

Mountain Food Production - Promising niches for rural development in Galicia, Spain

Lola Domínguez García^a, Paul Swagemakers^b and Xavier Símon Fernández^c

^aWageningen University, The Netherlands, Vigo University, Spain, Lola.DominguezGarcia@wur.nl

^bWageningen, The Netherlands, Paul.Swagemakers@gmail.com

^cVigo University, xsimon@uvigo.es

Abstract: *In the EU DERREG project, researchers explore how the interfaces between rural development initiatives, knowledge infrastructure and policies do and can effectuate regional learning and capacity building. One of the six case study areas in the project is the mountainous area of Comarca de Verín in Galicia, an Autonomous Community in the north western part of Spain. In the area, in recent years various new farming related initiatives have been started. In this paper we focus on two of them related to mountain food production: the Co-operative Biocoop and O grelo verde. In this paper we describe the initiatives and analyze their (potential) role for rural development in the case study area.*

Keywords: *Mountain food production, rural development, actor-network analysis, strategic niche management, transition processes*

Introduction

The concept of learning regions (Rutten and Boekema, 2007; Wiskerke, 2007) describes regions with an institutional environment that encourages private and social learning by individual workers, firms and government bodies. In learning regions, competitive, regional advantages are created, based on the exchange of tacit, regionally embedded knowledge (Lawson and Lorenz, 1999). In the DERREG project¹ researchers aim at extending the concept of the learning region to predominantly rural regions, rural development and relevant actors. In the project, analyses are made on the interfaces between rural development initiatives, knowledge infrastructure and policies. These three pillars are studied in six case study areas across Europe, in three phases. Firstly, the pillars and the stakeholders involved are mapped. Secondly, the interaction among the stakeholders is studied. Thirdly, regional learning will be assessed and evaluated.

For the DERREG project we explore the specific dynamics of rural development in the *Comarca de Verín*, a mountainous area in Galicia, Spain, and one of the case study areas in the DERREG project. In this paper we report on the (potential) role for rural development of two initiatives: *Biocoop* and *O grelo verde*, initiatives that deal with mountainous food production, retailing and consumers. As we cannot report yet on the way learning and capacity building of stakeholders has developed, neither on how knowledge that is produced is disseminated, we define, from our perspective, the promising role of the local initiatives for rural development in the research area.

The paper is structured as follows. In order to situate our research and research approach, we discuss theoretical notions on the dynamics of rural development and mountain food production. After that we introduce the case study area and present the two initiatives (Co-operative Biocoop and O grelo verde). We describe their production characteristics and their relations to retailers and consumers. Finally we present conclusions on the (potential) impact of these initiatives on rural development in the Comarca de Verín, or on mountainous food production more in general.

¹ DERREG: Developing Europe's Rural Regions in the Era of Globalization: An Interpretative Model for Better Anticipating and Responding to Challenges for Regional Development in an Evolving International Context (EU 7th framework project)

On exploring and interpreting mountainous food production

Often, programs for rural development aim at strengthening social capital. Usually, social scientists understand social capital as *the ability of individuals, groups, organizations and its institutions to engage in networks, to cooperate, to employ and use social relations for a common purpose and benefit* (Tisenkopfs et al., 2009). For rural development, the web of different and increasingly interlinked networks is decisive (Ploeg and Marsden, 2009). What if the interrelations between rural development initiatives, knowledge infrastructure and policies are weak? How to interpret (promising) local dynamics and get disadvantaged mountainous areas valorised? We think it is important to understand especially the *unfolding* of rural webs.

The focus in our research we base on the assumption that rural development in mountainous areas is favoured by the use and reproduction of natural resources, and, consequently, the central role of local knowledge on how to manage these natural resources, both technically *and* institutionally. We are interested in relating natural resources in mountainous areas to rural development through finding *and* elaborating on the concept of niche as *a protected space in which novelties can mature* (Kemp et al., 1998). In this definition, a novelty is to be understood as *a new configuration that promises to work* (Rip and Kemp 1998). Derived from technology studies, we use the concepts of novelties and niches for *analyzing the role of mountain food production for rural development in disadvantaged mountainous areas*.

Novelties and novelty production

In food production, a ‘novelty’ is defined as a new way of doing or thinking. Novelties are modifications of, and sometimes a brake with, existing routines, and consequently they refer to something new: new practices, new insights, unexpected but interesting results. Novelties need time. They require a specific ordering, and thus develop in specific contexts. They are to be interpreted as new modes that carry the potential to do it better (Ploeg et al., 2004; 2008). Following Rip and Kemp (1998) novelties relate to expectations, and will result in a wider program of interrelated and mutually reinforcing novelties that of each of them can succeed or fail. Hence, the outcome or the usefulness of ‘novelty production’ only can be assessed after a while.

Novelty production is intrinsic to food production as *the continuously shaping and reshaping of resources in and through the constantly evolving interaction between man and nature* (Ploeg et al., 2006). It refers to the capacity to continuously improve processes of production, products, and patterns of cooperation, and proceeds through the re-patterning of resource use and the capacity to make territorial connections that strengthen the local setting. Each and every link simultaneously involves negotiations, renegotiations, and possibly the creation of institutional relations (Ploeg et al., 2009). In our view it is this contextualized ‘unfolding’ interaction between man and nature resulting in newly emerging configurations in land use patterns and resource use, thus newly emerging practices, based on new insights and often having unexpected but interesting results, that should be central in assessment performance of learning regions in disadvantaged mountainous areas.

Socio-technical regimes and Strategic Niche Management

Rip and Kemp (1998) define a social technical regime as the ‘grammar or rule set compromised in the coherent complex of scientific knowledge, engineering practices, production processes of technologies, product characteristics, skills and procedures, ways of handling relevant artefacts and persons, ways of defining problems – all of them embedded in institutions and infrastructures’. The configuration of a socio-technical regime, or the organizational-institutional environment including the knowledge infrastructure and policies, differs from configurations of the new practices. Therefore, a social-technical regime most often is not open for changes as this would imply shifts in the regime.

Hence, the number of novel, promising practices remains small, and, the dynamics in the margin not well being recognized, novelty production at the level of institutional relations remains limited. The *successful unfolding or further spreading of new practices* with deviating configurations is constrained, either by strategic obstruction or, unintended, as consequence of insufficiently support of the ruling socio-technical regime.

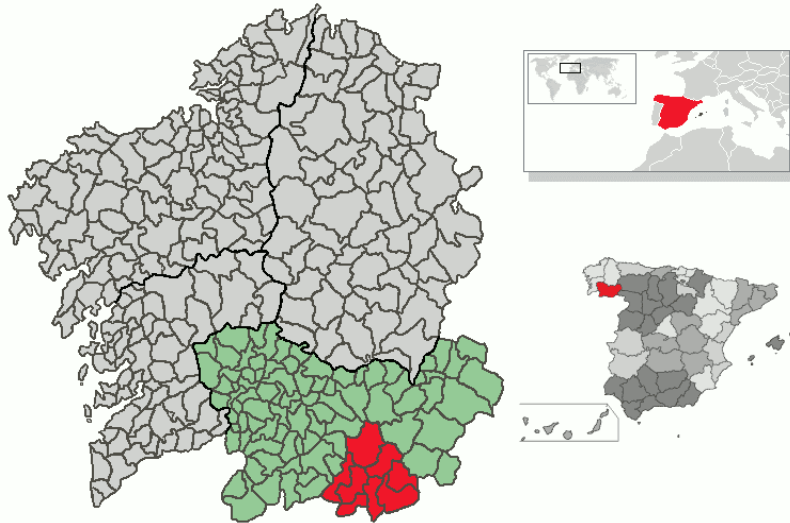
Regime shifts are complex transitions (Geels and Kemp, 2000), and entail gradually but continuing processes in which the character of society structurally changes (Rotmans et al., 2000). Research on new technologies, practices, strategies and modes of governance presume niches in which ideas and new patterns or configurations can ripen (Hoogma 2000). As a niche involves learning about constraints and requirements (Hoogma et al., 2002) they have an important function in learning about new 'configurations', and in testing, improving and consolidating them. A complex subsystem as mountainous food production we think should be understood as a new configuration, as a deviation of the rule of the current socio-technical regime in promoting agriculture progress, and promising practices therefore to be interpreted as niches. Strategic Niche Management (SNM) functions as a tool for simultaneously managing both technical and institutional change, nurturing promising technologies and/or practical solutions to enhance their rate of application. It attempts to create the space in which new ideas and configurations can be tested and further improved (Kemp and Moors, 2001; Moors et al., 2004). Whereas in technology SNM is about the 'creation, development and controlled break-down of niches for promising new technologies and concepts' (Moors et al., 2004), we will use the concept for *learning from* the cases we study in our research project.

Learning on promising configurations of mountainous food production

Taking promising local practices of mountainous food production as departure point and SNM as tool for bridging and interrelating rural development initiatives, the knowledge infrastructure and policies we think we have defined a solid approach to explore and interpret the potentials of mountainous areas and food production. Furthermore we will generate answers on the following questions: How can the possible impact of mountain food on rural development in mountainous areas be enlarged? How can connections between the production of mountain food and the provision of ecosystem services be sustained or improved? What is the impact of (public and private) regulatory frameworks and support schemes on the performance and development of mountain food chains?

Methods and materials

A case study approach (Yin, 1984) is useful for studying social phenomena; understanding and ordering empirical reality and complexity demand for specific case studies (Nooij, 1990; 1993; Whatmore, 1993). Actor-network analysis (Callon, 1986; Long, 2001) provides insight into how different aspects, be it artefacts, people, and institutions, but also natural resources, interrelate and, in mutual interaction, result in, if carefully balanced, technological progress. As we are interested in the role of mountain food production on rural development in mountainous areas, we focus on *Biocoop* and *O grelo verde*, two initiatives on producing and promoting mountainous food production in the *Comarca de Verín*, in Galicia, Spain (map 1).

Map 1. Galicia, its four provinces and the Comarca de Verín.

The Comarca de Verín, located in Ourense, a province in the south western part of Galicia, was chosen as a case study area for the DERREG project. The Comarca is formed by 8 municipalities: Castrelo do Val, Cualedro, Laza, Monterrei, Oímbra, Riós, Verín and Vilardevós. Over the last decades, the population in the Comarca has always been below 30,000 inhabitants (in 2005: 28,697). The extension of the Comarca is of 1,067 square kilometres, thus around 29 inhabitants per square kilometre, which gives it the characteristics of a rural area. The *monte*, the mountainous areas surrounding the settlements, the civilised parts of the Comarca, largely is abandoned, that is, often not in use for any activity at all.

The data we present in this paper we gathered by doing in-depth, semi-structured interviews of which transcripts were made, field trips, participatory methods and additional desk studies. The research reflects the grounded theory approach of Glaser and Straus (1967) in which theory gradually is developed, based on systematic gathering and analyzing of data. Actor-network analysis of the initiatives learns about their potential impacts, as well as about the conflicts which hold rural development from where it possibly could be. Also, it brings insight in the need of embedding the initiatives in knowledge structures and policies that might help the initiatives to further unfold.

Location and dynamics of the case study area

Galicia, in the Northwest corner of Spain, is one of the less developed and disadvantaged regions of the European Union (objective 1 first, and after European Union enlargement, an eligible region for convergence). It is by tradition and still today a rural region. The population density is below 95 inhabitants per square kilometre. Defining rural areas as places with less than 20,000 inhabitants, around half of the population lives in rural areas. In rural areas depopulation and ageing are serious problems.

Depopulation, ageing and land abandonment in rural Galicia

The concentration of Galician population shows the same tendency to polycentrism as other Spanish areas. This polycentrism has been reinforced and obeys the implementation of an economic policy articulated through plans of development and growth hubs. Such policy promoted the re-emerging of the four Atlantic cities of Vigo, Santiago, A Coruña and Ferrol (Lage 2001:114). The provinces with higher population density are those with stronger development of industry and services, therefore attracting people from rural areas and agricultural activity. Over the last century, consequently population density has continuously decreased in rural areas – mainly in the provinces of Lugo and Ourense - and increased in urban areas – mainly in the provinces of Pontevedra and A Coruña.

Besides young people being attracted to the growth hubs, in rural areas the Galician population is ageing as a result of the massive emigration of young people after the Second World War. Due to returning, retired migrants and the decrease of fertility rates which are currently among the lowest ones in the world (Guisan and Cancelo 2002) almost 60% of the population in rural areas is aged over 50 years (Fernandez and Lopez, 2000; INE, 2001). The differences among provinces regarding population density and ageing strongly link to the economic process of development. In rural areas, processes of depopulation and ageing are accompanied by reduced economic activity. The ageing process especially affects the primary sector (and includes agriculture). Land is often abandoned: field parcels are inherited in small pieces often belonging to people not living in the area, or part of the *monte*, sometimes private but often communally to be managed land.

Rural development initiatives in the Comarca de Verín

Despite its rural character in terms of population density, the Comarca has an economic structure that is close to an urban area. Around 49% of people work in the third sector (services), 16.5% work in agriculture, 15.8% in the industry and 18.5% in construction. Verín has always been famous because of its water. Cabreiroá, Sousas and Fontenova are enterprises that distribute water at national level. The implementation of spas is under consideration in the region, which is expected to promote tourism in the area. At the moment there is only one state-run hotel, situated in front of the middle-age Monterrei fortress.

In recent years various new initiatives and activities have been started in order to develop the region. The farmers' cooperative Biocoop is located in Riós and consists of farmers who produce organic beef (18 farmers and 4200 hectares). The cooperative started in 1998 and has been recently rewarded (2007) with an Agader prize (promoted by the Regional government and specifically by Galician Agency of Rural Development) because of its contribution to rural and local development by carrying out a profitable economic activity, which respects the environment and promotes a high degree of satisfaction and self-esteem among the farmers involved. O grelo verde located in the village of Verín is an association formed by 25 partners, 5 of which are organic farmers. Its goal is to promote local products, as well as organic production and consumption. One of its most interesting initiatives was the organic school meals (Sánchez and Dacosta, 2009). The promotion of these and other activities related to organic production have been carried out by farmers. In response, the government is developing a Plan de Desenvolvemento da Agricultura Ecolóxica na Galiza 2008-2013 (Plan of Development of Organic Farming in Galicia). The plan aims at promoting farmers associations, supporting the development of quality certifications, knowledge and research divulgation, and cooperating in the development of new products, processes and technologies.

In the region, characterized by a small-scaled mountain landscape with scattered in the fields many chestnut trees, there are various projects using the tradition of chestnut production and mushroom gathering. Two chestnut processing enterprises started, and a Ruta Europea da Castaña (European Chestnut Route) is developed upon initiative of LEADER II groups in the region. In the municipality of Riós, the Research Centre of Chestnut will soon be open. Mushrooms selling have become an extra source of income in the last years, since different enterprises pay inhabitants for gathering mainly *Lepiota procera* and *Boletus edulis*. Furthermore, the Comarca de Verín is famous for its wine. Since 1992 wine is produced under the Origin Designation Protection Monterrei.

Creating coherence and synergy

The abandoned but beautiful countryside along with the rural development activities makes the Comarca de Verín potentially attractive for tourists. The scarcely populated valleys with the small-scaled landscape and almost abandoned surrounding mountainous areas should be worked again by farmers. By actively managing the fields they can keep the fields free from small bushes, which in dry seasons often are the cause of fire in the countryside. By using extensive grazing schemes they will not excessively pollute water sources, water that in the near future might be in use for the spas.

We assume learning has taken place on how to optimize rural development; we assume that capacities of communities, enterprises and citizens have been developed and knowledge is produced, consumed and disseminated. How this is taking place and which actors and institutions are involved in which networks, relations and arrangements, has not been studied yet. Neither do we know about the economic effects. We expect Biocoop and O grelo verde to have both direct and indirect economic effects. Together they form a continuously further unfolding and promising configuration for the management of at present abandoned land.

Mountain food production in the Comarca de Verín

Biocoop and O grelo verde are rural development initiatives that relate to food production. They function as a niche in which maintenance of otherwise abandoned mountainous areas is combined with successful retail structures. Actor-network analysis of the dynamics of these evolving and mutually interacting initiatives possibly brings clarity in the specific, unfolding configuration. Hereafter we analyze Biocoop and O grelo verde: we question what, who, why, where to and how initiators and participants developed the configuration.

The comments in the portraits were provided by informants, the president of Biocoop and one of the members of O grelo verde, interviewed in December 2009. Their explanations appear in the text in quotation marks and in cursive. Further information on O grelo verde was derived from Sánchez and Dacosta (2009).

Portrait of Biocoop

In the late 1980s, a group of people started working until then abandoned land. Some years later they set up farming systems differing from the industrial way of production. They used EU funding to create a cooperative for milk and meat. Simultaneously, they developed a trademark for meat: *ternera verde (green veal)*.

“Ternera Verde was an intermediate step (before organic). We were ahead Ternera Gallega² because we prohibited the use of any chemical growth promoters and hormones. We were told our animals would explode because of not using these substances with a “stopping” effect in the stomach of the animals, and they would never stop eating. However we asked for advice to some experts in nutrition and we use substitutes as bicarbonate, yucca, etc... and everything went well.”

In 1998, 11 farmers of the initial cooperative created Biocoop. The latter was born with *“the clear idea of producing ecological, to link organic production with the aim of recovering breed autochthon cows (...)”*. Therefore Biocoop works with five autochthonous breeds: Cachenas, Vienesas, Frieirasas, Limiás, e Caldelanas. *“Those breeds accounted around 60.000 animals in the fifties but disappeared totally in the eighties after the process of mechanisation and intensification that started in the seventies. In order to recover those breeds the Ministry paid cattle traders to look for those cows in the villages. They found most of them in Portugal where they had similar animals but with a different name.”* In some punctual moments, when there was not enough supply from these breeds they *“worked with breeds from Portugal and Asturias (Cassim and Asturiana dos Valles) and with collaborative partners³.”* In 2001, Biocoop got its first organic certification. They had an agreement with an enterprise in charge of the meat-cutting-room and the slaughterhouse to commercialise the first units of production. However, in the beginning the volume of production was so small that they had to do the job themselves. Consequently they had to look for a market, and started promoting

² Ternera Gallega (Galician Veal) is a Protected Geographical Indication, recognised by European Union since 1996, although it initiated its labor of control and promotion in 1989.

³ Only farmers from the province of Ourense can be full members of the cooperative. Farmers from outside can be however collaborative partners.

their product by participating in fairs, symposiums and so on. Nowadays, the business runs well. The marketing still is on own hands, but the market share still very small.

“Nowadays we have small market niches, and this is still in its infancy because if we compare to Europe, we observe market shares for organic products from 8 to 20% within the total consumption budget, while here we hardly reach 1%”.

The five breeds are chosen because *“each of them had their own biological niche linked to a specific comarca”*. For example: *“the Cachena is a breed from the area close to Xures (Geres in Portugal), Lobios and Entrimo, without meadows, with bushes like heather, and it is the smallest cow in the world, but very suitable to leave in that ecosystem. The Limiá, on the contrary was in the riverside of of the lake in the riche area of A Limia and it is very similar to the Rubia Galega, i.e. big animal, with high production of meat.”* Although the Rubia Galega is not an endangered breed, it is also used by Biocoop farmers. The breeds are chosen depending on consumer demand. Some consumers want more quantity and less quality. For those consumers the Rubia is better than an autochthonous cow. The latter offers usually less quantity, worse colour to the eye but more intense taste. Furthermore, *“autochthonous breeds are not only about meat production but biodiversity, especies preservation, landscape and environment values, etc”*.

Biocoop has a highly differentiated market and retails their products in several circuits. Meat is sold directly to consumers⁴, organic butchers, to El Corte Inglés⁵, Michelin restaurants, in Galicia and all over Spain (mainly Madrid, Valencia), via telephone and internet orders, to restaurants, and via supermarkets selling quality products.

Nowadays biocoop has around 30 full members in the province of Ourense and other 30 collaborators out of Ourense. Mountain food production is combined with an impressive marketing system, and consequently the business runs well. Its configuration characteristics for protecting and sustaining the landscape in abandoned mountain areas combined with direct economic effects for the farmers involved in Biocoop build an attractive future perspective also for others. Through the success of Biocoop the small field parcels with scattered chestnut trees and the settlements surrounding *monte* as well as the biodiversity both in the fields as well as the range of autochthon cow races can be safeguarded.

Portrait of O grelo verde

O Grelo Verde is a non-profit-making association, which focuses on health and culture, i.e., its goal is not to promote their own production but the production and consumption of organic production in general and sustainable rural development.

O Grelo Verde was created in 2002. Since then the initiators give lectures in courses and conferences about different topics related to organic farming, cattle breeding, autochthonous breeds, recycling, good agricultural practices, deforestation, composting, biodiversity, renewable energies, etc. Furthermore they give advise to those who want to convert a farm into organic.

“Our main activity is to give talks, lectures, courses and so on. Here in this area (and in rural areas in general) it is difficult to organise something because of the lack of public transport. I mean we started doing our “talks” in the municipality, but we had to change to the small villages since people had not way to move at the time of the conference. (...) We were 3 years doing this very intensively. We still do it and get subsidised for that by the Xunta (regional government).”

One of the projects O grelo carried out was promoting the consumption of organic products in primary school dining halls. The project entailed two parallel goals. Firstly, it had to inform children and parents about organic production and the differences between organic and conventional

⁴ Selling to particulars requires to place an order of at least 20 kilograms of meat.

⁵ Big Spanish department store with a supermarket which is famous for having a big and diverse supply as well as all sort of quality production.

production regarding health, environment and animal welfare. Secondly, it had to make the educative communities conscious about consumption habits and the limits of energetic resources, and how to avoid negative impacts of food consumption on the planet. To meet these objectives, O grelo verde had to also solve the question of retailing. In the Comarca there is no any single shop where schools could buy organic products. Buying from particular producers from O Grelo entailed a sort of “ethical” problem. O Grelo did not want people to think that they were profiting from the project. Besides, school dining halls need to take in food from certified producers. The solution O grelo found was to elaborate a list of providers all over Galicia and Spain, with information about prices per product, so schools could choose for the best and more economic option.

“The ideal for an organic product is to be consumed within the area but as here everybody produces, the result is there is no big production. If you want to buy organic, the only solution is going to O Grelo where they can inform you about where to get the products.”

The last quote brings us to another “problem” in the area to promote the consumption of organic production is that home production is extended to almost all households, certainly in rural areas.

“Galicia is a bit particular in this respect. Everybody has a garden a produces their own vegetables. Myself, I prepare my own tinned food with my own vegetables for the whole year (...) there is a strong culture of self-consumption. (...) On the other hand, within the Comarca I think there are customers for organic production but the problem is the price. “

Here the spokesperson referred to the attitude of people not willing to pay the difference in price between conventional and organic products. In the area, rural inhabitants produce and consume from their own vegetable gardens. It is economical, healthy, and brings inputs for the cultural cuisine. The latter reasons, health and culture, should be arguments for getting local grown vegetables into the public infrastructure.

Future expectations

From our research we highlight the presence of a third level resistance in Galicia: people care about their natural environment and about themselves, their health, their children, and fight against overruling industrial modes of production. Biocoop and O grelo verde represent promising configurations on bridging land use in disadvantaged mountainous areas and consumer markets. They represent niches in which novelties are produced that induce rural development based on the use and reproduction of natural resources.

SNM sets in motion the further unfolding of these promising configurations. For a regime shift to occur a range of factors are relevant, among others exhaustion of perceived technological opportunities within the dominant regime, a dramatic change in governmental policies and/or the emergence of a new set of values that incorporate sustainability (Kemp et al., 1998). So far, the rural initiatives represent the protected spaces in which promising configurations are socially constructed, nurture, and ripen. The unfolding of both initiatives witness how governmental support helps to build and embody protected spaces. It is in such niches in which promising configurations further evolve, enhance their rate of application. Linking the configuration to knowledge infrastructure and policies likely supports economic progress in similarly characterized mountainous areas.

Discussion

Among the EuroMARC project⁶ objectives was the task to assess the perceptions for and interests of European consumers and retailers in mountain food products in order to add value to this type of products, and simultaneously contributing to biological, rural, cultural and economic diversity. Other objectives were to analyse various supply chain actors on their perceptions and related strategies towards mountain quality food products. Our project is in line with the latter. We analyzed how rural

⁶ EuroMARC: European Mountain Agrofood products, Retailing and Consumers (EU 6th framework project).

initiatives produce, process and retail mountain food products. Surprisingly, in the case of Biocoop these products arrive directly to consumers via internet or telephone orders all over Spain. Also, after being processed and packed, the meat is sent through regular distribution canals, via short circuits or in supermarkets oriented on quality products. Distribution is in own hands of Biocoop. O grelo verde supports Biocoop in spreading the advantages of consuming the quality food products. For their own projects and objectives O grelo verde, however, has to import most food products (pasta, rice, olive oil et cetera) from producers outside the Comarca. The initiatives should try to further strengthen their production capacity, and possibly diversify food production. This could be supported by policy structures that aim at having public institutions and tourism industries consuming regional products, next to meat also seasonal vegetables.

From an economic perspective Biocoop runs very well. Added-value to the products is created by diversifying the delivery and keeping autonomy over the distribution channel. As the objective of O grelo verde is rather to spread the message about sustainable food production and consumption than to sell products, without governmental subsidies it would soon finish. Until now, however, the two initiatives mutually support each other in their performance.

In our view, for further success, or implementing strategies in other disadvantaged regions in Spain, knowledge structures and policies should be oriented towards these initiatives, and learn from them. An idea for continuing the research is to study whether opinions of governors and school directors and/or teachers are convergent with objectives and perceptions of the interviewees in the initiatives. Once aligned, the promising niches of Biocoop and O grelo verde hypothetically further unfold and strengthen, and increase their impact on rural development and mountainous food production in the region and elsewhere, in other disadvantaged mountainous areas.

Acknowledgements: We are highly indebted to the managers of the DERREG project for organizing the research, and especially thankful to the contributions of the stakeholders involved in the research.

References

- Fernandez, X. and Y. Lopez (2000) *Estructura Económica de Galicia. Edicións Laiovento*. Noia (Spain).
- Geels, F.W. and R. Kemp (2000) *Transities vanuit socio-technisch perspectief. Achtergrondrapport voor het vierde nationaal milieubeleidsplan (NMP-4)*. Maastricht Economic Research Institute on Innovation Technology (MERIT), Maastricht.
- Glaser, B.G. and A.L. Strauss (1967) *The discovery of grounded theory. Strategies for qualitative research*. Chicago: Aldine.
- Guisan M.C. and T. Cancelo (2002) *Perspectivas demográficas de Galicia. Working Paper Series Economic Development nº 53. First Version, 1995; Updated 2002*. Santiago de Compostela: University of Santiago de Compostela.
- Hoogma, R. (2000) *Exploiting technological niches. Strategies for experimental introduction of electric vehicles*. PhD-thesis, Twente University. Enschede: Twente University Press.
- Hoogma R., R. Kemp, J.Schot and B. Truffer (2002) *Experimenting for sustainable transport. The approach of strategic niche management*. London New York; Spon Press.
- INE (2001) *Censos de población. Series históricas de población 1900-2001*. Madrid: Instituto Nacional de Estadística, Madrid.
- Kemp, R., Schot, J. and R. Hoogma (1998) Regime shifts through processes of niche formation. The approach of strategic niche management. *Technology Analysis and Strategic Management* 10, pp. 175-196.
- Kemp R. and E.H.M. Moors (2001) *Modulation dynamics in transport for climate protection*. Paper presented at the conference 'Institutions and instruments to control global environmental change' of METRO in Maastricht, The Netherlands, June 2001.

- Lage (2001) *La construccion social del bosque y la cultura forestal en Galicia*, PhD-thesis. Santiago de Compostela: University of Santiago de Compostela.
- Lawson, C. and E. Lorenz (1999) Collective learning, tacit knowledge and regional innovative capacity. *Regional studies* 33: pp. 305-317.
- Long, N. (2001) *Development sociology. Actor perspectives*. London: Routledge.
- Moors, E.H.M., Rip, A. and J.S.C. Wiskerke. The Dynamics of innovation: a multilevel co-evolutionary perspective. In: Wiskerke, J.S.C. en J.D. van der Ploeg (eds), *Seeds of transition. Essays on novelty production, niches and regimes in agriculture*. Assen: Van Gorcum, pp. 31-56.
- Nooij, A.T.J. (1990) *Sociale methodiek: normatieve en beschrijvende methodiek in grondvormen*. Leiden: Stenfert Kroese.
- Nooij, A.T.J. (1993) Classificaties in het sociologisch onderzoek. *Tijdschrift voor sociaal-wetenschappelijk onderzoek van de landbouw* 8 (1): pp. 3-19.
- Ploeg, J.D. van der (2008) *The new peasantries. Struggles for autonomy and sustainability in an era of empire and globalisation*. London: Earth Scan.
- Ploeg, J.D. van der, J. Bouma, A. Rip, F.H.J. Rijkenberg, F. Ventura, and J.S.C. Wiskerke (2004) On regimes, novelties, niches and co-production. In: J.S.C. Wiskerke, and J.D. van der Ploeg (eds), *Seeds of transition. Essays on novelty production, niches and regimes in agriculture*. Assen: Van Gorcum, pp. 1-30.
- Ploeg, J.D. van der, Verschuren, P., Verhoeven, F. and J. Pepels (2006) Dealing with novelties. A grassland experiment reconsidered. *Journal of environmental policy and planning* 8 (3), pp. 199-218.
- Ploeg, J.D. van der, Broekhuizen, R. Van, Brunori, G., Sonnino, R., Knickel, K., Tisenkopfs, T. and H. Oostindie (2009) Towards a framework for understanding regional rural development. In: J.D. van der Ploeg and T. Marsden (eds), *Unfolding webs. The dynamics of regional rural development*. Assen: Van Gorcum, pp. 1-28.
- Rip, A. and R. Kemp (1998) Technological change. In: S. Rayner and E.L. Malone (eds), *Human choice and climate change 2*. Columbus, Ohio: Battelle, pp. 327-399.
- Rotmans, J., Kemp, R., Van Asselt, M., Geels, F., Verbong, G. and K. Molendijk (2000) *Transitions and transitionmanagement. The case of low-emission energy supply*. International Centre for Integrative Studies (ICIS), Maastricht.
- Rutten R. and F. Boekema (2007) *The learning region: Foundations, state of the art, future*, Cheltenham, UK: Edward Elgar Publishing Ltd.
- Sánchez and Dacosta (2009) Comedores escolares ecológicos na Comarca de Verín. In *Construindo un rural agroecológico* (eds) Simon X e D. Copena. Servicio de Publicaciones de la Universidad de Vigo, Spain.
- Tisenkopfs, T., Lace, I. and I. Mierina (2009) Social capital. In: J.D. van der Ploeg and T. Marsden (eds), *Unfolding webs. The dynamics of regional rural development*. Assen: Van Gorcum, pp. 87-110.
- Whatmore, S. (1994) Farm household strategies and styles of farming. Assessing the utility of farm typologies, in: J. D. van der Ploeg and A. Long, (eds). In: *Born from within. Practices and perspectives of endogenous rural development*. Wageningen Perspectives on Rural Transformations. Assen: Van Gorcum, pp. 31-37.
- Wiskerke, J.C.S. (2007) *Robuuste regio's: dynamiek, samenhang en diversiteit in het metropolitane landschap*. Inaugural Address. Wageningen: Wageningen University.
- Wiskerke, J.S.C. and J.D. van der Ploeg (eds) (2004) *Seeds of transition. Essays on novelty production, niches and regimes in agriculture*. Assen: Royal Van Gorcum.
- Yin, R.K. (1984) *Case study research: design and methods*. London: Sage.