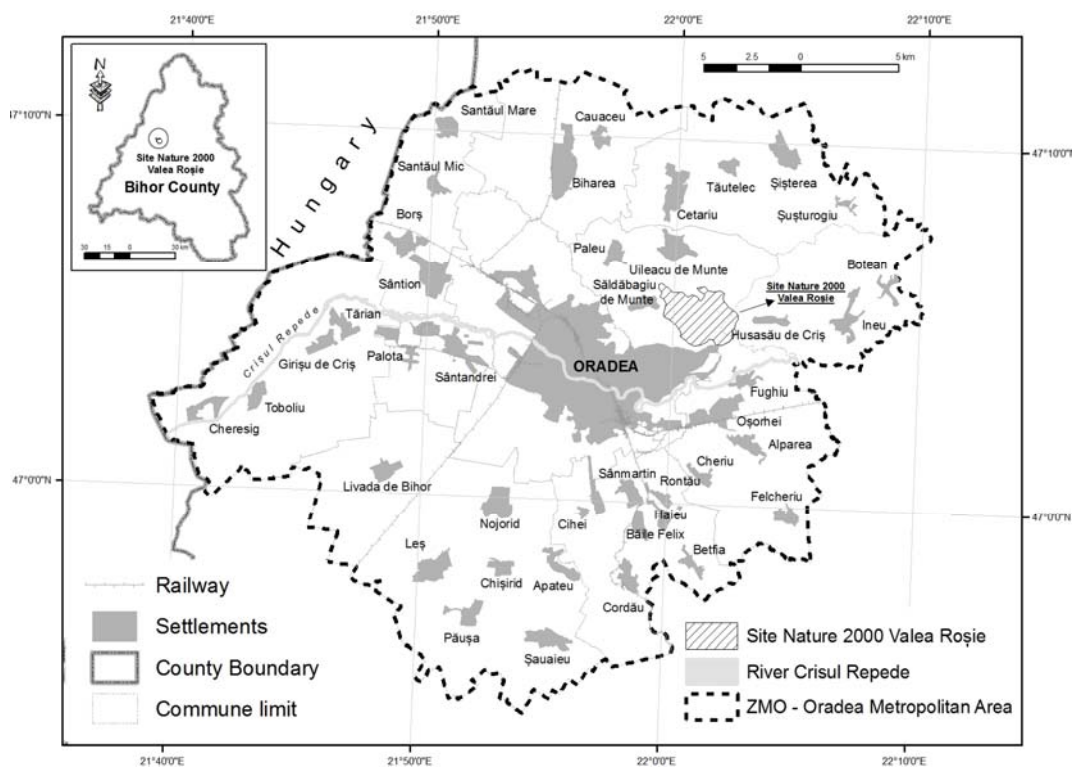
**Key words:** environmental education, Valea Roșie Nature 2000, interactive tourist map

---

\* Corresponding author

## AIMS AND BACKGROUND

In many countries, environmental education has become a new dimension of the educational curriculum aiming to initiate and promote positive attitudes regarding the environment, especially among young people. In Romanian schools, environmental education is an optional discipline. It would be necessary to be included among other subjects of the curriculum such as: geography, biology, physical education and sports, arts etc., and this could be done by school, based on parents' consent. This type of education acts in the following directions: educational needs - awareness regarding the risk of environmental degradation; benefits for society - by developing an appropriate behaviour of youngsters towards protecting and conserving nature (Eagles et al., 2001; Vishwanath, 2006; Kumar, 2006; Linc et al., 2011; Ollerrer, 2012; Blewitt, 2013; Stevenson et al., 2013; Bancheva, 2015; Ienciu et al., 2013; Ilieș et al., 2015; Jovanovic et al., 2016; Ilieș et al., 2016). The present paper aims to address issues of environmental education in a natural protected area within Nature 2000 sites network (Valea Roșie Nature 2000 site ROSC10267). The area is located in the central western part of Bihor County, in Oradea Metropolitan Area (Figure 1). The territory occupied by the site includes three categories of land: pasture (3%), beech forests (93%) and forest habitats (4%) (Herman et al., 2016a).



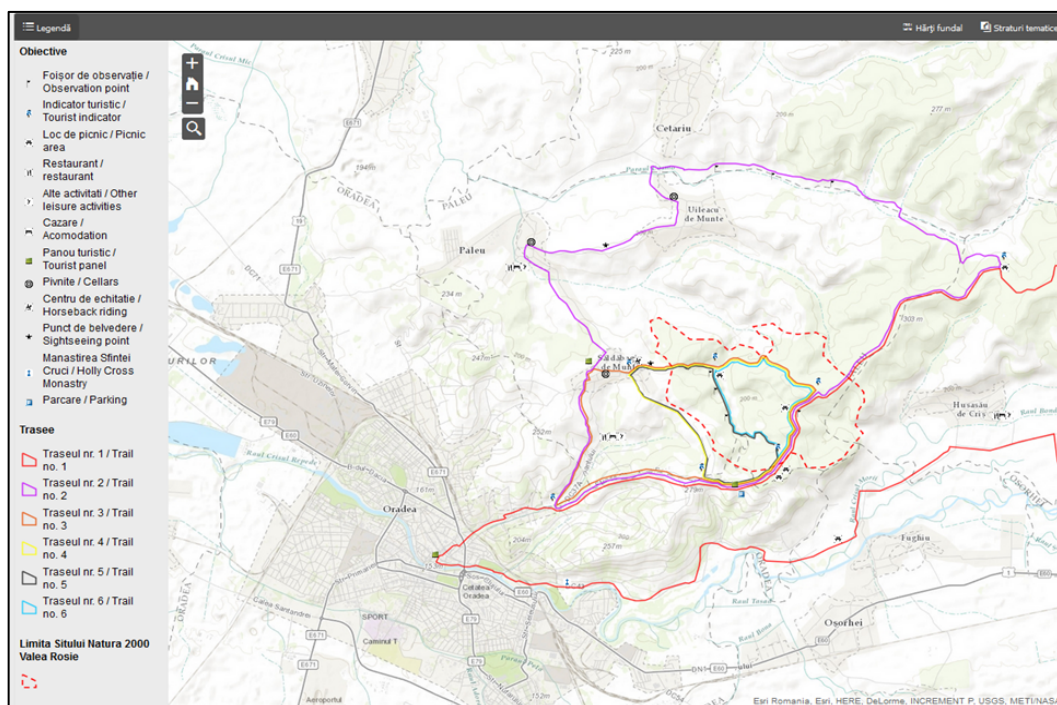
**Figure 1.** Valea Roșie Nature 2000 Site location

Data from this area outline the existence of a single type of habitat - 9130 beech forests *Asperulo-Fagetum* (according to Annex I of Council Directive 92/43/EEC it requires the declaration of special conservation areas), and also of some animal species of Community interest whose conservation requires the designation of special areas in this

sense (Annex II of Council Directive 92/43/ EEC) (Ghira et al., 2002; Herman et al., 2016a), (<http://natura2000.mmediu.ro/upl//formulare/ROSCIO267%20-%20F.pdf>).

## EXPERIMENTAL

Our research methodology consisted in: bibliographical documentation, field survey and mapping. After obtaining the information, we begun the analytical phase - processing data and information obtained through GIS technology and other specialized software. In order to reach the aim of the present paper, we called also a qualitative research method – the focus group. Using this in-depth methodological frame we can provide a complementary mean regarding the dimensions of environmental education in Oradea and the way in which this aspect in approached in relation to a natural protected area (Golumbeanu et al., 2014). The interactive tourist map of Valea Roșie Natura 2000 site (Figure 2), Bihor County, Romania has been created by using the application ArcGis Online. From a structural point of view, it has been organized into thematic layers: tourist attractions, trails, limits of Valea Roșie Natura 2000 site, with the possibility of introducing other thematic layers as well, changing the existing ones according to the necessities etc. The legend of the map is bilingual, Romanian and English.



**Figure 2.** Interactive tourist map of Valea Roșie Natura 2000 site, Bihor County, Romania

The map can be accessed at the hyperlink: <http://www.arcgis.com/apps/MapTools/index.html?webmap=f54ec5bfo1fa4660be159c5d29b2bbcb>. The development of the tourist map within the present study gathers a lot of basic elements in what regards the rules and techniques of visual communication in tourism. The map provides interpretative trails, which, according to Morales (1992) can be seen as touristic service for a general public, casual visitor to an area or not.

The trails on the map are developed along natural paths and are accessible for a wide range of population (even for people with disabilities) on foot, bicycle, horse-riding etc., and is one of the best ways to enjoy activities in a protected area. We state that the map has an appealing aspect (Ham, 1992) and fulfils specific technical requirements related to layout, design and operation (MBRS, 2005). Trails` layout is circular and uses curved lines, which, according to some specific studies are more attractive for people because they create a sense of curiosity (Ham, 1992).

The map is more than informative; it also provides information and location of certain elements of major interest and importance (MBRS, 2005). Besides, this map could be a strategic element for environmental education in a protected area, due to the fact that principles of nature conservation are better transmitted and understood if they are graphically illustrated by using familiar elements and facts (Herman et al., 2016b; MBRS, 2005). Therefore, we believe that the usage of such tourist maps can awaken and even enhance visitors` desire to conserve the protected area.

### **FOCUS GROUP METHOD AND RESULTS ANALYSIS**

The general objective of the focus group was to investigate how ecological education classes are integrated in the curriculum at pre-university level in Oradea. Accordingly, we delineated 3 specific objectives (Babbie, 2011): SO1: identifying the methods/instruments used by teachers from schools in Oradea city in order to integrate environmental education classes in the curriculum; SO2: outlining the feedback collected from pupils after participating at environmental education classes; SO3: identifying how cartographic materials (maps) can be integrated in environmental education classes. The focus group gathered different specialists who share common interests regarding ecological education in natural protected areas and who can provide professional opinions about our topic of interest.

The total number of participants was eight: the custodian of Valea Roşie protected area, an environmental education specialist, a pre-university teacher, an environmental specialist, a geographer, a biologist, a physician, a sports representative. Discussions, guided by a facilitator, lasted about 1 hour and 30 minutes and were audio-recorded. Throughout discussions participants were guided and encouraged to freely share their perceptions related to the topic.

The interview guide was elaborated in compliance with the research objectives and covers three themes of interest: 1. The way in which ecological education classes are integrated within the curriculum at pre-university level; 2. Pupils` feedback regarding ecological education classes; 3. The usage of cartographic materials in ecological education. First we aimed at identifying local and regional inhabitants` (from Oradea city and Bihor County) knowledge degree about Valea Roşie Nature 2000. Results outline the fact that information regarding this area is not widely disseminated among locals.

More popular natural protected areas are those which represent political, economic or social interest. Still, Valea Roşie Nature 2000 is very well known by specialists and in terms of surface, location and possibilities it is a suitable area for thematic study camps addressed to pupils and students. In what follows, analyses made on research themes will be discussed.

#### **Environmental education classes**

First of all, we aimed at identifying if schools in Oradea put an emphasis on the importance of ecological education. Answers had a high degree of homogeneity: unfortunately, there are very few schools in our city that provide classes of environmental

education. And when provided, these classes are optional and stipulated only at gymnasium level. Mostly, parents decide the educational path of their children and they tend to choose more pragmatic disciplines.

„Parents prefer math, informatics .... They are not aware of the importance of environmental education. They think children won't need it” (pre-university teacher).

Even if confronted with this reluctance, pre-university teachers consider that environmental education classes can be promoted through other specific school activities, like cleaning the class room or school-related activities organized in partnership with organizations. These practices tend to have a positive effect on pupils and they are more motivated to learn new things about the environment. Promoting environmental education based on local, regional and national inter-institutional partnerships (universities and public authorities) is also very important.

„We need to increase associativity. Universities can have a major role here. Only by doing this, we have a chance to increase the degree of knowledge regarding environmental education” (environmental specialist).

### **Feedback from pupils regarding environmental education classes**

In rare cases when pre-university children benefit of environmental education, classes are held outside the class room and teachers try to embrace a more applicative teaching-learning process. Hence, children interest regarding environmental education is stimulated and their feedback is always positive.

„Children are curious about environment and they appreciate all related activities. When they get to know certain aspects about environment, they begin to ask additional information” (pre-university teacher). Even if the feedback is positive, the Romanian legal framework is restrictive in what regards the possibility to conduct environmental education classes outside the class room. When the educational process develops in the field, few teachers are willing to assume increased responsibility for every children.

„Teachers don't want to take responsibility for children when going in the field for a class or another. They simply refuse to do that” (pre-university teacher).

### **Cartographic material and ecological education**

We were also interested in how the cartographic material, mostly tourist maps, can be efficiently integrated in ecological education classes, camps, etc. Two directions were delineated: usage in schools and in extra-curriculum activities. Cartographic materials can provide support for sports activities and competitions, touristic orientation and other tourism-related activities.

„Cartographic materials are being used during ecological education classes in our schools, in Oradea.....but we can rely only on maps” (pre-university teacher).

„Cartographic materials can be efficiently used in different activities: sport, tourism, touristic orientation for children, but not only. I think these materials will add something extra and new to this type of activities” (geographer). In terms of specific methods and techniques used in environmental education adapted to different age groups (preschool, school or high school), the interactive tourist map can be considered a support for practical actions (outdoor exercises, practical work, creative activities etc.) by developing specific activities on the proposed routes. The interactive map can be used for informational training with the help of the computer (e.g. interactive lessons using interactive maps and satellite images, mobile and tablet applications etc.)

## **RESULTS AND DISCUSSION**

Environmental education programs heavily depend on specific environmental conditions and social adaptation related to site's delimitation; in this case, the

administrative territory of the municipality of Oradea Metropolitan Area. In order to increase the awareness degree especially among young people (pupils, students etc.) through such activities, it is necessary to have a direct contact with the nature (a primary goal in a natural protected area must be developed through sports and recreation activities; also it would be useful to consult the material before the visit - e.g. books, brochures, guides, maps etc.), and also to have materials placed in situ in order to guide tourists and visitors (e.g. billboards, posters) (Serrano, 2011). In this respect, a first step would be to place information boards that contain cartographic material, data about protected flora and fauna, data about tourist attractions etc. The information included on boards aims to awaken the visual sense of the tourists, to train and consolidate some specific skills and competences in order to actively observe and understand the site's complexity. It would also be useful to have some guidance boards.

Six routes that follow the existing forest roads were proposed within the interactive tourist map; they will be synchronized with the site's management plan (if it will be available), interlinked with the city of Oradea and neighbouring localities, where other environmentally friendly sports and entertaining activities can be offered. These activities are interconnected with environmental education activities specific for a natural protected area. The prepared cartographic material can be used in proximity schools (e.g. with the help of some PowerPoint presentations, a brochure or a web page etc.) during the ecological education classes and with practical applicability in the field.

## CONCLUSIONS

At least at local level, more specific in Oradea city and in Bihor County, schools provide a poor educational offer in what regards environmental education classes. These classes are present mainly at gymnasium level and they are optional. Unfortunately, parents' educational options for their children are oriented towards other disciplines.

However, schools which undertake environmental education classes try to integrate and efficiently use cartographic materials (mostly geographic maps) in their teaching-learning process. But, these materials can be very well integrated in school-related activities and not only, such as sports, competitions, touristic activities etc.

Regardless of the above mentioned aspects, children display positive attitudes towards environmental education, and their curiosity is enhanced by specific practical activities in the field. Even if we take into consideration this feedback, it is a complicated procedure for teachers to conduct environmental education classes outside class rooms, because Romanian legislation is very restrictive in this sense.

A proper and efficient promotion of environmental education at pre-university level would require a strong collaboration between schools and local and regional institutions and authorities, such as universities.

## REFERENCES

- Babbie, E., (2011), *The Basics of Social Research*, 5th edition, Wadsworth CENGAGE Learning Publishing, Boston, USA.
- Bancheva, H., (2015), *Methodology for multi-day tourism in Vrackansky Balcan Nature Park as a contribution to the education for sustainable development*, in J. of Environmental Protection and Ecology, 16, no 1, 298-303.
- Blewitt, J., (2013), *The media, animal conservation and environmental education*, Routledge, Canada and USA.
- Eagles, P., Bowman, M., Tao, Chang-Hung, T., (2001), *Guidelines for tourism in parks and protected areas of east Asia*, Published by IUCN, Gland, Switzerland and Cambridge UK in collaboration with the University of Waterloo, Waterloo, Ontario, Canada.

- Ghira, I., Venczel, M., Covaciu-Marcov, S., D., Mara, G., Ghile, P., Hartel, T., Torok, Z., Farkas, L., Racz, T., Farkas Z., Brad T., (2002), *Mapping of Transilvanian Herpetofauna, Nymphaea, Folia naturae Bihariae*, 29, 145-201.
- Golumbeanu, M., Nenciu, M., Teohareva, M., Stepanova, K., Rubel, O., Dyachenko, A., Goriup, N., Gilca, A., Bilashvili, K., (2014), *Environmental Sustainable Tourism within the Black Sea Region*, 574, J. of Environmental Protection and Ecology, 15, No 2, 574-579.
- Ham, S., (1992), *Environmental Interpretation: A Practical Guide for People with Big Ideas and Small Budgets*, Forest Wildlife and Range Experiment Station, University of Idaho, USA.
- Herman, G., V., Ilieș, D., C., Baiaș, Ș., Măduța, F., M., Ilieș, Al., Wendt, J., Josan, I., (2016a), *The tourist map, scientific tool that supports the exploration of protected areas, Bihor County, Romania*, GeoSport for Society, 4, 24-32.
- Herman, G., V., Ilieș D., C., Măduța M., F., Ilieș Al., Gozner, M., Buhaș R., Mihok-Geczi I., M., T., (2016b), *Approaches regarding the importance of Natura 2000 sites' settings pupil's education through geography. Case study: Valea Rose (Red Valley) Natura 2000, Bihor country, Romania*. Journal of Geography, Politics and Society, 6(4), 57-62.
- Ienciu, I., Vorovenciu, I., Oprea, L., Popescu, C., (2015), *Urban Development of Mountain Areas with the Aim of Developing Local Tourism*, in J. of Environmental Protection and Ecology, 14, No 3, 980-985, (2013).
- Ilieș Al., Ilieș, D., C., Deac, A., L., (2015), *Selective, subjective or exclusive Tourist Map*, GeoJournal of Tourism and Geosites, 16, 217-226.
- Ilieș, Al., Wendt, J., Ilieș, D., C., Grigore Vasile Herman, G., Marin Ilieș M., Anca Luminița Deac A., (2016), *The patrimony of wooden churches, built between 1531 and 2015, in the Land of Maramureș, Romania*, Volume 12, pp 597-602 - Issue sup1 (<http://dx.doi.org/10.1080/17445647.2016.1243075>).
- Jovanovic, S., Zivkovic, L., J., Prnjat, Z., Obradovic-Arsic, D., Mihajlovic, B., Budovic, A., (2016), *Environmental education from the perspective of serbian primary school geography teachers*, J. of Environmental Protection and Ecology, 17, 394-401.
- Kumar, D., A., (2011), *Environmental education*, New Age International (P) Ltd., New Delhi, India.
- Linc, R., Nistor, S., Turnock, D., (2011), *Aspects regarding the environmental impact of tourism activities in the Apuseni Natural Park (Romania)*, Analele Universității din Oradea – Seria Geografie, 21, no. 2, 340-353.
- Morales, J., (1992), *Manual for Environmental Interpretation in Wild Protected Areas*, Technical Document, no. 8, Project FAO/ UNEP, (in Spanish), Santiago, Chile.
- Ollerrer, K., (2012), *Ecological education – between necessity and opportunity, (in Romanian)*, The Quality of life, 23, 25-44, Bucharest, Romania.
- Serrano, E., Trueba, J., J., G., (2011), *Environmental education and landscape leisure*. Geotourist map and geomorphosites in the picos de europa national park, GeoJurnal of Tourism and Geosites, 8, 295-308.
- Stevenson, R., B., Brody, M., Dillon, J., Wals, A., E., J., (2013), *International handbook of research on environmental education*, Routledge, New York, USA.
- Vishwanath, H., N., (2006), *Models of teaching in environmental education*, Discovery Publishing House, New Delhi, India.
- \*\*\* (2005), *Project for the Conservation and Sustainable Use of the Mesoamerican Barrier Reef System (MBRS)*, Environmental Interpretation Manual for Protected Areas in the Mesoamerican Barrier Reef System Region, Belize City, Belize.
- <http://natura2000.mmediu.ro/upl/formulare/ROSCIO267%20-%20F.pdf>  
<http://www.arcgis.com/apps/MapTools/index.html?webmap=f54ec5bf01fa4660be159c5d29b2bbcb>

Submitted:  
26.07.2016

Revised:  
02.05.2017

Accepted and published online  
04.05.2017