Analysis of the Criticizes for Zootechnics Development in a Mountain Area of Italy

Simona Rainis¹, Sirio Rossano Secondo Cividino², Franco Sulli³ and Elena Valent¹

1. CirMont—International Research Center for Mountain, Amaro, Udine 33028, Italy
2. Department of Agricultural and Environmental Sciences, Faculty of Agriculture, University of Udine, Udine 33100, Italy
3. Mountain Community of Carnia, Tolmezzo, Udine 33028, Italy

Received: March 07, 2013 / Accepted: June 14, 2013 / Published: August 30, 2013.

Abstract: The paper considers the main causes of the difficulties of zootechnics in Friulian mountains (Italy), evaluating different approaches. From the methodological point of view, there were analyzed the different aspects that causes the present crisis in this territorial contest and that, contextually, at the same time, prevent its recovery. The procedural pathway followed these steps: analysis, synthesis, comparison, deduction and induction. The results showed that there are technical, social, environmental, political and infra-structural aspects that cause this stated economical emergency for the compartment. A “new rural paradigm”, in particular, the multi-functionality of the farm seems to be the road to the progress of mountain regions. Unfortunately, there are no definitive universal answers, but individual solutions that should be investigated and calibrated for specific local resources.

Key words: Sustain rural development, marginal and mountain areas, livestock farming systems.

1. Introduction

Zootechnics compartment is a fundamental leader train for all agriculture in Italian Alps. Its vitality allows economic and social progress of autochthonous people, and, more in general, the tutelage of their identity and cultural peculiarity [1]. In these areas, the lively presence of livestock farms contributes to safeguard and valorize the rural-paesagistic aesthetic, the ecological and the recreational quality of these areas (Fig. 1a and Fig. 1b) [2-4]. Nowadays the new paradigm of sustainable growth emphasizes the strategic role of animal husbandry in mountain area for the economic progress, in ensuring food security, reducing poverty, decreasing income disparities, enhancing the development of the rural less favored communities and the environmental protection [5-7]. Unfortunately the primary sector and animal husbandry in marginal area are extremely fragile, bear and especially vulnerable to global changes all around the world, and also in the Italian arch of Alps this situation is observed [2, 6, 8, 9].

In the last fifty years, the rural landscape of vast areas in European mountain regions, historically modeled by livestock farming, has experienced considerable radical alterations [10]. The depopulation and the related economic, social and technical difficulties of zootechnis compartment had deeply modified the agriculture and landscape contest, creating a deleterious and progressive inexorable deterioration of the surroundings [11, 12]. The environmental challenges such as climate modifications, water management, land abandonment, employment of bioenergy and decreasing of biodiversity are dramatically actual and need huge and urgent strategies for the preservation of biological, landscape and cultural diversity [13]. The challenge for the immediate future is to understand if alpine farming would be able to maintain an economical
relevance, sufficient for appealing also young
generations, and if all the actual constrains, such as
the conservation of biodiversity, the reduction of
pollutants emission, the improvement of energetic
efficiency an so on, that compromises the actual
survivor of the compartment, would instead become
passwords to face the future [14].

The contribution takes a look in particular at the
main causes of the difficulties of zootechnics
compartment in Friulian mountains, characterized by
low profitable farms and where shorter growing
seasons avoid other more lucrative agriculture, such as
intensive crops cultivation. The study evaluates
different approaches and their interdependence which
are possible to undertake, in order to help this rural
space to transition and transform within its specific
potentials and cultural heritage [15].

2. Materials and Methods

2.1 Territorial Contest

In the present paper it was considered the situation,
from the agriculture point of view, of the Friulian
mountains, situated at the extreme Eastern edge of the
Italian slope of the Alpine arc, as shown in Fig. 2. The
geographic marks are the following: the area is 2.1130
km² (about the 26% of the total area of Friuli Venezia
Giulia), population is 51.277 inhabitants (about the
4% of the total inhabitants of Friuli Venezia Giulia)
with a density of 24.3 loc./km² and administratively,
the space is organized in 37 communes.

The farming landscape system in this area is
categorized especially by livestock husbandry
(almost the 77% of the agricultural holdings) of
bovines and ovi-caprines, with large pastures available.
The farms, in total are 443, are generally of small
dimensions (16 of average number of animals), owner
farming, and, quite often, structurally obsolete [16,
17].

2.2 Analysis of the Criticizes

From the methodological point of view, there were
considered the different aspects that causes the present
crisis of the zootechnical compartment in this
territorial contest and that, contextually, at the same
time, prevent its recovery [18]. The procedural
pathway has followed these steps: analysis, synthesis,
comparison, deduction and induction [19].
3. Results

3.1 Contextual Analysis

At the present, rural society is facing far-reaching changes, and, as reported in many papers, this critical situation can be wide world observed. The experts foresee a very precarious scenery with negative impacts, especially for marginal areas, because the primary sector will have to deal with many challenges, as the increasing of international market competition, further exchange liberalization and the high decline of the rural population and, most of all, the climate changes [19]. In the European context, in particular, a weakening in the relative importance of agriculture, observed in the last decades, was determined by three “standard” development problems, which between them will determine to a large extent the future of rural society:

- The pressure of modern development in rural areas close to or easily reached from large towns or cities;
- Rural decline in many regions of the European Community, but particularly in outlying Mediterranean areas;
- Depopulation and the abandonment of the land in areas those are particularly marginal, such as certain hill and mountain areas and islands [20].

3.2 Data Analysis

The data referred to the present context (last census about the situation of the agriculture in Friuli Venezia Giulia) show clearly that there is a very depressing trend of reduction of farms in ten years, from 2000 to 2010. In particular in mountains, about the 42% of breeders closed their activity, vs. about the 34% in the entire region and 32% in Italy. It is evident that the number of small medium farms is strictly reducing in the past decades [16, 17].

Considering the driving forces in this contextual analysis, it can be pointed out that the slow but inexorable closing up of the farms is prevalently determined by the following aspects (Fig. 3).

![Fig. 3 Main aspects that determine the crisis of zootechnical compartment in the friulian mountains in Italy.](image)

(1) Technical
- limited farm dimensions;
- inadequate of the breeding structures;
- inappropriate technologies and productive techniques;
- abandon and degradation alpine summer houses and pastures.

(2) Economic
- low market competitiveness and monopoly installed by food industries;
- scarce labor productivity;
- most exclusive orientation to the dairy compartment, that up to now is in a regression phase;
- growing difficulty to produce high quality milk;
- little presence of structured agri-food chains;
- long-distance transport.

(3) Social
- negative demographic trend such as depopulation of marginal areas, rural aging of the employers and weak generational turn over, exodus flow toward plains and the cities;
- disaggregation and low cooperation among the operators;
- low inclination to innovation;
- low attractiveness of farming activities as a future job to young people.

(4) Environmental
• climatic changes;
• orographic situation (little farmlands available, bad viability, inexorable invasion of useless plants and of wood, ground slope, lack of organic soil);
• low soil fertility, high hydro-geological and seismic risks;
• weather trend, that determines short vegetative season, particularly penalizing in respect to other productive realities such as hilly and plan landscapes;
• natural risks and hazards.

(5) Infrastructural and politics, in particular
• excessive fragmentation of agricultural lands;
• lack of resultful strategies and programs for the needs of the local agriculture model;
• insufficient funds;
• low agricultural management;
• supranational wide world crisis [21].

4. Discussion

The background analysis shows a very alarming situation. The driving forces listed above present both a local characteristic but also a global one. It is, in a certain way, foreseeable to attend to the first ones, in fact it is possible to elaborate immediate strategies to intervene, but otherwise the worldwide causes are very difficult to be faced. Anyways the actions must be immediate on both the two levels, local and global, in order to invert the course, before the damages would be to deep and irreparable. In fact, traditional dairy farming in this mountain area has always been characterized by a tight and positive joint between the territory and the livestock husbandry, contributing to model the landscape and to create an eco-compatibility environmental. All the activities connected to animal husbandry, as mowing, grazing in marginal areas, flood control of rivers, the accommodation of paths, the utilization of wood, had always been fundamental tools to maintain a variegated and valuable rural scenery, with positive and protective effects also for the downstream [22, 23]. This type of husbandry was sustainable and, by using all the land for forage production, it provided in a silent way an important environmental service called “no-food” production towards the maintenance of the alpine bit [24].

This trend that shows a danger abandonment of animal husbandry for the reasons shown above is going to create a rural space characterized by a chaotic management. The progressive disuse of pastures and meadows shapes the trajectory of a general worsening evolution of the aesthetics of alpine landscape. The economic, social and cultural repercussions are obviously quite heavy and they are evident not only in this area, but they are influencing also the bottomlands zones. The loss of the territorial control and of attendance of mountain areas, traditionally guaranteed by farmers in highlands, determines an increment of the natural hazards (e.g. risk of soil erosion, avalanches, fires and moreover that menaces also hills and the plain). An important consequence is the evident reduction of biodiversity and the simplification of the territory, from the animal and botanical point of view. The resulting natural intensive reforestation causes the suffocation of the villages, the approaching of wild animals with the relative diffusion of zoonosis and damages to the cultivated fields. Obviously, long-term implications of the alteration of the traditional way of life of this contest not only comprise the natural habit, but also have negative impacts on alpine infrastructure and built environment. This situation enhances the decay of the cultural and heritage patrimony, in particular the agro-alimentary tradition [25].

4.1 Analysis of Possible Strategies

The importance of mountain territories for centuries is represented by its capacity to produce human high quality “welfare friendly” food for the mankind, by sustainable methods. Its agro-food system is of high quality, thanks to the renewable raw materials and the respect of biodiversity and local genetic resources, strictly correlated to the peculiarity and vocation of the area [13]. It is clear that it is extremely important for the food security of both the local people and the
mankind that the mountains continue to produce quality food, by sustainable methods [14]. Therefore, the preservation and valorisation of the surroundings is an essential tool for the growth of another outstanding productive activity of the mountain, the tourism; in this precious, but fragile areas, recreation and agriculture walk together to offer a safe harbour where you can rediscover the beauty and the genuine quietness of the nature, in contrast with the citizen life that is getting day after day more hectic, overwhelmed by the rhythm of the progress [24]. The peculiarity of alpine animal husbandry, characterized by an extensible and sustainable ecological model, that allows at the same time the valorization of the aesthetic of the territory and the appeal of a quality consumer, can contribute to guarantee the necessary profitability to maintain that activity [13].

To overcome this inexorable trend, in the last decades, some attempts were observed to switch towards an intensive and modern model. This new mountain development paradigm has clearly shown to be detrimental for both animal welfare and environment and today is questionable also from the economical point of view [25]. Nowadays high input livestock systems and the standardization of production techniques are criticized, while traditional methods and autochthonous breeds are revaluated [26].

For these reason, new strategies have to be elaborate for a recovering of this precious areas. In a so uncertain global and local situation agrarian policies have to concentrate on enhancing a development able to valorize and not standardize the qualities of mountains territories. These approaches are at the base also of the future CAP 2014-2020 [27], but also of Alpine Space Programme 2014-2020 and of some other national and regional projects [28, 29]. The experts that study possible solutions for the crisis of agriculture and animal husbandry in marginal areas agree in suggesting the multi-functionality of the farm as a road to the development of mountain regions [30].

The key idea of this new role of dairy farms consists in many different activities, expressed in the categories of goods, services and markets, however, animal husbandry also produces non-market services, e.g. affects the preservation of the landscape or biodiversity. The instrument for the implementation of the objectives of multitasking agriculture involves three actions: supporting farming in areas with unfavorable conditions, sustain undertakings related to rural life and environment and improving of animal welfare and foresting arable land. Based on the results of supporting actions related to production and environmental (green economy) functions, the application of multi-functionality in farms is diversified spatially in mountainous areas [31].

The model of a traditional and not intensive agriculture is based on the valorization of the polyvalent meaning, so peculiar of this area, that joins the farmer to his territory, and guarantees a care and a management otherwise hardly feasible in maintaining an appropriate condition of the natural environment and preserving the cultural heritage [32]. In the highlands, the beauty of the landscape represents the mandatory starting point for the development of all the outdoor and recreation activities. The interest towards the diversification is nowadays enhanced by the new European Common Agricultural Policy, that has the aim to valorize the secondary functions of the primary sector [33]. In this optic, an innovative model can be shaped up, in order to modernize and revitalize less favored areas. These marginal territories can assume a new social and economic role, if the multi-functionality of a farm is interpreted as the production of externalities. The principal activities that can help the breeder to diversify the incoming are the following:

- biologic and low impact production;
- quality and geographical references labels;
- processing and direct selling;
- tutelage of biodiversity (e.g. recovering ancient genotypes, etc.);
- agri-tourism;
• labor-only subcontracting;
• renting of agricultural builds and lands.

The diversification allows the production of private goods, but at the same time public ones, thanks for example, to the agri-tourism and the biological agriculture, that are related to environmental issues and surroundings tutelage [34, 35].

Another important tool for the re-launching of the agro-ecosystem in mountain is the creation of productive short chains. In fact, nowadays, there is an increasing interest by the customers towards ambient quality and safety of food, in relations to the need to buy goods without the sanitary risk [36]. In this social-economic-territorial context, an agro-food chain can have a technical and practical role to give a concrete opportunity to the primary sector in crisis, becoming a multidisciplinary tool of management to defend the zootechnical compartment and to preserve the environmental and the rural space. It has been observed that biodiversity in agro-ecosystems depends on both landscape heterogeneity and farm management, in particular, Weibull et al. [37] identified farmers as important decision-makers in conservation issues. In marginal sites as in the present paper, the extensive farms confirm their great eco-compatibility and do not turn out disadvantaged in terms of profitability [22]. The valorisation of local genetic resource and extensive productive techniques is certainly the challenge that the mountain animal husbandry has to collect and overcome with a winning strategy [38]. The revival of animal husbandry in mountain area, stimulated also by this productive chain, has, certainly, positive effects on natural resources and, in particular, its contributes can be listed as follow [39]:

• to valorise genetic resources and to safeguard native races (tutelage of biodiversity);
• to exploit traditional local productive techniques, exalting the binomial “typical product-territory”, that correlates merchandise and organoleptic characteristics of the local agro-system to the productive area;
• to stimulate gastronomic-rural tourism and new trade relationships [40].

The identification of new strategies for the valorisation of the tradition product of mountain area is an important tool for a sustainable development of marginal regions [41].

A productive pathway is also a solution to encourage the livestock breeders, together with all the other stakeholders, to dialogue and to share common problems, but most of all, solutions. In fact, it is typical of marginal areas a physical and psychological isolation, that expands the difficulties. The strategies of governance and the action of the spread of the chain in the agriculture system contribute to valorise the role of the small and medium sized firm (as a stock farm or a private slaughter house), in fact, the aggregation in a system stimulate the economical sustainability of the productive reality, the virtuous synergies and the scale economies. This is a little step to motivate the mental opening of the mountain, traditionally hugely close on itself, towards new trade horizons and outlets. “Making system”, starting interactions among primary producers, agro-industries, distribution and assisting the knowledge transmission, is the only way to individuate and develop innovative pathways throughout the chain [42].

5. Conclusion

A mountain without agriculture is condemned to a dangerous decline, for several points of view, such as environmental, economic and socio-cultural. The natural habitat does not exist as a sphere separate from human actions, ambitions and needs [13]. Marginal areas are a “resource” and not a “problem”, so a rational management of the territory can be an important tool to face the worldwide crisis. The rural communities had to look for the right elements of the economic system that would offer them a long term progress, according to existing resources, including raw materials, workforce and adaptability to the market economy [43]. Adequate politics for the primary sector has to enhance the model of a
traditional agriculture, because this approach allows a more responsible management of natural surroundings, from the ecological and territorial point of view, a very high quality agro-food production, using renewable raw supplies and the autochthon genetics sources (Fig. 4a and Fig. 4b) [44]. Furthermore, the sustainable use and protection of local biodiversity in this region is not only a desirable aim but at the same time a tremendous social and political challenge, considering that Alpine threats need a management of hazards and risks also in respect to global change [45].

From this analysis, it is evident that this complex present day situation requires a trans-disciplinary method to create a “new rural paradigm”, which considers regions as polymorphic and multidimensional socio-spatial relations. As suggest by Della Lucia et al. [46], the key words are “consultation, collaboration and coordination” and these involve a multifaceted patterns of multi-level, multi-sectoral and multi-actor challenges. Economic institutions and networks of power have to govern not only tourist markets, but also social, spatial-environmental and political affairs, in order to have an alignment toward a common goal. Furthermore Ward and Brown [47] stated that the embedded governance aims is to support the regional development of marginal areas, focusing the attention towards knowledge, innovation and interconnectedness. Embodying the principles of a holistic approach to development, sustainable agriculture concerns itself with economic vitality, environmental preservation and social equity all inclusively, straying from the isolationist tendency to focus only on the ability of a food system to produce maximum quantities. Instead of being based purely on net financial gain, within the concept of sustainable agriculture, economic vitality is considered as the long term increase in the value to the community [13].

All the approaches, to have a positive impact, as observed by Boyadzhiev [48], must be based on a bottom up approach and a real cohesion policy, which involves the productive substrate [11], in order to valorise and empower the farmers. Emphasis on participatory methodology and on the development of capabilities for end-user involvement, in the assessment and implementation of multi-functional forestry as a policy priority for sustainable rural development, requires high levels of stakeholder competence and capacity-building in forest policy, land use planning and resource management. Strengthening partnerships of science, strategic plans and practice can assist forest management to maintain and improve key ecosystem services and enlarge support to mountain communities [13]. Furthermore, it is necessary to support and stimulate the improvement of local agro-food chains of production-distribution and consumption, because it is important to promote typical products, tightly related to the territory peculiarity and the agro-eco-system.

![Grazing bovines.](a) ![Grazing bovines.](b)
For concluding, it is evident that adequate policies and the application of best practise models are urgent for a sustainable development of the region [49]. Unfortunately, there are no definitive universal answers, but individual solutions that should be investigated and calibrated for specific local resources. European mountain strategies and national rural policies must cooperate with regional and local interventions, in order to face all the kind of problem, both global and more specific of the present context. Nevertheless, an essential aspect for the successful of any initiative requires a radical change in the mental attitude of the stakeholders. To avoid disappointing and expensive failures, an active and proactive cooperation from all the actors involved (farmers in primis) is essential and a basic requirement.

References

[1] Autonomous Region of Friuli Venezia Giulia, Sectoral Analysis of PSR 2007-2013, 2007, http://www.regione.fvg.it/rafvg/cms/RAFVG/economia-imprese/agricoltura-foreste/psr-programma-sviluppo-rurale/. (in Italian)

[2] European Commission, Marketing Sustainable Agriculture: An Analysis of the Potential Role of New Food Supply Chains in Sustainable Rural Development, The Fifth Framework Programme 1998-2002a, 2002, http://europa.eu/rapid/press-release_P-88-100_en.htm?locale=en.

[3] P. Kurz, Mountain pasturing plans for upper Austria—Creating a tool for adaptive management of cultural landscapes and natural resources in Alpine regions, in: Managing Alpine Future Proceedings of the Innsbruck Conference, October 15-17, 2007, p. 125.

[4] J. Stötter, A. Borsdorf, E. Veuilliet, Managing Alpine Future, Proceedings of the Innsbruck Conference, October 15-17, 2007, Austrian Academy of Sciences Press, Wien, Austria, 2007.

[5] C.M. Barbu, The Romanian agriculture—Between myth and reality, Annales Universitatis Apulensis Series Oeconomica 13 (2) (2011) 485-496.

[6] R. Rey, Romanian Mountain Forum, To the Secretariat of RIO + 20 UNCSID, 2011, http://www.unbcd2012.org/content/documents/195Apel%20RMF%20UNCSID.pdf.

[7] J. Rüdisser, E. Tasser, U. Tappeiner, Distance to nature—A new biodiversity relevant environmental indicator set at the landscape level, Ecological Indicators 15 (1) (2012) 208-216.

[8] FAO, Restarting from Nature for the Agricultural Development, FAO Introduces a New Model of Agricultural Development to Produce More with Less, 2011, http://www.fao.org/news/story/item/80136/icode/. (in Italian)

[9] INEA (National Institute of Agricultural Economics), Report on the State of Agriculture, 2011, http://www.inea.it/public/pdf_articoli/1616.pdf. (in Italian)

[10] M. Ramanzin, L.M. Battaglini, L. Morbidini, M. Pauselli, G. Pulina, Development of zootechnical systems and landscape transformation, Ital. J. Agron. 3 (2009) 19-23. (in Italian)

[11] National Agency of Mountains, Statistic Atlas of Italian Mountain Area, Bononia University Press, Roma, 2007. (in Italian)

[12] S. Rainis, F. Sulli, S.R.S. Cividino, E. Cossio, The impact on the landscape, environment and society of new productive chains in a mountain area: Strategies, analysis and future perspectives, The Journal of Agricultural Engineering 43 (e1-e2) (2012) 3-8.

[13] M. Nijnik, K. Thomson, J. Hutton, B. Mason, L. Lesinski, D. Petenella, et al., Linking Multi-Functional Forestry Goals With Sustainable Development Objectives in European Mountain Regions, in: International Conference on Rural Space and Local Development, Sighetu Marmatiei, The Carpathian Mountains, Romania, July 18-22, 2012, pp. 40-41.

[14] F. Gusmeroli, L. Battaglini, L.M.S. Bovolenta, M. Corti, G. Cozzi, E. Dallagiacoma, et al., Alpine farming facing challenges of the future possible future sceneries of mountain animal husbandry, Quaderno SOZOOALP 6 (2010) 9-22.

[15] L.B. Brujan, Europe’s Rural Areas: Transition and Transformation, in: International Conference on Rural Space and Local Development, Sighetu Marmatiei, The Carpathian Mountains, Romania, July 18-22, 2012, p. 60.

[16] National Institute of Agricultural Economics, Report on the State of Agriculture, 2011, http://www.inea.it/public/pdf_articoli/1616.pdf. (in Italian)

[17] IRES Social Entrepreneurship (Institute of Economics and Social Research of Friuli Venezia Giulia—Italy), The Socio-Economic Contest of Friulian Mountain area in the Years of Crisis, 2012, http://www.cgilfvg.it/media/news/722_3417_allegati.pdf. (in Italian)

[18] EIM (Italian Agency for Mountains), Transversal and Multidisciplinary Approach for the investigation of Mountain Territories, 2010, www.eim.gov.it.

[19] A. Crisci, C. Moonen, L. Ercoli, M. Bindi, Study of the Impact of Climate Change on Wheat and Sunflower Yields Using an Historical Weather Data-Set and a Crop
P. De Castro, European Agriculture and New Global Challenges, in: International Conference of Agriculturability, Agriculture & Sustainability: People, Environment, Economy and the Challenge of Feeding the Planet, Rome, Italy, Nov. 12, 2010.

S. Rainis, S.R.S. Cividino, F. Sulli, E. Valent, Analysis of the Criticizes for Zootechnics Development in a Mountain Area of Italy: Technical, Social, Political and Infra Structural Aspects, in: VIII Congress of AISSA: “Food Production, Overcoming Poverty and Environmental Tutelage: The Role of Agrarian Sciences”, Italy, Nov. 24-26, 2010.

G. Cozzi, M. Bizzotto, G. Rigoni Stern, The employment of the territory, environmental impact, animal wellness and economical sustainability of milky cows breeding system in mountain areas, the case study of Asiago (Vicenza-Italy) highlands, Workbook SOZOOALP 3 (2006) 7-25.

I. Andrighetto, P. Berzaghi, G. Cozzi, Dairy feeding and milk quality: The extensive systems, Zootechnics and Animal Nutrition 22 (1996) 241-250.

G. Cozzi, M. Bizotto, Sustainability and environmental impact of the dairy production systems in mountain areas, Acta Agriculturae Slovaca (Supplement 1) (2004) 21-28.

S. Fabbro, The degradation of traditional autopoietic cycles and the research of an autonomous way of local development in the Friulian mountains in north-eastern Italy, in: The 39th European Congress of the European, Regional Science Association, Vienna, 1999.

S. Loszach, E. Bianco, S. Bovolenta, Biodiversity and mountain livestock in FVG region, Quaderno SOZOOALP 5 (2008) 279-285.

European Commission, Legal Proposals for the CAP after 2013, 2012, http://ec.europa.eu/agriculture/cap-post-2013/legal-proposals/index_en.htm.

Alpine Space program, 2013, http://www.alpine-space.eu/.

Project “Bellimpresa”, 2013, http://www.ita-slo.eu/ita/.

R. Rettinger, Multi-functionality as a Road to the Development of Mountain Regions in Poland, in: International Conference on Rural Space and Local Development, Sighetu Marmatiei, The Carpathian Mountains, Romania, July 18-22, 2012, p. 101.

M. Brady, K. Kellermann, C. Sahrbacher, L. Jelinek, Impacts of decoupled agricultural support on farm structure, biodiversity and landscape mosaic: Some EU results, Journal of Agricultural Economics 60 (3) (2009) 563-585.

A. Kołodziejczak, B. Maćkiewicz, Supporting the development of multifunctional agriculture in the area of the sudeten and the polish carpathians, Journal of Settlements and Spatial Planning Special Issue 1 (2012) 71-76.

Directorate General for Research – Food, Agriculture and Fisheries and Biotechnology – En, 2nd Scar Foresight Exercise, New Challenges for Agricultural Research: Climate Change Food Security Rural Development Agricultural Knowledge Systems, 2009, ftp://ftp.cordis.europa.eu/pub/ip7/kbbe/docs/scar.pdf.

N.F. Sayre, L. Carlisle, L. Huntsinger, G. Fisher, A. Shattuck, The role of rangelands in diversified farming systems: Innovations, obstacles, and opportunities in the USA, Ecology and Society 17 (4) (2012) 12.

P. Borsotto, R. Henke, Diversificazione dei redditi nell’agricoltura mediterranea: Il caso italiano, Agrigioni europea 3 (10) (2007) 1-9.

C. Peri, V. Lavelli, A. Marjani, Qualità nelle aziende e nelle filiere agroalimentari, Gestione e certificazione dei sistemi per la qualità, per la rintracciabilità e per l’igiene, Biblioteca Tecnica Hoepli, Milano, Italy, 2004.

A.C. Weibull, O. Östman, A. Granqvist, Species richness in agroecosystems: The effect of landscape, habitat and farm management, Biodiversity and Conservation 12 (7) (2003) 1335-1355.

L. Segre, The Mountain Area, a Feasible Policy, in: Proceeding of the “Study Day”, University of Milan, Regional Council of Lombardia, Ex Regional Councils of Lombardia Region, Milan, Italy, 1997.

S. Rainis, Market Investigation on Agro-Food Productive Chains Related to the Valorization of Meat Present or Potentially Activated in Mountain Community of Carnia Area, Mountain Community of Carnia Area, Tolmezzo, Udine, Italy, 2008.

L. Battaglini, A. Mimosi, A. Ighina, C. Lussiana, V. Malfatto, M. Bianchi, Sistemi zooteccniche regionali e produzioni legate al territorio. Il sistema delle malghe alpine. Aspetti agro-zooteccniche, paesaggistici e turistici, Quaderni SoZoAlp 1 (2004) 42-52.

G. Elias, Prodotti Agroalimentari Tradizionali della Montagna Italiana. Tradizione e Innovazione in Cinque Caso Studio, FrancoAngeli Ed., Milano, 2010.

R. Raffaelli, Sostenibilità e Multifunzionalità dell’Agricoltura di Montagna. Istituto Nazionale della Montagna, Bologna, 2005.

C. Filimon, L. Filimon, Rural economy in Beiuș Land: Perspectives and risks, analele Universitatii din Oradea-Seria Geografie 2 (2012) 316-326.

European Commission, Strategia dell’Unione Europea per lo Sviluppo Sostenibile, Belgium, 2002.

C. Pfurtscheller, A.H. Thieken, Local and global
developing projects must be planned in order to respond to real necessities of the territory, in: Managing Alpine Future, International Conference, Innsbruck, Austria, 2011.

[46] M. Della Lucia, F.M. Go, M. Trunfio, Confronting multi-level governance challenges: The case of networked rural marginal areas of Trentino, in: Regional Studies Conference, Delft, May 13-16, 2012.

[47] N. Ward, D.L. Brown, Placing the rural in regional development, Regional Studies 43 (2009) 1237-1244.

[48] V. Boyadzhiev, Bulgarian agrarian paradigm and rural mountain areas, in: International Conference on Rural Space and Local Development, Sighetu Marmatiei, The Carpathian Mountains, Romania, July 18-22, 2012, pp. 40-41.

[49] F. Traversi, La qualità come leva per la competitività euro mediterranea delle montagne italiane. SLM-Sopra il Livello del Mare 35 (2009) 50-54.