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BUZAU LAND GEOPARK. STEPS IN BUILDING A NEW GEOPARK IN ROMANIA

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Abstract: Rapid development of geopark concept and positive results of existing geoparks have generated in Romania both the official recognition of geopark as distinctive protected area and the increase of interests of new territories to develop geoparks. Based on a local initiative and a grass root effort a new geopark project has been launched in Romania: The Buzău Land Geopark. Located in the South-eastern part of Romania (Fig. 1), the territory covers about 1100 sq kilometers, comprises 18 mayoralties and a population of 45000 inhabitants. Unique geological sites like: mud volcanoes, amber deposits, salt caves and oil springs are present. Sedimentary rocks folded and overthrust are depicting a geological history covering more than 70 million years. The paper is presenting the main steps taken so far in building the new geopark. The approach is based on our previous experience in Hateg Geopark and in other geoparks members of the European Geoparks Network. The process comprises: interdisciplinary research studies, stakeholders identification, local heritage evaluation, and sustainable development strategy design, establishing the basic requirements for a brand development, correlation with local projects and initiatives and design of training courses for the geopark team. This approach allowed us to identify the optimal territory for the geopark, to create a framework for partnership, local needs identification and to set-up clear objectives for sustainable use of local resources. The commitment of local communities has generated national projects dealing with public awareness, cultural events, promotion, and informal education. All these are valuable elements to prove the rightness of the geopark concept and its capacity to join around groups and stakeholders from different areas of interest.

Keywords: geopark, Romania, Buzau Land, sustainable development

1. Introduction

The geopark concept as we know it today is the result of continuous efforts of few dedicated specialists and of innovation and cooperation of different teams and territories across Europe. Key elements of the concept development are synthesized below:

a) Innovative approaches in using local geological heritage as main resource for socio-economic development in LEADER territories from France, Germany, Greece, Spain then Italy, Great Britain and other countries (Frey, 2003; Martini, 2003; Zouros, 2003, Zouros, 2004);

b) Continuous development of geoconservation activities especially after the 1st *International Symposium on the Conservation of our Geological Heritage* and of the 4th *International meeting of the Earth Science Conservation – European Working Group*, held in Digne, France, in 1991 that adopted the *Digne Declaration*;

c) The need for a practical use in geotourism, education and public awareness of all geological assets identified and classified by different geopark teams, working groups of ProGEO, specialists from natural parks and museums and other professional geological associations (Brilla et al., 1999; Hose, 1999; Page, 1999; Fassoulas, 2003; Kollman, 2003; Macadam, 2003; Watson, 2003; Weber, 2003);

d) The need for an integrated approach and a better understanding of the close connection of natural environment and socio-economic needs for sustainable development plans design and for local Agenda 21 as required Rio the Conference in Brazil, in 1992.

The beginning of European Geoparks Network (EGN) started in 1996, and was clearly stated in 2000 as a result of an international project among four territories focused on their geological heritage

(Zouros & Martini, 2003, Zouros, 2004; Frey et al., 2006). UNESCO's division of Earth Sciences supported from the beginning the process and had a first attempt to launch a new programme and a geopark label in 1997 when a first guidelines was issued (Patzak & Eder, 1998). UNESCO watched and sustained the process and, based on the European experience and results, extended the concept worldwide in 2004 (UNESCO, 2004, 2008) when the Global Geopark Network (GGN) was set up. The geopark approach of geoconservation proved to be very efficient and now EGN has 35 members from 13 countries and GGN has 63 members from 19 countries.

A Geopark creates appropriate methods to raise the awareness for the geological heritage of our planet and develops new strategies in nature conservation and local development. During the 2nd UNESCO International Conference on Geoparks, held in Belfast, in 2006, Guy Martini (2006) launched the provocation of a complete new vision of geopark concept and management and suggested to some of the oldest geoparks to develop inside their territory experimental zones called "geopark - phase II".

Hateg Country Dinosaurs Geopark (HCDG) was the first geopark in Romania (Fig.1). Established in 2004 as a natural park, it joined EGN and GGN in 2005. HCDG is the result of a grass root effort which started in 2001. It's development followed since the beginning the EGN Charta, and UNESCO's recommendations but adapted to local social and economic realities (Grigorescu & Andrasanu, 2003). The territory of Hateg Geopark is a good example of the geodiversity of Carpatho – Balkan region. Geological evolution of the area covers more than 500 million years and the network of geosites comprises: granite outcrops and boulders, bauxite quarries, reef limestone, volcanic structures, Mesozoic and Cenozoic continental and marine fossils, karst and cave systems. The territory contains one of the latest assemblages of dinosaurs in the world, internationally unique and commonly known as the "dwarf dinosaurs of Transylvania" (Grigorescu, 2005).

Our experience in Hateg Geopark set-up and management and in other geoparks revealed that for the South East European countries there are special economic and social conditions we have to take into consideration in the process of building a geopark (Grigorescu & Andrasanu, 2006).

Hateg Geopark experience generated in Romania a new approach in nature conservation, Romania being one of the first countries to recognise the geopark as a distinct protected area according to the Act no. 57/ 2007. Also geodiversity become part of management plans in several natural and national parks and new geopark initiatives and projects were launched: Mehedinti Plateaux Geopark (South Carpathians) is already recognised as natural park, Buzau Land Geopark (southern part of East Carpathians) is near to become official a geopark (Andrasanu, 2008). and a new initiative for Baia Mare Geological and Mining Park (northern part of East Carpathians) was launched in 2009 (Kovacs & Fulop, 2009).

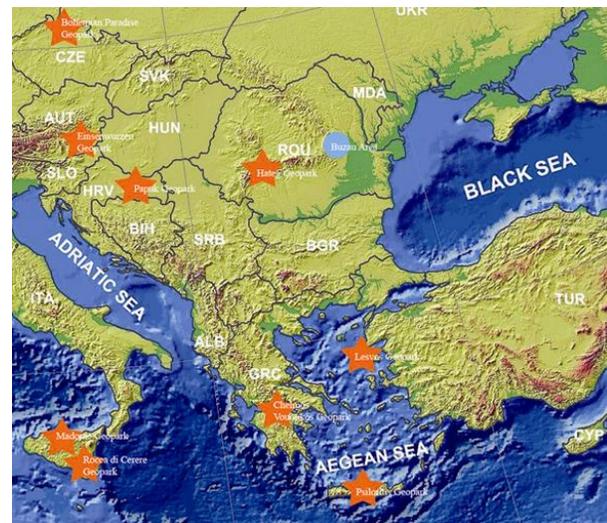


Fig. 1. Location of the Buzau Geopark area. The stars point geopark members of the European Geoparks Network (modified after EGN map, 2009).

The Buzău Land Geopark project is an initiative of the Buzau County Council in partnership with the University of Bucharest and is supported by other local and national bodies and institutions. Located in South East of Romania, in the Carpathian bend zone, the territory endorses unique geological places and phenomenon, a high biodiversity, five Natura 2000 sites, and a well preserved cultural heritage. All these assets recommend the area to be well fitted to become a geopark.

2. Materials and Methods

Our research approach in geopark project development was focused in keeping a balance among the requirements of what an international geopark means, the local socio-economic and cultural realities and the need to create a base for further European funded projects and initiatives.

Cooperation and partnership development between institutions and private individuals, both from the public and private sectors, together with governmental and non-governmental organizations was the first step we taken so far. Three levels of partnerships and working groups were created: i) first one is that of decision makers and stakeholders; ii) the second one comprises national and local institutions with specialists from different areas of competence able to develop and sustain research studies; iii) and the third group is made of local enthusiastic people able to create a link among different teams and between specialists and local communities.

The second step was the evaluation of the partner's interest and a work plan development (table 1). Interdisciplinary teams of specialists in geology, biology, anthropology, ethnography, sociology, tourism, education were established in order to produce detailed research studies of the whole area. The objective was to identify the territorial system components, their relationships, social and eco-

nomical needs, and to assign a role and relative priority to each identified need (Andrasanu, 2007).

The third step was to analyse the results of preliminary studies for 36 mayoralties (more than 200 villages) foreseen to be part of the geopark. This activity offered us the possibility to evaluate the potential of geopark development and further management in the frame of the Buzau County and its neighbouring areas. This evaluation is important if we take into consideration that a geopark territory overlaps an organic context of tangible and intangible realities. Physical structures, such as geodiversity and biodiversity, are linked to local cultural identity. In respect to that the geopark area has to be coherent from the social, administrative and cultural point of view and to be a key element to support and strengthen local identity (Andrasanu & Grigorescu, 2006). The results of all these analysis indicated the need to select for the Buzau Land Geopark only 18 mayoralties (about 156 villages) from the 36 foreseen initially.

Table 1. The partnership working plan.

Objectives	Results	Assumptions
R1. Mapping proposed Geopark with relevant levels of protection	Map provided and endorsed by relevant local, national and international authorities and institutions	Results of surveys provide bulk of necessary technical information Realistic available data
R2 Complete inventory of geological, biological archaeological, cultural assets	Inventory provided and endorsed	Results of surveys provide bulk of necessary technical information
R3 Recreation / tourism opportunities (carrying capacity & infrastructure) analysed and sustainable financing resources identified	Identify the main element to support tourism development (tangible and intangible); SWOT Analysis for existing tourism activities Design the framework for a Management visitor plan; Identification of a brand	Appropriate co-operation with stakeholders; Funding opportunities available; Existing strategies for tourism development, commitment to apply them and appropriate local and national fund resources or chemes
R4 Small business development, analyse opportunities for small business development within Geopark framework, training and funding opportunities identified	Analyse of different local initiatives, projects, strategies, web pages; Questionnaires, interviews with stakeholders, decision makers, local people; Intercommunal association to support the projects	Appropriate co-operation with stakeholders; Funding opportunities available; Realistic local development plans and political commitment; Previous cooperation projects of local stakeholders
R5 Provision of all necessary documents / guidelines and costs for registration and management of the geopark	Structure of the geopark documentation; Develop a Charta (Strategical fame-work) for the local communities; Develop the geopark brand : Buzau Land Geopark; Partnership with mass-media	Appropriate co-operation with stakeholders; Local initiative, existing associations and community projects; Policy makers and local stakeholders support the brand development and incorporate it in other initiatives
R6 Provision of all necessary documents for registration of the geopark as a protected area	Documents provided and endorsed; Local and national partnership for education, research and management	Local resources for geopark management; Project team; Charismatic person to represent the geopark
R7 Provision of all necessary documents for joining national network, EGN, GGN	Documents provided and endorsed; Management structure, financial resources, development plans, local partnerships	Commitment of local communities; Results and impact in geopark management

The fourth step was dedicated to detailed interdisciplinary studies for the selected villages and a SWOT analysis for tourism and community projects. The fifth step was to provide and endorse documentation for geopark official recognition and to set up a strategy to support local sustainable development. The sixth step was to identify the basic elements required to create the “Buzau Land Geopark” Brand and to sustain the project by national partnership projects. The Buzau Geopark Intercommunity Association was created to foster the geopark project in partnership with local and national institutions, universities and museums.

3. Results

Field research and documentation allowed us to map and inventory the components of the geopark geodiversity, biodiversity and cultural assets and to provide documents for further plans and projects.

The Romanian Carpathians are part of a complex

structure formed in response to the Triassic to Tertiary evolution of three continental blocks. The first two are represented by Tisza (the Internal Dacides) and Dacia (the Median Dacides) the third one by Eastern European, Scythian and Moesia platforms. The blocks were separated by two oceanic domains, the Transylvanides and the Outer Dacides (Ceahlau – Severin) (Sandulescu, 1984; Csontos and Vörös, 2004; Schmidt et al., in press, Vasiliev et al., in press). Cretaceous and Miocene events led to the deformation of these units and their related sediments. According to different interpretation several structural units were identified (Sandulescu, 1984): Transylvanides, Piennides, Median Dacides, Outer Dacides, and Moldavides. The geopark territory is partially overlapping the Moldavides (Tarcau Nape and Subcarpathian nappe) and the thrust internal foredeep. The geologic map (Fig. 2) shows a faulted and folded geological setting of flysch deposits of the Tarcau

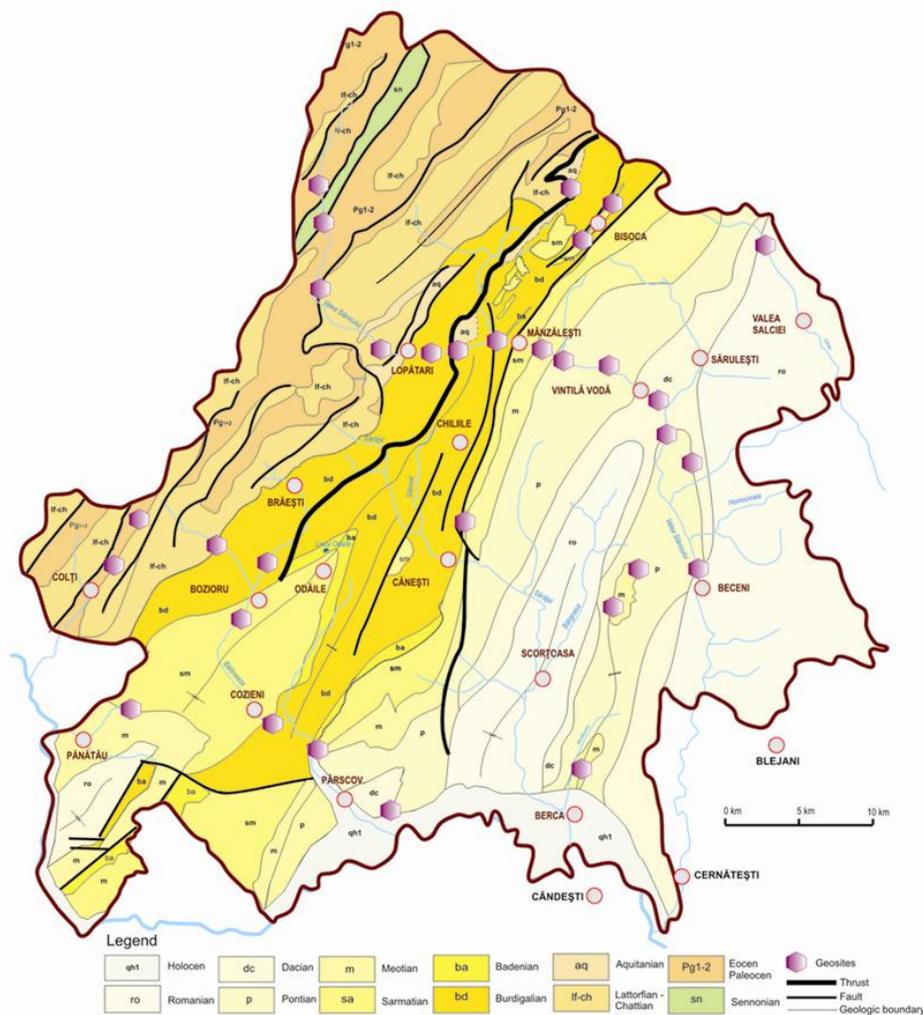


Fig. 2. Geologic map of the Buzau Land Geopark territory (after IGR, Covasna and Prahova maps, Sc. 1:200000).

Nappe (Sennonian – Lower Miocene), marls, sandstone, salt and gypsum of mollase type deposits of Subcarpathian Nappe (Lower – Middle Miocene) and sandstone, marls of marine, lacustrine, deltaic and fluvial environments of the thrust internal foredeep (Upper Miocene – Holocene). Associated fauna of invertebrate's fossils and sedimentary structures are characteristic for the last part of Tethys Basin Evolution, the transition to Paratethys (Dacic Basin) and the intermittent connections with other basins. A well documented sedimentary record of Messinian Crisis event and of the Miocene / Pliocene boundary in Paratethys are well represented along the Slanicul de Buzau Valley (Krijgsman et al., in press). The area is well known for its comprehensive Pontian, Dacian and Romanian deposits and also for few outstanding geological assets like Romanian amber, salt diapirs and mud volcanoes.

The Colti amber, Oligocene in age, is famous for its variety in color from yellow to black and insect's fossils remains and was described for the first time as *rumanit*. Samples of amber and a collection of documents and tools from a former local mine are exhibited in Colti Museum (Fig. 3).



Fig. 3. Examples of local geodiversity: mud volcanoes in Piclele Mari (left); Colti amber (center); salt Hills in Meledic area (right).

The salt deposits (Aquitanian) outcrop along faults and diapir structures in different locations. The largest area is in Meledic hill where salt like exo and endo karst structures could be seen (Fig. 3), fresh water lakes and typical salt habitats, all of them quite well preserved. The salt was a local trade product but also an important factor in generating natural hazards.

The biggest mud volcanoes in Romania are located on the Berca-Arbanasi hydrocarbon bearing structure (Eastern Carpathians Foredeep). The Paclele Mari (PMA) and Paclele Mici (PMI) areas were declared natural reserves since 1924 (Baciu & Etiope, 2003) and now are part of a larger Natura

2000 SCI site. Their activity is generally quiescent with some intermittent explosive activity up to one meter high generating a peculiar landscape and a special habitat for halophile plants (Fig. 3).

Geopark biodiversity was shaped by the geological and climatic evolution of the Carpathians in connection to North Dobrogea and Black Sea areas. The geopark territory is covering three biogeographic regions: steppic, alpine and continental. Field studies allowed us to identify 77 habitats types, a great number of species listed in different national and European directives for nature conservation and few endemic species: *Euscorpius carpathicus*, *Nitraria shoberi* and *Artemisia santonicum*.

One of the most impressive historical and archeological characteristic is done by the 30 caves digged since VI century (?) by orthodox Christians in soft Oligocene sandstone beds. Hard living conditions and isolation of this small monastic community made people to call the area „Romanian Athos” (Fig. 4). The map from figure 5 presents a selection of natural and cultural sites of the Buzau Land Geopark.

4. Discussion

Rich geological and biological diversity often coincides with cultural diversity, and the conservation and management cannot be undertaken without the involvement of people closest to these resources. The main objectives of a geopark are: i) to respect and protect local cultural values; ii) to strengthen identification of the population with their area; iii) to foster socio-economic development that is culturally and environmentally sustainable. A successful geopark has a balanced construction, in terms of surface, resources and support and a good management structure. To build a Geopark means a bottom-up process, based on a

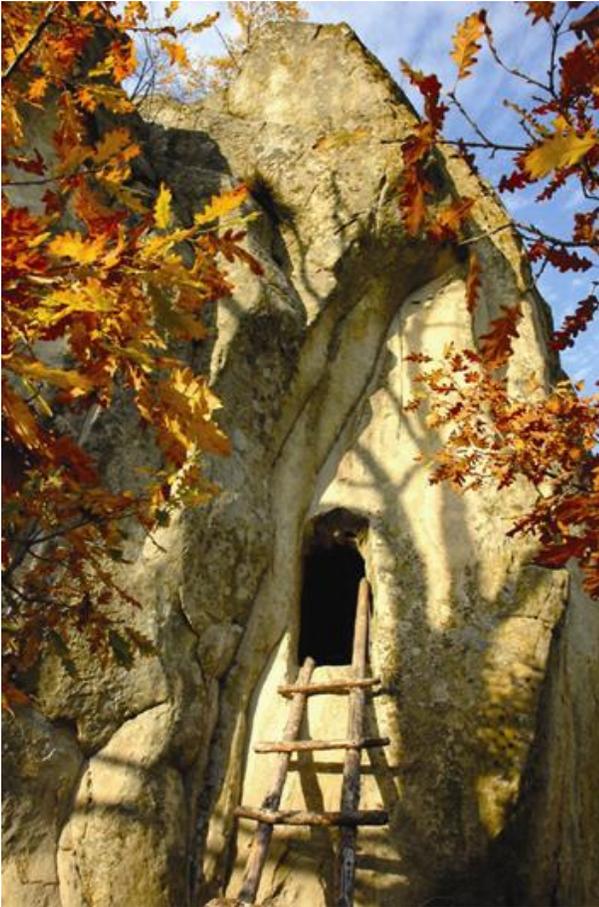


Fig. 4. Entrance of the “DionisieTorcatorul Cave” part of an ancient orthodox monastic settlement (photo credit M Mincu).

strong multi task-force concept and political will with long-term financial support. Effective management requires a strong commitment of local communities and administrations. To create a successful geopark one of the key point is to identify its optimum territory. An optimum territory could be defined by the following conditions:

- 1) Relevant network of significant and valuable geological, biological, cultural sites, with a balanced distribution and worthing to be preserved in a sustainable way;
- 2) A territory enough large to foster sustainable socio-economic development. A small territory of few communities has no natural, social and financial resources to support a geopark. A large territory is difficult to be managed in a sustainable way and generates conflicts with other development projects or land use plans;
- 3) A geopark territory has a cultural value being a distinct place of interaction between nature and people, a record of past and present activities and a place of local identity made by tangible and intangible values.

4) The associate communities have strong cultural, social and economic affinities. The management process requires a continuous consultation with relevant statutory bodies, to guarantee effective conservation and to adopts its own territorial policy for sustainable regional socio-economic and cultural development;

5) Geopark`s border is overlapping the administrative border of associate communities. Geopark management needs organizational arrangements to involve public authorities, local communities, private interests, and both research and educational bodies in partnership projects that cover the whole geopark territory.

The Buzau Land is a territory of continuous cultural influence of the three Romanian provinces: Transylvania, Moldavia and Wallachia. Being mainly a remote rural area these influences were continuously adapted and transformed to local characteristics in different degrees and generated cultural, social and economic differences among the communities. Field research, meetings of partners, public debates allowed us to identify local values, cultural affinities and the commitment of different structures to participate in geopark development. The results indicate that the initial territory of 36 mayoralities foreseen by county administration for a future geopark is not an optimum one due to the following considerations:

The initial territory is too large, about 30% of the county surface (Fig. 6), being a potential source of unbalanced development and conflicts. The high mountain area in Northwest is very sparsely populated and our recommendation is for that part to be integrated into a regional national park;

There is an unbalanced distribution of the geological, biological and cultural sites. The Eastern and Southern parts left out are mostly agricultural areas with less geological and biological sites of interest;

Due to geographical position an historical evolution there are communities with strong influence, cultural affinities and commercial connections in the neighboring regions Transylvania, Wallachia and Moldavia (Fig. 7). This context generates a lack of commitment or interest for different communities to work together within a geopark

The selected territory considered being optimum for geopark development and management comprises 18 mayoralities representative for what was historical called “Buzau Land”. These communities are strongly bound by cultural, commercial,

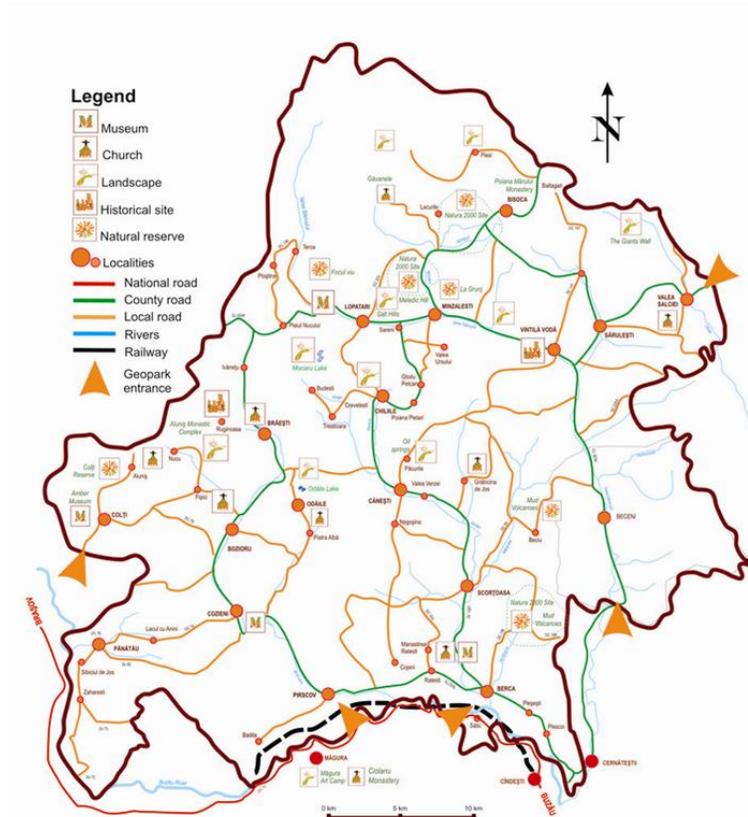


Fig. 5. Natural and cultural sites of the Buzau Land Geopark (selection).

social activities and traditions, and already developed common projects. The selected territory for Buzau Land Geopark is quite homogenous from the economic point of view (Fig. 8), is covering an

area of about 1100 sq km and a population of 45000 inhabitants, most part of them still living in a traditional way (Fig. 9).

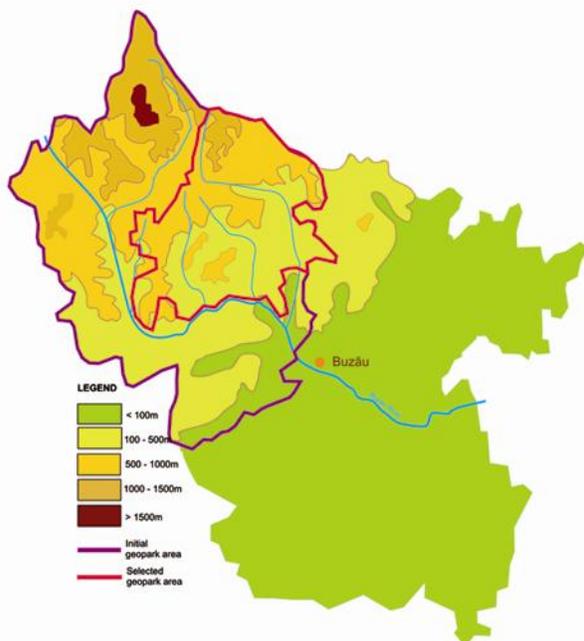


Fig. 6. Buzau County relief map presenting the borders of the initial and the selected geopark areas.

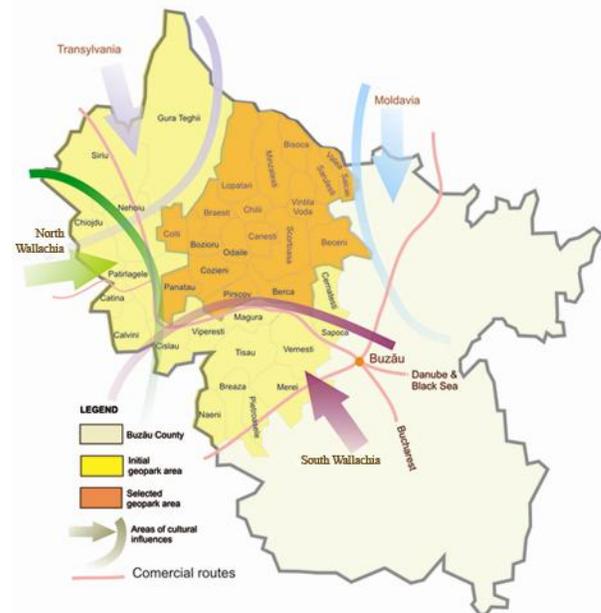


Fig. 7. Local identity is a key issue in geopark management and common projects implementation. For Buzau Geopark heterogeneous areas with strong influence from neighboring regions were left apart after cultural and socio-economic analysis.

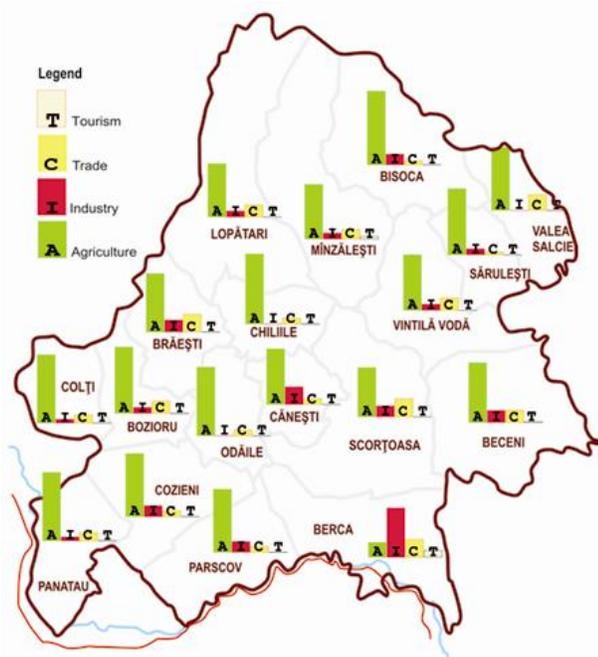


Fig. 8. Synthesis of the main incomes for local communities of the geopark. The sum of the four activities represents 100%. Note the small amount of incomes from tourism, less than 5%.

The selection process of the optimum territory was a crucial point in geopark development and allowed us to plan future common activities and especially to focus on projects aiming to strengthen local identity. The geoparks border is overlapping the administrative borders of the associate localities and different development documents like Geopark Charta or Geopark Management Plan will be easier implemented with the full support of local administrations and policy makers.

A detailed SWOT analysis of the geopark territory was the base for a strategical framework for sustainable use of local resources: the Geopark Charta. In concordance with the LEADER initiative of local communities, the document identified the main axis of territorial development, possible projects, partnerships and financial resources. Members of the Action Local Group are partners of the geopark team. The 18 mayoralties set-up an Intercommunity Association in order to implement the identified projects, correlate different initiatives and manage the future geopark and to assure a political and administrative support for the geopark.

The results we have mentioned completed the inventory of the Geopark in accordance with the conditions of Romanian legislation that regulate the declaration of an area as official Geopark.



Fig. 9. Local people are still living in a traditional way (photo credit I. Piturescu).

5. Conclusions

To fulfill the dual objectives of geo-conservation and the fostering of local socio-economic development that is socially and environmentally sustainable for Buzau Geopark our approach was based both on experience of different European geoparks and Hateg Geopark and we presented few basic ideas in approaching a geopark set-up:

The territory of the geopark has to comprise a relevant number of geological, biological, cultural sites, with significance both for scientific and local communities and worthy to be preserved;

The territory of the geopark has to be quite homogenous from cultural, economic and social point of view and its border to overlap the administrative borders of the partnership communities;

The need for detailed interdisciplinary research studies to identify the territorial system components, their relationships, social and economical needs and assign a role and relative priority for each one related to local identity valorization;

Use of the research results and multi-stakeholders approach to develop social, economic and cultural projects and to support active participation and involvement of local communities;

Create local, national and international partnerships for formal and informal education, public awareness, projects development and to promote the area and its values;

Develop a brand for the geopark territory in order to strengthen local identity and to valorize local innovative approach, in our case “Buzau Land Geopark”;

Each territory has its own identity, and also is part of a national and international context. For Romania and other South East European countries is important to adapt the geopark concept to their context of socio-economic evolution, European development programs and the need to foster local identity.

This approach has generated in Buzau area a framework for partnership, local needs identification, set-up of clear objectives for sustainable use of local resources. Strong support of local communities generated partnerships for national projects dealing with public awareness, cultural events, promotion, and informal education.

Buzau Land Geopark territory is fulfilling the requirements to become a geopark and all the steps we have already taken so far created the base for its official recognition. The geopark territory comprises a rich geodiversity and peculiar geological phenomena are representatives for the established geological framework items of Carpatho-Balkan area and Europe, as were defined by different PRO-GEO initiatives (Wimbledon et al, 1998) and can aspire to play its own role as an international geopark.

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