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## **FOREWORD**

*The today's world is controversial – nothing around us remains stable. We, as human beings, we should constantly adapt ourselves to the climate changes, to the bad economic circumstances, to the consequences of our own aging process and, above all, we should keep a balance between us as individuals, our family, and the society as a whole. It not easy at all!*

*The East European Countries, in the past decades, experienced a lot of dramatic changes: the endless transition to the market economy shaped the collective behaviour of the mature and young generations, the old ones failed to adapt themselves. Access to resources has changed the equilibrium in power; authorities, most of the time, have hesitated in giving the land back and have perpetuated the corrupt way of doing “historical justice”. In Romania, old generation representatives still claim in front of the court their rights on land ownership; most of them have already died, and passed the litigious rights to next generation as inheritance. The current JEDEP Issue includes an interesting paper on access to resources which is raising important debates on power and authority in post communist countries, especially in Romania.*

*In the past decades, an important part of East European inhabitants have experienced the mirage of the West. Young, healthy workers leave their home country, their family looking for better life - a wealthy one. What means wealth? Sometimes, it signifies a good second-hand car or a new house on bricks built in the home village. The labour force migration causes economic imbalances, especially in the home countries and even some strange social phenomena: children remaining at home with their grandparents are psychologically affected. Finally, when the crisis strokes the exodus starts: the migrants are returning to their home countries, their children born in a foreign country, barely understand their own culture and sometimes are even rejected. They experience an identity crisis- another type of crisis.*

*We are living in a very complex and complicated world, adaptation is important as much as sustainable development. Concerns about economic sustainability are numerous and they should be analyzed in connection with the insurance of vital energy resources to sustain the economic growth. Current economic crisis seems to be endless, politicians and economists are looking for the “global cure” but the most affected are ordinary people: unemployment, bankruptcy and fear for daily security in term of food and living conditions. Two papers are tackling the sustainability issues from two different points of views. One of our current authors is suggesting*



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*that education could make the difference in adopting a green approach to today's' challenges, so I am inviting you to discover what education can do.*

*Why society is a complex problem? Philip Ball in his book "Meeting Twenty-first Century Challenges with a new Kind of Science" is trying to obtain some answer and an excellent review of this book is included also in our current issue.*

*Dear readers, we are letting you discover the rest by accessing the content of our current issue.*

*Manuela Epure*

*Editor in-chief*



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## The analysis of the energy intensity of economies by selected indicators of sustainability (Rio+ 20)<sup>1</sup>

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### **Abstract**

*The aim of this paper is to analyze the status and the development of energy intensity in selected countries of Central and South-eastern Europe. Reducing of energy consumption is one of the ways to ensure not only economic, but also environmental aspects of sustainability.*

*This paper describes the relationship between economic development and energy intensity of countries, particularly the countries of the selected region.*

**Keywords:** energy intensity, primary energy consumption, GDP, national economy

**JEL Codes:** Q01, R11

### **1. Introduction**

One of the questions, which the United Nations Conference on Sustainable Development Rio 20 + dealt with, was the question of higher utilization of renewable energy sources.

Renewable energy, with support of economic growth, could significantly reduce carbon emissions and pollution in outdoor and indoor spaces. (The Future we want, 2012)

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<sup>1</sup> This article is published as one of the outputs of the grant No. APVV- 20-060805, APVV LPP-0211-09, KEGA 384-001PU-4/2010, VEGA 1/0541/11 and KEGA 007PU-4/2011



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Various climate scenarios predict raising the temperature of climate over the next 100 years up to 3 °C. According to these forecasts, there would be a rapid melting of glaciers in the Antarctic, the Arctic and Greenland, which would cause increasing the global sea levels and flooding of densely inhabited areas, particularly in India, Bangladesh, but also in Europe. Currently, there is an acceleration of melting glaciers. At the national conference UNO in Rio de Janeiro in 1992, which was oriented to environment and sustainable development, was adopted the United Nations Framework Convention on Climate Change, which is a main legal tool for the global climate protection. Problems with the enormous growth of all types of environmental pollution are currently transferred to Asian countries, especially to highly populated areas in China and India. Economies of these countries are developing rapidly, but there are not contracts or agreements oriented to reducing emissions (Barančíková, G., Fazekašová, D., Manko, P., Torma, S., 2009, s.173).

There are renewable natural resources usable as energy: sun, water, wind, and biomass. The potential of renewable energy sources is used around 25% in the Slovak Republic (Hronec et al, 2009, s.150).

The issue of more intensive use of renewable energy sources is the topic of many other authors (Milošev et al, 2011; Golušin, Ivanovič, Vučenov, 2012; Matovska, Siljanovska, 2012 and others).

The more intensive use of renewable energy sources leads to cleaner production. Cleaner production is characterized as the systematic and purposeful application of strategies for the prevention of environmental pollution, focused on processes, products and services with the main aim to increase their efficiency and to reduce risks to humans and the environment. Consistent application of cleaner production affects all phases of the reproductive process and is oriented to reducing of environmental impacts. In practice, cleaner production is applying by solution of partial problems in technology characterized by important impact to environmental pollution (Chovancová, 2011, s.84).

Realization of renewable energy sources projects is one of the groups of environmental projects. On the basis of demonstrated differences of environmental projects in comparison with conventional commercial project, we can conclude that the financing of environmental activities is characterized by following specifics:

- low or no economic return of projects based (mainly or exclusively) on environmental activities
- low interest of entrepreneurs in the realization of environmental activities,
- pressure of government authorities to entrepreneurs to environmental activities support and their realization, mainly by legislative standards
- specificity in assessing of the economic benefits raised from environmental activities - benefits in reduction of fines and payment due to lower environmental damages after the realization of environmental project
- significantly more social than economic character of realization of environmental activities
- the result is often, in the eyes of the public, improved perception of economic activities of entrepreneur, in the comparison with PR activities (Kotulič, Závorská, 2007, s. 5)





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We can conclude that the increased use of renewable energy sources cannot do in the current technological conditions without simulative external environment (especially financial support). An alternative to the environmentally efficient use of energy can be a more efficient use of technologies based on conventional energy consumption, thus the continuous improvement of technological processes in the activities of national economies.

## 2. Methodology

In the present contribution we analyze the status and development of renewable energy sources in the selected EU countries with a focus on the countries of Central and Southeastern Europe.

We use a set of selected indicators of sustainable development (in the category Climate change and energy, used also by Eurostat), which is also in accordance with the strategy Europe 2020. We complement the global economic indicators into the analysis.

The analysis includes the period 2001-2010.

There are assessed indicators: GDP per capita in EUR, indicators of sustainable development: Primary energy consumption in tones of oil equivalent (TOE) respectively in 1000 tones of oil equivalent (TOE)

Data for the analysis were obtained from official sources of Eurostat.

In the analysis, we focused mainly on the status and development of selected indicators in those countries which are members of ACEU. Unfortunately, due to the absence of relevant data, analysis could not be realized in all members' countries.

We are focused on countries of Central and Southeastern Europe: Bulgaria, Hungary, Romania, Slovak Republic and Slovenia.

The data were processed by statistical software Statistica and Systat.

There was realized normality test of analyzed values, considering sample size, by Shapiro-Wilk test<sup>2</sup>.

$$W = \frac{\left( \sum_{i=1}^n a_i x_{(i)} \right)^2}{\sum_{i=1}^n (x_i - \bar{x})^2},$$

$x_{(i)}$  – the  $i$ th-smallest number in the sample

$\bar{x}$  – the sample mean

$a_i$  – the constants  $a_i$  are given by

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<sup>2</sup> <http://www.vniuk.co.uk/products/imsl/jmsl/v30/api/com/imsl/stat/NormalityTest.html>



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$$(a_1, a_2, \dots, a_n) = \frac{\mathbf{m}^T \mathbf{V}^{-1}}{(\mathbf{m}^T \mathbf{V}^{-1} \mathbf{V}^{-1} \mathbf{m})^{1/2}},$$

$$\mathbf{m} = (m_1, m_2, \dots, m_n)^T,$$

$m_i$  – the expected values of the order statistics of an iid sample from the standard normal distribution  
 $V$  – the covariance matrix of those order statistics.

Correlation analysis in case of rejection of normality was realized by Kendall tau coefficient:

$$\tau_B = \frac{n_c - n_d}{\sqrt{(n_0 - n_1)(n_0 - n_2)}}$$

$$n_0 = n(n-1)/2$$

$$n_1 = \sum_i t_i(t_i - 1)/2$$

$$n_2 = \sum_j u_j(u_j - 1)/2$$

$n_c$  - number of concordant pairs (i.e. if  $x_i > x_j$  a  $y_i > y_j$  or  $x_i < x_j$  a  $y_i < y_j$  for each sample consisting of  $n$ -observations pair of variables  $X$  and  $Y$ )

$n_d$  - number of discordant pairs (i.e. if  $x_i > x_j$  a  $y_i < y_j$  or  $x_i < x_j$  a  $y_i > y_j$ )

$t_i$  - number of tied values the  $i^{\text{th}}$  group of ties for the first quantity

$u_j$  - number of tied values the  $j^{\text{th}}$  group of ties for the second quantity

### 3. Results and Discussion

We assessed the relationship between economic development and consumption of energy.

Economic development was assessed by the indicator of production - GDP per capita in millions EUR in current prices, average of the period 2001-2010. We assessed the energy consumption by indicator Primary energy consumption in tonnes of oil equivalent (TOE) per capita and by indicator Primary energy consumption in 1000 tonnes of oil equivalent (TOE) to GDP in millions EUR.

Because the normality test leads to the rejection of preconditions about normal distribution of analyzed values, the correlation test was Kendall test.

	energy/GDP	energy_per_capita	GDP_per_capita
energy/GDP	1,000	-0,269* (0,027)	-0,610**(0,000)
energy_per_capita	-0,269* (0,027)	1,000	0,644**(0,000)
GDP_per_capita	-0,610**(0,000)	0,644**(0,000)	1,000



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Based on the results of the analysis, we can conclude that there is a highly significant correlation between the parameters. Between the economic development in the countries (economic indicator) and both indicators of energy consumption, there is highly reliable and close causal relationship. High production of GDP per capita in the country also indicates high energy consumption per capita. In this case, there is causation - high economic development in the country or welfare of country allows to inhabitants to achieve a higher level of satisfaction of their needs, which are often related with the consumption of energy resources. However, the analysis also pointed out to another important (and statistically significant) relationship - higher output GDP per capita in the country is in indirect relation to the energy consumption per unit of GDP. Thus, countries more advanced economically – more developed countries, are able to produce their outputs and income more energy efficiently - per unit of GDP they consume less energy than economically less developed countries. It relates to the structure of the economies of more and less developed countries. In the economically more developed countries, there is a gradual transition to a more sophisticated sectors, not only in industry (with a lower consumption of resources, including energy consumption), but also to higher level of development of the tertiary and quaternary sectors of national economy.

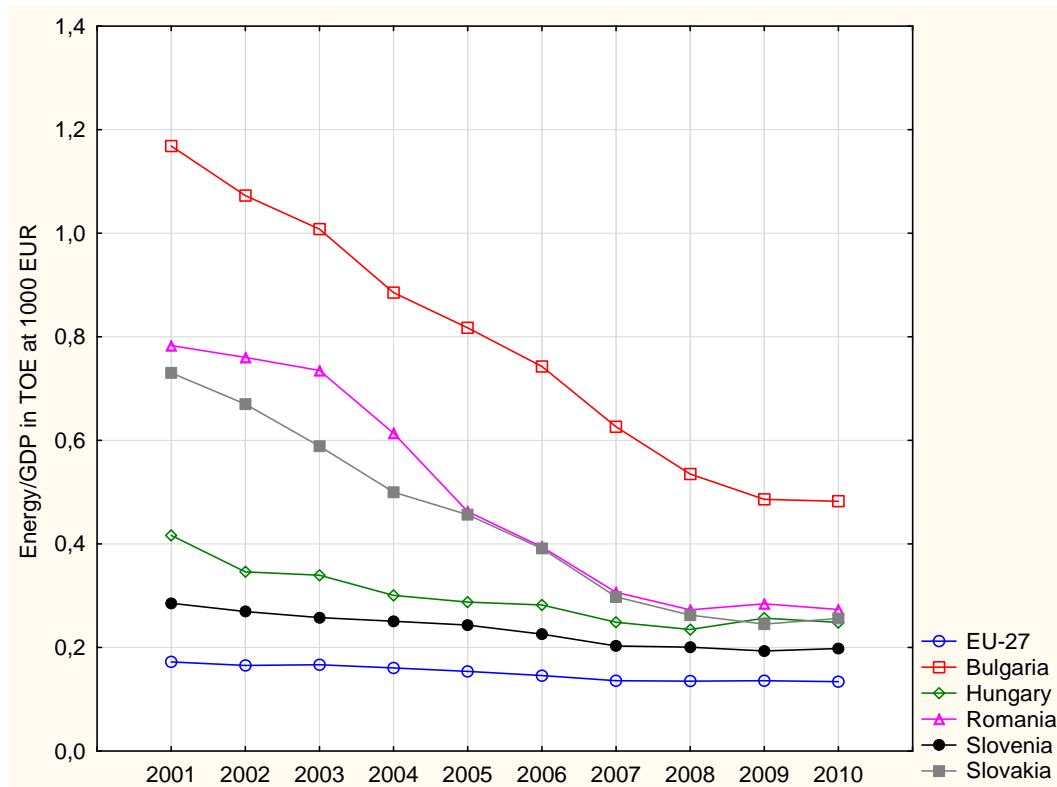


Fig. 1: Annual change of energy consumption in the selected countries (in TOE/1000 EUR)



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Even though economically less developed countries have significantly higher energy consumption to GDP production. We can observe a significant decrease in the energy intensity of these economies over the past 10 years. Although still we cannot conclude, that the transitive countries are with their level of energy intensive of GDP, at the level of EU countries average, in several cases there were even a multiple reduction in energy intensity. It is due to both higher annual increase of GDP in these countries (opposite to economically more advanced countries of the EU), as well as the ongoing restructuring of economies in favor of less energy intensive activities and sectors.

In the time series analysis oriented to modeling of possible future development of energy intensity of economies it is possible to use linear regression models. There were calculated highly significant models (in the model as a whole, as well as in the regression parameters) in each country.

Assuming that the energy consumption is changed, the effect of time is significant (technological changes, continuous process of restructuring economies is realized in time). In this case will be time only one dependent variable.

regression model of EU – 27:

$$y^{**}=0,1769^{**}-0,0048^{**}x$$

regression model of Bulgaria:

$$y^{**}=1,2325^{**}-0,0818^{**}x$$

regression model of Hungary

$$y^{**}=0,3904^{**}-0,0171^{**}x$$

regression model of Romania:

$$y^{**}=0,8626^{**}-0,06799^{**}x$$

regression model of Slovenia:

$$y^{**}=0,2915^{**}-0,0107^{**}x$$

regression model of Slovak republic:

$$y^{**}=0,7581^{**}-0,0578^{**}x$$

There is a prediction of development modelled based on the linear regression models given in table 2.

Table 2: Model values of energy consumption, including prediction

	EU -27	Bulgaria	Hungary	Romania	Slovenia	Slovakia
2001	0,1721	1,1507	0,3732	0,7946	0,2809	0,7002
2002	0,1673	1,0689	0,3561	0,7266	0,2702	0,6424
2003	0,1625	0,9871	0,3390	0,6586	0,2595	0,5845
2004	0,1577	0,9052	0,3219	0,5906	0,2488	0,5267
2005	0,1529	0,8234	0,3047	0,5226	0,2381	0,4689
2006	0,1482	0,7416	0,2876	0,4546	0,2275	0,4110



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2007	0,1434	0,6598	0,2705	0,3866	0,2168	0,3532
2008	0,1386	0,5780	0,2534	0,3186	0,2061	0,2953
2009	0,1338	0,4962	0,2362	0,2506	0,1954	0,2375
2010	0,1290	0,4144	0,2191	0,1826	0,1847	0,1797
2011	0,1242	0,3326	0,2020	0,1146	0,1741	0,1218
2012	0,1194	0,2507	0,1849	0,0466	0,1634	0,0640
2013	0,1146	0,1689	0,1677	-0,0214	0,1527	0,0061
2014	0,1098	0,0871	0,1506	-0,0894	0,1420	-0,0517

Based on the predictions of the development of energy consumption based on the acceptance obtained regression models, it is possible to assume, that analyzed countries will achieve level of the energy intensity of EU countries, in the next few years. This statement cannot be unequivocally accepted, it is necessary to remember, that it is prediction of the future development only based on the only one dependent variable. We can see a trend of continuous reduction of the energy intensity of economies in transition countries and its convergence to average of EU countries. Most probably, the average values of EU countries will not be achieved in any of the analyzed countries in the next few years.

#### 4. Conclusions

One of the ways of sustainability ensuring in the context of the conclusions of the Rio + 20, is searching for more energy-efficient ways of GDP producing. In this paper, we analyzed the energy consumption of selected economies of Central and Southeastern Europe. We can make conclusion that there is a highly significant relationship between economic development and energy consumption, as well as there is relationship between the sophistication of countries and energy-efficient producing of GDP. Transitive countries of Central and Southeast Europe do not attain average of EU countries, but their energy intensity has been improved, in 10 last years. This is one of the ways to ensure of sustainability, higher energy self-sufficiency and better environment of these countries, except for the use of renewable energy sources, in the relation to the conclusion of Rio 20 +.

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## Appendix

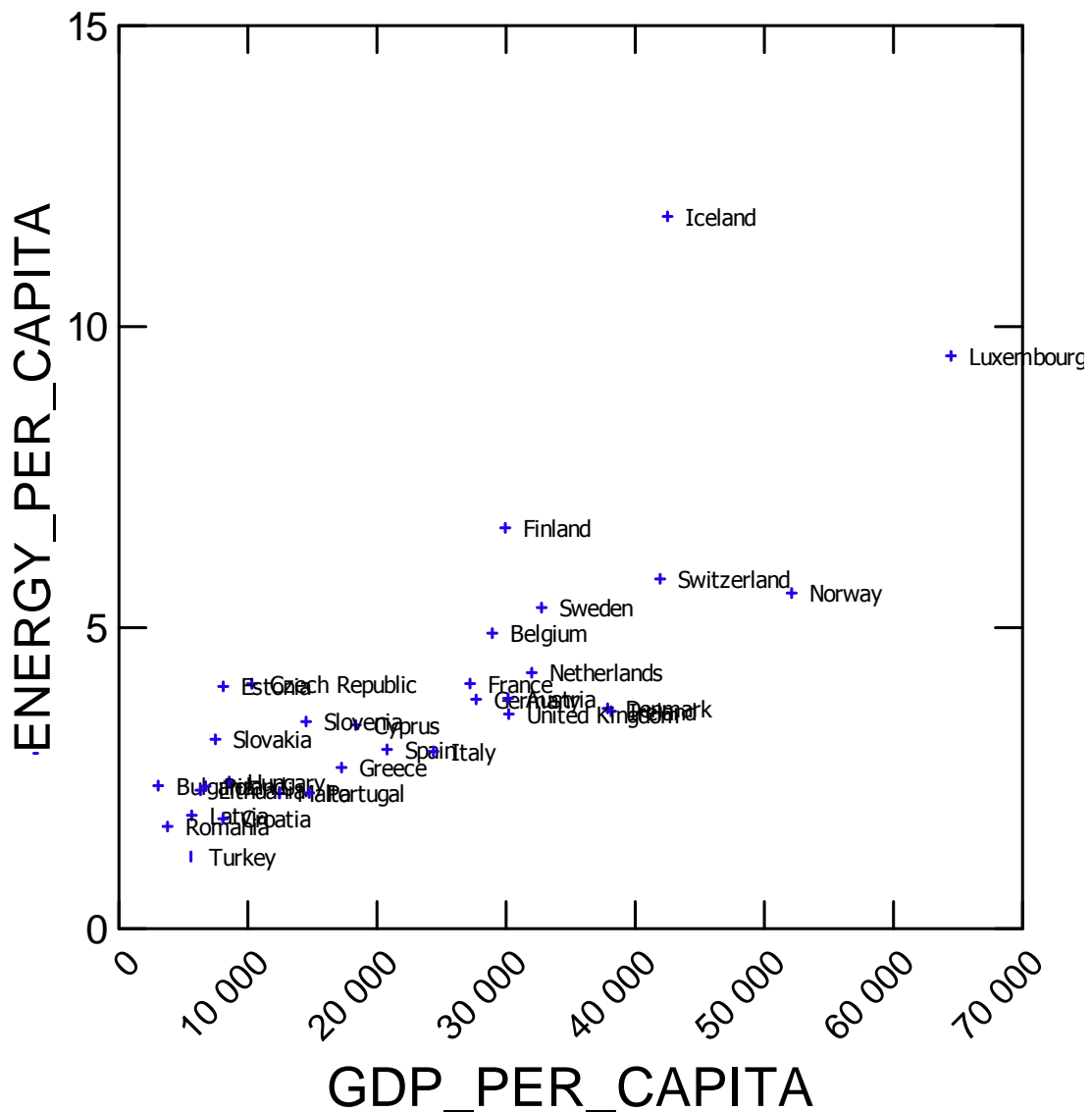


Fig. 1: Relationship between GDP per capita and energy consumption per capita in the selected countries.



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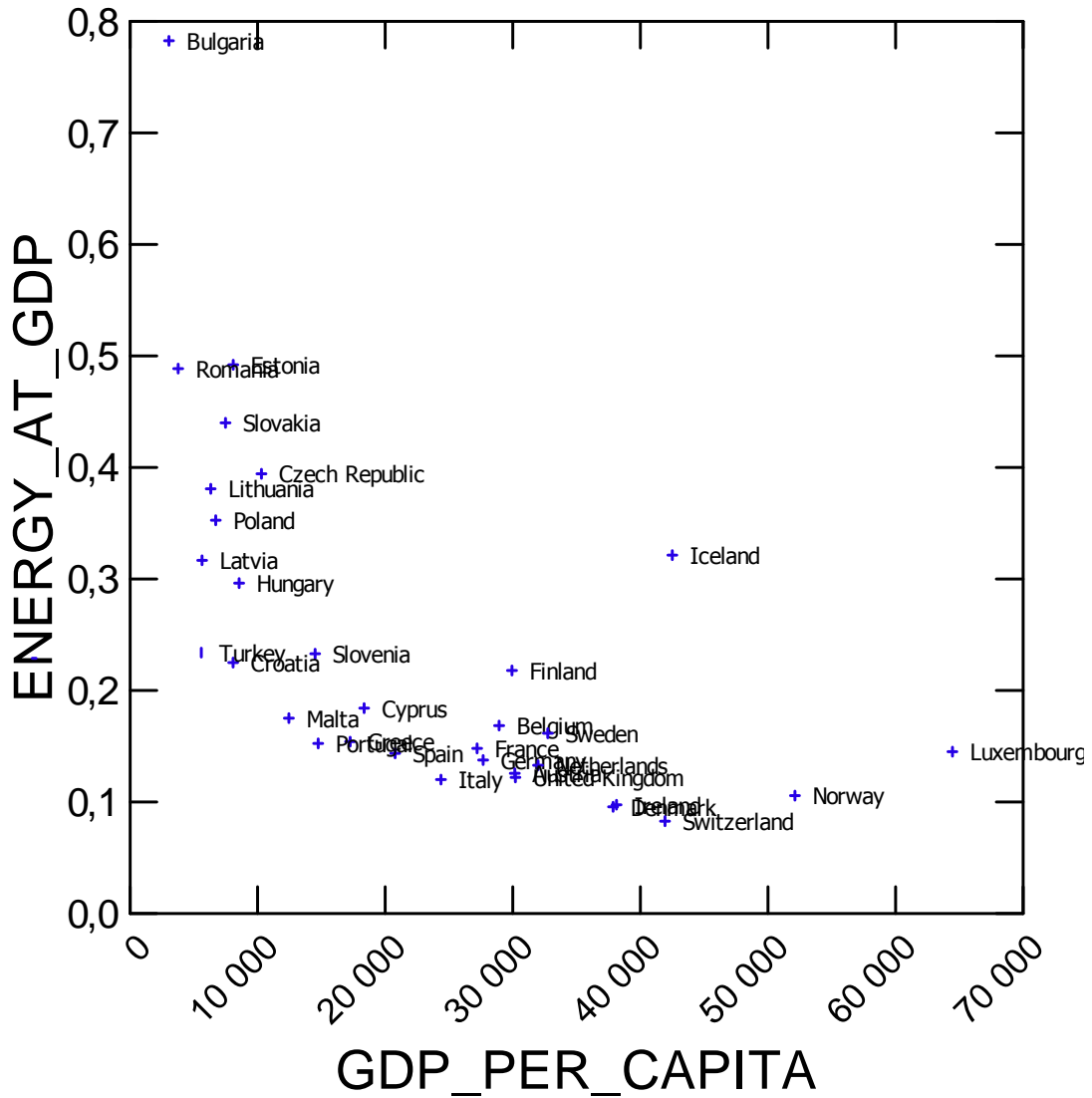


Fig. 2: Relationship between GDP per capita and energy consumption per unit of GDP in the selected countries.





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## Environmental sustainability model and biodiversity preservation in Central Rhodopes

**Zlatka Grigorova, Ekaterina Arabska\***

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### Abstract

*The paper examines the significance, opportunities and ways of biodiversity preservation and sustainable use of natural resources in the central region of the mountain of Rhodopes in Bulgaria.*

*The proposed integrated model of recommendations embraces the following issues: preservation of rare, in danger of extinction and protected plant and animal species and their habitats; implementation of approved environmentally friendly practices in plant growing and animal husbandry; sustainable use of forest, hunting and fishing resources; knowledge, capacity building and motivation in applying measures for sustainable development.*

*In fact that model is composed of many components and considers a number of important aspects. Its application will contribute to the sustainable use of natural resources and preserved biodiversity for future generations.*

**Keywords:** environment, sustainability, biodiversity, sustainable development, habitats, rare and protected species

**JEL Codes:** Q00, Q01, Q18, Q20, Q28

### 1. Introduction

Although Bulgaria is a relatively small country (110,912 sq. km), it is rich in biological diversity due to it is highly varied climatic, geological, topographic and hydrologic conditions. These characteristics predetermine the occurrence of biota, consisting of 94 species of mammals, 383 birds, 36 reptiles, 16 amphibians, 207 Black Sea and freshwater fish, around 27,000 insects and other invertebrates, between 3,500 and 3,750 higher plant species and more than 6,500 lower plants and fungi. Thus Bulgaria country-region ranks among the countries of the greatest biological diversity in Europe [11].

Bulgaria has some of the largest Natura 2000 areas in Europe covering 34.3 % of its territory (Fig. 1).



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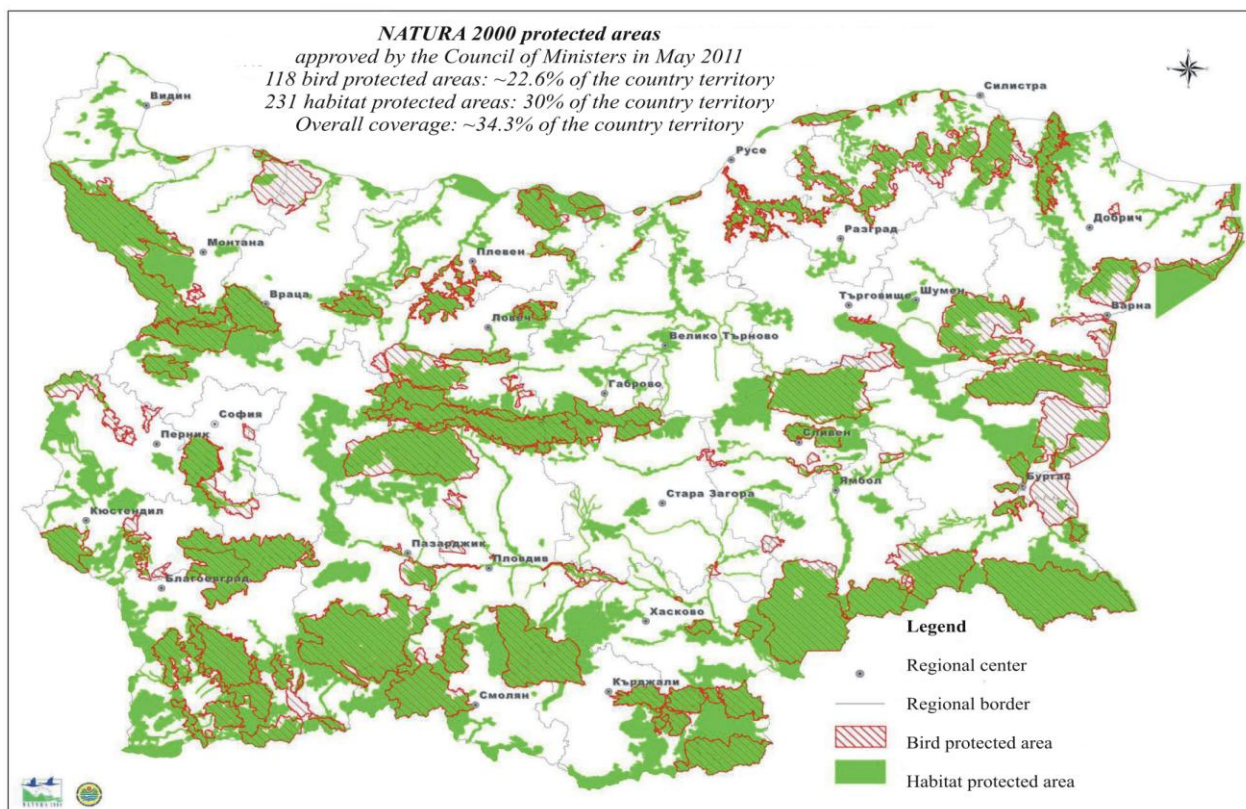


Fig. 1: Protected areas under Natura 2000 approved by the Council of Ministers in 2011

A variety of landscapes, geology and microclimates and thousands of years of human activity have resulted in a rich diversity of species, communities and natural habitats. Bulgaria contains three biogeographic areas (Alpine, Black Sea and Continental), a variety of communities and ecosystems and almost all major European habitat types [4].

Being a common European network composed of protected areas, Natura 2000 aims at providing long-term surviving of the most valuable and endangered species and habitats in Europe in accordance to the international agreements in the field of environmental protection and biodiversity preservation.

As an EU member state Bulgaria must comply with all relevant European Union legislation and directives, including the EU Directive 92/43 on the conservation of natural habitats and of wild fauna and flora and the EU Directive 79/409 on the conservation of wild birds [12].

The main requirements of the above stated directives are put in Bulgarian legislation through the Biodiversity Act of the Republic of Bulgaria adopted in 2011. The protected areas have been announced as a part of national ecological network. Those are pieces of land or water which are in compliance to the requirements for availability of plant and animal species of importance to biological diversity, as well as natural habitats according to the corresponding directive.



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This paper examines the significance and the ways of biodiversity and landscape preservation in connection to the sustainability aspects in the Central Rhodopes Mountain in Bulgaria as a part of a mountain chain with exceptional ecological significance. Enormous climatic and soil variety in the region examined determines the great plant diversity and occurrence of Balkan endemic plants in danger of extinction. In the region some of the least damaged natural ecosystems are situated giving shelter of many rare animal species. Thanks to the fact that it has not been affected by the glaciers, many plant and animal species from Central and North Europe have found protection there [14]. Thus the Rhodope massive represents a valuable ecosystem on the Balkans and one of the most interesting regions in the whole Europe.

All this underlines the importance of biodiversity preservation in the region in terms of species diversity, genetic differences and variety of ecosystems. It is the combination of life forms and their interactions with each other and with the rest of the environment that has made Earth a uniquely habitable place for humans. Biodiversity provides a large number of goods and services that sustain our lives [1].

Thus the paper considers the goal of sustainable development to satisfy current needs but preventing and saving natural resources for future. Economic effectiveness, social responsibility and ecological conformability are the three pillars when characterizing sustainable development and those are implemented in the proposed model.

## 2. Materials and Methods

The recommendations proposed in this paper were formulated through an investigation of the biodiversity of the region and of the European and national legislative and strategic documents. In addition observations were made on place, local community was contacted and some good practices were looked for. On that basis the most important issues and key points were determined and conclusions were made.

## 3. Results and Discussion

In accordance to the Birds Directive in the region of Smolyan (which is the object of current investigation) 3 protected areas have been established: Trigrad-Mursalitsa, Persenk and Dobrostan, and according to the Habitats Directive: Western Rhodopes, Central Rhodopes and Tzigansko gradishte. The territories of Trigrad-Mursalitsa and Western Rhodopes overlay each other and Mursalitsa Hill is placed on the territory of both.

**Trigrad-Mursalitsa** is a territory of middle and high mountains. Forest, rock, meadow and pasture habitats are mainly presented there. Forests cover about 70%, coniferous being the main part - spruce (*Picea excelsa*); pine spruce (*Abies alba*) and pine-tree (*Pinus*). Very small is the share of broad-leaved



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species beech-tree (*Fagus*) and mixed forests. There are two gorges with broad rock complexes (Trigrad and Buynovo). 74% of the land is owned by the state, the municipal property is 12%, and private – 14% which gives lots of opportunities for implementation of the special measures proposed in the paper.

*The preservation objectives:*

- preservation and maintenance of endangered birds habitats in the periods of nesting and migration;
- improvement of nesting conditions for *Falco naumanni* and recovering its population in the region;
- recovering natural forest and pasture habitats;
- preservation of other bird species habitats endangered in Europe according to the Bern Convention on the Conservation of European Wildlife and Natural Habitats;
- investigation of the state of populations of nesting birds in the Annex 2 of Biodiversity Act of the Republic of Bulgaria for improving the conditions of maintaining their vitality and favorable nature conservation status;
- providing protection of vulnerable places of key importance for the species being objects of preservation;
- preserving and maintaining biological diversity in the region as a prerequisite of the stability of ecosystems;
- environmentally friendly use of natural resources and sustainable development of communities.

*Objects of preservation:* 141 species nesting birds, 68 of them being endangered or vulnerable, and special measures that are required for their habitats preservation. 20 species are described in the Red Book of Bulgaria.

Species of European Conservation Concern (SPECs) – 55, SPEC1 – 3 (*Crex crex*, *Falco cherrug*, *Falco naumanni*), SPEC2 – 16, SPEC3 – 20 species. The rest of the species are with a favourable nature conservation status but they are concentrated in Europe and their preservation is of special importance too.

The region provides suitable habitats for 37 species from Annex 2 of Biodiversity Act of the Republic of Bulgaria which requires special measures of protection. 29 of them are placed in Annex 1 of Directive 79/409.

Objects of protection on the territory are the following bird species: *Ciconia nigra*, *Pernis apivorus*, *Milvus migrans*, *Circaetus gallicus*, *Aquila pomarina*, *Aquila chrysaetos*, *Buteo ryfinus*, *Falco peregrinus*, *Alectoris graeca*, *Bonasa bonasia*, *Tetrao urogallus*, *Bubo bubo*, *Glaucidium passerinum*, *Aegolius funereus*, *Caprimulgus europaeus*, *alcedo attis*, *Picus canus*, *Dryocopus martius*, *Dendrocopos medius*, *Picoides tridactylus*, *Dendrocopos syriacus*, *Lullula arborea*, *Lanius collurio*, *Lanius minor*, *Sylvia nisoria*, *Emberiza hortulana*. The territory is one of the most important places in Europe for preservation of valuable populations of *Regulus regulus*.

In the borders of the protected area the following activities have been forbidden:



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- ploughing up the pastures and their turning into arable land;
- pesticides use in pastures and meadows;
- mowing meadows before 1st July as well as mowing from the periphery towards the center;
- establishing new ballast mining places in river beds and terraces, water-power electricity works and wind generators with small exceptions if they are in accordance to the law.

**Western Rhodopes** is the biggest protected area in Bulgaria. It embraces 271909,21 ha.

*Objectives of preservation:*

- preservation of natural habitats and the habitats of species and their populations;
- preservation of natural status of natural and species habitats, including natural species composition, typical species and environmental conditions;
- recovering (when needed) the area and the natural status of natural and species habitats of priority as well as the species' populations being objects of preservation in the borders of the protected area.

*The application of the proposed integrated model is needed because of several reasons:*

- There is a serious and crescent problem connected to pasture habitats preservation and recovery and related to that traditional animal breeding in the region of the Rhodopes Mountain in Bulgaria;
- Pasture and meadow habitats of European significance are a subject of degradation in a great extend because of the insufficient number or the full absences of pasture animals. Those specific ecosystems depend strongly on herbivorous animals and mowing regimes;
- The populations of some rare species, very often objects of poacher's hunting, are in danger of extinction – for example *Bonasa bonasia* and *Tetrao urogallus*;
- The populations of some ecosystems structure defining species are significantly reduced as those of wild rabbit *Lepus europaeus*;
- The capacity and the motivation of agricultural producers and forests owners, hunters, fishermen, specialists and local community in doing high value agricultural lands management and activities in the framework of Natura 2000 is insufficient as is the case for the benefits of multifunctional planning and forest management, ways of wild flora and fauna habitats preservation and of species of European and world significance, etc.;
- There is a lack of a unified policy and a strategy of integration of forest managing and hunting practices with the measures of biodiversity preservation and natural resources integrated management;



The typical sector approach is still being applied in the practices of forest management which hides some risks of a decrease in biodiversity (rare species and their habitats) in the near future.

In addition to the rules of Good agricultural practice adopted by the government, other law acts and strategic documents, investigations in the region led to the formulation of the following recommendations for biodiversity preservation and sustainable use of natural resources on the territory of the Central Rhodopes (Mursalitsa Hill) (Fig. 2).

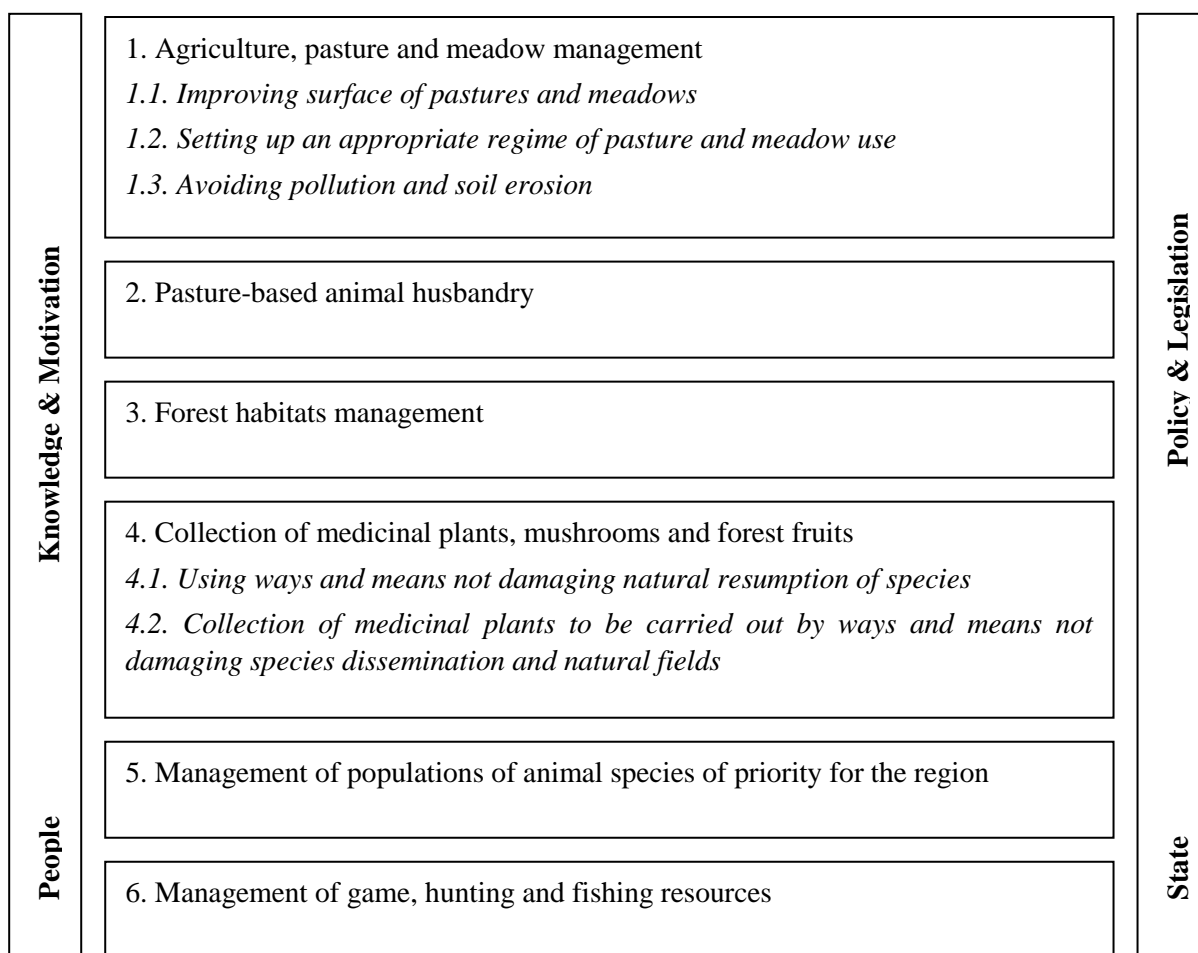


Fig. 2. Integrated model embracing the key issues in biodiversity preservation and sustainable development of Central Rhodopes – Mursalitsa Hill



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## **4. Recommendations in the integrated model of biodiversity preservation and sustainable development of Central Rhodopes – Mursalitsa Hill**

### **4.1. Agriculture, pasture and meadow management**

In pasture and meadow management the following issues should be considered:

- pasture and meadow use that allows long-term preservation of biodiversity;
- the regime of use to be consistent with the climate and the soils in the region;
- the animal load of every one pasture to be in accordance to its productivity, pasture duration and day ratio which is dependent on the animals in agriculture – cows, sheep, horses, goats, etc.;
- the animal load to be mainly determined by the number which could be fed from a unit of area for a season.

#### **4.1.1. Improving surface of pastures and meadows**

- mechanical cleaning of bushes but in accordance with the objectives of the protected area avoiding the mass cutting of bushes, with an exception to juniper in cases of mass invasion in pastures and meadows;
- sufficient animal load of pastures;
- the control of weed and ruderal plant species to be executed by a control of the number of the animals, pasture prohibition early in the spring and in the late autumn and pasture on dry soil;
- sanitary mowing (1-2) for removing unwanted species (*Veratrum album*, prickles, *Conium maculatum* and others);
- adhering to the periods and the number of mowing (traditionally once in August);
- a combined use of mowing and pasture or mowing twice – regularly in a period of 2 years;
- cleaning of stones and concentrating them in dividing borders;
- observation of the European and national law;
- the regulation of water regime in wet habitats (pasture and meadows) to avoid the drainage methods;
- using natural fertilizer, manure;
- sowing suitable species on areas of strong degradation and erosion – the choice of the species must take into consideration the natural type of the territory and main fodder plants.

#### **4.1.2. Setting up an appropriate regime of pasture and meadow use**

- considering carefully the beginning and the end of the pasture season with the concrete characteristics of the region;



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- providing an order in pasture – in spring to start from the lowest parts and gradually to move up, in autumn – in reverse order;
- introducing the rotation use of pastures – steep pastures where the turf is small to be used through the year in order to restore the natural turf;
- pasturing mainly in places which are strongly bushed, especially in the beginning of the vegetation;
- avoiding animal collection on a place in order to prevent the selective eating up;
- when needed, especially in cases of significant increase of the number of the animals, to implement a system for consecutive pasture though plotting the territory.

#### **4.1.3. Avoiding pollution and soil erosion**

- avoiding ploughing of tilted grounds on the tilt;
- in crops fertilization, especially for potatoes, besides manure and nitrogen to use potassium and phosphorus fertilizers;
- controlling the use of chemicals for plant protection – expiration dates and periods of quarantine;
- in farms, in dependence of the number of animals, to build works for manure storage with solid concrete basis in order to protect underground and surface water and soils of nitrates contamination;
- reducing to maximum pesticides use in pastures and meadows.

*The management of pastures and meadows in a proper way can assure maximum produce and effectiveness in a farm.*

## **4.2. Pasture-based animal husbandry**

### **4.2.1. Recommendations for preservation and development of traditional pasture-based animal husbandry:**

- undertaking preventive measures for avoiding damages of bears, strolling dogs, wolves, etc. through building up fences and protection of herds by dogs;
- obligatory registration of animals in farms and bee hives for making easier the application of compensation mechanisms in cases of damages and avoiding diseases advent;
- preservation of local varieties through the selection methods – supportive breeding;
- elaborating plans for local varieties and maintaining the genetic diversity;
- storage of spermatic fluid and embryos aiming at using the time trend and increase the population divergence;
- consolidating and creating professional farms;
- building up local processing works;





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- increasing motivation, qualification and entrepreneurship of agricultural producers in fields of effective use of arable land, pastures, meadows, forests, crops and animals of different species by informational sessions, special training programs, courses, etc.
- improving subsidizing in the sector.

#### **4.3. Recommendations for forest habitats management**

- preservation of existing forest habitats by improvement in security guard – increasing the number of sections under guard and number of guards; increase in community engagement and intolerance towards the violations in the forests;
- fire-precaution measures – increasing and maintaining crop borders and mineralization bands, increasing the number of fire observers, building up permanent observation points and new anti-fire sheds, putting warning signs at the places of tourists collection (parking places, roads running through the forests, etc.), establishing suitable plain terrains for landing helicopters.
- elaborating and implementing a plan for multifunctional forest management including the benefits of hay collection for winter for feeding wild animals, developing the basis of the organized collection of herbs and forest fruits, mushrooms, Christmas trees, spruce barks, lightwood, etc.;
- setting felling with prolonged restoration period, leaving old and hollow trees, as well as fallen dry forest material spread up unevenly on the territory;
- preserving and controlling the mixed character of the plants;
- afforesting with typical local species and forest fruits trees;
- avoiding development of erosion processes – for example by building barrages and fortifications;
- providing preservation of the key elements of biodiversity in marking and taking out the felling – leaving in the forest parts of dead wood with a different grade of degradation, as well as dead trees, etc.;
- preserving the so called ‘old age islands’ – old growth forests;
- preserving the big trees and those that have a diameter close to the maximal values for the concrete species, trees having a diameter of 100 cm and 1.3 m high because the big crowns are used as a shelter and a nesting place by birds;
- preserving the trees having nests of predatory birds because they have been used for many years by them;
- preserving the trees used by the cock of the wood Tetrao urogallus;
- providing zones of calmness.



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#### **4.4. Collection of medicinal plants, mushrooms and forest fruits**

##### **4.4.1. Using ways and means not damaging natural resumption of species**

- avoiding picking up of the whole mushroom – leaving the mycelium;
- in transportation using baskets - not polythene bags which do not allow spores dissemination;

##### **4.4.2. Collection of medicinal plants to be carried out by ways and means not damaging species dissemination and natural fields**

- avoiding collection before seed formation or picking up unripe fruits – it's a waste of resources;
- avoiding breakages of branches from the tops of trees and bushes;
- using scissors or a sickle when cutting the stalks in order to prevent the eradication;
- avoiding trampling down the fields or their pollution.

In the examined area *Sideritis scardica* is traditionally collected in great quantities. It is sold around the tourist objects which lead to the progressive decrease in natural populations. In that connection we give the following recommendations:

- cultivating the crop, especially around the tourist destinations places;
- temporary law restriction until restoration of its natural habitats;
- prohibiting the trade with non-cultivated plants and a stronger control by the authorized institutions.

#### **4.5. Population management of animal species of priority for the region**

##### **4.5.1. *Ursus arctos***

- afforesting with forest fruits trees (plum, pear, apple, etc.) diffusely all over the region and around used agricultural lands;
- creating and maintaining fields with oats which is the main food during the spring period for waken up bears – the distance should be more than 1 kilometer from farms and buildings;
- electric fences for protection of domestic animals, beehives and agricultural crops;
- guard dogs for herds' protection;
- monitoring of the species with the objective of making assessments of number and trends;
- forming an emergency group in cases of rising problem animals – identification, chasing away, stamping and as an extreme measure shooting;
- popularizing the good practices in joint living bear-man;
- promoting new tourist services – places for observing the bear.



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#### **4.5.2. Rupikapra rupikapra balkanika**

- decreasing the number of strolling dogs;
- forming a special guard for the species;
- establishing a stronger control in order to avoid the poaching;
- 

#### **4.5.3. Birds**

- postpone the mowing for the maximum latest period around the end of summer (in August when the nesting is finished) in cases of birds nesting on the land;
- leaving old and hollow tress;
- afforesting with forest fruits trees and avoiding their felling;
- avoiding ploughing up of pastures and meadows and their turning into arable lands;
- building and construction activities to be done only following the generative period of the birds (April – June).

#### **4.6. Recommendations for the management of game, hunting and fishing resources**

- applying methods of selective shooting;
- avoiding inbreeding by introduction of geographically remote populations;
- maintaining suitable density of predatory species;
- strong control of poaching;
- increasing the discipline and control during hunting;
- placing photo traps for observations and counting;
- creating conditions for feeding all over the year, feeding up and watering places;
- placing feeding-through for rare and endangered of extinction species;
- financing of the hunting associations for building facilities for game feeding;
- establishing new fodder fields for the game;
- limiting in hunting of some species in cases of decrease in the number of their populations;
- establishing of zones of calmness during the generative period;
- spreading the local *Salmo trutta fario* in natural water basins (not its competitor *Oncorhynchus mykiss*);
- gradual change of fish passes in established facilities (electricity works, water storage, etc.) with new ones;
- building fish passes in the river of Muglenska;



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- preserving the population of *Astacus astacus*;
- establishing a stronger control system for permissions of usage of water and water facilities in the region;
- increasing control in giving permissions for economic activities in the region.

In general, in the region a special system of monitoring is needed embracing:

- invasion of bush and forest species;
- populations of *Ursus arctos*, *Rupicapra rupicapra balkanika*, *Tetrao urogallus* and other rare, in danger of extinction and protected species;
- identification and preservation of sustaining trees;
- building and construction activities, etc.

In order all of these to be implemented successfully there is a need of assuring the mass participation of the local community, state and municipal authorities, nongovernmental organizations, associations, training institutions and others involved in activities in the region.

## 5. Conclusion

The goal of the proposed recommendations implemented in an integrated model is finding the best ways of supporting sustainable management of natural resources and decreasing human impact on biodiversity in the region examined. They are directed towards the local community which plays a crucial role, as well as towards the authorized institutions, specialists, etc. They are in accordance to strategic documents on both national and local level, especially in the sections concerning environment and biodiversity.

The main conclusion which implements the most important recommendation is that special measures should be undertaken increasing the level of motivation, knowledge and entrepreneurship behaviour of the people in the region to use the rich natural resources, and especially the opportunity of the great biodiversity in the region, in environmentally friendly activities, particularly organic farming and alternative forms of tourism, in order to reach environment, social and economic sustainable development.

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## How Does the Changing Access to Resources Affect the Power and Authority of the Postsocialist Romanian State?

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### **Abstract**

*In the past two decades, former postsocialist countries such as Romania have experienced very radical changes in terms of government and resource policy (Swinnen, 1997; Swinnen et al., 1997; Szelenyi, 1998; Turnock, 1998). To make sense of these changes this review paper will make use of recent postsocialist literature, which links the access and control over resources to the exercise of power and authority in the postsocialist state (Berry, 1993; Lund, 2002; Verdery, 2002; Ribot and Peluso, 2003; Sikor, 2006; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009).*

*The review paper aims to re-trace this line in postsocialist thinking in the relevant literature and show how the concepts of property and access to resources are connected to the crucial concepts of power and authority. It will perform a critical review of the relevant literature and also explore the aforementioned concepts of property, access, power, authority and state.*

*It will furthermore show how these concepts feed into the formation and consolidation of the Romanian postsocialist state. Since conflicts over property are emphasised by postsocialist researchers (de Waal, 1996; Giordano and Kostova, 1996; Verdery, 1999; Rabinowicz and Swinnen, 1997; Swinnen and Mathjs, 1997; Szelenyi, 1998; Sikor, 2003; Sikor, Stahl and Dorondel, 2009; Dorondel and Sikor, 2009), these are underlined here and thought to be the main thread connecting property and access to resources with power and authority in the new state. More specifically, the paper will reveal how said conflicts force actors to seek the authorization of their property claims at the door of the state. By doing so, they grant the new state the authority to do so again in the future and thereby contribute to the consolidation of its legitimacy.*

*Essentially this review paper argues that changes to resource access engender conflicts, which in turn lead to the formation of a new social contract between the postsocialist state and its people (Lund, 2002).*

**Keywords:** postsocialism, resources, property, power, authority and the state

**JEL Codes:** K11, P26, P28, P 36



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## 1. Introduction

The demise of socialism in Central and Eastern European has signified the waning and decentralization of state power (Sikor, 2003). In the past two decades, countries here have experienced a radical shift in resource governance, away from that of the previously dominant legal and administrative hierarchy of socialism towards that of markets (Swinnen, 1997; Swinnen et al. 1997; Sikor, 2003; Sikor and Lund 2009).

Romania is one such country which has experienced the full impact of these drastic reforms (Swinnen, 1997; Szelenyi, 1998; Turnock, 1998; Sikor, 2003) which gave away the control over resources from the state and its collective units to private individuals (Swinnen et al., 1997; Tangermann and Banse, 2000; Leonormand, 2001).

Initially this change was enthusiastically received by Romanian peasants due to its wider political implications. However, postsocialist academics are of the opinion that the state enforced here alien notions of property and individual wealth that were a far cry from previous community-centred strategies (Fox, 2009; Humphrey, 1995; Kaneff, 1995; Hivon, 1998; Dorondel and Sikor, 2009; Hann, 2007).

To further compound the issue, along with this broad shift in resource governance came significant gaps between legislation and rights-in-practice (Sikor, Stahl and Dorondel, 2009; Sikor and Lund, 2009; Sikor, 2003). This discrepancy meant the exclusion of some interests in favour of the interests of those of more powerful individuals (Sikor, 2003), a situation which was widely reported in postsocialist and postcolonial case studies (Boone, 2003; Comaroff and Comaroff, 1999; Corbridge et al., 2005; Das and Poole, 2004; Hansen and Stepputat, 2005; Lund, 2007; Migdal, 2001; Verdery, 1996, 2002, 2003; Mungiu-Pippidi, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009).

It would therefore seem that Romania has been the witness of a diversity of changes in property and rural property relations, which have varied depending on which legal property rights overlapped with which rights-in-practice (de Waal, 1996; Giordano and Kostova, 1996; Verdery 1999; Sikor, 2003).

As a consequence of the aforesaid changes, postsocialist academics blamed local conflicts here on the postsocialist transformations themselves and on their inclination to remove people from their previously lived land experiences (Hollis, 1999; Verdery, 1996, 1999, 2002, 2003; Sikor, 2003; Dorondel and Sikor, 2009). What this review paper will be concerned with is the fact that the ensuing struggles over resources were also considered by academics to have played an important part in the formation of the postsocialist state (von Benda-Beckmann, 1981; Stark and Bruszt, 1998; Kurtz and Barnes, 2002; Verdery, 2002; Sikor, 2003; Sturgeon and Sikor, 2004; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009).



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In order to better understand postsocialist transformations and their impact on state formation, this paper therefore suggests a critical review of current postsocialist literature focusing on postsocialism and postsocialist state formation.

By initially addressing the concepts used in the argument and only then moving on to its interpretation of postsocialist change and state formation, this paper hopes to provide a comprehensive picture of how the changing access to resources is able to influence the power and authority of the new postsocialist state. The paper will look at rural Romania through its own conceptual lens, with a particular emphasis on conflict to explain how the changing access to resources influences and is therefore linked to the power and authority of the new Romanian state.

It will thus firstly narrow its focus on the review of current postsocialist thinking on the concepts of property, access, power, state and authority. The way in which they have been explored by various scholars in postsocialist cases studies will also be briefly expanded upon so as to give the reader a better sense of what these concepts are and how useful they can be when trying to make sense of a postsocialist setting.

After these clarifications, the review paper will look more closely at its interpretation of postsocialist change. The second half of the paper will therefore link the concepts of property and access to resources with those of power and authority by placing an emphasis on conflicts. In accordance with current postsocialist thinking (Berry, 1993; Lund, 2002; Verdery, 2002; Ribot and Peluso, 2003; Sikor, 2006; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009), this paper thus hopes to corroborate its presupposition that access to resources influences postsocialist state power, authority and ultimately state formation itself.

Current postsocialist literature points to these struggles over natural resources as underlying processes of everyday state formation (Verdery, 1996; Verdery, 2002; Scott, 1998, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009). Since post-socialist property relations are widely viewed as being underlined by political contestations at both a local and national level (Rabinowicz and Swinnen, 1997; Swinnen and Mathjs, 1997; Szelenyi, 1998; Verdery, 1999; Sturgeon and Sikor, 2004), this paper will really focus on the important role of conflicts in a postsocialist setting so as to further strengthen its theory.

The paper intends to analyse how these various conflicts link the changing access over resources to the power, authority and formation of the new Romanian state, by relating them to the current literature on postsocialist property and power relations. Conflicts over resources will be brought out as the central dynamic of the postsocialist state (Verdery, 1996; Verdery, 2002; Scott, 1998, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009). Due to these struggles being seen as an essential part of the Romanian post-socialist state formation, the originality of this review paper also comes from its specific accent on conflict.

Aside from this interpretation and analysis of current postsocialist literature, the review paper will also suggest where future investigation might be rewarding. In according with current literature, it argues that it would be interesting to investigate in a field study the processes through which these





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various actors obtain power and maintain control over resources (Fortmann, 1995; Rocheleau and Ross, 1995; Sikor, 2006; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009).

It proposes a spotlight on institutions as regularized patterns of behaviour between individuals and groups in society (Mearns, 1995; Leach et al., 1999). It posits that institutions play a crucial role in mediating environment-society relationships, and suggests the need for a future analysis of the ecological and social dynamics behind the concepts of property, access, power and authority (Leach and Mearns, 1991; Mearns, 1995; Mearns, 1996).

## **2. The main concepts reviewed: property, access to resources, power, authority and the state**

The last few decades have been witness to a significant focus on property as a means of making sense of the transformations undergone by postsocialist and postcolonial states (Demsetz, 1967; Firmin and Sellers, 1996, 2000; Platteau, 1996; Verdery, 1999; Sikor, 2004; Dorondel and Sikor, 2009). This was the result of changes and upheavals in both postsocialist and postcolonial countries throughout the world. Asia, Africa, Latin America and Europe have all seen some radical shifts in the last two decades regarding control over land, away from collective agricultural units to individual property holders (Sikor and Müller, 2009).

At its most basic level, property is understood as representing the relationships between social actors with regards to objects of value (von Benda-Beckmann et al., 2006; Sikor and Lund, 2009). The state plays a crucial role here in facilitating these relationships and in linking various actors together, as well as enforcing any subsequent claims on land and natural resources (MacPherson, 1978: 3).

So, while varied (Akram-Lodhi, Borras and Kay, 2007; Bernstein, 2002; Byres, 2004; Otsuka and Place, 2001) in their approach to understand post-totalitarian reforms, all of these past studies have had a central theme: a focus on property and the state as a means of comprehending the changes sweeping these nations.

Studies in the last two decades comprise many such examples. One instance is the study of redistributive land reforms in Brazil (Ludgewigs et al., 2009; Pacheco, 2009). Studies there looked at the allocation mechanisms being employed in the country, meant to be “market-friendly” or “market-assisted” (Borras, 2003; Boucher, Barham and Carter, 2005): that is the redistribution of property through markets, facilitated by the state. Other studies focusing on Sub-Saharan Africa tackled property legislation and land tilting (Bruce and Migot-Adholla, 1994; Peters, 2009; Place, 2009), where countries whose governments had established specialised procedures for land registration were put under the microscope and criticised for their inability to take into account the potential of collective tenure systems. Postsocialist studies engaged with similar analyses (Fay, 2009; Upton, 2009) also trained their eye on the redistribution of agricultural land by the state to its historical owners (Swinnen, 1997; Verdery, 2003; Wegren, 1998) and the problems associated with it.



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It is for that reason safe to say that a significant proportion of postsocialist and postcolonial studies all over the world have focused significantly on property and the role of the state as primary initiator and enforcer of property rights.

However, these relations in regards to property only exist at the formal level of laws, regulations, norms and practices which are legitimized and sanctioned by the resident politico-legal authority i.e. the state (Sikor and Lund, 2009). And, like in postcolonial contexts, property relations in a postsocialist context are in reality not very clear cut. They have been found to be fluid and negotiable as a result of the multitude of institutions competing here over authority (von Benda-Beckmann and von Benda-Beckmann, 1999; Berry, 1993, 2002; Juul and Lund, 2002; Moore, 1998; Shipton and Goheen, 1992; Sturgeon and Sikor, 2004; Verdery, 1999). This signifies that the former ways of understanding postsocialist transformations through property are relevant but incomplete, due to their inability to take into account practices and property relations outside of the sanctioned legal system.

This is where the concept of access to resources comes in. Property is now being increasingly seen by many scholars as being one part of a larger picture: that of access to resources (Fortmann, 1985; Peluso, 1992; Bruce et al., 1993; Vandergeest and Peluso, 1995; Rocheleau and Edmunds, 1997; Sikor, 2006; Sikor and Lund, 2009). Access to resources is thus addressed due to the reality that despite them actually representing an important element in people's livelihoods, not all forms of access to resources and their benefits are legally guaranteed by the state.

So what does access represent then as a concept of postsocialist analysis? Access encompasses property and is at the same time much broader than it, for it covers all forms of possession which the law or other social norms often do not (Leach et al., 1999; Ribot and Peluso, 2003; Sikor and Lund, 2009). While postsocialist property is still widely discussed in the literature, it is now often clearly set apart from access to resources, which is the more encompassing and comprehensive way of analysing postsocialist transformations.

Like in the case of the postcolonial states (Boone, 2003; Comaroff and Comaroff, 1999; Corbridge et al., 2005; Das and Poole, 2004; Hansen and Stepputat, 2005; Lund, 2007; Migdal, 2001), postsocialist land owners realised that they were in actuality unable to successfully translate their formal ownership into "effective ownership" (Ribot, 1998; Verdery, 2003). This discrepancy is currently being explored by academics through the analysis of access to natural resources in a postsocialist setting.

The focus on access is thus due to property being regarded nowadays as too narrow an analytical lens (Sikor and Lund, 2009). This is a result of academics discovering other mechanisms throughout the years which open, influence, hinder or close access to resources instead (Fortmann, 1985; Peluso, 1992; Bruce et al., 1993; Vandergeest and Peluso, 1995; Rocheleau and Edmunds, 1997; Ribot and Peluso, 2003; Sikor, 2006). The past few decades have abounded in case studies of access as a primary way for social actors to benefit from resources.

So, it is rather through access that actors gain and maintain benefits from the resources to which they might otherwise not be legally entitled (Leach et al., 1999; Ribot and Peluso, 2003). This situation is



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illustrated in many postsocialist or postcolonial cases. One such example is found in Ribot's (1998) analysis of the distribution of benefits along the charcoal commodity chain in Senegal. From processing, transport and trade, charcoal passes on benefits to more than just the villagers owning the property from which it is extracted. In this way very many actors, such as migrant woodcutters, merchants, transporters and salesman can benefit from charcoal through their ability to gain and maintain control over the access mechanisms related to the charcoal chain- access to markets, to transport, to labour etc. Similarly it has been found in other former totalitarian cases, such as Peluso's (1996) analysis of Indonesia, that kinship and other social relations often prevail over formal property rights and these are the mechanisms which in reality redistribute benefits from the Durian fruit trees.

Examples of this nature are also found in the postsocialist states of Central and Eastern Europe. Millions of property owners here found that, despite having legal rights to land, enforcing such rights is not an easy feat- even with the state backing them up. Villagers in Romania for example were found as not being able to translate their legal ownership into an "effective ownership" (Verdery, 2003) due to more powerful actors controlling the access to forest resources (Giordano and Kostova, 2002). So, like in Ribot's (1998) article on Senegal's charcoal trade, lack of technology, knowledge, credit and access to markets (i.e. market mechanisms) meant here that the legal owners were unable to extract the full extent of benefits which they were expecting (Hann, 1993; Verdery, 2003; Sikor, Stahl and Dorondel, 2009).

While the concepts of access to resources and property have been described to be important in postsocialist literature, one can see that there is another concept which surfaces in the reading: that of the state.

But why is the state important in this context and what does it represent here? In all postsocialist and postcolonial projects, one finds that the state plays a key role in initially distributing property rights and later in enforcing them (MacPherson, 2002; Lund, 2006). Therefore it not only performs but also enforces territoriality and, while actors may rebel against it, it is regarded by many as the ultimate authority in land disputes (Vandergeest and Peluso, 1998; Fogel, King and Shanker, 2008).

Aside from being the main politico-legal institution controlling the distribution of land, the state can be seen as many things. It can be the idea of the state (Abrams, 1988) but it can also represent the more concrete, on-the-ground practices of its state actors. Some authors like Fox (2009) may even replace the concept of "state" with that of power when approaching recent land transformations in postsocialist settings. Depending on the author, the state can represent many things in post-totalitarian studies.

What is interesting here about the concept of state and its actions of territoriality is that on the ground one actually notices that the reifications promoted by this institution melt away. Fox (2009) for example noticed that while the Romanian government attempted to match reality with their technological grids, people in reality end up building their own practices, acts of compliance, resistance as well as delineations of property (Scott, 1998; 2005). This is also observed in postcolonial states such as



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Thailand, where Vandergeest and Peluso (1998) note that these resistances occur as a result of the state not taking into account important social dynamics (Fogel, King and Shanker, 2008).

Some authors have found it very compelling therefore to explore the “grey zones” that appear in these countries, between what the state legislates and who actually has the power to give access to resources. Authors such as Sikor (2004) and Sikor and Lund (2009) suggest the need for further investigation in this area, into the way in which the competition for society’s vital resources is structured and into the way in which polities emerge, recede and consolidate themselves here through varying practices of legitimization, inclusion, exclusion and violence.

It would seem that other forces beside the state and formal property rights are at work in postsocialist countries (Sikor and Lund, 2009). It is these access mechanisms that have been touted as playing a crucial role in the variations noted between property rights and rights-in-practice.

Although, importantly, it must be noted that property, access to resources and the state are only half of the story. To further understand the picture of postsocialism, one must turn their attention to the other half of the story: to the concepts of power and authority in the new state.

As Sikor (2004) describes, the new land reforms in postsocialist countries challenged previous historical distributions of power. Postsocialist land legislation enforced a strict hierarchy of control over land and resources, in stark contrast with the previously flexible lived land relations (Sikor, 2004).

The actors involved ended up having to incorporate elements of this new legislation but also attempting to preserve certain features of the historical land relations. As a consequence, conflicts between the new and the old appeared here as the various actors attempted to legitimize their claims over resources and to consolidate their power (Sikor and Lund, 2009) - with more powerful actors even trying to launder their power as authority.

This is why it has been emphasised in current postcolonial and postsocialist studies that the government’s state-centric approach to property does not take place in a political vacuum (Verdery, 1996, 2002, 2003; Mungiu-Pippidi, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009; Sikor and Lund, 2009). As Dorondel and Sikor (2009) aptly put it, people are not merely passive victims to postsocialism. So, while governments promote private property, villagers and local officials fight back in order to assert their various property claims. The new property relations are for that reason often based on more than formal rights, they are also crucially based on power, notions of kinship, identity, family heritage, social well-being and respect (Leach et al., 1999; Ribot and Peluso, 2003; Dorondel and Sikor, 2009).

This struggle for power is also seen in rural Romania. Rural people here have had to constantly fight over access to resources (Verdery, 1996), as a result of the upheavals in power and lived land relations brought on by the change in political regimes. Various actors have tried to gain and maintain power over resources and their benefits. Local authorities in particular have taken advantage of their newly found powers and have hijacked legal processes so as to have access and control over resources (Kaneff, 1996; Verdery, 1996, 2002; Mungiu-Pippidi, 2005; Sikor, Stahl and Dorondel, 2009). Many have specifically abused the decentralization process to do exactly what Sikor and Lund (2009) have described: to launder their new powers as the ultimate authority on the matter. This situation is very similar to the changes



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experienced in many other post-totalitarian cases such as the land tilting process in rural Nicaragua or in Thailand. Authors such as Broegaard (2009) and Vandergeest and Peluso (1995) describe how less powerful actors often cannot obtain land titles or gain access to resource benefits and thus miss out to those who are more powerful.

As a result, conflicts are commonplace in many postsocialist and postcolonial states. They are usually underlined by the competition between a personalized and a law-governed exercise of state authority (Hollis, 1999; Verdery, 1996, 1999, 2002, 2003; Sikor, Stahl and Dorondel, 2009).

It can be safely concluded that, while initiated by the state, the process of land privatization is not merely the by-product of central government (Sikor, Stahl and Dorondel, 2009). Because the state neglects important local-historical and social dimensions of property rights (Dorondel and Sikor, 2009), the rural actors involved often have to compete with each other for the power to secure access to forest resources or to ensure the enforcement of property legislation (Sikor, 2003).

The meeting point between these actors of various powers is where the concept of authority finally comes into play. It is frequently employed in post-totalitarian literature to denote the influence of the state in the management of natural resources and the way in which certain actors are able to gain or re-gain control over resources (von Benda-Beckmann, 1981; Stark and Bruszt, 1998; Kurtz and Barnes, 2002; Verdery, 2002; Sturgeon and Sikor, 2004; Sikor and Lund, 2009) .

Case studies in Romania (Verdery, 1996, 2002, 2003; Mungiu-Pippidi, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009) are full of stories about disappointed rural owners who turn to corrupt means of gaining access to resources. In most of these studies, it was local officials who were principally responsible for unravelling property as the key means to distributing property resource benefits, by gaining control over access mechanisms and laundering power for authority (Sikor, Stahl and Dorondel, 2009).

So where exactly does authority come in? After restitution, many people in Romania felt that they had been disadvantaged by the state and therefore sought the reconfiguration of property and access through extra-legal means (Sikor, 2003; Mungiu-Pippidi, 2005; Verdery, 2002, 2003; Sikor, Stahl and Dorondel, 2009). Regardless of where access or power originated from, people appeared to have an inherent need to legitimize it (Sikor and Lund, 2009). Like in many postcolonial states, a lack of technology, knowledge, credit and access to markets (i.e. market mechanisms) may initially hold legal owners back (Hann, 1993; Ribot, 1998; Verdery, 2003; Sikor, Stahl and Dorondel, 2009). However, these disadvantages can soon be overcome by appealing to the greater authority of the state and of the law.

Examples also abound in current post-totalitarian literature of property owners resorting to the law, the state's authority or another relevant institution's authority so as to cement or make claims to land and resources. This situation is particularly prevalent in post-totalitarian settings where many institutions shop around for authority. Such cases have been noted in postcolonial states like Ghana (Lund, 2008) where people sought to authorize their claims either with the help of the state or the priests, or in



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instances in Latin America where law and authority represent a major factor in maintaining Peruvian agricultural communities (Sikor and Müller, 2009).

As rural relations respond more to market pressure or other non-state influences (Sikor, 2003), conflicts deepen. While regrettable for the property owners who cannot extract the expected benefits (Verdery, 2003; Giordano and Kostova, 2002) this is a golden opportunity for the concept of state authority to manifest itself. Wronged property owners can and often do appeal to the state's authority to legitimise or re-assert their claims.

The state and its authority are as a result being currently explored in postsocialist literature. The state particularly is being pursued beyond its first role as distributor of property rights and initiator of land reforms (Sikor and Müller, 2009).

The first part of this paper has now described how postsocialist land reforms challenge previous distributions of property and power and influence the characteristics of the main concepts this review paper works with.

New land legislation in these countries is seen by postsocialist scholars to have enforced a strict hierarchy of control over land and resources, in stark contrast with previously flexible lived land relations (Sikor, 2004). The actors involved have therefore been forced to resort to the incorporation of elements from this new legislation, but also to attempt to preserve certain features of historical land relations.

The changes that occur as a result of postsocialism are seen to inevitably lead to conflict, as the actors involved all try to legitimize their own claims over resources and to consolidate their power (Sikor and Lund, 2009). The new postsocialist state comes into this situation too, assuming the primary role in property reforms (Stark and Bruszt, 1998): it tries to control property titles and constantly tries to reaffirm its position as the higher power (Kurtz and Barnes, 2002; Verdery, 2002).

Postsocialist literature has thus more recently been inclined to argue that in this context, all of these conflicts and negotiations are necessarily interwoven with and therefore lead to the construction of the postsocialist state (Verdery, 1996, 2002; Scott, 1998, 2005; Sturgeon and Sikor, 2004; Sikor, Stahl and Dorondel, 2009; Fox, 2009). Having explored the concepts needed to elucidate and understand how this process works the second part of this review paper will now be concerned with investigating how the changing access to resources and the ensuing conflicts lead to postsocialist state formation. This will be achieved by linking the concepts of property and access to resources to the concepts of power and authority. The paper will explore how these four concepts are connected via a thread of conflicts, and how this constantly reconnecting thread ultimately leads to the formation and consolidation of the new postsocialist state of Romania.



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### **3. Exploring postsocialist Romania: linking the concepts of property and access to resources with those of power and authority & showing how they lead to postsocialist state formation**

While Romania's amorphous socio-political and institutional landscape may appear hard to grasp initially (Douglas, 1986; Cleaver, 2002) it can be made sense of, like Nujiten (2003) suggested, by looking at the attempts to control resources and at the forces at play amidst them (Sikor and Lund, 2009).

This review paper argues that these forces are reflected in and represented by the various conflicts over access between central state actors, local state authorities, historical landowners, new entrepreneurs and agricultural managers (Rabinowicz and Swinnen, 1997; Swinnen and Mathijs, 1997; Szelenyi, 1998; Verdery, 1999). All of these actors are seen to be fighting for legal rights to natural resources or access to them, and to ensure the translation of their rights into practice.

The demise of socialism in Romania, like in all of the other Central and Eastern European states, has been characterised by the waning and decentralization of state power (Sikor, 2003). In the past two decades, the country has therefore experienced a radical shift in resource governance, away from that of the previously dominant legal and administrative hierarchy of socialism towards that of markets (Swinnen, 1997; Swinnen et al. 1997; Sikor, 2003; Sikor and Lund 2009).

The restitution of property in Romania was initially undertaken by the state (Cartwright, 2001) and it has been argued that due to this important local and lived land relations were ignored (Sikor, 2003). In order to ensure the support of the majority of the rural population, the Romanian government also restricted the maximum areas of agricultural land that any one individual could receive, further spurring conflicts between local actors. The Romanian process of restitution can for these reasons be characterised as fraught with difficulty, and resulting in frequent displays of personalized instead of law-governed forms of exercising state authority (Hollis, 1999; Verdery, 1996, 1999, 2002, 2003; Sikor, Stahl and Dorondel, 2009).

In addition to these problems, it has been increasingly observed by academics that certain "grey zones" (Sikor and Lund, 2009) occur here between property legislation and rights-in-practice (Sikor, 2003). Although the Romanian state, as a politico-legal institution, officially guarantees access to forest resources and their benefits, these "grey zones" signify a discrepancy between who has authority to give access to resources and who actually has power to give access to resources (Sikor and Lund, 2009) i.e. who really makes the local decisions that will affect people's access to forest resources and benefits.

This paper wishes to shed light on this process of decision-making, by linking the crucial concepts explored in the first part of the paper and by placing particular emphasis on the crucial role of conflicts in this process. Aside from this, the review paper's second half intends to show how this entire process contributes to the Romanian state's postsocialist state formation.

In order to understand how postsocialist changes to resource access are linked to concepts of power and authority, one must first understand the history of Romania. Only then, using the concepts detailed



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in the first part of the paper and showing how they are linked via a thread of conflicts, can the picture of postsocialist Romania finally come together. Firstly it will establish why these conflicts over resources arose in postsocialist Romania and how they have unfolded here. Only then will it turn to explain how said conflicts feed into postsocialist state formation.

So, what happened in Romania after the revolution? After Romania's democratic revolution of 1989, former high-ranking communist politicians took over (Hollis, 1999). While this in itself did generate a certain degree of dissatisfaction with the regime (Pop-Eleches, 2001; Tismaneanu and Kligman, 2001) it did not weaken the authority of the newly formed state in the eyes of the people (*ibid.*).

And, just like in other postsocialist and postcolonial states, property restitution began immediately. While these reforms were in principle meant to link economic and political benefits with private property (Deininger, 2003; de Soto, 2000; Schwartz, 2006; Hanna et al., 1995; Schwegler, 2008), they were in actuality considered to be the government's principal way of cementing its authority and legitimacy (Verdery, 1996; Stark and Bruszt, 1998).

Romania rapidly underwent radical privatization reforms (Swinnen, 1997; Szelenyi, 1998; Turnock, 1998; Sikor, 2003) which gave control over resources away from the state and its collective units to private individuals (Swinnen et al., 1997; Tagermann and Banse, 2000; Leonormand, 2001). While this restitution of private property took place partly as a response to postsocialist citizen expectations, it was revealed by scholars to be mostly due to the state's own desire to cement its power and authority and due to various international pressures which regarded private property as the basis for a thriving market economy (Deininger, 2003; de Soto, 2000; Schwartz, 2006; Hanna et al., 1996; Schwegler, 2008).

Therefore, local conflicts over resources rapidly erupted due primarily to the fact that the rural property owners' trajectory was being determined by actors located many kilometres away from their villages that were removed from their lived land experiences and their historical property relations (Sikor, 2003). Even the language regarding property introduced by the new government was alien and not typically found in the discourse of rural people (Hann, 2007).

An intrinsic conflict was thus created in the first instance between the Romanian peasants and the state, frequently seen in their opposition of the notion of land as a source of individual wealth (Fox, 2009). This was due to the fact that many rural actors still preferred to regard property as a communal resource (Humphrey, 1995; Kaneff, 1995; Hivon, 1998), often being tied to it by family bonds and historical identity rather than abstract economic strategy (Dorondel and Sikor, 2009).

Aside from the original conflicts of values and trajectory between the state and its rural property owners, another important source of conflict has been the redistribution of property rights among actors at the local level. These local actors are in competition over resources and this paper argues that it is their struggles that play a crucial role in connecting the concepts of property, access to resources, power and authority in postsocialist Romania.

After the revolution, property reforms in Romania became the essential component of the newly formed state's transformation (Verdery, 2004; Sikor, Stahl and Dorondel, 2009; Staddon, 2000, 2001).





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However, despite the hopes of individual economic prosperity these changes prompted, in reality they quickly gave rise to a monopolistic market structure, which reduced the returns of property for landowners and offered sizeable profits to more powerful local and national actors instead (Giordano and Kostova, 1996).

It soon became clear to the new property owners that along with newly found freedom and hope this broad shift in resource governance also brings significant gaps between legislation and rights-in-practice (Sikor, Stahl and Dorondel, 2009), depending on who holds the most power. This meant that when the state changed and became more decentralized, it inadvertently caused significant gaps or “grey zones” (Sikor and Lund, 2009) between property legislation and rights-in-practice (Sikor, 2003), a discrepancy which lead to the exclusion of some interests in favour of the interests of more powerful individuals (Sikor, 2003).

Like scholars have repeatedly observed in postcolonial states (Boone, 2003; Comaroff and Comaroff, 1999; Corbridge et al., 2005; Das and Poole, 2004; Hansen and Stepputat, 2005; Lund, 2007; Migdal, 2001), postsocialist land owners here were unable to successfully translate their formal ownership into “effective ownership” (Ribot, 1998; Verdery, 2003) due to the practices of more powerful actors.

So, during this time, Romania saw the advent of diverse rural property relations, which varied depending on which legal property rights overlapped with which rights-in-practice (de Waal, 1996; Giordano and Kostova, 1996; Verdery 1999; Sikor, 2003). Therefore post-socialist property relations were described here as being frequently ambiguous (Verdery, 1999; Sturgeon and Sikor, 2004), and underlined by political contestations at both a local and national level (Rabinowicz and Swinnen, 1997; Swinnen and Mathjs, 1997; Szelenyi, 1998; Verdery, 1999).

Frequent conflicts over resources erupted throughout the years in rural Romania. Increasingly, as rural relations responded more to market pressures or other non-state influences (Sikor, 2003), these conflicts deepened. Regrettably for property owners, this meant that those local actors with sufficient power were able to control access to resources and their benefits. Like in other post-socialist countries, rural Romania saw the rapid emergence of rural elites (Verdery, 1999, 2003; Lampland, 2002; Mungiu-Pippidi and Althabe, 2002; Patterson, 2009) who tried to enforce new boundaries. Local newspapers abounded in stories of corruption (Verdery, 1996, 2002): local officials, abusing powers and authority given to them by the Local Government Autonomy of 1991 (Verdery, 1996), formed mafia-like networks and padded their pockets with benefits by controlling the access to property resources (Mungiu-Pippidi, 2005; Verdery, 2002, 2003; Sikor, Stahl and Dorondel, 2009).

It would appear that different forces other than the state (Sikor and Lund, 2009) have lead to great variations between property rights and rights-in-practice in Romania. As Sikor (2004) describes it, these new land reforms challenged previous distributions of power, superimposing a starkly different, unified hierarchy and redistribution on pre-existing social distributions and controls over land. This explains why local authorities and people countered this influence through frequent extra-legal means.



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Conflicts over resources such as these found in Romania are thus rightly considered by many postsocialist authors as representing a central dynamic in the postsocialist state (de Waal, 1996; Giordano and Kostova, 1996; Verdery, 1999; Rabinowicz and Swinnen, 1997; Swinnen and Mathijs, 1997; Szelenyi, 1998; Sikor, 2003; Sikor, Stahl and Dorondel, 2009; Dorondel and Sikor, 2009). Current literature on postsocialist property points to these struggles over natural resources more specifically as “processes of everyday state formation” (Lund, 2002; Sikor and Lund, 2009; Verdery, 2002; Scott, 1998, 2005; Fox, 2009).

This is explained as being due to the fact that these legitimizing practices and conflicts appear to underpin all access and control over property and natural resources, as has been pointed out in Romania’s example above.

This paper has highlighted the important role of conflicts in this process of state formation and suggests the need for a further investigation, as well as one into the actors’ legitimizing practices (Foucault, 1980; Fortmann, 1995; Rocheleau and Ross, 1995; Ferguson and Gupta, 2002; Li, 2007), in order to shed light on Romania’s current resource management and postsocialist state formation.

The rest of this review paper will now be concerned with how these various conflicts link the changing access over resources to power, authority and the formation of the new Romanian state. This will be explored by relating these concepts to the larger literature on postsocialist property and power relations.

Having previously ascertained that Romanian legal property owners were left in an unfavourable position after socialism, it is time to investigate how they reacted to these conflicts and show how their struggles to regain property rights feed into the power and authority of the newly formed state.

This paper has previously described how postsocialist land reforms challenge previous distributions of property and power. Postsocialist land legislation enforces a strict hierarchy of control over land and resources, in stark contrast with previously flexible lived land relations (Sikor, 2004). The actors involved are forced to incorporate elements of this new legislation while also attempting to preserve certain features of historical land relations. The transformations that occur lead to conflict, as the actors involved have the inherent need to legitimize their claims over resources and to consolidate their power (Sikor and Lund, 2009).

Postsocialist academics have duly noted that guaranteeing property rights for some people in these post-totalitarian contexts inevitably means denying the very same rights to others (Verdery, 1996, 2002, 2003; Mungiu-Pippidi, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009). Such decisions however do not take place in a political vacuum and are often met with resistance.

So, in order to fully understand Romania’s postsocialist transformations, this paper stresses the importance of addressing not only property and the access and control of forest resources, but also forms of resistance and conflicts, and how these relate to the forming power and authority of the postsocialist state (Fortmann, 1985; Peluso, 1992; Bruce et al., 1993; Vandergeest and Peluso, 1995; Rocheleau and Edmunds, 1997; Sikor, 2006).



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Postsocialist thinking currently posits these struggles over access and control to be embedded in broader power and authority relations (Berry, 1993; Lund, 2002; Verdery, 2002; Ribot and Peluso, 2003; Sikor, 2006; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009), as they not only influence resource management, but actively contribute to the formation of the postsocialist Romanian state (Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009).

This is also what this review paper argues, by tracing the thinking of current postsocialist literature. It maintains that access and control over resources and the power, authority and creation of the new state are tightly interwoven, as a result of the everyday struggles over natural resources.

The paper encourages the use of access analysis (Peluso, 1996; Ribot, 1998; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009), which is capable of uncovering the forces and dynamics behind resource management (Ribot, 1998), and the ways in which this is achieved (Peluso, 1996; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009). To give depth to the analysis, it also suggests looking at the powers and authority behind this transformation of property, and subsequently, of the very country itself (Berry, 1993; Lund, 2002; Verdery, 2002; Ribot and Peluso, 2003; Sikor, 2006; Sikor and Lund 2009; Sikor, Stahl and Dorondel, 2009). This type of combined access-power analysis not only focuses on the importance of changing access to resources for postsocialist state formation, but also is capable of reinforcing how crucial conflicts are in a postsocialist setting.

Individual property rights in Romania thus signalled a break with socialism, the birth of new political rights, participation in the economy and renewed hopes (Sikor, Stahl and Dorondel, 2009). Property especially represented the first and foremost field politico-legal institutions competed for. Like in other postsocialist and postcolonial settings, these institutions tried to establish their authority (Berry, 2002; Lund, 2002, 2006; Verdery, 1996).

Since the initial restitution of land gave away authority to competing local institutions, this meant that the authority of the state was at stake during these transformations. But the state quickly wised up that shopping for property claims reinforces its position (Verdery, 1996; Sikor, Stahl and Dorondel, 2009). In an environment rife with local corruption (Kaneff, 1996; Verdery, 1996, 2002; Mungiu-Pippidi, 2005; Sikor, Stahl and Dorondel, 2009) this meant that the state was in a strong position to establish, consolidate and expand its authority (Verdery, 1999, 2002) and shop for authority and legitimacy.

Due to the reasons highlighted in the first part of this argument, rural property owners here, like in other postsocialist countries (Rabinowicz and Swinnen, 1997; Swinnen and Mathijs, 1997; Szelenyi, 1998; Verdery, 1999; Sikor, 2004; Verdery, 1996, 2002, 2003; Mungiu-Pippidi, 2005; Fox, 2009; Sikor, Stahl and Dorondel, 2009; Sikor and Lund, 2009), began resisting the implementation of the new land legislation and conflicts over resources became widespread. Where authority relations overlapped, the rural people had to direct their claims to the main politico-legal institution: the state (Sikor and Lund, 2009).

Property rights, just like citizen rights, are produced, endorsed and sanctioned by the legitimate authority of the state. Property is therefore connected to authority (Weber, 1976) and depends on it for support (von Benda-Beckmann, 1995). So, when authority relations overlap, social actors are forced to



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turn to the main politico-legal institution to clarify any ambiguities regarding property and property relations (Sikor and Lund, 2009; Berry, 1993).

Thus, in the tumultuous aftermath of the revolution, claimants sought the help of the state to authorize their property claims. Their reaction was natural, as rights and access to property resources are formally recognized and upheld by the state, and in turn by doing so, the state also gains authority to do the same in the future (Sikor, Stahl and Dorondel, 2009).

Since the state was also seeking claims to authorize in order to consolidate its position, this meant that a dynamic and interdependent relationship formed (von Benda-Beckmann, 1981; Lund, 2002; Sikor, Stahl and Dorondel, 2009). This reciprocal relationship has been characterised by academics as a social contract linking property and authority- which represents state formation (Lund, 2002).

The claimants and the state therefore have a dynamic relationship (von Benda-Beckmann, 1981; Stark and Bruszt, 1998; Kurtz and Barnes, 2002; Verdery, 2002) which lends legitimacy to the new state and leads to the construction of the post-socialist state itself (Sturgeon and Sikor, 2004).

Recent postsocialist literature supports this idea that the exercise of authority is intimately linked to the legitimacy and formation of the new state (von Benda-Beckmann, 1981; Stark and Bruszt, 1998; Kurtz and Barnes, 2002; Verdery, 2002; Sturgeon and Sikor, 2004; Sikor and Lund, 2009). Institutions such as this tend to argue or justify their legitimacy in relation to the concrete exercise of authority because they need to actively establish their legitimacy (Sikor and Lund, 2009). The new state assumes the primary role in property reforms (Stark and Bruszt, 1998), it controls property titles and then reaffirms its position as the higher power by settling property conflicts (Kurtz and Barnes, 2002; Verdery, 2002).

This is why it has been argued that property and access claims inevitably become processes through which authority is formed, as the local actors appeal to the authority of the main politico-legal institution to back their claims and solve their conflicts (von Benda-Beckmann, 1981; Stark and Bruszt, 1998; Kurtz and Barnes, 2002; Verdery, 2002).

In this postsocialist process, the local actors and the state are constantly forming, challenging and unravelling property rights through their various conflicts described above. For this reason, recent postsocialist literature has further argued that in this context, all of these struggles and negotiations are interwoven with the construction of the postsocialist state (Sturgeon and Sikor, 2004; Verdery, 2002; Scott, 1998, 2005; Fox, 2009; Verdery, 1996; Sikor, Stahl and Dorondel, 2009).

In conclusion, despite the difficult situation after the restitution of property, the systematic unravelling of property rights somehow only served to strengthen the Romanian state's authority as the property owners turned to it for the translation of laws to practice (Verdery, 1996; Sikor, Stahl and Dorondel, 2009). The respective property owners blamed individual politicians (Sikor, Stahl and Dorondel, 2009), while the state was viewed apart from these actions (Abrams, 1988) and became stronger due to the notions of private property that it upheld and its ability to enforce these rights where local authorities had failed (Sikor, Stahl and Dorondel, 2009).



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This paper thus suggests for further investigation the postsocialist process via a combined access-power analysis, with a special emphasis placed on the role of conflicts and legitimizing practices in shaping postsocialist state formation and in affecting natural resource management.

#### **4. Future research: where to now**

As the previous sections of this paper have established, property relations often appear ambiguous in postsocialist or postcolonial settings due to uncertain power and authority relations (Sikor, 2004; Verdery, 1999).

The postsocialist literature consulted appears torn between two schools of thought: postsocialist relations can be seen as “fuzzy” and guided by seemingly unclear rules or they can be seen as rules that become clearer the further the postsocialist state evolves from its revolution.

Thus, authors such as Sikor (2004) and Verdery (1999), point to the existence of a certain “fuzziness” in postsocialist states, due to the apparent lack of routinized rules and crystallized practices characterising postsocialist property relations.

On the other hand, more evolutionary approaches argue that as land becomes more valuable and transformations here more defined, narrower definitions of property emerge and clearer rights ensue (Demsetz, 1967; Firmin Shellers, 1996, 2000; Platteau, 1996). Whatever the situation, it would seem rewarding for future research to attempt an analysis of the transformations occurring in postsocialist states such as Romania.

Recent work on the matter suggests looking at concepts and the way in which truths are established in the tumultuous context of postsocialist transformations (Ferguson and Gupta, 2002; Foucault, 1980; Li, 2007). This approach understands access to be more than an instrument of analysis. People and institutions are thought to actively employ and interpret concepts in their attempts to enact their different political projects and interests. So, academics such as Sikor and Lund (2009) argue that it would be interesting to analyse how these various concepts and ideas of different origin enter a local arena where they become “idiomatized” and how this is achieved.

Another approach could be to focus on institutions and the ways in which these affect the dynamics of natural resource management and consequently the consolidation of the postsocialist state. Usually discussed by authors specialising in postcolonial states (Leach, Mearns and Scoones, 1999; Leach and Mearns, 1991; Mearns, 1995; Mearns, 1996), it highlights the central role of institutions in mediating and shaping environment-society relationships.

In this approach, institutions are taken to mean the regularized patterns of behaviour between individuals and groups in society, rather than just community-level organisations. This interpretation can be used to analyse how differently positioned social actors of varying power and authority are able to



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command natural resources instrumental in their well-being. This type of approach would be well suited to the disaggregated concepts analysed in the beginning of this paper.

Therefore, such a focus on institutions would be able to elucidate how the changing ecological and social dynamics of postsocialist Romania have influenced natural resource management and the activities of various actors involved, as well as how these have shaped the environment and the formation of the new democratic state (Leach and Mearns, 1991; Mearns, 1995; Mearns, 1996).

The postsocialist environment which researchers frequently describe depends on ecological and social dynamics. A disaggregate analysis of the concepts linking the community with its natural resources would be helpful to shed light on postsocialist transformations. The ways in which different social actors gain power and access to resources can be explored through such an analysis in order to make sense of postsocialist change (Leach, Mearns and Scoones, 1999).

Recent advances in political ecology suggest that post-totalitarian environments are inevitably characterised and defined by a high variability in time and space (Leach, Mearns and Scoones 1999). This is especially relevant in postsocialist case studies which, like former colonial states, have now been seeing significant changes which have affected the way in which they manage their natural resources. A disaggregate approach to postsocialist society would be relevant, as a society such as Romania is made up of many active individuals and groups, constantly engaging in conflicts over resources and contributing to state formation (Verdery, 2002; Scott, 1998, 2005; Fox, 2009).

The relationships between various institutions would be therefore interesting to investigate, so as to determine which social actors gain access and control to local resources, how they manage these resources and thus shape the landscape and the new state over time.

This paper also believes that an institutional approach would be valuable in understanding the changes undergone by postsocialist states such as Romania, because it looks not only at a snapshot in time, but at the dynamic mapping processes that underlie each static set, which are mediated through various forms of institutions operating at either macro or micro level at various points in time (Leach, Mearns and Scoones, 1999).

## 5. Conclusion

It would thus appear that since 1989 Romania has seen some very intense negotiations over property and access to natural resources. People's expectations initially ran high, believing in the hopes of economic efficiency, social equity and democracy (Sikor, Stahl and Dorondel, 2009). These dreams however were soon dispelled by conflicts of interest and power struggles (Verdery, 2004; Sikor, 2006; Sikor, Stahl and Dorondel, 2009), with rural areas quickly becoming the backdrop for frantic struggles over property resources.

This paper has argued that the dynamics of property and authority in this postsocialist state have not only been radical, but have actively reinforced each other. It is precisely the simultaneous occurrence of property and authority negotiations which has created conflicts and ambiguities in property and



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power relations (Sturgeon and Sikor, 2004). These negotiations and transformations challenge the very notions of property rights and that of the state, the distribution of property rights amongst social actors as well as the power and position of said actors.

The various actors involved are constantly competing for resource access and control, for fear of losing out on benefits and of being driven out by the competition. Some either focus their energy on gaining property via claims or influencing recognition of their claims, while others such as local officials focused instead on gaining access to property benefits via illegal logging, the control of the timber industry, bribes for protection or taking advantage of their position to gain a share of property benefits (Kaneff, 1996; Verdery, 1996, 2002; Mungiu-Pippidi, 2005; Sikor, Stahl and Dorondel, 2009).

Postsocialist politics are therefore characterized by contestations, which play out in these struggles over access and control of resources (Sikor, Stahl and Dorondel, 2009). Postsocialist land relations are “fuzzy” and characterised by the aforementioned conflicts over the control and use of natural resources (Verdery, 1999; Sikor, 2004; Sikor, Stahl and Dorondel, 2009).

By using access-power relations (Berry, 1993; Ribot and Peluso, 2003) and narrower property-authority relations (Lund, 2002; 2007) current postsocialist literature (Berry, 1993; Lund, 2002; Verdery, 2002; Ribot and Peluso, 2003; Sikor, 2006; Sikor and Lund, 2009; Sikor, Stahl and Dorondel, 2009) upholds that these struggles are inevitably entwined with the exercises of power and authority and the formation of the postsocialist state (Sikor and Lund, 2009).

The local authorities’ predatory practices and the struggles of rural property owners to authorize their property claims only seem to strengthen the new state’s authority (Verdery, 1996; Sikor, Stahl and Dorondel, 2009), while their fights over access and property, contestations of authority, legitimizing practices, territoriality and any violence are processes of everyday state formation (Verdery, 2002; Scott, 1998, 2005; Fox, 2009).

The stage is hence set for a battle where the winners will be the social actors which are able to command the most advantageous economic, political and cultural resources.

Future postsocialist and postcolonial research appears to be headed in this direction, towards the analysis of resource conflicts and legitimizing practices under changing political regimes. This paper reviews some of the methods suggested for this purpose, such as concept analysis or institutional analysis (Ferguson and Gupta, 2002; Foucault, 1980; Li, 2007; Sikor and Lund 2009; Leach, Mearns and Scoones, 1999). Particular emphasis is placed on institutional analysis, due to its ability to connect the concepts of access to resources with those of power and authority, and thus of elucidation the conflicts and legitimizing practices that occur within this context.

This institutional approach focuses on the role of institutions in mediating people-environment relations by mapping the underlying processes of natural resource management and postsocialist or postcolonial state formation. Authors supporting this approach (Leach, Mearns and Scoones, 1999) emphasise that there is a multitude of institutions involved in natural resource management which



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people rely on to support their claims to environmental goods or services. These could in the future be further investigated in order to elucidate the complex process of state formation.

The environment is seen here as dynamic. The need to understand and contextualise resource conflicts is therefore considered paramount in order to make sense of the struggles these actors encounter and in order to possibly improve future resource management (Bradbury, Fisher and Lane 1995).

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## Education of the next generation of managers in context of green economy

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### Abstract

*This paper deals with the issue of education for sustainable development of the generation of future managers in the context of the green economy. The paper analyses the need for environmental education of graduates in theoretical way who are expected to act as executives and in positions which are defined as Green Enhanced Skills Occupations or shortly Green Jobs and who should be able to apply the tools of environmental protection in a business sector, municipalities or third sector. The essential part of the article presents the partial results of the research, which was focused on finding whether students of economic universities are aware of issue of sustainable development and environmental policy tools, which can help the implementation of green economy in the practice and whether this issue is taught at universities. At the end of the article authors point out the important role of universities in preparing the future managers to work in the green economy.*

**Keywords:** Sustainable development, Future managers, Education and training, Environmental policy tools, Green economy, Green Enhanced Skills Occupations

**JEL Codes:** A20, A23, Q01, Q56



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## 1. Introduction

The issue of sustainable development (SD) is richly developed theoretically and supported for over 20 years, yet the problem still remains i.e. the transfer into practice. The reserves of natural resources are being exploited by tremendous speed. On the other hand, human population, excessive consumption and damage of life supporting ecosystems are growing. In this situation the green economy as a tool of sustainable development is gaining on interest.

In the paper the authors focus on education and training as an essential tool of change. Society of the 21st century expects that its members will be able to understand and solve the integrated problems of humanity (environmental, social, and economical) both in the local and global environment and that they will be equipped for practical application of sustainable development in practical life.

## 2. Environmental education and awareness

The need for environmental education is embedded in many international and national documents. The most important are *The Lisbon Strategy* (revised in 2005), where the first priority action was “investing more in knowledge and innovation”, *Europe 2020* – a 10-year strategy which follows the Lisbon Strategy and *The European Union Strategy for Sustainable Development* (revised in 2009), where education is considered an important instruments in facilitating the transition to a more sustainable production and consumption patterns. Based on these strategies the national documents have been created and implemented within EU member states, e.g. in Slovakia it is „*The concept of environmental education at all school levels in the Slovak Republic and the system of lifelong learning*“ (2006) and its Action Plan – „*Action Plan for Education and Training for Sustainable Development in SR*“ (2006), „*National Biodiversity Strategy of Slovakia*“ (1997), „*Action Plan for Sustainable Development of SR in the years 2005 – 2010*“ (2005), „*The UNECE Strategy for education for sustainable Development*“ (2005), as well as other national and international commitments of the Slovak Republic.

In 2009 the national conference with international participation took place in Slovakia. The conference was organized by the Faculty of Natural Sciences of Matej Bel University in Banská Bystrica. It was already the fifth conference, referred mostly to third and fourth national conference focused on issues of environmental education in schools of the Slovak Republic, and on the other hand, it was based on the conclusions and recommendations of meetings of representatives of ministries of environment and education, held in Vilnius in 2005, contained in the UNECE Strategy for education for sustainable development. The outputs of the conference were published in the Proceedings of education for sustainable development<sup>1</sup>. Dozens of contributions were presented at the conference and they were

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<sup>1</sup> Halašová, M. (ed.) (2009). *Výchova a vzdelávanie k trvalo udržateľnému rozvoju. Zborník príspevkov a závery z 5. národnej konferencie s medzinárodnou účasťou konanej 21.-22. januára 2009 v Banskej Bystrici, Banská Bystrica 2009*, ISBN 978-80-8083-876-8





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divided into four sections. The papers were focused on the environmental education as well as other current topics of environmental protection and sustainable development.

Rands (2009) deals with this issue as well and refers to the principle of personal responsibility, through which individuals contribute to sustainable development. Managers as well as the future managers can be seen as a group of individuals who have a lot of power and responsibilities. Therefore, environmental education and education for sustainable development of managers can be seen as key to implementing the principles of sustainable development into practice.

Two special issues of the magazines (1) *The Journal of Teaching in International Business*<sup>2</sup> and (2) *Journal of Management Education*<sup>3</sup> dealt with the topic of environmental education of managers, which included nine articles. The articles opened various topics and proposed solutions for faculties with the focus on management and economy and how they could include the problems of environmental protection to the curriculum of future managers and the questions of environmental education of managers. The magazine contained eight articles which provided concepts, pedagogical approaches, case studies, seminars curriculum, practical lessons and activities focused on the integration of environmental protection into existing courses or on creation of special courses on this topic.

Authors of the above mentioned articles unite in the opinion, that environmental education of managers should support the awareness, understanding and interest, which motivate the students to environmental activities and environmentally sustainable behaviour in their personal, social and professional life.

It is necessary to rethink the changing meaning of the term “sustainable development”. Therefore, development of sustainable society must be understood as continual process of learning, researching the problems and perplexity, where correct answers and solutions can be changed with the growth of our experience.

Halašová, M. (2009) states, that educational goal of sustainable development should include broadening the knowledge, development of special behaviour, intellect, forming of life attitudes and values. Education toward sustainable developments is still being formed as a broad and complex conception, which includes interconnected ecological, economical and social questions. It broadens the concept of environmental education, which includes an increasing range of questions regarding development, various forms of education about the questions of development and other topic-focused forms of education. Therefore, environmental education should be re-made and more branches within the range of complex approach to the education to sustainable development should be added.

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<sup>2</sup> Mintu, A. T., Lozada, H. R., Polonsky, M. J. (1993). Environmental consciousness and the business curricula: Some thoughts. *Journal of Teaching in International Business*, 5, XV-XVIII

<sup>3</sup> Egri, C.P. , Rogers, K. S. (2003). Teaching about the natural environment in management education: New directions and approaches. *Journal of Management Education*



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Inclusion of ethical dimension, questions of equality, solidarity, reciprocal dependence among generations, as well as reciprocal relations among people and nature and among the rich and the poor, has an important meaning by building environmental awareness and education of future managers toward sustainable development.

On the present the requirements for qualification of graduates of all types of schools are changing. Issues of so called Green jobs are getting to the fore. Bellan (2010) states that the quantitative changes in the labour market are accompanied with qualitative changes, in particular changes related to qualification requirements. Greening of economy pursues three basic types of the qualification effects: on increase in demand for jobs with the same qualifications, job changes in given scale and level of qualifications needed, create new jobs with entirely new qualification requirements.

In connection with these changes in the labor market and the emergence of green jobs universities can play an important role in education of future managers and preparing them for new conditions in new green economy. Comprehensive education of the topic of sustainable development and tools of environmental policy will be essential for bringing the green economy to life.

### **3. Environmental policy tools**

Development of opinions for solution of the problems of sustainable development was reflected in the EU policy, where a broad spectrum of tools was established, which can be used by organizations and managers to improve their environmental performance. Chovancová (2012) states the most known and widely used tools: Environmental management systems (EMS) according to ISO 14001, Eco-management and audit scheme (EMAS), cleaner production, corporate social responsibility etc. Their implementation in the corporate (and public) sphere is voluntary. Majerník, Chovancová, Hodolič (2009) state, that these tools are aimed for organizations, which want to valorise and improve their environmental behaviour, minimize negative influence on the community and environment, where they carry out their activities. Implementation of these tools requires financial investments and also support from the management and all employees. On the other hand, for the organization, these investments can bring a better position on the market and improve relations with other parties and other important added values. Bellan (2010) indicates that in the context of the green economy the question of how to set the environmental policies and tools of environment protection so that besides ensuring the transition to a greener and more sustainable economy they would also facilitate the economic recovery and employment growth is getting into the spotlight.

### **4. Research**

The goal of the research was to find out, how much the teaching about the topic of sustainable development correlates with the amount of information provided for the Slovak, Polish and Hungarian students – the future managers. Partial goal of the research was to investigate whether the Slovak, Polish and Hungarian students have the need to educate and develop themselves in this field. These are the



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basic data which show us the correlation between teaching the topic of sustainable development and the students' knowledge.

#### **4.1. The research methodology**

A questionnaire was used for acquisition of basic data. Besides other things, it included the questions about the knowledge of students about the environmental policy tools, which closely relate to sustainable development and green economy, and a question, if, as future managers, they consider education in the field of environmental protection and sustainability necessary. The closed questions were used in the questionnaire and the students could choose from five options within the Likert scale. The research was carried out in the first half of 2012. Two research questions were formulated within the research:

1. Is there a difference between the amount of knowledge related to the environmental policy tools among Slovak, Polish and Hungarian students?
2. Is there a difference in opinions on environmental education of future managers among Slovak, Polish and Hungarian students?

#### **4.2. The research sample**

The research sample consisted of 173 students from Slovakia, 100 students from Poland and 47 students from Hungary. All of them were students of economics and/or management. Postgraduate students were addressed. The average age of students was 23 years. It was assumed that these students might get in touch with the topic of green economy, sustainability or environmental protection during their graduate studies or it could be the topic of their diploma thesis. The students were not addressed statistically at random. An important issue when addressing the students was the opportunity of delivering the questionnaire personally, in order to obtain high questionnaire return and assure the most relevant results.

#### **4.3. Results and interpretation of data**

At first, the knowledge about specific environmental policy tools was evaluated. It included following tools: system of environmental management according to ISO 14001, EU regulation about eco-management and audit scheme EMAS, Life Cycle Assessment – LCA, Corporate Social Responsibility – CSR, Environmental Performance Evaluation and Eco labelling. In order to obtain results, following steps were taken: points were assigned for every possible answer within the Likert scale according to their importance. The importance of answers were set by the authors as follows: know about it – 5 points, more or less know about it – 4 pts, maybe – 3 pts, more or less do not know – 2 pts, do not know – 1 pt.



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As the next step, sum of particular multiplications was made and the resulting sum was divided by 5. By this calculation was obtained the average coefficient of frequency of answer appearance. The highest obtained value of coefficient represents the highest level of knowledge; the lowest value of coefficient represents the lowest level about the particular environmental policy tool. Particularly obtained results were arranged into a table which shows, which environmental policy tool is mostly known among students Radar graph was used for graphical presentation for easy visual arrangement of data.

Instrument of environmental protection	Coefficient of frequency		
	Slovaks	Poles	Hungarians
Environmental management system according to ISO 14001	2,98	3,26	2,04
Regulation (EC) on Eco-management and audit scheme - EMAS	2,15	2,89	1,38
Life cycle assessment – LCA	2,17	3,11	2,12
Corporate social responsibility (CSR)	4,03	3,56	2,83
Environmental performance evaluation (EPE)	2,93	3,90	3,21
Ecolabelling	3,32	4,06	2,63

Table 1: Overview of the knowledge about environmental policy tools

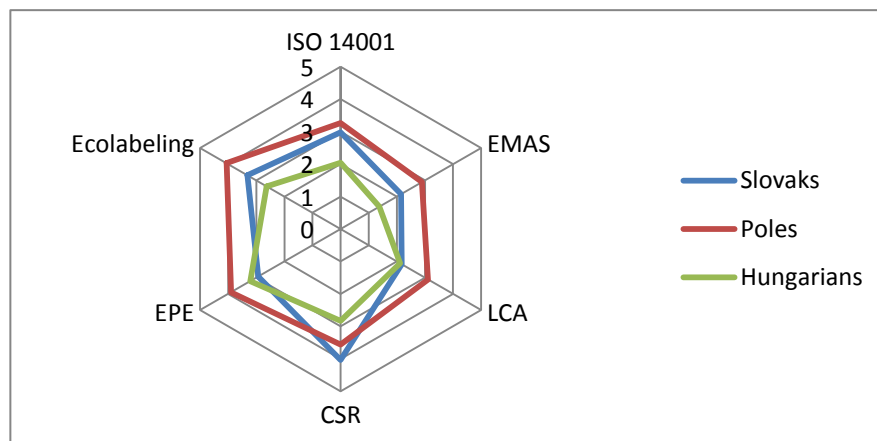


Fig. 1: Knowledge about environmental policy tools

As it can be seen from the presented results, the Slovak students have greatest knowledge about the corporate social responsibility. This topic is present in the curriculum of the subject “international management”, which it taught at business and management oriented universities. The issue is not only lectured but also practically trained by problem tasks and case studies. Based on this assumption, the authors expected that students will have good knowledge about this instrument in particular and the expectation was confirmed. Polish students have the widest knowledge about Ecolabelling. Hungarian



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students are most aware of Environmental Performance Evaluation. Ecolabelling reached the second place among Slovak students. The assumption was that those students, who care when buying environmentally friendly products, will at least partially know about this issue. This assumption was confirmed. The same can be assumed about Polish and Hungarian students, where Ecolabelling reached high score, too. Recently, in press and other media, environmental management system according to ISO 14001 is often mentioned, related to its implementation into praxis of some organisations, and therefore it was assumed, that students have already heard about the system, but they do not know what it is about. The value of coefficient reached 2,98 among Slovak students, which confirms the correct assumption of the authors. Among Polish students the coefficient was about 0,28 higher, which means that they have more knowledge about this tool than Slovak students. Among Hungarian students coefficient reached 2,04; which in average is less than 1,08 in comparison to Slovak and Polish students. This shows that Hungarian students do not have enough knowledge about this tool. Regulation (EC) on Eco-management and audit scheme – EMAS and Life cycle assessment – LCA is not taught in most Slovak schools at all and if it is, then only on a minimal level, therefore, it was assumed, that Slovak students will have a minimal knowledge about these tools. The assumption was confirmed – coefficients reached the lowest values.

According to calculated coefficients Polish students have more knowledge about these tools than Slovak students. Hungarian students reached the lowest values of coefficients. Polish students have more knowledge about issues of environmental performance evaluation than Hungarian and Slovak students. Based on the results evaluation the first research question can be answered. There are the differences in the amount of knowledge about environmental policy tools among Slovak, Polish and Hungarian students.

Table 2: The organization of data using descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Slovak	6	2	4	2,93	0,714
Poland	6	3	4	3,46	0,458
Hungarian	6	1	3	2,37	0,654
Valid N (listwise)					

After assessing the overall average coefficients, the Polish students reached the highest score 3.46. Slovak students reached 2.93 and Hungarian students 2.37. Based on these data, it can be concluded that Polish students have the greatest knowledge about environmental policy tools, followed by Slovaks and Hungarian students have the smallest amount of knowledge about these tools.



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The answer to the second research question was sought by the methods of descriptive statistics. The following statement of Slovak, Polish and Hungarian students was rated in this research question.

Statement: “As a manager I think it is necessary to be educated in the field of environmental protection”. For the evaluation these methods of descriptive statistics were used: frequency of responses and due to unequal number of Slovak, Polish and Hungarian students the percentage of answers; to allow comparisons of responses obtained. Obtained data are presented in a tabular form as well as graphically using a bar chart.

Table 3: Frequency of answers and their expression in percent.

Possible answers	Frequency			% expression		
	Slovaks	Poles	Hungarians	Slovaks	Poles	Hungarians
Yes	83	51	25	47,98	51,00	53,19
Rather yes	75	46	15	43,36	46,00	31,91
Maybe	13	2	6	7,51	2,00	12,76
Rather no	1	1	0	0,05	1,00	0,00
No	0	0	1	0,00	0,00	0,02

Table 4: The organization of data using descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Slovak	5	0	48	19,78	23,887
Polish	5	0	51	20,00	26,086
Hungarians	5	0	53	19,61	22,869
Valid N (listwise)	5				

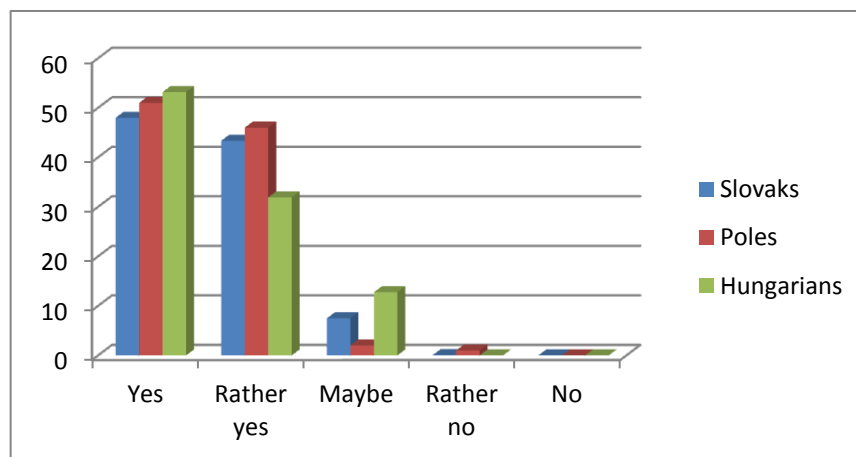


Fig. 2: Opinions of students on environmental education.



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As can be seen from Table 4 - Mean value, the most aware of a need of environmental education are Polish students, followed by Slovak students and the least aware are Hungarian students. Based on the evaluation of responses it can be concluded that the Slovak, Polish and Hungarian students recognise the importance of protecting the environment and the importance of acquiring knowledge and skills through their university study. The proof of that is also the fact that no Slovak and Polish student stated s/he should not be educated in this area (just one Hungarian student said that he does not need to be educated in this area). The graph shows that students clearly considered it as necessary to be educated in the field of environmental protection and sustainable development. From a statistical evaluation the answer to the second research question was revealed. There is a minimal difference in the views of Polish, Slovak and Hungarian students to educate managers in the field of environmental protection and sustainable development. This discovery also justifies the need for education about environmental protection and sustainable development at universities in Slovakia, Poland and Hungary.

## 5. Discussion

The results of the research showed, that it is very important to implement the issues of environmental protection and sustainable development into the curriculum of suitable subjects; with no exception of business schools and universities. If the topic is presented by an adequate, creative and motivating teaching methods (discussions, case studies, practical examples etc.), they will be able to support awareness, understanding and interest of students for environmental protection in the way as it is stated by the authors already mentioned above. The authors unite in the idea that environmental education of managers should support awareness, understanding and interest, which motivate students to environmental activities and environmentally sustainable behaviour in their personal, social and professional life. The acquired knowledge and skills in this area will enable them to more easily find a job in the labour market in the context of greening the economy. Even though, in the case of future managers, it may not necessarily be the direct employment in so-called green jobs, there may be an indirect employment in the green economy. Future managers will be able to implement projects that will apply the principle of 3P or Tripple Bottom Line in the management of the company, which can contribute to the realisation of sustainable development and green economy.

Several authors suggest that universities have an important position as the core of the knowledge base, acting as key elements of innovation system, supporting science-based innovation of regional growth (Huggings & Kitagawa, 2009; Zsibók & Gál, 2012). Universities therefore may play a key role in building the green economy that would respond to the social demand and to prepare future graduates for the green enhanced skills occupations. Universities have in this area a number of options that could be used. First is the transfer of knowledge and know-how on environmental protection and sustainable development. This information should, however, encourage personal responsibility of managers, through which, as stated in Rands (2009) individuals contribute to sustainable development, as well as



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motivation, which in Kravčáková (2007) plays an important role of managers in implementing their activities. Motivation is also important for future managers, who will be employed in green jobs and who would want to apply different tools in environmental business practice. Universities can serve and "teach" also by their own example. Environmental educator David Orr (1992) suggests that a key element in the development of ecological literacy is the opportunity for students to engage in hands-on learning about environmental problems. The specific activities of the universities can demonstrate their own commitment to environmental protection. They also may become a place where students can directly meet, try and participate in various environmental activities. For this purpose numerous universities have coalesced in the "campus sustainability" or "greening the campus" movement, as for example Green campus, Campus Climate Challenge, Campus Ecology etc.

## 6. Conclusion

Education to sustainable development requires redirecting from providing the knowledge to a discussion about problems and looking for possible solutions. Therefore, education should keep the traditional focus on teaching particular subjects together with possibilities for multilateral and interdisciplinary exploration of real life situations. It should influence the structure of teaching programs and methods, what requires the change in pedagogues – from exclusive transporters, and the change in students – from exclusive recipients, so that both groups build one team.

There are many possibilities for using education towards sustainable development in individual consciousness, but their realisation will require fundamental changes in the approach to education, as well as in universities with focus on management and economy.

## 7. Acknowledgements

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## **Green Trends in the Hotel Industry - Status and Opportunities of SERBIA**

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### **Abstract**

*So-called "green" hotels that are trying to respect the rules of environmental pollution and reduce it to a minimum have become wide spread recently. The main principle of this trend is to use a variety of methods of responsible hotel operations, to reduce energy, water consumption and carbon dioxide emissions, to take care of the decomposition of solid waste and increase the recycling of waste materials, to use conventional detergents and other chemical agents to the lower measure and replace it by harmless "organic", to prevent or at least reduce the pollution of the environment and, wherever possible to preserve local biodiversity. In this paper, the authors provide an overview of green trends in the hotel industry with a focus on status and opportunities in Serbia.*

**Keywords:** green hotels, environment, pollution, local biodiversity

**JEL Codes:** L83, M31 Q01



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## 1. Introduction

Hotels which use “green” concept have made better business results and also made an important contribution to environmental protection (mostly in USA). The main goal of the concept of “green hotels” which has become planetary popular in the recent ten years is to reduce energy, water consumption and carbon dioxide emissions in order to prevent pollution of the environment. Ecological and sustainable hotel management has many advantages - on one hand it decreases expenses and on the other hand it represents successful marketing tool. These advantages have been recognized by big hotel chains and that is the reason to increase the number of the hotels which will adopt “green” technology. More and more hotels are trying to provide bigger number of stars that represent category of the hotel, but in the same time they give their best to ensure themselves some of the “green” certificates.

## 2. Sustainable Tourism Development

Expansive and uncontrolled tourism development over the past few decades, accompanied by many adverse environmental, social and cultural consequences imposed the need to broaden this activity in the concept of sustainable development. Sustainable development of tourism primarily depends on the ability of the environment to ensure a stable and long-term development basis. A clear demand to adapt new development strategy and a way of thinking is imposed to all the participants and stakeholders in tourism. It is important to point out the most recent expansion of the concept of sustainable tourism which is not only a need and the right of local communities to make an influence on their resources (for example threatened by tourism development), or on the other hand, tourist fashion of receptive countries. It has become a future tourism development strategy for all responsible participants in tourism (Jovicic, 2000).

It has become clear that the concept of sustainable tourism presents a new movement totally different to the tourism trends that dominated in the last decade of the 20<sup>th</sup> century. It clearly distinguishes those activities and processes that occur as a result of a deliberate approach to understand the environment and its overall coherence and possible threats to destroy this harmony. Ultimately, a responsible tourism emerges as the understanding that tourism industry has become a threat to the environment harmony.

If tourism was a country, it would have one of the world’s largest GDP’s, and would consume resources at the scale of a northern developed country. The environmental impacts of tourism are tremendous. Each year, the tourism industry consumes nearly as much energy as Japan, produces the same amount of solid waste as France, and consumes as much fresh water as is contained in Lake Superior.

At the end of the 20<sup>th</sup> and at the beginning of 21<sup>st</sup> century influence of ecological environment has got great importance. Increased awareness of the importance of preserved and healthy environment requires an ecological approach to marketing management of tourist destinations and tour operators. The only effective approach of tourism development could be the right balance between tourism development and the protection and enhancement of the natural environment.



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Nowadays a great importance is given to mutual dependence and influences of tourism development, preserved nature and economy. A new international movement is reflected on tourism demand and includes people who tend to feel the pure nature, taste organic food, buy natural materials and use renewable energy. On the other hand, global supply has made extraordinary efforts in order to minimize negative effects of tourism and to raise environmental awareness which made positive effects on tourists.

The concept of sustainable tourism development arose out of recognition of both the economic importance of tourism, as well as its realized and potential impacts. Sustainable tourism implies taking some of the principles and best practices of ecotourism and applying them to mass or conventional tourism businesses (Berno, T., Bricker, K., 2001). Today some chain hotels and large resorts, golf courses, beaches, and ski resorts and to a more limited extent, some cruise ships, have sought to “green” their operations. This is a promising trend. The ultimate goal, of course, should be to expand sustainable tourism practices to all tourism businesses, i.e., to make the entire industry environmentally, socially and economically sustainable. This process is being spurred by a growing “green” consumer movement, includes also ecotourism and sustainable tourism. It has been noted that most tourists avoid destinations with the disturbed environment. Leisure time recently takes place in a natural environment where cultural, historical, ethnographic and eco content is always welcome (Muhi, 2011).

A large number of tourist populations that participates in the global tourist migration have increased environmental awareness and desire to stay in a healthy environment, learning about flora and fauna of protected areas, etc. In order to become successful, green destinations have to be found in terms of sustainable development and improved quality of life, economic development, individual sense of well being and all that through the reduced use of nonrenewable resources and pressure on the environment and man, while preserving the integrity of creation and fostering economic growth and benefit the local community.

World Tourism Organization (UNWTO), World Travel and Tourism Council (WTTC) and the other tourism international organizations deal problems for which are responsible all entities in the tourism industry, in order to achieve the goals of sustainable development. Their goal is to establish a universal code of conduct in this area, acceptable to all participants in the development of tourism, but also to all countries. The concept of sustainable development implies a balanced economic, social and cultural development without harming the environment, which will enable future generations to develop on the same or higher level.

Planning of sustainable tourism should recognize the rights and the needs of local residents, respect their resources (physical environment), life style and the culture, but also it should give them right to make an influence on the local resources (tourist and other resources). Because of these reasons concept of sustainable tourism has become more important recently. According to many authors it has become the most important challenge and the task of tourism in the 21<sup>st</sup> century. Sustainable tourism should be



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based on an integrated, holistic approach that includes the interconnection and cooperation of all the factors influencing development of tourism (Bakić, 2008).

### **3. Tourism as One of the Leading Sectors of the Global Economy**

As a major driver of economic growth and employment worldwide, the tourism and travel sector is a critical component in the global economy. It provides economic benefits by connecting countries to international markets, encompassing people, capital, and resources. Moreover, travel and transport networks – especially air and rail – are essential economic assets for more than just transporting people; these networks also form the backbone for cargo shipments, thereby increasing regional or global economic activity. In addition, the tourism and travel sector breaks down cultural barriers and links people from various nations, while at the same time it contributes to the development of regional communities by building partnerships among local residents, organizations, and businesses. The importance of the sector worldwide is demonstrated by the liberal business environment that exists in most countries, with more than 130 World Trade Organization (WTO) members having made commitments to open up their tourist industry – more than any other service sector.

International touristic turnover in 2011 has recorded a growth of 5% and made a new record of 970 million international touristic arrivals despite the second wave of the world economic crisis. Compared to the same period in the last year it presents 50 million more of international touristic arrivals. These results show that the international tourism continues consolidation and a growth, which has begun in 2010. No matter to all the challenges to which it was exposed. The first results of 2012 indicate that international tourism continued to show sustained growth in spite of challenging economic conditions. During the first half of 2012, international tourist arrivals grew by an estimated 5,7 percent compared to the same period of 2011, according to the June issue of the UNWTO World Tourism Barometer.

The World Tourism Organization (UNWTO) forecasts that international tourism will continue growing at the average annual rate of 4%. UNWTO's *Tourism 2020 Vision* projects that domestic and international arrivals are expected to reach nearly 1.6 billion by the year 2020. Of these worldwide arrivals in 2020, 1,2 billion will be intraregional and 0,4 billion will be long-haul travellers. With the advent of e-commerce, tourism services have become one of the most traded items on the internet.



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Source: World Tourism Organization (UNWTO) (2011) UNWTO Tourism Highlights

Fig. 1: International tourist arrivals and tourism receipts

### 3.1. Environmental Impact of Tourism

Tourist movements, which today are characterized by a very large number of participants (mass tourism), cause also negative effects. Primarily it is devastation of the various forms of natural and social environment. During the 60's and especially in the 70's and 80's of the last century, attention of many countries and tourist companies were strictly on the economic aspects of tourism development, i.e. its direct, indirect and multiplier effects on the economy (at macro and micro level). This produced a significant wave of criticism and focus on issues of tourism impacts on society, locals and tourists themselves. The arguments for this drew from the many examples of the negative sign in the development of tourism, such as, for example the destruction of the surrounding space (it's spending for tourism issues), derogation of the natural environment and natural attractions, the commercialization of cultural, historical and other heritage. One could make a really long list of all shapes and forms of pollution, from the most banal ones to those that significantly affect the natural and social environment. The challenge is always placed on the relationship between costs and benefits brought by tourism development in a given area. It may be noted that the concept of sustainable tourism as a form, basically, means and aspirations of the local community (or communities of wider scope) in connection with tourism development.

Therefore, there is a strong need for building tourism on the values of sustainability principles. In this way, "ecotourism", "green tourism", "sustainable tourism" is becoming a trend in the global tourism market that has a significant impact on the consciousness-tourism demand and therefore sets a new



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system of evaluation resources that determine the individual tourism products, such as flora, fauna, traditional culture, gastronomy, cultural and historical heritage, and the like.

Ecotourism has become one of the fastest-growing sectors of the tourism industry, growing annually by 10-15% worldwide. One definition of ecotourism is “the practice of low-impact, educational, ecologically and culturally sensitive travel that benefits local communities and host countries” (Honey, 2008). Responsible ecotourism includes programs that minimize the negative aspects of conventional tourism on the environment and enhance the cultural integrity of local people. Therefore, in addition to evaluating environmental and cultural factors, an integral part of ecotourism is the promotion of recycling, energy efficiency, water conservation, and creation of economic opportunities for local communities (Randall, 1987).

#### **4. Green Hotels**

Innovative concept of “green hotels” was presented on touristic market a few years ago. These hotels respect the rules of environmental sustainability. A big pressure which was made by ecologists, clients, staff, but also good financial moments made an attractive terrain for hotels to introduce modern and environmentally sustainable concept which among other things implies a rational consumption of energy and water, concern about waste and less pollution.. As soon as it was introduced, it was spread around the globe.

In order to keep up with the modern trends, hotel industry has introduced green hotels which respect all the ecology rules and strive to reduce the pollution of the environment. Green hotels present an example of a high quality service which provides healthy natural environment and preservation of natural beauties. The main aim of the concept of green hotels is to reduce the consumption of energy, water and the carbon dioxide emissions, to mind about the decomposition of solid waste and increase recycling of all waste materials, to use conventional detergents and other chemicals to reduce to a minimum or replace it into harmless; to prevent or at least reduce environmental pollution and, where possible, preserve local biodiversity.

Hotels which have successfully introduced this new concept (among all the countries worldwide, the biggest number of green hotels is in USA) have made better business results and a significant contribution to the environmental protection. For instance, some of the principles of green hotel involve the moment when guest leaves the room and doesn't use some of the room facilities and at that moment lights, air-condition and television turn off automatically; in the bathroom instead of special soaps and shampoos containers are placed so it can be supplemented, and the flow of water over the sink triggers movement and the time limit; also the towels and bed linen are not changed every day, etc. According to a survey of the Association of Green Hotels, at least 70% of guests support this concept. Research which was done by the TIA – U.S. Travel Industry Association shows that 60 million tourists, or 78% of the U.S. tourist population, would stay in green hotels despite the price. On the other hand, according to the results of the statistical agency of the European Union (Euro Barometer, 2011), one





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third of the population of the European Union would choose to travel and stay on holiday on eco destination or in a green hotel.

#### **4.1. Some Green Hotel Samples**

California's Grand Hotel Marriott a member of the American branch of the International Association of Green Hotels (GHA - Green Hotels Association), was awarded for the highest annual water savings, as much as 7,5 million litres per year.

Hotel Hyatt in Chicago reduced for 80 percent the amount of discarded supplies (napkins, towels, bedding, cutlery etc.). Management of the hotel ordered the employees to review carefully the items marked as "charged off". The value of what was saved was from 3,000 to 10,000 dollars per month.

Hotel Hyatt in New Zealand made annual savings in short period by introduction of a system that shuts down lights and other electrical appliances when guest leaves a room. It cost the hotel 16,000 dollars, but it achieved annual savings of 14,000 dollars after only 14 months.

Spa resort Fairmont Sonoma in Canada reduced electricity consumption by 203,000 kilowatt-hours, "earned" 61,000 dollars per year and prevented the release into the atmosphere 144,000 pounds of carbon dioxide by replacement of 4400 ordinary light bulbs by energy saving light bulbs.

A small hotel from Toronto, which joined the city's water conservation program in the public, industrial and commercial sector, installed a commercial water softener which shortens the cycle in the washing machine. It saves daily 476,000 liters of water which is enough to supply 500 households.

The next two examples represent successful usage of ecological concept in hotel management.

##### **Bella Vista Trafoi Hotel**

A brand new design of Bella Vista Trafoi Hotel in Italian Alps was made by an Italian architect Matteo Thun. Only a huge front wall made of glass gives an idea of a human settlement. These walls made of glass keep the maximum of natural light and give beautiful views. Insulation is made of tree layers which protect the hotel object out of noise and the outside cold temperatures. Temperature inside the hotel object is moderate and pleasant. There are many environmental benefits on the Earth similar to this specific design. This specific design provides protection from the exterior weather damage, and it also maintains the flora and fauna in the region. Reducing energy consumption is a major advantage in an underground facility. Using the principles of passive design for heating and cooling is done by the heat pump on the ground floor which is supplied by the water from the local natural resources.<sup>1</sup>

##### **Naturhotel Waldklause**

One of the most visited green hotels in Austria is Naturhotel Waldklause. Despite the fact that this is one of the most expensive hotel, this hotel is usually fully booked. Modern hotel building made of

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<sup>1</sup> <http://www.ecofriend.com>



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wooden materials is in harmony with the forest, situated near the famous Austrian touristic centre Zelden, fourhanded by the mountain heights that reach 3000m above the sea levels and by a stream.

Buildings made of wooden materials are not any innovation since they have been built around the globe ever since. However, Naturhotel Waldklause is a hotel which has a capacity of 50 rooms, restaurant, bar, wellness centre and all the facilities that one luxurious hotel should have and it represents a hotel made of wood.

At the time when it was built, this hotel building was more expensive for some 30-40% since it was made of ordinary materials. Total cost was 10 million Euros. Important to mention is that the wood which was used for building wasn't ordinary wood. Wood which was used can be named "Wood of the Moon" since the trees were cut when the moon was at some stage - from full to the young, because at that stage the tree has little moisture and it cannot shrink.

However, material cannot be the only reason for the title of the best Eco Hotel in Europe. In this hotel only organic cleaning products are used. For the heating only sawdust and wood briquettes that are purchased from a local sawmill are used, so that they can have benefits. In an ecological hotel food must be also organic. It is purchased in the nearby vicinity from the local peasants. If guests ask for the food origin, hotel staff gives them the address of the peasants, so that the guests can go to see from where the food supplies come from and purchase the food.

Of course, all this has its price. The rooms are at twice as expensive as in nearby hotels of the same category. Despite this, the hotel was sold out almost all year round.<sup>2</sup>

#### **4.2. Eco Lodge**

Over the last few years at many destinations a new type of accommodation called "eco lodge" has been noticed. This type of accommodation is based on the principles of ecotourism, and includes the concept of experiential education perspective, combined with the principles of environmental protection. The conclusion is that this type of accommodation provides both high quality of tourist experience and adequate environmental protection.

Eco lodge is a modest facility that meets the basic tourist needs, located in the protected areas. This type of tourist accommodation must meet the following criteria:

- Protects natural and cultural components of the environment;
- Makes a low impact on the environment while it is under the construction;
- Fits in the specific context of the environment;
- Uses alternative, sustainable means of water consumption;
- Provides careful management of waste and water waste;
- Has excellent cooperation with the local residents;

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<sup>2</sup> <http://www.waldklause.at>



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- Implements programs of environmental education both for employees and visitors;
- Contributes to sustainable community development through research programs.

## 5. Green Hotels in Serbia

At the Seventh International Forum of hotels and hotel managers which was organized in Belgrade with a topic “Green hotels - the basis of sustainable development of the hotel industry” it was said that the hotel managers in Serbia do not know much about the “green” technology and that only a small number of hotels in Serbia use this concept. However, the first steps have been made. Hotels in Kopaonik mountain have already arranged transportation of the oil from their fryers from the kitchen, since it is well known that the oil spill makes a real irreparable damage to the environment. A few hotels have also started using in their toilets faucets with sensors in order to avoid unnecessary spillage of water, and thereby preserve one of the most precious resources - water. Some hotels in Belgrade introduced the energy efficient lighting.

Hotel Hyatt in Belgrade has introduced a new, more economical heating system, installed sensors to control lighting in offices and other venues, as well as the frequency regulators in the kitchen and laundry room of the hotel. Hotel also introduced the recycling of all waste materials and the usage of recycled paper for all printed materials. Renewed hotel Balkan replaced coal furnace system for district heating. Good insulation in this hotel reduced to a minimum energy consumption which was previously wasted on heating and cooling.

At the moment, hotel Hyatt is the only hotel in Serbia that formed a so called “green team” which deals with this topic. This hotel has reduced the usage of the energy for 20% according to the spokesman of hotel Hyatt. New heating system HVAC was introduced together with a new switches in guest rooms, light control, sensors installed in the offices and employees in other areas as well as frequency regulators in the kitchen and laundry hotel. This way, it saves energy when the light automatically goes off when the guest leaves the room or tap water stops running after some time. Recycling of all waste materials that are used in the hotel was also introduced, as well as the usage of recycled paper for all printed materials.

Unfortunately, Serbia cannot boast of good infrastructure of hotel industry (249 officially registered hotels of which 70% have two or three star, four stars out of five hotels, while only eight hotels can boast five stars), but things are going better, which confirms the fact that in the last three years, 54 new hotels were open (hotels which have three, four, or five-star), environmental standards were introduced, the same ones which are applied in the European Union and that use elements of new “environmentally friendly” technologies.

An organization called „Environmental Ambassadors“ actively promotes the concept of green hotels in Serbia. They argue that in the years to come only work with sustainable hospitality management system is economically viable, socially acceptable and safe for the environment.



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## 6. Conclusion

We live in a time when a great importance should be given to discussions about mutual dependence and influences of tourism development, preserved nature and economy. Ecology has become essential need of modern society and therefore it can be treated and discussed as a trend in modern business. A new international movement which is reflected on tourism demand as a primary need of modern tourists includes that people tend to spend their holidays and feel the pure and untouched nature, taste organic food, buy natural materials and use renewable energy. On the other hand, global supply has made extraordinary efforts in order to minimize negative effects of tourism and to raise environmental awareness which made positive effects on tourists that demonstrate their increased interest in the preservation of the planet.

In the past few years, all around the world one can find „green hotels” which respect all the ecology rules and strive to reduce the pollution of the environment as much as possible. The main goal of such business trend on the market is to reduce the usage of the energy and water, reduce emission of carbon dioxide and to make minimum pollution. Green hotels are the best examples how to provide a high quality service to the guests while taking them into the healthy natural environment which will preserve the natural beauties for the future generations that are about to come.

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## Why society is a complex problem?

### A review of Philip Ball's book – Meeting Twenty-first Century Challenges with a New Kind of Science

Diana Tampu<sup>1</sup>, Carmen Costea<sup>2</sup> 

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#### Abstract


*The 21st century is burdened by a series of dramatic changes and efforts are carried out to find potential solutions to consumerism, access to information, transient climate disequilibria, health care and demographic transformations. A new page in human history will bear witness to the introduction of new ways of thinking, new changes, new relationships and interconnections that transcend states and societies. The moment is ripe for individuals aware of the implications carried by global changes and challenges, to step up and encourage responsibility and sustainable development. Mankind is currently living in a data-rich world, where information is widely dispersed. Nevertheless, extracting the right assumptions and conclusions from the available data proves difficult as numerous social phenomena do not run with clockwork precision as the laws governing the Newtonian universe.*

*Human awareness and intelligence demand a more responsible approach to all operations and steps should be made in determining the consequences and their impact. The goal of this paper is not restricted to providing a review but also to enforce certain ideas in relation to the complex interactions specific to society and economic activities.*

**Keywords:** multi agent model, complex society, crashes

**JEL Codes:** H3, D5, G01

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## 1. Multi agent models and their role in predicting traffic or crowd movements

Traffic is one of the simplest systems that can be predicted by treating it as a complex structure. In this way the safety would be improved, pollution would be reduced and millions would be saved from lost working time and inefficiencies of transportation.

When we are in traffic and travel from one place to another, we have only a few expectations: to avoid collisions with other vehicles, to drive at a speed that suits us, and not to flout legal constraints. When we are walking from here to there, the only thing that we want is to avoid collision. All these are possible with the use of very simple agent based models of traffic flow or pedestrian models, like the ones presented in Fig. 1“a” and “b”. Researchers have demonstrated that humans tend to follow each other’s footsteps in public areas because of a psychological impulse.

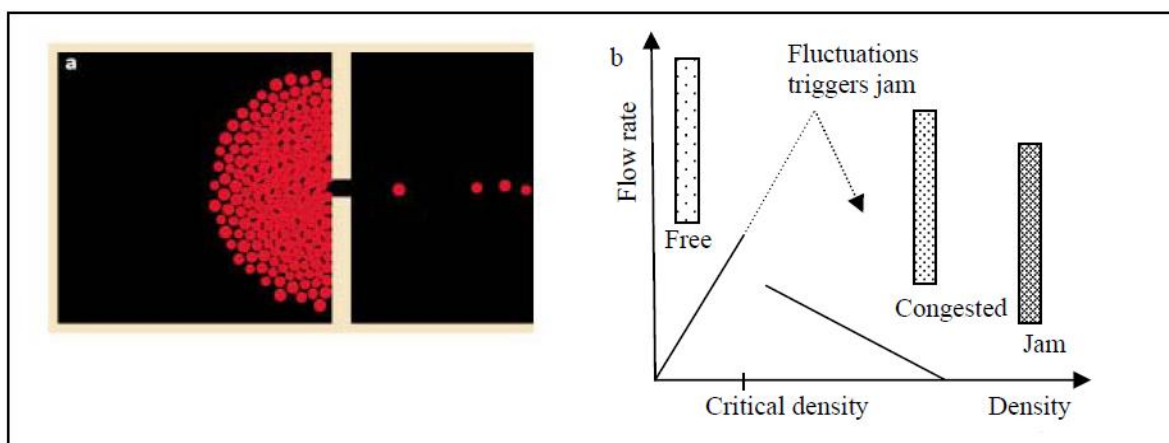


Fig. 1: Agent based model of crowd movement and traffic flow (Ball P., 2012, pp.2, 9)

Fig. 1a, presents the simulation of a crowd trying to exit rapidly from a room in a panic situation, in which individuals escape only slowly and sporadically. Walkers press in against one another in front of the door, trying to move faster. They involuntarily form an arch-shaped line and become unable to move forward. Fig. 1b, illustrates an agent-based model of traffic flow assuming that there is a critical density until the flow rate increases steadily. After this point the flow rate stops increasing and abruptly starts to fall, until a traffic bottleneck develops. Both figures present a limit situation, where the actual models aren’t efficient in resolving these problems. To have tangible results (the average delays can be reduced by 30-40%) in real



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time it is necessary to make an innovation that has to be efficient. Winston Churchill (1924) once said: *We make our buildings and afterwards they make us. They regulate the course of our lives.* Understanding how humans go in public places should enable architects to design them more efficient (Ball P., 2012), as well as the idea of traffic sensors placed before an intersection should give useful information about the traffic density of that area. Nothing could be more real. Schemes like this are already implemented in American cities (Dallas, Texas) and an extension, which could generate a broader vision, is currently considered. In this way the loss of lives caused by uncontrolled movements of crowds during fires, earthquakes, on stadiums or at concerts could be avoided. Sensors implemented in the human body would provide important information about where we are, the speed that we have or direction that we follow. In this way, by using heuristic rules, computer models would enable the buildings to be constructed according to the needs of people, not to adapt people to buildings, roads to be designed in a manner that avoids traffic jams, not to adapt us to the road network. This last argument, for example, influences another phenomenon: robberies. This is dependent on the structure of human environment.

## **2. Diseases and epidemics, the spread and control of crimes in a complex society**

Is not a secret that nowadays all occurrences can be predicted, sometimes very accurately, by statisticians or other scientists. The area of prognosis is very wide, from epidemics to places where robberies and crimes are most frequent. The bell curve – the same curve that describes the variation of birth and death can also forecast the variation of crimes from year to year – because as it has been demonstrated, the crime is not a random or individual act, but a collective social behaviour. The complex systems cannot be guaranteed to answer all the questions of society, but can prove that criminality depends among other things on the establishment of norms, changing demographics, multiculturalism, economic conditions, urban planning and education. In parallel with this, the incidence of burglary is characteristic for terraced houses, not too far from the thief's house.

The current mathematical models in their analysis may not include demographic aspects, or spatial ones, as the above mentioned, but agent based models can include them. Identifying the places where crime has a high level provides the positive effect of increasing the number of law enforcement personnel in that area with the possibility of reducing the number of crimes.

Sociologists James Q. Wilson and Kelling Goerg have shown that people tend to produce antisocial acts when the environment or other people influence them. Thus, the New York subways renounced in 1980 the graffiti designs, and demonstrated that users would behave better when evidence of neglect is removed.





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A once result positive, the crime rate decreased and the numbers of violent acts and robberies were cut to 50% between 1989 and 1999 (Ball P., 2012, pp. 20). The model of crime found in a certain area is similar to the biochemical process thought to produce pigment spots in animal skins (Short M.B., Bratingham P.J., Bertozzi A.L. & Tita G.E., 2010, pp 107) presented in figure 2.

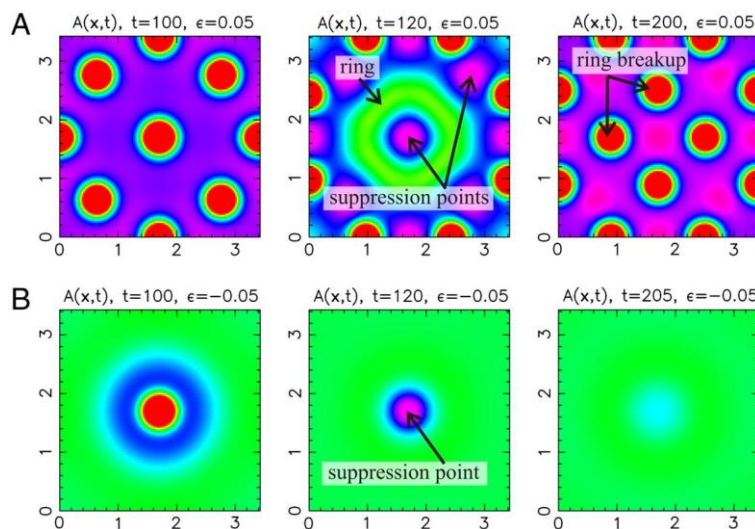


Fig. 2: Interaction of criminals and victims and the similarity with reaction diffusion (Short M.B., Bratingham P.J., Bertozzi A.L. & Tita G.E., 2010)

Crime hotspots presented in Fig. 2 a, can be displaced into a surrounding neighbourhood (the ring situated in the centre in Fig. 2b).

This analysis made available to the competent bodies leads to the concentration of the police officers in problem areas. Although such models have not yet been put into practice, through an empirical approach they can be very useful for law enforcement strategies.

Predictable are not only crimes, but also diseases and epidemics. Transported in ships, airplanes, or in the road network, the transmission of infectious diseases depends on the type of human movement models and the road network described in chapter 1.



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Society has evolved, and the same is true in the case of viruses and infections. If in 1346 the Black Death spread slowly and predictably similar to an ink blot, in 2012 the human crisis crossed the globe in an instance, with the potential for disease epidemics (Balcan D., Colizza V., Gonçalves B., 2009) as can be observed in Fig. 3.

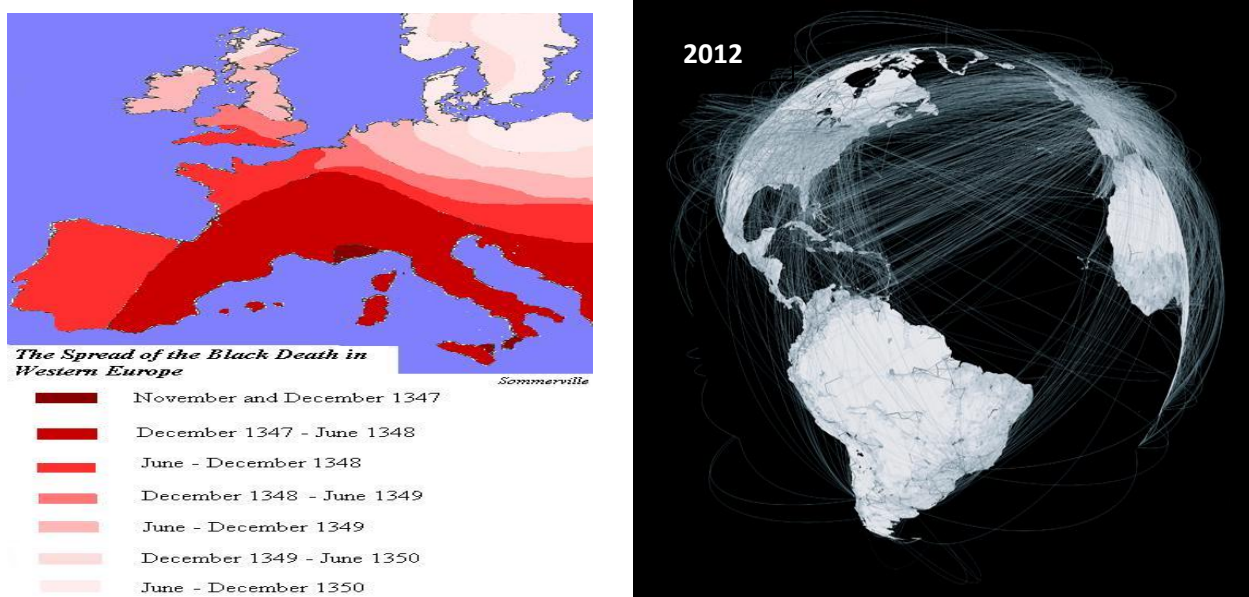


Fig. 3. Year 1346 vs 2012 - the spread of things (Balcan D., et al, 2009, Image courtesy of B. Gonçalves, et al./Indiana University)

Today, each of us can cross the globe in less than a day. The increase of human mobility has negative effects on virus transmission such as H5N1 (bird flu), H1N1 (swine flu) or other diseases. What at first may seem a regional medical problem; through the transportation network it can become a global pandemic. The solution for combating these infectious diseases is the *hubs*. Targeting immunization or preventative treatments for key individuals can reduce the chances for the development of an epidemic (Ball P., 2012, pp.30). In this way understanding and predicting the spread of diseases become a multi-dimensional issue. Agent-based model like the Global-Scale Agent Model developed by the Brookings Institution in Washington DC have begun to appear. If in the previous periods we were afraid of viruses, today problems such as increasing obesity in many countries is a better concern. Obese people form clusters in social networks, people tend to borrow from friends habits, research suggesting that a person's chance of becoming obese increases by 57% if one of his friends is faced with this problem (Ball P., 2012, pp.32). The reasons for this contagion of obesity may underlie several reasons, including: eating habits, increased tolerance of weight



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gain, psychological effect of imitation, because *people are connected, so their health is connected too* (Christakis N., Fowler J., 2007).

So the contagion through social networks is also true in case of healthy behaviour. The spread of smoking in the U.S. has decline from 45% to 21%. A study conveyed (or conducted) over 12,000 people has shown that smokers tend to cluster together. A smoker has 67% smaller chance of smoking if their spouse quits 25% smaller if a sibling quits, and 36% if a friends quits (Christakis N., Fowler J., 2008). To be effective, the anti-smoking campaigns require more targeting relied mostly on clusters and networks.

### 3. The network failures and the economic crash

The infrastructure of water supply, transport, energy, health and webs of trade and travel that link global airports, seaports, and the social network for friends, associates or businesses do not cover the developed societal needs that exist in our time. None of these networks was designed for the society we live in the present. They are all grown spontaneously after the needs dictated by society. The new view brings in front a dynamic, non-equilibrium system that has constantly changed and adapted to the social needs. As Michael Batty (2008) said *planned cities are always the exception rather than the rule and when directly planned, they only remain so for very short periods of time*. As indicated in Fig. 4, inter-connectivity is one of the defining and determining features of the modern world.

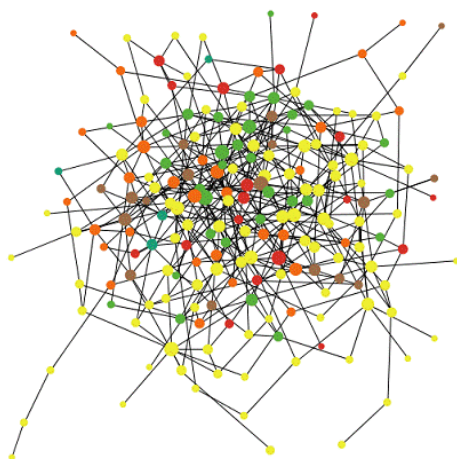


Fig. 4: A random network ( Hawoong Jeong, 2000)



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Stanley Milgram (1960) has demonstrated that the world has created through the social networking time shortcuts between two points. Thus, appeared the famous *six-degree of separation* which can be translated into the fact that between any two people, who do not know each other, there are never more than 6 individuals that could make the connection. Similar, any web page is connected to any other by an average of 19 links. This is the principle that Google uses in page ranking schemes, to reflect how good a web page is. These shortcuts have a number of benefits in the real world but when the systems fail they generate crisis.

*Economic predictions are notoriously unreliable* (Amartya Sen, 1986). On Black Monday the stock market crashed, and like all the previous crashes it came as a surprise to almost everyone. The current models have a missing component that could not predict the unsustainable growth that was encountered in most economies, neither the crisis, which represented the climax. It is not a secret to anyone, that conventional economic theories used in the present by central banks and other economic institutions that inform government policies, fail to anticipate market crashes. The reason is quite simple. These theories and models exclude the presence of such events, the markets being the ones that must adjust themselves. We are still living with traditional patterns of mistakes that not only failed to detect crises, but also cannot offer any kind of comprehensive and effective means of escaping it. The traditional economy is based on several fundamental ideas that in an era of scientific revolution seems to be very simplistic. The physical sciences have passed long ago to models that describe non-equilibrium processes. The latter one argues that since all agents from economy are identical, and that all have access to the same information in the market they take rational decisions that can maximize their profits.

Such concepts should be changed if the global economy, being an immensely complex system, can demonstrate its potential benefits. Agent based models are not a panacea. There is not a general rule according to which a model can be built that is able to guide agents so that crises can be avoided. As stated by Isaac Newton, *I can calculate the motion of heavenly bodies but not the madness of people*, it is obvious that economic agents aren't rational and the market isn't as efficient as it is thought to be. The alternative to traditional models lies in multi agent models, in which the assumption is that each decision is not identical from one agent to another, price fluctuations are not imposed by exogenous factors but by endogenous ones.

The fluctuations in multi agent models are not similar to the traditional models. If ultimately, the economic fluctuations could be likened to the white noise (see Figure 5a), in reality they tend to have bigger spikes (see Figure 5b). These changes are not related to the changes in the intrinsic value, but are the result of many individual decisions.



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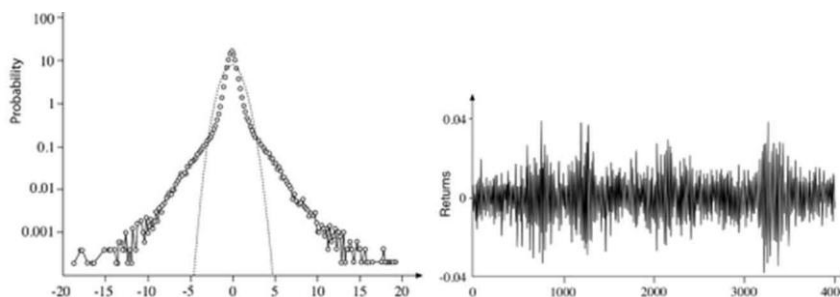


Fig. 5: Traditional models vs multi agent models (Ball P.,2012)

In traditional economies, it was assumed that economic fluctuations tend to have small spikes. The reality is different; in fact they tend to have bigger and large spikes. Because they can accommodate interactions between agents, it is possible to demonstrate the cascades and herding effects that produce the economic bubbles and panics.

Scientists analyse the feasibility of a multi agent model sustainable at national or global level. This would require the knowledge of economic experts in each sector of the economy: labour markets, finance, supply chains, marketing, etc. in order to elaborate basic rules that underlie the decision making of billions of agents, companies and institutions. Between 2006 and 2009, a European team already created a model called Eurace – the largest agent based model created so far. (LeBaron B., Tesfatsion L., 2008). The model, meant to be tested on Greece and Italy's economy will show an appropriate way to deal with massive government debts. The conducted simulations suggest that in the long run economic growth is boosted and unemployment is reduced. If the forecasts are correct, time and agents from the economy are those who shall decide, because better models of our complex society have started to become available.

#### 4. Conclusions

Long-term stability and development should represent the pragmatic and realistic objectives for any economy. The present research has demonstrated that only by analysing the society as a complex system, its social and economic issues can be explored and investigated in a fair manner. And because society is complex, the problems we are facing are complex too: epidemics and disease, avalanches, traffic jams, crowd panic, criminality, economic crises and financial crashes can be solved only if equations and aesthetic axioms will be replaced with multi-criteria analysis of dates that can cope and best manage our complicated



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and interconnected human world. In order to face all the problems, they cannot be studied in isolation. It is time for a multidisciplinary collaboration between economists and scientists in order to:

- Observe inter-connections between global phenomena and between individuals groups and institutions;
- Create conceptual and technological tools that can handle the actual data-rich society;
- Abandon linear and one –size-fits all thinking;
- Create conditions for effective solutions and not only impose solutions that aren't efficient;
- Discover the advantages of diversity and networking;
- Let organizations to adapt and innovate because this is the future of development;
- Realize that history matters only until multi agent models will be sustainable;
- Offer comprehensive explanations and solutions for social phenomena;

Complex system research on social and economic problems is a very rapidly growing area of scientific enquiry and represents the future.

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