



# Mountains and Eco-Economy. A New Attitude in the 21<sup>st</sup> Century. Economic Recession and Efforts in the Romanian Carpathians

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## ABSTRACT

Demographic growth and the climatic changes, the perspectives of hunger – in the 21<sup>st</sup> century turn mountains into points of interest for food and human habitat. A new attitude is necessary, aiming at preservation of populations and poliflora of mountain grasslands and hayfields, created during centuries, based on organic fertilizers, whose absence for only 7-8 years leads to ir retrievable degradation. In the Romanian Carpathians one can notice a wide regression: rural exodus, agri-zootechnics abandonment, industrial food monopoly, with ridiculously low prices for milk and meat, poverty, discouragement, the big agriculture's domination over the mountain eco-bio economy, with economic marginalization. The economic recession has seriously affected the mountains. Safeguarding is still possible, through specific ample measures. The differences between the mountain development rates of West-South-East are too big. The weak competencies, as far as knowing the mountain specificity is concerned, constitute a real peril. A European mountain strategy and national mountain policies are considered emergencies.

## 1. INTRODUCTION

The 21<sup>st</sup> century's world is becoming more and more affected by the prospects of and food risks.

The climatic changes, the reduction of agricultural areas and the increase of population to 9 billion people in the year 2050, require a change of attitude towards the mountain areas, which become important not only for forests and bio-diversity but also as food producer and new spaces for human habitat. Mountain eco-bio-economy [11], "the driving force" of mountain rural life, aims at the production of food products valuable for a healthy life, through good agriculture and zootechnics practices, dependant on the

existence of indigenous populations, with traditional knowledge and physically-psychically adapted, which brings many services for environment and society. Having a "mountain farmer" requires about 5 successive generations. The outside populations become inhabitants but not important agricultural producers.

UN – by Agenda 21, chapter XIII – Mountains, has drawn attention on their importance and set up the guidelines. The global economic recession highlighted new realities and the necessity to have some new types of interventions. Depopulation of mountain areas, with agriculture and zootechnics traditions, rapidly leads to degradation of pastures and the loss of many socially important resources.

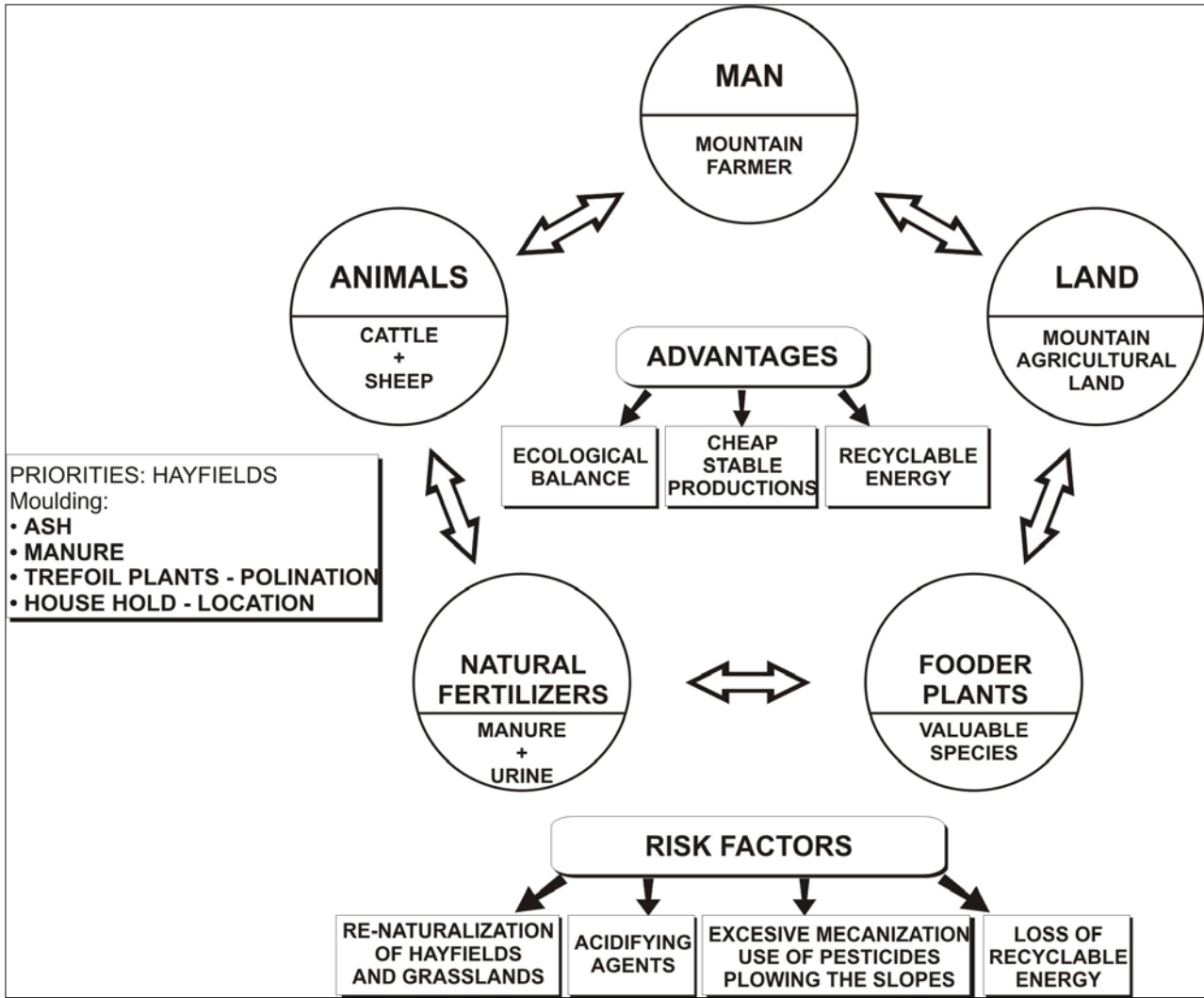


Fig. 1. Basic eco-agri-mountain relationships [62].

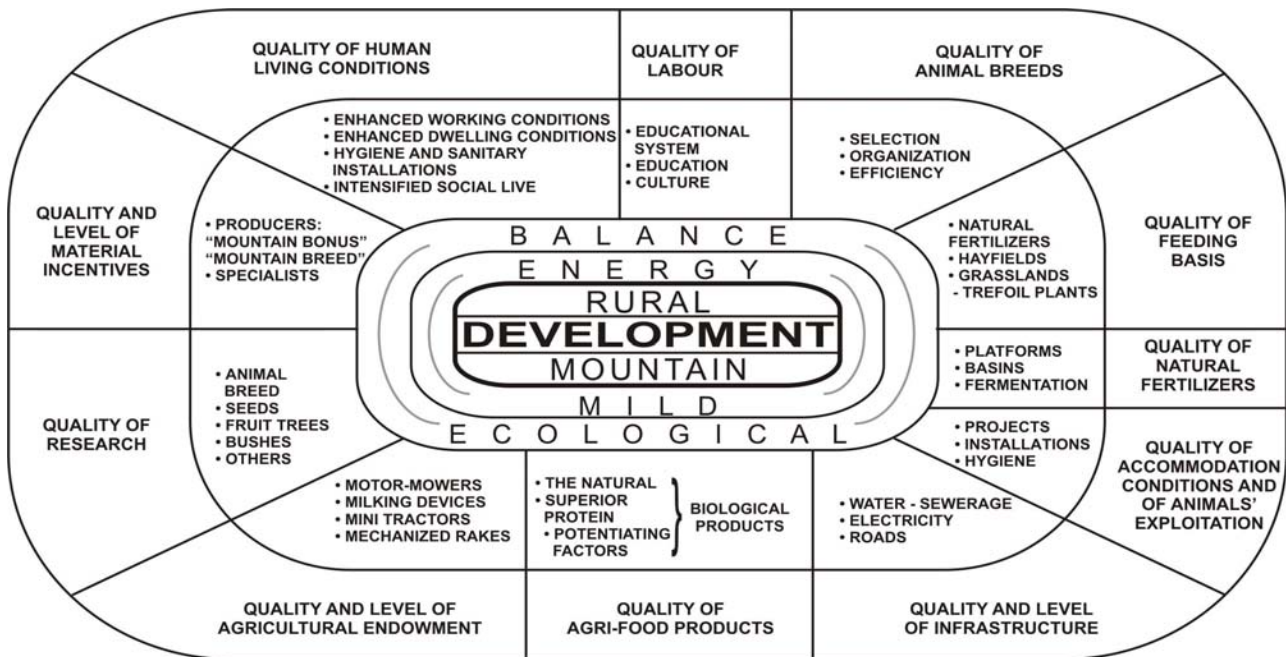


Fig. 2. Mountain evolution through quality [62].

The investments for bringing back the young farmers who have left for the cities are too high and not so effective.

The research carried out in Romania [62] showed a specific relationship between the acidity of mountain soils, the alkalinity of fermented organic fertilizers from cattle, ruminants and high-value fodder flora created by inter-specific natural antagonism during centuries of human perseverance.

In just 7-8 years, the abandonment of breeding ruminants and the absence of organic fertilizers will lead to the degradation of quality of flora's structure, by getting back to the initial natural ecosystem with low value fodder plants or even no value fodder plants (the plants will turn wild again).

The loss of a human creation during several centuries is now at stake and this loss is irretrievable now when the young mountain farmers have so many alternatives. Hence the logics of having priority preventive interventions – in the agri-mountain eco-economy.

In the lowlands/hills the land can afford to wait for their farmers. Quite the opposite is the situation of the mountains, which PENALIZE ...

The society of 21<sup>st</sup> century cannot afford such a luxury...

In the relationship between MAN – ANIMALS – ORGANIC FERTILIZERS – FODDER PLANTS for HUMAN FOOD, a balanced mountain ECOSYSTEM and traditions based on sustainable good practices represent the safe improvable side, but these traditions are more and more unknown by the new generations of technical bureaucrats who are trained on the technologies of big agriculture.

The absence of skills is more and more dangerous in the poorly developed countries with mountains.

In the developed countries, where the use of chemicals and the intensive systems have penetrated even the mountains, they are now turning to „re-conversion”, with high costs.

It is not the case of the Romanian Carpathians, which have not been touched by chemicals, which have traditions, extensive animal breeding, unpolluted environment, opportunities generated by agri-food eco products and which, paradoxically, due to the fact that they are lagging behind they can make it to the top, through biological quality and sanitary guarantees [60].

The economic recession has touched the mountain economy in a different way: in Europe, where mountains cover more than 30% of the surface and 20% of the agricultural area, the developed countries, with strengthened agri-rural structures, have been able to deal with the recession.

In the Carpathians chain the effects are different, not so serious in the case of Poland, Czech

Republic and Hungary, which have a lower percentage of mountains and very serious in the case of the Romanian Carpathians, where the mountains represent more than 74,000 km<sup>2</sup>, with 4 million ha of forests, 3 million ha of agricultural lands (2.3 million ha of grasslands and natural hayfields), 3560 villages, 2.1 million farmers, more than 800,000 small traditional farms, one of the most important economic “actor” for E.U.'s mountain areas.

Table 1. Population in the Carpathian mountain chain [103].

Total population in the Carpathians	Total population in the Romanian Carpathians	% of population in the Romanian Carpathians
9966351	4553602	45.69

## 2. ISSUES IN THE ROMANIAN CARPATHIANS (AND OTHER SIMILAR AREAS)

The former communist regime, for political reasons, has neglected the development of non-collectivized agri-mountain economy, with a real tendency to start the collectivization of mountains (Two „reference” books, Future in the Carpathians (1979, 372 pages) and Mountain Civilization (1985, 280 pages) and the author's energetic attitude (dr. Radu Rey) played a very important role for preventing the collectivization of mountains, generating interest, through the innovative ideas, for delegations from USA, China and even USSR). But the farmers, animals, fodder flora, traditions, jobs and social protection (health, pensions, etc.) have been maintained.

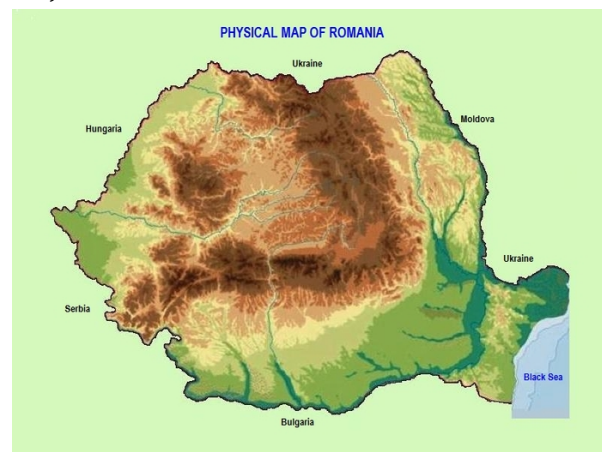


Fig. 3. The map of the Romanian Carpathians.

After 1990, the ultra-liberal capitalist system installed in the mountains generated: savage exploitation of forests (aliens/profit and indigenous people for making a living); the monopoly of the owners food industry, with ridiculously low prices for raw materials (e.g. 8.5 litres of milk /1 euro..!); massive

exodus of young people from the mountain villages; agricultural abandonment; up to 70-80% decrease of the number of cattle and sheep; degradation of quality of the flora of grasslands and hayfields – due to lack of organic fertilizers; ageing of population; fewer jobs; poverty, discouragement, distrust.

Exaggerated interpretations of the notion of „biodiversity” – induced in norms: protection of weeds (e.g. *Nardus stricta*, tens of thousands of hectares) and of a very high number of wolves and bears – very harmful for animal breeding; payments for late harvest of hayfields and for non-harvesting (payment for non-work– E.U. funds..!); attempt to ban grazing and sheepfolds in the largest mountain massifs (the Bill on Environment - 2005) that would have resulted in destroying the sources of living for tens of thousands of mountain farmers and human desertification (!).

Thus, „biodiversity” has been turned into „bio-diversionism”.

Table 2. Evolution of number of animals in Romania (thousands heads) [104].

	1990	1995	2000	2005	2008
Cattle	5,381	3,496	2,870	2,862	2,684
Sheep	14,062	10,381	7,657	7,611	8,882

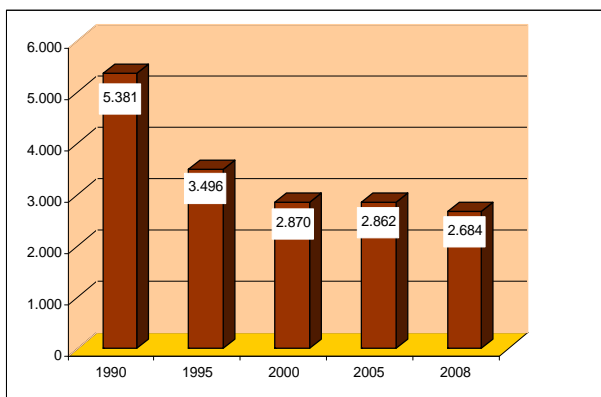


Fig. 4. Evolution of cattle's number in Romania.

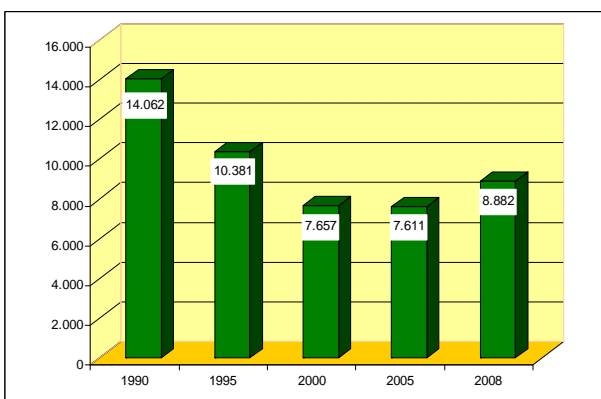


Fig. 5. Evolution of sheep's number in Romania.

If at country's level the number of animals decreased with 50%, in the mountain area, which is predominantly depending on animal breeding, the situation is far more serious, about 80% decrease of the number of animals.

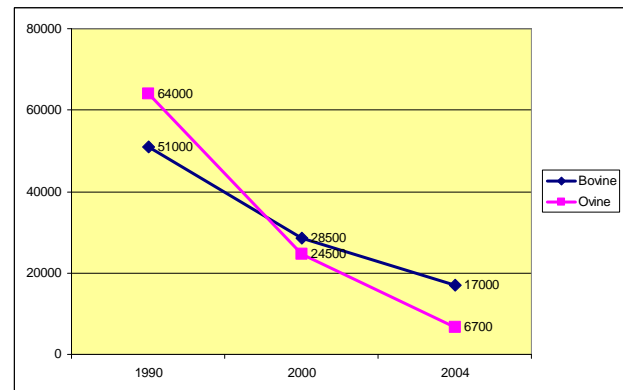


Fig. 6. Evolution of number of cattle and sheep in Dorna Basin.

Own research (R. Rey, 1990-2004) showed that in Dorna Basin the number of cattle decreased with about 66% and the number of sheep with 90% (this situation is pretty similar to the one of other 84 mountain basins).

### 2.1. Efforts after 1990

The first institutions for the Romanian mountains have been established: The Committee on mountain areas and the National Agency of Mountain Areas (ministry of agriculture – 1990-2010); Mountain Institute - Cristian, Sibiu (research, 1991) and Mountain Commission, with the Academy of Agricultural and Forest Sciences – 2002 (definition of the notion of „mountainology” – Romanian priority, published in the book „Mountain civilization” (1985) – „Multi inter and trans-disciplinary scientific field dealing with the study of the economic-ecologic and social phenomena that characterises the relationships between MAN and NATURE in the mountain system and aiming at the promotion of ways, methods and techniques of optimized development of these relationships”); Training and Innovation Centre for Development in the Carpathians – CEFIDEC Vatra Dornei (1994–2010, 6000 graduates); Mountain Inter-governmental Committee and County Committees (2003); agri-mountain faculties (Agricultural universities of Cluj and Iași cities); NGOs: Mountain Farmers’ Federation „Dorna” (1993); National Association for Mountain Rural Development -ROMONTANA (2000); Romanian Mountain Forum (2002 – an outcome of IYM 2002, member of the Mountain Partnership); the Centre of Mountain Economy (established in 2008 by the Romanian Academy, within the National Institute of Economic Research - INCE).



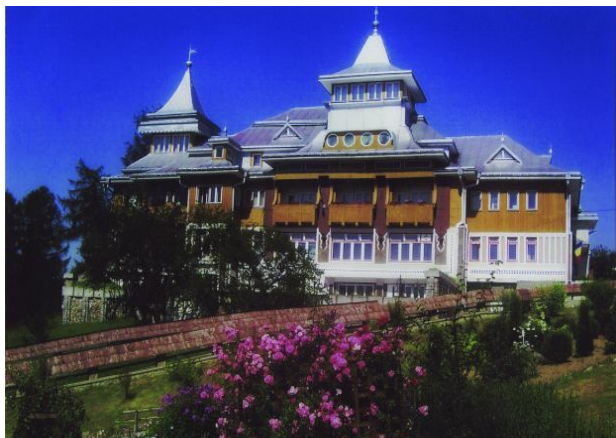


Fig. 7. Headquarter of Training and Innovation Centre for Development in the Carpathians, CEFIDEC Vatra Dornei.



Fig. 8. Mountain Farmers' Federation „Dorna” headquarter.

The numerous projects on mountain agri-rural development, with bilateral (Germany, France, Switzerland, Austria and so on.) and international financing (European Commission / Phare, World Bank) have established „pilot stations” that now can be multiplied.

*Official laws:* Delimitation of mountain area, according to EC criteria /1999 (2002); the Strategy for sustainable development of mountain area (2004); Mountain Law (no. 347/2004), the third mountain law in Europe. Romanian science has taken important steps in the field of mountain eco-bio-economy, with real results: researchers, specialists, trainers and young farmers have been trained; more than 100 pilot-objectives and more than 6000 agri-tourism guesthouses have been established; progress has been made as far as raising Romanian society's awareness on the mountain issues was concerned.

The importance of „models” proved to be special for mitigating a high conservatism, inherited as a defence mechanism from the communist period.

There are results on fundamental and applied research, meant for the mountain private sector

(theoretic concepts, pastures, improvement of breeds, mountain gradients, agri-tourism, specific management and so on).



Fig. 9. Natural mountain pasture – valuable.



Fig. 10. Natural mountain pasture – degraded.

The administration and political parties from Romania couldn't keep up with the scientific achievements and could not provide continuity and use of the valuable results.

The pressure of lowland's agriculture in Romania is too big and is permanent, just as the tendencies to marginalize the mountain eco-bio-economy are. A separate specific institutional and juridical system, endowed and served by experts, is an objective necessity. The weak competencies at the decision-making level and the size of mountain area, the reduced financial means and the insufficient and late interventions through Community support have lead to a state of marginalization and intense degradation of mountain eco-economy based on agriculture and zootecnics. The global and national economic recession increased the negative economic and social effects from the Romania Carpathians. Important ongoing projects have been abandoned (e.g. establishment of 10 „agri-mountain” vocational schools and of the institutional basis of the Centre for Mountain Economy) and, this is very serious, the National Agency of mountain area and

Training and Innovation Centre for Development in the Carpathians CEFIDEC Vatra Dornei (august 2010) have been abolished. Romanian Mountain Forum (7 national scientific sessions) drew the attention of EU's institutions on the gravity of the economic recession from the Romanian Carpathians, through a Memorandum addressed to the European Parliament, European Commission and the European Council (September 2010).

### 3. SOLUTIONS

#### 3.1. A change of attitude towards mountains

Rebuilding and maintaining balanced relationships between forests and agriculture; Prioritization of preservation of populations and specific traditions; the mountain grasslands' flora is also an absorbent of carbon dioxide and a provider of high quality food. The demographic growth, the growth of rivers' levels and the food shortage turn the mountain areas into a more and more important resource of food and new living habitats for the possible displaced masses of people. The idea is to use each hectare of mountain land that is capable of producing food – and this idea is strictly depending on the permanent existence of mountain farmers and their good practices. The European, global and national efforts must be concentrated on avoiding human desertification in the mountains – with limits for development of eco- agriculture and zootechnics, depending on the natural gradients.

Mountain populations provides for cultural inheritance as well. By healthy food products and environment, they represent a „biological reservoir” for humankind, untouched by industrial contaminants.

It is advisable the conservation of biodiversity for rare species to be carried out on reasonably large areas and not on very large spaces. The notion of „biodiversity with major social usefulness” is recommended – with careful preservation of natural mountain fodder flora, rich in valuable species and traditionally consolidated biotopes.

When it comes to conceiving strategies and policies for the mountain area, it is important to have the contribution (points of view) of mountain agricultural experts and economists and not just the points of view of biologists, foresters and geographers, in order to obtain balanced concepts, guidelines and rules, adapted to various mountain ecosystems.

#### 3.2. For the Romanian Carpathians (and other similar areas)

Re-thinking, updating and development of the organizational system for the mountains: administrative – institutional and research, adaptation of educational system to the mountain specificity, the establishment of

a network of agri-mountain vocational schools, consolidation and development of non-governmental framework established in the last 20 years.

Putting a stop to the evolution and persistence of monopoly system and protection of mountain eco-agri producers, the “reference” prices for milk and meat – as raw materials, being a solution. Putting a stop to the exodus of young mountain people, by safeguarding, preserving and developing the mountain ecosystem, the valuable flora of grasslands and natural hayfields and by strongly motivating the young generations of agricultural producers to start working on increasing the number of cattle, sheep/goats, within normalized limits and in extensive breeding systems.

Modernization and realistic rules adapted to the development stage, with the aim of turning the agri-food quality resources and the positive externalities with economic, social and cultural perspectives into account.

Fighting against the industrial food monopoly, by inducing loyal competition, by establishing western type of associations and cooperatives (such as the ones from France, Italy, Switzerland, Norway and so on), with their own processing and selling systems of mountain eco-bio agri-food products and by prices that are motivating for farmers and affordable for consumers. Intensive support of young mountain farmers who have “subsistence” farms and minimum 5 hectares of land, through efficient subsidies for modernization (breeds, mechanization, stables) and effective bonuses per capita of cow/sheep/goat (motivation of work). Acceleration of transfer of ownership from the elderly to young people, through the attractive system of early retirement Re-evaluation of some exaggerated rules regarding “biodiversity”, which cause unbalances in the mountain eco-bio-economy of Romanian Carpathians. Changing the collective mentality, by enhancing the trust in a new democratic system and by annihilating the fear (still strong) when it comes to associative forms, by creating “eco-economical” models that are trustworthy and that can be multiplied. The orientations of the new CAP (2014-2020) seem to follow these directions, which are absolutely necessary for a rational future in the 21<sup>st</sup> century.

### 4. CONCLUSION

Mountain eco-economy becomes more and more important for humankind, in the 21<sup>st</sup> century and beyond. The high increase of the demand for food and the predictions regarding the decrease of agricultural surface bring about the mountain agriculture's resources, which is comparable to the importance of mountain forests and biodiversity. A parallel and balanced evolution of the two great eco-economies of the mountain is a requirement for the future. The numerous alternatives and the speed of the agricultural

abandonment in the mountains – call for energetic and efficient quick measures.

A new specific sectoral strategy, at the level of EU (and not only) on the sustainable protection and preservation of the eco-economy of mountain areas, with differentiations between West and South-East, adapted to the specific national evolution stage and programs – is also an urgent requirement – starting with the beginning of the second decade of the 21<sup>st</sup> century. The effect of such orientation would result in the healthy auto-feeding of millions of people, with great contributions for the urban populations, resulting in the decrease of agglomeration, unemployment and some important social cost, with positive effects for environment and human health.

## REFERENCES

- [1] **Agapi, I.** (2007), *The activity of “Dorna” Mountain Farmers*, Federation, thanks to the “Carpathian Project”, becomes a living example for agri-rural mountain development, National seminar of RMF 2006, Gutenberg Publishing house, Campulung Moldovenesc.
- [2] **Bavaru, A., Godeanu, S., Butnaru, G., Bogdan, T. A.** (2007), *Biodiversity and environment protection*, Romanian Academy Publishing house.
- [3] **Bazin, C.** (1999), *The main results of the assessment of mountain agricultural policy in France*, Comisariat general du Plan: La politique de la montagne, La documentaire française, Paris.
- [4] **Berca, M.** (2000), *General ecology and environment protection*, Ceres Publishing house, Bucharest.
- [5] **Bocănici, M.** (2007), *Contributions to cattle breeding in the private farms from Vatra Dornei and Campulung Moldovenesc basins*, PhD thesis, USAMV, Iasi, 2007
- [6] **Bocănici, M., Chirileanu, Ț, Agapi, I.** (2009), *The sheepfold from the Romanian Carpathians-a safe processing unit from the point of view of hygiene*, National seminar of RMF 2008, PreText Publishing house, Campulung Moldovenesc.
- [7] **Bogdan, T. A., Rey, R., Străteanu, A. G.** (2007), *Mountain anthropic impacts generated through technical-scientific and educational activities, necessary for sustainable development of Romanian mountain communities*, National seminar of RMF 2006, Gutenberg Publishing house, Campulung Moldovenesc.
- [8] **Bogdan, T. A., Rey, R., Paraschivescu, M., Ipate, J.** (2008), *Contribution to the design of a strategy for achieving mountain zootechnics biodiversity, in the context of climatic changes and sustainable development of mountain communities*, National seminar of RMF 2007, PreText Publishing house, Campulung Moldovenesc.
- [9] **Bogdan, T. A. and collaborators** (2010), *E-banking products and services for agribusiness based eco-economy, with ways “from the farm to the fork” in forecasting the developed and developing countries on period 2020-2050-2100*, Recent researches in business administration, finance and product management, WSEAS Press.
- [10] **Bogdan, T. A. and collaborators** (2010), *Prospects for Development of Livestock Production between 2010–2100 Based on Integrated Rural Bioeconomics and Ecoeconomics*, Bulletin UASVM Animal Science and Biotechnologies, 67(1-2)/2010.
- [11] **Bogdan, T. A. and collaborators** (2010), *Prospects of Agrifood Green Power in 2050 and Forecasting for 2100 with Sustainable Solutions Based on Ecobioeconomics new Paradigm*, Bulletin UASVM Animal Science and Biotechnologies, 67(1-2)/2010.
- [12] **Bogdan, T. A. and collaborators** (2009), *More Animal Production in Agrifood Green Power Development, a New Paradigm of Concepts Regarding Sustainable Rural Bioeconomics and Eco-Economics*, Bulletin UASVM Animal Science and Biotechnologies, 66(1)/2009.
- [13] **Bojor, O.** (1983), *Medicinal and aromatic herbs from A to Z*, Recoop Publishing house, Bucharest.
- [14] **Bojor, O.** (2007), *Development of the rural areas from Apuseni mountains. “Rosia Montana” case and the protection of mountain environment*, National seminar of RMF 2006, Gutenberg Publishing house, Campulung Moldovenesc.
- [15] **Brown, R. L.** (2001), *Eco-Economy: Building an Economy for the Earth*, Earth Policy Institute.
- [16] **Brown, R. L.** (2003), *Eco-Economy*, James & James (Science Publishers) Ltd.
- [17] **Brown, R. L.** (2006), *B 2.0 Plan: Saving an under pressure planet and a civilization in impasse*, Technical Publishing house, Bucharest.
- [18] **Brown, R. L.** (2008), *B 3.0 Plan: General mobilization for saving the civilization*, Technical Publishing house, Bucharest.
- [19] **Bucur, C.** (2008), *The structural polyvalence Romanian mountain ecosystem’s functions – dynamic perspective*, National seminar of RMF 2007, PreText Publishing house, Campulung Moldovenesc.
- [20] **Bucur, C.** (2007), *The fundamental strategic role of the Romanian mountain areas for building and developing the Romanian folk civilization and for defining our national identity*, National seminar of RMF 2006, Gutenberg Publishing house, Campulung Moldovenesc.
- [21] **Crăciun, A.** (2007), *The European policy on regional financing. Balance and safeguarding factors for the sustainable development of Romanian mountain area*, National seminar of RMF 2006, Gutenberg Publishing house, Campulung Moldovenesc.

- [22] **Crăciun, A.** (2008), *Living in Apuseni mountains*, National seminar of RMF 2007, PreText Publishing house, Campulung Moldovenesc.
- [23] **Crăciun, A.** (2006), *Reorganizing the administration and territorial endowment - balance and safeguarding factors for the sustainable development*, National seminar of RMF 2005, Gutemberg Publishing house, Campulung Moldovenesc.
- [24] **Davidescu, D.** (2002), *Conservation of biodiversity of vegetal and animal species*, Romanian Academy Publishing house, Bucharest.
- [25] **Dumitrescu, D.** (2008), *Romania – development regions, social-economical disparities*, Cetatea de Scaun Publishing house, Targoviste.
- [26] **Elnor, M.** (2008), *Report on the situation and prospects of agriculture from mountain and hill areas*, European Parliament, Agriculture and Rural Development Commission, no.2066.
- [27] **Faoro, B.** (2007), *Romanian Carpathian area in the context of European integration*, National seminar of RMF 2006, Gutemberg Publishing house, Campulung Moldovenesc.
- [28] **Faoro, B.** (2008), *Europe's low populated or unpopulated areas – mountain areas – the future of European Union*, National seminar of RMF, 2007, PreText Publishing house, Campulung Moldovenesc.
- [29] **Georgescu-Roegen, N.** (1979), *The law of anthropy and the economic progress*, Technical Publishing house, Bucharest.
- [30] **Giurcăneanu, C.** (1988), *Romanian Carpathians' population and human settlements*, Scientific and Encyclopaedic Publishing house, Bucharest.
- [31] **Giurgiu, V.** (1995), *Conservation and improvement of biologic diversity of forests. Protection and sustainable development of Romanian forests*, Graphic art Publishing house, Bucharest.
- [32] **Gîțan, D.** (2009), *The strategy of sustainable rural development in Dorna basin*, PhD thesis, USAMV, Iasi.
- [33] **Gîțan, D.** (2009), *Vocational training of farmers and specialists from the Romanian mountain area, a component of adult education system*, Romanian Carpathians as part of the International Year of the Mountains, Iasi.
- [34] **Hera, C.** (2006), *The rural world today and tomorrow*, Romanian Academy Publishing House, Bucharest.
- [35] **Ionașcu, Ghe.** (2009), *Population's food security and the mountains*, National seminar of RMF 2008, PreText Publishing house, Campulung Moldovenesc.
- [36] **Ionașcu, Ghe.** (2008), *The effects of climatic changes and the mountain habitat*, National seminar of RMF2007, PreText Publishing house, Campulung Moldovenesc.
- [37] **Jelev, I.** (2002), *Protection of mountain environment in the Romanian Carpathians – a component of sustainable development*, Romanian Carpathians as part of the International Year of the Mountains, Alexandru Bogza Publishing House, Campulung Moldovenesc.
- [38] **Jelev, I.** (2008), *Indicators for assessing the climatic changes and some aspects specific to mountain areas*, National seminar of RMF, 2007, PreText Publishing House, Campulung Moldovenesc.
- [39] **Marușca, T.** (2001), *Gradients and mountain ecology*, Transilvania Publishing House, Brasov.
- [40] **Marușca, T. and collaborators** (2010), *Treaty on the ecologic reconstruction of pastures and mountain degraded lands*, Transilvania Publishing House, Brasov.
- [41] **Oțiman, P. I.** (2006), *Sustainable rural development in Romania*, Romanian Academy Publishing House, Bucharest.
- [42] **Oțiman, P. I.** (2008), *Mountain economy*, National seminar of RMF, 2007, PreText Publishing house, Campulung Moldovenesc.
- [43] **Oțiman, P. I.** (2009), *Mountain economy – a huge reserve for expanding the mountain agriculture, habitat and agri-tourism*, National seminar of RMF, 2008, PreText Publishing house, Campulung Moldovenesc.
- [44] **Plăiaș, I.** (1996), *Mountain agriculture – society. Apuseni Mountains*, Libris Publishing house, Cluj-Napoca.
- [45] **Postolache, T.** (2007), *Towards a real ideal*, Romanian Academy Publishing house, Bucharest.
- [46] **Rey, A.** (2009), *A crossborder Romania-Ukraine mountain project-successfully completed: "Education for mountain rural development, through agri-tourism"*, National seminar of RMF, 2008, PreText Publishing house, Campulung Moldovenesc.
- [47] **Rey, R.** (2002), *Real possibilities to enhance the economic potential of zootechnics in the mountain area*, Alexandru Bogza Publishing house, Campulung Moldovenesc.
- [48] **Rey, R.** Current problems regarding animal husbandry in mountain areas, Study books, Reports, Debate no.20, Centrul de Multiplicare al Universitatii din Bucuresti.
- [49] **Rey, R.** (1978), *Perspectives of the complex development of mountain areas in Romania*, Viitorul Social no. 2, Bucuresti.
- [50] **Rey, R.** (1979), *Mountain area – an interdisciplinary issue*, Flacara Magazine, no. 3, Bucharest.
- [51] **Rey, R.** (1979), *Aspects specific to Carpathian mountain rural area*, Flacara Magazine, no. 2,3,4,16, Bucharest.
- [52] **Rey, R.** (1979), *Systematization and mountain specificity*, Flacara Magazine, no. 15, Bucharest.
- [53] **Rey, R.** (1980), *Carpathian zootechnics*, Flacara Magazine, no. 3, Bucharest.
- [54] **Rey, R.** (1980), *Tourism – a potential factor for development of mountain zootechnics*, Flacara Magazine, no. 29, Bucharest.
- [55] **Rey, R.** (1980), *Mountain agricultural lands – grasslands or hayfields?*, Flacara Magazine, no. 39, Bucharest.



- [56] **Rey, R.** (1980), *Model mountain household*, Flacara Magazine, no. 48, Bucharest.
- [57] **Rey, R.** (1981), *At the basis of mountain agriculture – a scientific attitude towards lands and animals*, Flacara Magazine, no. 49, Bucharest.
- [58] **Rey, R.** (1982), *Mountain agrarian tourism*, Flacara Magazine, no. 41, Bucharest.
- [59] **Rey, R.** (1979), *Mountains – a space for balance and collaboration*, Romania Pitoreasca Magazine, no. 3, Bucharest.
- [60] **Rey, R.** (1979), *Future in the Carpathians*, Editura Scrisul Romanesc, Craiova.
- [61] **Rey, R.** (1981), *Agri-zootechnics vocation of mountain area*, Economics Magazine, no. 43, Bucharest.
- [62] **Rey, R.** (1985), *Mountain civilization – Food-Energy-Ecology*, Editura Stiintifica si Enciclopedica, Bucharest.
- [63] **Rey, R.** (1988), *Factor of zoo-hygiene and their influence on the health and production of cattle from the households of the population living in the mountain area called “Dorna Basin”*, PhD thesis, “Dr. Petru Groza” Agronomic Institute, Cluj-Napoca.
- [64] **Rey, R.** (1993), *“Dorna” Mountain experiment*.
- [65] **Rey, R.** (1998), *Basic relations and resources for development of mountain agriculture, through corrections to the traditional systems of agricultural practices*, Scientific works, volume I, Cristian-Sibiu Mountain Institute, Risoprint publishing House, Cluj-Napoca.
- [66] **Rey, R.** (2001), *Romanian Carpathians*, Agris Publishing House, Bucharest.
- [67] **Rey, R.** (2001), *Favouring the development of quality in the mountain areas of CEEP. The version of an integrated mountain development. The role of agri-tourism in turning into account the agricultural and handicraft products*, Romanian Carpathians, Agris Publishing House, Bucharest.
- [68] **Rey, R.** (2001), *Living Carpathians – Biodiversity, Quality, Sustainability, Romanian Carpathians*, Agris Publishing House, Bucharest.
- [69] **Rey, R.** (2001), *Training and education for the specificity of mountains – a mandatory segment in the context of a national mountain policy*, the Mountain, CEFIDEC's newsletter, no.1, Bucharest.
- [70] **Rey, R.** (2002), *Romanian mountains – in the European constellation of mountains. Sustainable mountain development, through specific organization and good management*. Romanian Carpathians in the International Year of the Mountains, Alexandru Bogza Publishing House, Campulung Moldovenesc.
- [71] **Rey, R.** (2002), *Main components of the mountain policy in the rural area of the Romanian Carpathians, from experiment to multiplication*. Romanian Carpathians in the International Year of the Mountains, Alexandru Bogza Publishing House, Campulung Moldovenesc.
- [72] **Rey, R.** (2005), *The state of crisis in the Romanian mountain agriculture and the road to the European Union – Biodiversity, Quality, Sustainability in the Romanian Carpathians*, Albina Romaneasca magazine, January-February, Bucharest.
- [73] **Rey, R.** (2005), *Romanian mountain policy – in the perspective of accession to EU and post-accession, a great economic opportunity*. Albina Romaneasca magazine, May-June, Bucharest.
- [74] **Rey, R.** (2006), *Fundamental elements specific to mountains, motivations and institutional and political responsibilities. Emergencies for saving the mountain agricultural economy and the depopulation of Romanian Carpathians. A vision on the protection and sustainable development of Romanian Carpathians*, in European and international context. National Seminar of Romanian Mountain Forum 2005, PreText Publishing House, Campulung Moldovenesc.
- [75] **Rey, R.** (2006), *Re-gaining the mountain pastures from the Romanian Carpathians, through private zootechnics and good agricultural practices*, Scientific works, volume IV, Cristian-Sibiu Mountain Institute, Mira Design Publishing House, Sibiu.
- [76] **Rey, R.** (2006), *The European context and the state of crisis in the Romanian agriculture and rural area, Rural world – today and tomorrow*, Romanian Academy Publishing House, Bucharest.
- [77] **Rey, R.** (2007), *The European integration, cohesion policy and the mountains. Changing the attitude of Romanian governments, through development / establishment of specific institutions and partnerships – a strong need*, National Seminar of Romanian Mountain Forum 2006, Gutenberg Publishing House, Campulung Moldovenesc.
- [78] **Rey, R.** (2007), *Romanian Carpathians – at cross point of history*. Economic issues Magazine Bucharest.
- [79] **Rey, R.** (2008), *The need to modify the political guidelines on the mountain areas, as a way of preventing the effects of climatic changes and demographical growth. Integration of mountain areas, mountain agriculture into the globalization process-through multi-functionality and diversity*, National Seminar of Romanian Mountain Forum 2007, PreText Publishing House, Campulung Moldovenesc.
- [80] **Rey, R.** (2008), *“Pro-mountain” civil society and its role for the protection and sustainable development of Romanian mountain areas, in the context of the accession to EU and the climatic changes and demographical growth*. National Seminar of Romanian Mountain Forum 2007. PreText Publishing House, Campulung Moldovenesc.
- [81] **Rey, R. Ionascu Ghe.** (2008), *The strategy of sustainable development of Romanian mountain areas*. Academica Magazine, Romanian Academy, Bucharest.
- [82] **Rey, R. Ionascu Ghe., Marusca T., Juravle V., Ungureanu D.** (2008), *Study “The agri-tourism and*

*social-economical potential of mountain areas from the departments of Putyla, Vijnita and Storojinet, Cernauti area, Ukraine.* Pretext Publishing House, Campulung Moldovenesc.

[83] **Rey, R.** (2009), *Romanian mountain policy in the context of climatic changes and demographical growth. The need to have food security and safety.* National Seminar of Romanian Mountain Forum 2008. Pretext Publishing House, Campulung Moldovenesc.

[84] **Rey, R.** (2009), *Carpathian Convention and the sensitive factors. The need for a change and professionalism.* National Seminar of Romanian Mountain Forum 2008. Pretext Publishing House, Campulung Moldovenesc.

[85] **Rey, R.** (2010), *Crisis and anti-crisis in the Romanian Carpathians. The dramatic economical-social state in the Romanian mountain rural and a vision for safeguarding and evolution.* Academica magazine, issue no. 9-10, September-October, Romanian Academy Publishing House, Bucharest.

[86] **Rey, R.** (2011), *Mountains and the 21st century. Compared study of the European strategies regarding the mountain areas, with special reference to the Romanian Carpathians.* Romanian Academy/INCE, Bucharest.

[87] **Rusu, M., Gițan, D.** (2001), *Quality agri-food productions in the Romanian Carpathians,* Romanian Carpathians, Agris Publishing House, Bucharest.

[88] **Rusu, M. and collaborators** (2010), *Increasing the Value of the Pastures in the Cindrel Basin by Applying some Non-pollutant,* Environment-friendly Technologies, Scientific papers Animal Science and Biotechnologies, Agroprint Publishing House, Timisoara.

[89] **Rusu, M. and collaborators** (2010), *Effects of soil liming and mineral fertilizers on the palatability of fodders at grazing with young sheep,* Acta Universitatis Cibiniensis.

[90] **Silvaș, E.** (2007), *Modernization – an extreme emergency for the mountain area.* Mountains as common good and opportunity, National Seminar of Romanian Mountain Forum 2006, Gutemberg Publishing House, Campulung Moldovenesc.

[91] **Silvaș, E.** (2009), *The opportunities and limitations of capitalization of Romania's mountain patrimony under the circumstances of globalization,* National Seminar of Romanian Mountain Forum 2008, PreText Publishing House, Campulung Moldovenesc.

[92] **Ștef, T.** (2002), *Mountain rural economy in Romania: the experience of FAER Reghin between 1991 and 2001,* Romanian Carpathians as part of the International Year of the Mountains, Alexandru Bogza Publishing House, Campulung Moldovenesc.

[93] **Stiglitz, J.** (2002), *La grand désillusion,* Librairie Arthème.

[94] **Tabără, V., Pușcă, I., Tabără, C.** (2003), *Romanian mountain area – specific problems,* Scientific papers, vol. II, Cristian-Sibiu Research – Development

Institute for Mountain Issues, Mira Design Publishing House, Sibiu.

[95] **Tofler, A.** (1972), *The shock of the future,* Political Publishing House, Bucharest.

[96] **Ungureanu, D.** (2007), *Economic and management study on the effective capitalization of the agri-tourism potential of the rural settlements from Dorna Basin,* PhD, USAMV, Iași.

[97] **Ungureanu, D.** (2008), *Perspectives of sustainable development of mountain agri-tourism in the current context and in the context of climatic changes,* Scientific papers –Agronomy, no. 51, USAMV, Iași.

[98] \*\*\* (2009), *The Bioeconomy to 2030: Designing a Policy Agenda,* OECD Publishing.

[99] \*\*\* (2005), *Romania 's Accession to the European Union - a challenge for agriculture and the environment,* BUE Publishing House.

[100] \*\*\* (2006), *Agrifood and Environment Economy. Reform and European Integration,* BUE Publishing House.

[101] \*\*\* (2006), *Complex Development of the Rural Space, Diversifying Economic Activities in the Rural Environment and Increasing Performance in Agriculture,* Vol. I, BUE Publishing House.

[102] \*\*\* (2008), *Sustainable Development of the Rural Environment,* BUE Publishing House.

[103] \*\*\* (2010), *Report no. 6, European Environment Agency,* September 15th 2010, pp. 35, 37

[104] \*\*\* (2009), *Romanian Statistics Yearbook 2009,* National Institute of Statistics.

[105] \*\*\* [www.insse.ro](http://www.insse.ro)

[106] \*\*\* (1992), *The report of UN's Conference on environment and development – June.*

[107] \*\*\* (1997), *The works of the National Conference on Development of Mountain Area,* Romanian Academy.

[108] \*\*\* (1998), *The Report of the European Institute of Alpine Research/ICALPE,* European Parliament, "Towards a European mountain policy".

[109] \*\*\* (2000), *The works of EUROMONTANA's International Conference* (Trento, Italy), March.

[110] \*\*\* (2001), *The works of International Conference "Mountain Policies in Europe",* Bucharest, September.

[111] \*\*\* (2001), *The works of the "Conference for sustainable development of Carpathian – Danubian countries",* Bucharest.

[112] \*\*\* (2001), *The works of World Mountain Symposium from Interlaken,* Switzerland.

[113] \*\*\* (2001), *Cusco Declaration of the International Workshop on Mountain Environments,* Peru.

[114] \*\*\* (2002), *The Report of the "World peak for sustainable development",* Johannesburg.

[115] \*\*\* (2002), *The Resolution of UN's General Assembly on IYM-2002.*

[116] \*\*\* (2002), *The works of National Symposium "Sustainable Mountain Development",* Vatra Dornei.

[117] \*\*\* (2002), *The works of the Seminar "Assessing the regional poverty and the strategic opportunities",* FIDA, Bucharest.

- [118] \*\*\* (2002), *The works of the Meeting of World Association of mountain people*, Quito.
- [119] \*\*\* (2002), *Johannesburg Declaration on Sustainable Development*.
- [120] \*\*\* (2002), *Agenda 21, chapter XIII, "Sustainable mountain development"*.
- [121] \*\*\* (2002), Declaration of United Nation's general Assembly on IYM-2002.
- [122] \*\*\* (2002), Tokyo Declaration on IYM-2002.
- [123] \*\*\* (2002), *Katmandu Mountain Declaration*.
- [124] \*\*\* (2002), *International Conference's Adelboden Declaration on sustainable agriculture and rural development of mountain areas*.
- [125] \*\*\* (2002), *The Recommendations of the Summits from Asia, Africa, America and Europe*.
- [126] \*\*\* (2003), *The works of the Conference for sustainable development of mountain areas "The transitional mountain policy and globalization"*, EC, Italy.
- [127] \*\*\* (2003), *The works of the Meeting of "Focal points" for IYM-2002, from Europe, Asia and South America*.
- [128] \*\*\* (2004), *Romanian Mountain Law no. 347/2004*.
- [129] \*\*\* (2004), *The Romanian Strategy for Sustainable development of mountain area*, GD 1779/2004.
- [130] \*\*\* (2004), *The works of International Mountain Partnership/FAO*.
- [131] \*\*\* (2004), *The works of European Conference "Mountain policy and the expansion of EU"*.
- [132] \*\*\* (2005), *The works of the Symposium "Promotion of some sustainable agricultural technologies in order to strengthen the mountain agricultural farms"*, ICDM Cristian, Sibiu.
- [133] \*\*\* (2005), *The works of National Seminar of RMF "The contribution of local communities for protection and sustainable development of mountain areas and the role of specific vocational training"*, ICDM Cristian, Sibiu.
- [134] \*\*\* (2005), *"European Charter of mountain quality products"*.
- [135] \*\*\* (2005), *The works of the National Meeting of intellectuals living in villages*, Busteni.
- [136] \*\*\* (2005), *The works of the Seminar of Romanian National Commission for UNESCO / the decade of education for sustainable development, on the subject "Education for sustainable development in the mountain rural area"*, CEFIDEC Vatra Dornei.
- [137] \*\*\* (2005), *"Mountain platform"*, Bishkek.
- [138] \*\*\* (2006), *The works of National Seminar of RMF dedicated to "International Day of the Mountain"*, December.
- [139] \*\*\* (2006), *RMF's Resolution*.
- [140] \*\*\* (2007), *Resolution – "RMF's appeal"*.
- [141] \*\*\* (2004), *"Mountain areas in Europe"*, NordRegio's Report.
- [142] \*\*\* (2006), *"Implementing an international mountain convention. An approach for the delimitation of the Carpathian Convention area"*, Bolzano.
- [143] \*\*\* (1985), *Mountain Law no. 85-30*, France.
- [144] \*\*\* (1971), *Mountain Law*, Italy.
- [145] \*\*\* (1994), *Law no. 97/1994 "New rules for mountain areas"*, Italy.
- [146] \*\*\* (1995), *National Strategy for preparing Romania's accession to EU*, Snagov.
- [147] \*\*\* (2007), *Final Report*, EUROMONTANA's European Conference "Towards the integrated development of mountain areas and their recognition within CAP – shaping the new European space", Piatra Neamt.
- [148] \*\*\* (2008), *The National Strategy for sustainable development of Romania. Horizon 2013-2020-2030*, GD no. 1460/2008.
- [149] \*\*\* (2007), *The works of National Seminar of RMF dedicated to International Day of the Mountain: "Climatic changes and the mountains / characteristics and stages of the transition from an unplanned spontaneous development to a sustainable development of mountain communities"*, Bucharest.
- [150] \*\*\* (2008), *The works of National Seminar of RMF dedicated to International Day of the Mountain: "Mountains and food safety" and "The need to have a mountain policy in Romania"*, Bucharest.
- [151] \*\*\* (1995-2010), *The works and recommendations of the EUROMONTANA's International Conventions and the periodical reports of EUROMONTANA's national conferences*.
- [152] \*\*\* (2010), *RMF's Memorandum addressed to European Parliament*, European Commission and European Council, September.
- [153] \*\*\* (2010), *RMF's Appeal at EUROMONTANA's Convention*, September 15-17, Lillehammer.
- [154] \*\*\* (2010), *The National Conference of RMF dedicated to International Day of the Mountain: "Mountain minorities and indigenous peoples" and "Mountain realities, results and new guidelines for the countryside of the Romanian Carpathians"*, Bucharest.