Original scientific paper
10.7251/AGRENG1801043A
UDC 338.48-44:631

PLANT GENETIC RESOURCES AND GASTRONOMIC TOURISM

Maria-Mihaela ANTOFIE*, Camelia SAVA SAND

University "Lucian Blaga" from Sibiu, Faculty of Agricultural Sciences, Food Industry and Environment Protection, 7-8 Dr. Ioan Rațiu Str., Sibiu, 550337, Romania
*Corresponding author: mihaela.antofie@ulbsibiu.ro

ABSTRACT

Plant genetic resources for food and agriculture (PGRFA) came into the world attention due to their genetic erosion upon the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty) in 2001. Among these, landraces are recognized for their value when are maintained in the same agro-ecosystem for more than 50 years. However, food security as a complex and sensitive subject, is acting between national and local levels and depends on socio-economic attributes of rural societies deeply embedded in the history of the place grounding the traditional knowledge (TK) related to local communities' lifestyle. In the past 25 years Romania lost more than 75% of its own plant genetic resources based on recorded official data, even its economy depends on the activity of more than 69% small landowners (i.e. over 800,000.00). From economic point of view, such type of agriculture is not productive. However, 32% of the today Romania's territory is declared as protected areas and most of these arable lands are in buffering zones or inside protected areas. Studying the village Ațel, from Sibiu county, Valea Târnavelor (i.e. in the buffering zones of protected areas), reveals that rural areas are rich pools of landraces that have been preserved and cultivated by at least 50% of local householders for more than 50 years (i.e. wheat, corn, rye, barley, oats, peas, cabbage, beans, onions, lettuce, spinach, celery, parsley, garlic, carrot, dills). The poorness of these villages in the today economic terms is counteracted by the richness of biodiversity, TK, PGRFA and local gastronomy. The scope of this article is to envisage original approaches, for connecting local TK to economy based on gastronomic tourism that may provide these villages the chance to become part of it.

Keywords: *landraces, food security, rural development, gastronomic tourism, traditional knowledge.*

INTRODUCTION

Complying commitments to multilateral environmental agreements (MEAs) become more and more difficult for signatory Parties in terms of financial mechanisms implementation (Horn and Mavroidis, 2014). It is also the case of biodiversity and heritage conservation that are claimed by different MEAs. On the

other hand, exists lots of opportunities that may be accessed for developing financial innovative mechanisms that may also act for biodiversity or heritage conservation and securing genetic resources for food and agriculture. Among these very appreciated are those related to business and especially connected to tourism (Gelcich and Donlan, 2015). However, a key role in the sustainability of environmental policy implementation belongs to regional and local stakeholders, rather than to national level and bottom-up and top-down approaches should be developed based on peculiarities of regions, especially by tackling synergies among all identified activities (Sala *et al.,* 2015). Moreover, developing rural economy is a challenge in protected areas and it becomes more relevant when climate change and food security are at the edge (Smith *et al.,* 2016). Food security is highly depending on the conservation of biodiversity and securing all genetic resources for food and agriculture will become essential for future strategies development (Khoury et al., 2015). Furthermore, a complete analysis of all above mentioned drivers, will pave the way for developing more resilient rural communities (Lipper *et al*., 2014). According to these authors, for rural areas, climate-smart agriculture should be relevant and they are grounding their theory on the results regarding the estimation of climate change effects on world agriculture, presented into the report of the Intergovernmental Panel on Climate Change or IPCC (IPCC, 2014). Furthermore, it is predicted for southern Europe, the decline in rainfall and meltwater from snow, that would increase the costs of production and living (Falloon and Betts, 2010; Spinoni *et al*., 2015; Antofie *et al*., 2015). On the other hand, the Carpathian Region, is recognized as a mosaic of crop fields, grasslands, forests as well as a host of a rich biosphere (Loos *et al*., 2014) due to a diverse relief and peculiarities of geographical position (Mráz and Ronikier, 2016). However, rural communities in the region, rich in biodiversity, are highly depending on their own production that is not reflected yet in coherent policies for sustainable development based on applied holistic approaches (Spânu and Nicula, 2016). Traditional knowledge (TK) related to the region (TK related to resources management and practices) is poorly studied and less used in developing appropriate conservation measures (Hanspach *et al.,* 2014). In 2016, Sibiu County was awarded as a *European Region of Gastronomy for 2019* based on a white paper entitled "Sibiu richness and legendary tastes" and analysed by an independent jury of the International Institute for Gastronomy, Culture, Arts and Tourism from Barcelona, Spain according to a specific procedure (Richards, 2014). The dossier is a regional political commitment to support the development of gastronomic tourism from cities to villages inside the borders of Sibiu county. The third objective of this white paper focused to ensure long-term food security, the development of adaptation and mitigation measures related to climate change for safeguarding the resilience of local communities. This study has the aim of analysing new opportunities for connecting TK related to local resources to culinary tourism for Aţel commune into Sibiu county. Based on this approach it might be possible to increase connectivity between cities and villages, secure genetic resources for food and agriculture, that may further support local

communities' resilience towards climate change and ensure food security for the future.

MATERIAL AND METHODS

The paper is based on data surveys collected between 2009 and 2016 from Aţel householders and producers as well as based on provided data from the Division for soil analysis of the County Direction for Sustainable Agriculture, Sibiu. The survey focused on crops and agricultural practices and it was applied on 62 householders originating from Aţel (10.95%). A survey regarding the origin of producers in the agri-food market from Sibiu city was applied. All collected data have been analysed against the white paper, published in 2016 and entitled: "Sibiu richness and legendary tastes", as a Programme for the award *Sibiu European Region of Gastronomy 2019*.

Description of the administrative territory unit (ATU) Aţel. Aţel ATU is located in Sibiu County at the confluence of the Plateau Târnavelor, Hârtibaciului Plateau and Târnava Mare Valley (Lat: 46.15; Long: 24.47). This ATU is occupied today by two villages: Aţel and Dupuş. The history of the place goes before XIII century and the microregion is recognized as a multicultural place influenced by different ethnical groups (e.g. Romanian, Germans, Hungarians, Gypsies and others (Corsale and Iorio, 2014). From historical point of view Aţel was assessed for its agricultural potential and landscape values since XIII century. It was presented as being located near a wetland and having a medium fertile soil especially for spring time crops. However, in 1750 it was stated that maize was cultivated in better conditions compared to wheat that was often attacked by wheat leaf rust (*Puccinia recondita* f.sp. *tritici*). Vineyards and pastures are among other types of agricultural occupations of the time. The ratio between forests, agricultural land and grasslands is almost equal and according to the historical evidences this equilibrium supports local community to rely on their own resources for more than two centuries (Gyémánt *at el*., 2009). Agricultural land encompasses a surface of 2700 ha (98,8% of the total agricultural territory) of the total of 3900 (Acelenescu et al., 2007). A surface of 1205 ha is arable lands, 972 ha are pastures, 439 ha are meadows (a total of 1411 ha grasslands) and 191 ha are vineyards (over 90% of the vineyards have been lost during communist times). 1470 ha of 3902 ha are public properties and the rest are private. 37 of the total 568 houses are public property and Aţel has no public sewerage. There live 1601 people which means 46 people/km^2. The major occupation is agriculture and more than 60% are retired people. The today annual average temperature is 8,6 °C and the annual average rainfall is 627 mm. Dupuş is part of Natura2000 European ecological network of protected areas SCI 200706 Sighişoara - Târnava Mare.

RESULTS AND DISCUSSION

The award *Sibiu European Region of Gastronomy for 2019* implies among others the sustainable development of agriculture in Sibiu county, covered by protected areas for more than 50% of county' surface. A series of regional developing

programmes were committed before and after accessing the European Union, for supporting the sustainable development of Central Region of Romania where resides Sibiu county, especially those related to structural funds (Mazilu *et al.*, 2011). In addition, Sibiu was awarded in 2007 with the title of *European Capital of Culture* that boost the economy of the city (Richards and Rotariu, 2007; Mitrut and Constantin, 2009). However, the current target for Sibiu city, from tourism perspective, is that tourists need to spend more than one night in hotels in Sibiu or region (Nicula et al., 2013) that is hard to be reached after 2008 (Bodosca *et al.*, 2014). However, accessing new political commitments such as the *European Region of Gastronomy* award, may develop regional economy based on culinary tourism extended in rural areas (Sasu and Epuran, 2016). Based on these assumptions in 2016 it was released a regional political commitment, as a white paper, entitled "Sibiu richness and legendary tastes". According to this white paper in Sibiu exists 175 restaurants, 3 certified producers with 11 certified products and a sole product with geographical indication (i.e. Sibiu salami).

Conservation and sustainable use of PGRFA. According to the second specific objective of the white paper entitled *Cultural diversity*, in Sibiu County will be further supported *research, inventory and conservation, valorisation and promotion of local gastronomic heritage and its official recognition as intangible immaterial heritage*. It is a very first step in connecting cities with villages and furthermore with the scope of securing genetic resources for food and agriculture as a basis for local gastronomy. Based on this white paper it is possible to further connect TK to local gastronomy as an intangible heritage of the regional culinary tourism. However, traditional gastronomy needs to be surveyed and recognized up to the level of hotels and restaurants from cities (i.e. Sibiu, Mediaș), as a future possible connection for tourism development. The second objective of the white paper supports the *interconnecting between urban and rural areas* as well as the interconnection of rural producers and cities markets. We consider that this white paper is grounding the opportunity for raising awareness about traditional values in countryside and use their values for community in a regional context. But, the real economic support of rural communities may become relevant only based on their commitment to this programme and universities may play a crucial role in collecting scientific data and supporting the implementation of an encouraging and maintaining participatory system (Middendorf and Busch, 1997). Only based on local communities' commitment in a regional context, it will be possible to fulfil the objectives of the current white paper. Thus, it can represent an opportunity for further foster the proper implementation of international MEAs that are relevant for the country in synergy with culinary tourism. It is also the case of the Plant Treaty, that should be implemented down to the local level considering the provisions of Art. 5, regarding the compulsory need for surveying all PGRFA. Moreover, by engaging local communities in the regional context based on securing PGRFA the white paper will further support the increasing of food security for *long term*. The Plant Treaty, since its adoption in 2001, is highly supporting food security through the PGRFA conservation and sustainable use, free access to genetic resources for

signatory Parties to the Treaty as well as rights of framers (Padulosi et al., 2012). The white paper will further support through its objectives the increase of food security in the region based on developing interconnectivity between cities and rural communities. This objective is also related to the objective related to *Cultural diversity* that supports the inventory of local gastronomic heritage including all genetic resources for food and agriculture.

Genetic resources for food analysis. The results of our survey reveal, for Ațel ATU that wheat occupies 30 ha followed by triticale with 2 ha and six row barleys, with 5 ha in the past 10 years. It was recorded an old wheat variety: 'Arieșan' registered into the Official Catalogue for varieties in 1985, removed after 2004 and reintroduced after 2014. Local people remains attached to this cultivar due to the decrease attack from wild herbivores (i.e. ears due to long palea development) and as well as due to the resistance to wheat leaf rust. For barley, it was possible to identify an old variety 'Precoce', first officially recorded in 1986 and for triticale it is a commercial variety. Maize is still cultivated at the gardening level and not in the arable land of the ATU due to the presence of wild herbivores in the region (i.e. boars and dears). However, the cultivated surface reach more than 20 ha spread on small plots between 0.1 and 5 ha. In this ATU were identified different maize landraces (yellow and red with 10 and 12 and 14 rows on the cob and one or two cobs on the plant) with low productivity (i.e. about 3500 kg/ha). The maize is cultivated for local use only but it can be used as a valuable resource for gastronomy at the region level. Considering the history of the place, local communities are following the long history traditions in cultivating crops as in 1750 (Gyémánt *et al.,* 2009). Even during the communism times for more than 50 years local communities were imposed to cultivate for high production it seems that TK related to the land use, genetic resources choosing is prevalent. Cabbage is a very common vegetable present all the time in the menu of the local's cuisine, traditions and legends. All investigated householders (over 10% of the total) are cultivating peas, cabbage, beans, onion, tomatoes, lettuce, spinach, celery, parsley, garlic, carrot, dills and different spices. However at least two householders are applying complete traditional technologies for onion, garlic, lettuce, spinach, celery, parsley and tomatoes, pepper and eggplant. These two producers (i.e. Families Bunea and Mija) are not officially registered and act only locally for all year duration. Moreover, one producer has the potential to develop their own affairs and wish to be included in the regional market place. The family Mija provides vegetables seedlings for almost half of community during the spring time and have experience for selling agricultural products all year. In this regard, our analysis in the agri-food market from Sibiu revealed that no one from this ATU is recorded as a producer especially due to the lack of connectivity measures. Moreover, based on our survey only 16% of the commodities trade on this market are originating from Sibiu region. Over 45% of registered persons in the market are only traders, the access of producers being limited in Sibiu market. This result should determine local political factors to find solutions for increasing the access of local producers from rural communities to agri-food markets in the cities. As a

general remark, it can be said that in Aţel exists valuable genetic resources that are unique as well as potential producers that can become part of the future European Region of Gastronomy 2019.

Traditional knowledge analysis. Local communities apply, TK related to the use and access of genetic resources for food and agriculture (35.68% of respondents are applying traditional practices in agriculture, storage and use), landscape management (15.23% of respondents do not change land use as historically established by their ancestors), agricultural practices (68.23% of respondents are applying agricultural practices for crops gardening and livestock), social organization and management in the community level (82.23% of respondents are supportive for each other in neighbourhood organized at the street level). Thus, TK is still part of the social life of community. These data resulted after the survey of more than 45% of householders. In case of genetic resources for food and agriculture, TK includes wild plant genetic resources and edible mushrooms, local people knows places and time for collecting from the wild of berries, mushrooms and medicinal plants. TK is associated to the grasslands flora composition and agricultural practices related to. The most relevant case it is related to plant associations between *Juncus effuses* and *Molinia coerulea* (inferior pastoral value) present on gleysoils and associations *Phragmites australis* and *Gliceria maxima* present on gleysoils and land with ponds and swamps. According to inhabitants these habitats should be avoided when are traditionally mowed due to the presence of wild bird's eggs (i.e. *Crex crex*). Usually this is related to the period of May and June.

Climate change commitments taken under the United Nations Framework Convention on Climate Change are engaged under the third general objective of the Programme. It is already proved that food security is highly depending on the management of resources and negatively influenced by climate change effects (Cheeseman, 2016). Therefore, adaptive management tools need to be applied especially in marginal areas inhabited by highly vulnerable population for ensure food security framework (Kahane *et al.*, 2013). It can be considered that for rural communities, climate change effects are of outmost importance considering the need for improving their resilience (Mc. Evoy *et al.*, 2013).

Landscape analysis For the Central part of Romania, the historical province South-Easy Transylvania, we proposed to be taken into consideration the administrative territorial unit or ATU at the commune level (this includes couples of villages separated through hills landforms) because they usually share similar agricultural landscape type or types. However, these villages are similar for all Târnava Valley that is a historical larger administrative unit established some over 800 years ago (Hanspach *et al*., 2014). In Aţel case, the ATU includes Dupuş village and both villages share similar landscape features: arable land (i.e. it occupies 30% of the total surface) separated by hills landforms (covered 50 years ago with vineyards and occupying 30% of the total surface) forests (i.e. it occupies 30% of the total surface) and constructed area (10%). The constructed area of these villages is following the crick course and is placed in the bottom of the valley. Each locality is

protected during the winter season of strong cold winds and during the summer by hot weather. Such a resilient landscape was set during 1260 according to historical evidences (Gyémánt *et al*., 2009). Even each village is a very well defined both local communities still share the same administration. Inside this landscape unit it can be defined hilly pastures, arable land and two folds terraces covered in the top of the hills with forests. The crick valley is towered by old white willow on the whole course as an indicator species for high humidity of the region (*Salix alba*). First dramatical change in landscape is recorded during the communist times when vineyards where transferred from the top of the two folded terraces to the bottom of these hills. Vines do not survive during in the valley due to the extended periods of fog in spring and autumn that is a peculiarity of the region. Therefore, the entire vineyard surface of the commune was lost and only vines planted in the yards survived up today. Thus, today these landscapes sub-units are composed of two folded terraces covered with pastures. After the communism times, the landscape suffered again due to the invasion of some exotic species starting with 2000. *Solidago canadensis* and *S. gigantea* were established in the arable land as well as in ruderal areas of ATU Aţel. In the ruderal areas of Dupuş, plantains (*Plantago media* and *P. lanceolata*), knotweed (*Polygonum aviculare*), white clover (*Trifolium repens*) have been replaced completely by these invasive alien species. A second issue of present days is the spreading of invasive alien species in arable and ruderal areas by removing native species and changing the habitats structure. The official recorded land abandonment is 3% for more than 10 years and it is especially due to the deficit of agricultural policy for small landowner protection as well as due to property' disputes. However, if land abandonment should become beneficial for native species and habitats conservation (Queiroz *et al*., 2014) however, in this case the land will be populated by invasive alien species (Zimmermann *et al.,* 2015). Dupuş Village that is inside protected area of European importance Natura2000 SCI 200706 Sighişoara - Târnava Mare is invaded by *S. canadensis and S. gigantea* in the arable land, gardens and ruderal areas. Based on the European regulatory framework for nature protection, all invasive alien species need to be part of a controlling or eradication programme for invasive alien species (Vicente *et al.*,2013). Moreover, some of the Common Agricultural Policies measures imposed to local inhabitants that are claimed to support biodiversity conservation some time needs adjustment according to some authors (Mikulcak *et al.*, 2013), and in this case, are in favour of spreading invasive alien species as the mowing is forbidden up to August. Thus, forbidding traditional mowing during late May up to July it will support these invasive alien species to better install in this landscape. Based on this observation for Aţel it will be beneficial to restore vineyards on the two folded hills and apply traditional mowing in late May up to August for removing invasive alien species. A positive aspect observed during these field missions is related to the attachment of the owner to the land as their property. They know better all peculiarities of the arable land and making him or her the very first witness of any possible unpredictable change that may become relevant for climate change and biodiversity conservation. The proper

information and awareness of local communities may gain the best supporter in this programme implementation. The landscape is unique in terms of aesthetic for Transylvania and therefore may be used as a potential destination for the future regional culinary tourism network.

Culinary tourism potential of Ațel In Ațel ATU the rural economy is low as only two producers are officially recorded at the county level: one is for beekeeper and another for traditional products based on wheat (i.e. traditional bread, bread for church ceremony and traditional cakes). However, these products or processes are not certified even they follow traditional procedures and are accessing traditional resources. Tourism is not developed in the region as no accommodation unit is yet developed. However, at least 5 householders express their interest in developing a rural tourism based on availability of houses. Thus, the community existence is due to several key economic drivers (i.e. agriculture, forestry, water, education, transport, energy sector) that must synergic work together for supporting food security on *long term*.

CONCLUSIONS

Regional political commitments are keys factors that may work for the proper implementation up to local level of national political commitments taken for food security and biodiversity conservation. They are relevant in understanding all local peculiarities and developing more suitable business. Local gastronomy may be treated as an ecosystem service that may be integrated into policies supporting culinary tourism in the context of the award Sibiu European Region of Gastronomy 2019. Connecting ecosystem services and regional business may provide an appropriate framework for securing the conservation of biodiversity and plant genetic resources for food and agriculture. Promoting unique culinary tourism in Sibiu region may further support the conservation of all genetic resources for food and agriculture and will provide an appropriate framework for ensuring food security in the region.

REFERENCES

***. (2016). Sibiu richness and legendary tastes, Bid Book for European Region of Gastronomy. http://europeanregionofgastronomy.org/PDF/Sibiu.pdf

Acelenescu S., Prepeliță V., Ștefăescu Ș., Bătrâna A.L., Bunea M., Ifrimelea R. (2007). Report to the Contract no. 10/2007 regarding soil and land quality assessment.

Antofie T., Naumann G., Spinoni J., Vogt J. (2015). Estimating the water needed to end the drought or reduce the drought severity in the Carpathian region. Hydrology and Earth System Sciences, 19(1), 177-185.

Bodosca Ş., Gheorghe G., Nistoreanu P. (2014). Tourist Consumption Behaviour before and after the Crisis from 20-08. Procedia Economics and Finance, 16, 77-87.

Cheeseman J. (2016). Food Security in the Face of Salinity, Drought, Climate Change, and Population Growth. Halophytes for Food Security in Dry Lands, 111-123.

Corsale A., Iorio M. (2014). Transylvanian saxon culture as heritage: insights from Viscri, Romania. Geoforum, 52, 22-31.

Falloon P., Betts R. (2010). Climate impacts on European agriculture and water management in the context of adaptation and mitigation—the importance of an integrated approach. Science of the total environment, 408(23), 5667-5687.

Gelcich S., Donlan C.J. (2015). Incentivizing biodiversity conservation in artisanal fishing communities through territorial user rights and business model innovation. Conservation biology, 29(4), 1076-1085.

Gyémánt L., Câmpeanu R., Dörner A.E., Mureşan F.V. (2009). Conscripţia fiscală a Transilvaniei din anul 1750. Editura Enciclopedică. Cluj Napoca p 2257-2259.

Hanspach J., Hartel T., Milcu A.I., Mikulcak F., Dorresteijn I., Loos J., von Wehrden H., Kuemmerle T., Abson D., Kovács-Hostyánszki A., Báldi, A. (2014). A holistic approach to studying social-ecological systems and its application to southern Transylvania. Ecology and Society, 19(4) 32:1-27.

Horn H., Mavroidis P.C. (2014). Multilateral environmental agreements in the WTO: Silence speaks volumes. International journal of economic theory, 10(1), 147-166.

ICGAT. (2017).

IPCC. (2014). Summary for Policymakers Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects (eds Field, C. B. et al.) (Cambridge Univ. Press, 2014).

Kahane R., Hodgkin T., Jaenicke H., Hoogendoorn C., Hermann M., Hughes J.D.A., Padulosi S., Looney N. (2013). Agrobiodiversity for food security, health and income. Agronomy for sustainable development, 33(4), 671-693.

Khoury C.K., Achicanoy H.A., Bjorkman A.D., Navarro Racines C., Guarino L., Flores Palacios X., Castañeda-Álvarez N.P. (2015). Estimation of countries' interdependence in plant genetic resources provisioning national food supplies and production systems. FAO Research study no. 8.

Lipper L., Thornton P., Campbell B.M., Baedeker T., Braimoh A., Bwalya M., Hottle R. (2014). Climate-smart agriculture for food security. Nature Climate Change, 4(12), 1068-1072.

Loos J., Dorresteijn I., Hanspach J., Fust P., Rakosy L., Fischer J. (2014). Low-intensity agricultural landscapes in Transylvania support high butterfly diversity: implications for conservation. PLoS One, 9(7), e103256.

Mazilu M.E., Avram M., Ispas R. (2011). The Effects of the World Economic Crisis on the Tourist Market from Romania. International Journal of Energy and Environment, 5, 113-122.

McEvoy D., Fünfgeld H., Bosomworth K. (2013). Resilience and climate change adaptation: the importance of framing. Planning Practice & Research, 28(3), 280-293.

Middendorf G., Busch L. (1997). Inquiry for the public good: Democratic participation in agricultural research. Agriculture and Human Values, 14(1), 45-57.

Mikulcak F., Newig J., Milcu A.I., Hartel T., Fischer J. (2013). Integrating rural development and biodiversity conservation in Central Romania. Environmental Conservation, 40(2), 129-137.

Mitrut C., Constantin D.L. (2009). Quantitative and Qualitative Dimensions of Tourism Contribution to Regional Development in Romania. The Case of Cultural Tourism. Economic Computation and Economic Cybernetics Studies and Research, 43(1), 55-59.

Mráz P., Ronikier M. (2016). Biogeography of the Carpathians: evolutionary and spatial facets of biodiversity. Biological Journal of the Linnean Society, 119(3), 528-559.

Nicula V., Spanu S., Neagu R.E. (2013). Regional tourism development in Romania–consistency with policies and strategies developed at EU level. Procedia Economics and Finance, 6, 530-541.

Padulosi S., Bergamini N., Lawrence T. (2012). On farm conservation of neglected and underutilized species: status, trends and novel approaches to cope with climate change: Proceedings of an International Conference, Frankfurt, 14-16 June 2011. Bioversity International, Rome.

Queiroz C., Beilin R., Folke C., Lindborg R. (2014). Farmland abandonment: threat or opportunity for biodiversity conservation? A global review. Frontiers in Ecology and the Environment, 12(5), 288-296.

Richards G. (2014). The role of gastronomy in tourism development. In Presentation to the Fourth International Congress on Noble Houses: A Heritage for the Future, Arcos de Valdevez to be held on (pp. 27-29).

Richards G., Rotariu I. (2007). Sibiu European capital of culture 2007: evaluation report. Association for Tourism and Leisure Education (Atlas).

Sala S., Ciuffo B., Nijkamp P. (2015). A systemic framework for sustainability assessment. Ecological Economics, 119, 314-325.

Sasu K. A., Epuran G. (2016). An overview of the new trends in rural tourism. Bulletin of the Transilvania University of Brasov. Economic Sciences. Series V, 9(2), 119.

Smith J., Lang T., Vorley B., Barling, D. (2016). Addressing policy challenges for more sustainable local–global food chains: Policy frameworks and possible food "futures". Sustainability, 8(4), 299.

Spânu S., Nicula V. (2016). The Importance of The Climate Index for Characterize Tourism Favorability In the Cindrel Mountains. Revista Economică, 68(5).

Spinoni J., Lakatos M., Szentimrey T., Bihari Z., Szalai S., Vogt J., Antofie T. (2015). Heat and cold waves trends in the Carpathian Region from 1961 to 2010. International Journal of Climatology, 35(14), 4197-4209.

Vicente J.R., Fernandes R.F., Randin C.F., Broennimann O., Gonçalves J., Marcos B., Honrado J.P. (2013). Will climate change drive alien invasive plants into areas of high protection value? An improved model-based regional assessment

to prioritise the management of invasions. Journal of environmental management, 131, 185-195.

Zimmermann H., Loos J., von Wehrden H., Fischer J. (2015). Aliens in Transylvania: risk maps of invasive alien plant species in Central Romania. NeoBiota, 24, 55.