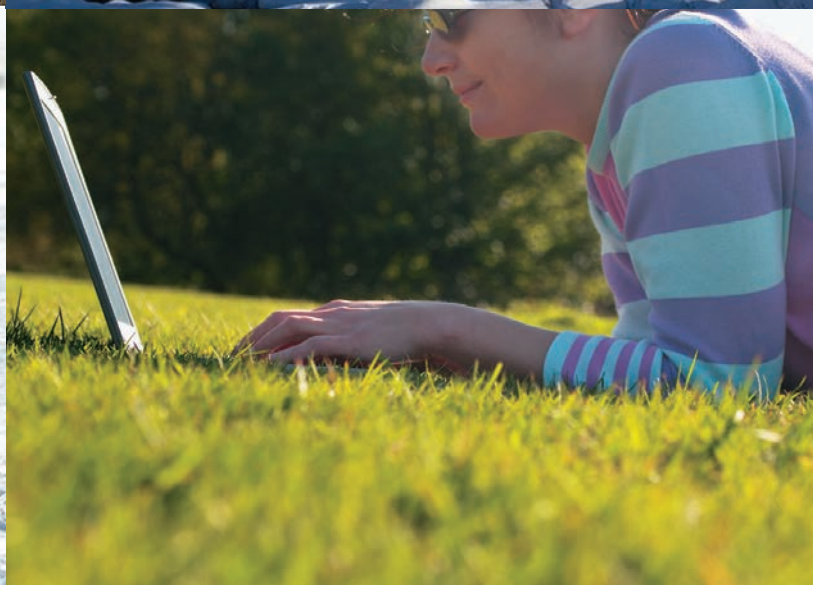
OECD Rural Policy Reviews

Innovation and Modernising the Rural Economy



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Innovation and Modernising the Rural Economy

BETTER POLICIES FOR BETTER LIVES

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Foreword

With gains in agricultural productivity leading to a dramatic reduction in farm employment, rural regions across the OECD now depend on a wide range of economic engines for growth. Increasing globalisation, improved communications and reduced transportation costs are additional drivers of economic change in rural areas. Traditional policies to subsidise farming have not been able to harness the potential of these economic engines. In 2006, the OECD published a thematic report *The New Rural Paradigm: Policies and Governance*, which seeks to explain the shift in rural development policies to account for these important economic changes and the need for a new approach to governance.

Policies to develop rural places are beginning to take into account the diversity of economic engines as well as the diverse types of rural regions. On the aggregate level, rural regions face problems of decline with out-migration, ageing, a lower skill base and lower average labour productivity which then reduce the critical mass needed for effective public services, infrastructure, and business development, thereby creating a vicious circle. However, there are many rural regions which have seized opportunities and built on their existing assets, such as location, natural and cultural amenities and social capital. The success of such dynamic rural regions is evident in regional statistics.

Promoting rural development poses numerous policy and governance challenges because it requires co-ordination across sectors, across levels of government and between public and private actors. OECD countries have therefore been undergoing a paradigm shift in their approaches to accommodate such important challenges. The most defining characteristics of this shift are a focus on places rather than sectors and an emphasis on investments rather than subsidies.

The multi-disciplinary nature of rural development has contributed to the lack of comprehensive analytical frameworks to analyse and evaluate multisectoral, place-based approaches. To fill this knowledge gap, the OECD co-operates with stakeholders worldwide. Its work on rural development was intensified with the creation in 1999 of the Territorial Development Policy Committee (TDPC) and its Working Party on Territorial Policy in Rural Areas. These bodies provide governments with a forum for discussing regional and rural development. In early 2006, under TDPC's guidance the Directorate of Public Governance and Territorial Development (GOV) launched a series of national rural policy reviews, such as this one, to deepen international knowledge in this field.

Acknowledgements

The OECD report *Innovation and Modernising the Rural Economy* was co-ordinated by Betty-Ann Bryce (OECD Directorate of Public Governance and Territorial Development, Regional Policy Division). The report was drafted by Betty-Ann Bryce, David Freshwater (University of Kentucky, United States) and Lucero Perez (formerly of the OECD), under the direction of Joaquim Oliveira Martins and the supervision of Enrique Garcilazo and William Tompson.

The Secretariat is very grateful to the Ministry of Regional Development of the Russian Federation and the Government of Krasnoyarsk Territory for hosting the 8th OECD Rural Development Policy Conference on Innovation and Modernising the Rural Economy in Krasnoyarsk on 3-5 October, 2012. This work grew out of the discussions at this event. We are also grateful to the OECD's Working Party on Territorial Policy in Rural Areas (WPRUR) for participating with interest and providing opportunities to continue the discussion.

A number of experts provided valuable input through the discussion in Krasnoyarsk. They are Jane Atterton (Scottish Agricultural College, United Kingdom), John Bryden (Norwegian Agricultural Economics Research Institute, or NILF, Norway), Mark Cropper (Directorate General for Agriculture and Rural Development, European Commission), Dimitris Diakosavvas (OECD), Anabela Dinis Maria (University of Beira Interior, Portugal), Olavur Gregersen (Syntesa, Faroe Islands), Laura Janis (Ministry of Employment, Finland), Maria-Varinia Michalun (formerly OECD), Armin Kloeckner (GTZ, Germany), Vadim Medvedev, (Zheleznogorsk, Russia), Marianne Neraal (Nordic Council of Ministers, Copenhagen, Denmark), Andrey Neshchadin (Financial University, Russia), Andrey Nikolaev (Financial University, Russia), Natalia Pyzhikova, (Deputy Minister of Agriculture and Food Policy of Krasnoyarsk Krai), Priidu Ristkok (Ministry of the Interior, Estonia), Ernan Rustiadi (Bogor Agricultural University, Indonesia), David Smallbone (Kingston Business School, United Kingdom), Gillian Skinner (Department of Innovation, Business and Rural Development, Canada), Victor Tomenko (Krasnoyarsk Krai Government, Russia), Raffaele Trapasso (OECD), Ekaterina Travkina (OECD), Grigoriy Tulchinsky, (National Research University, Russia) and Irina Vorontsova, (Siberian Federal University, Russia).

Prior to the Krasnoyarsk Conference, the OECD solicited proposals for papers by academics and government officials on the topics of rural innovation and modernising rural economies. We would like to thank the authors of the papers chosen, Thomas Dax (Federal Institute for Less Favoured and Mountainous Areas, Austria), Carmen Hubbard (Newcastle University, United Kingdom), Bruno Jean (University of Québec at Rimouski, Canada) and Eleni Papadopoulou (Aristotle University of Thessaloniki, Greece).

Jennifer Allain, Victoria Elliott and Kate Lancaster provided editorial support. Jennifer Allain, Erin Byrne and Gemma Nellies prepared the report for publication.

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Executive summary

The topics of "innovation" and "modernising the rural economy" are closely related. OECD rural regions are highly connected to global markets and open to trade. Their growth potential depends on their capacity to modernise their economic base and to innovate, in other words to produce goods and services that can be sold at a profit in local and in international markets, and to introduce new sectors and new products. However, this exposure to greater competition from domestic and international markets sometimes comes without complementary policies that can help strengthen the capacity of rural areas to adapt. The focus on innovation and modernisation represents an important next step in the evolution of the OECD rural policy dialogue. The fact that it is widely believed that the future prosperity of rural regions will be driven by enterprise, innovation and new technologies, tailored to specific markets and applied to new and old industries, makes this discussion timely. Furthermore, focusing on the two pillars critical to revitalising rural areas – innovation and modernisation – is one way to identify factors that can trigger or facilitate improved economic performance and identify those that tend to weaken it.

Each rural region is different and has its own set of opportunities and constraints. Local actors must come together to build an understanding of how best to use these resources, given these constraints. The OECD Regional Development Policy Division has devoted considerable attention to examining innovation as it relates to regions, but its research has largely focused on analysis of innovation as seen from the national perspective that is based on formal, research-based innovation systems, which rely on large research institutions such as universities, national government and corporate laboratories. This approach leads to a focus on patents as the main measure of innovation. Some rural regions display a high level of innovation. But this is chiefly manifested at the level of processes on the ground, and very little of it is patented. To ensure that the message of the potential for growth in all regions is carried forward, it is important to develop a better understanding of how innovation can emerge in a rural setting and how governments can support and encourage it.

Similarly, the theme of modernising rural economies meshes with the broader OECD work on how regions grow. Rural regions by their nature are highly open to trade and must focus on improving their competitiveness in order to advance economically. With globalisation and shifts in trading patterns, most rural regions have had to find new economic roles. This suggests that a better grasp of their strengths and weaknesses is essential to improving their prospects for growth. It is important to understand the framework of the modern economy and where rural economies stand in relation to it. Typically, the modern economy is conceived of as driven by endogenous growth. It is led by the service sector, with a strong emphasis on producer services; is well networked, e.g. using information and communications technology (ICT); and has a highly skilled workforce. Economic growth is driven by innovation systems and experiences high productivity, with entrepreneurs and small and medium-sized enterprises (SMEs) accounting for the bulk of the jobs. Rural economies have some of these characteristics, but they are qualitatively different. Skills are often in short supply, and connectivity

remains a challenge. SMEs are often low growth, employment occurs in low-productivity services, and manufacturing is largely consumer-oriented and at a fairly mature stage in the product cycle.

Part I of this volume provides an overview of the two themes of modernisation and innovation. Chapter 1 focuses on identifying the attributes of the modern rural economy and showing how it differs from the traditional rural economy and from metropolitan economies. Modern rural economies are strongly integrated into national and global markets, and while the broad drivers of growth are similar to those in urban regions, they operate in different ways. This makes it important for policy makers to understand the structure of the modern rural economy if they wish to support rural development. Chapter 2 focuses on rural innovation as a key driver of rural economic growth. It shows how the focus on patents as the main measure of innovation has led to the mistaken assumption that rural regions are not innovative. By embracing a less restrictive point of view, it is easy to find innovative firms and governments in rural regions.

Part II consists of four chapters that were first presented at the 2012 OECD Rural Development Policy Conference in Krasnoyarsk, Russian Federation. The four chapters offer evidence of rural regions' potential to contribute to national economic growth. In addition, each provides useful context for Part I by outlining four different perspectives on the process of modernisation and innovation, and specifically, how they can take place in the rural territories of OECD countries. In each paper, the authors explore the opportunities and impediments to these twin processes and how government policy can help or hinder them.

Clearly, rural regions will not grow in the same way as urban regions. And because first-nature geography (natural resources, topography, transport network and climate) is more important in rural regions, growth opportunities will vary considerably among rural regions, even within the same country. The current regional development approach, which focuses almost exclusively on large cities as engines of growth, overlooks the economic significance of rural areas and the degree to which both the economic viability of cities and their quality of life depend on the rural sector. Increasing our knowledge of how rural areas innovate and the key factors driving the rural economy will help identify more ways to help rural communities. Often, there is a struggle to implement strategies that build on local assets, create local wealth, replenish rural resources and create resilient rural communities. A more nuanced rural policy can offer some solutions.

The discussion about innovation and modernising the rural economy is really about how to construct modern rural development policies, i.e. policies more in sync with the changing rural context. In a 2012 report, the International Labour Organization stressed that rural development remains a wide and complex topic requiring action that goes beyond general prescriptions or blanket policies. With this in mind, this report offers policy makers the following broad lessons for consideration when developing policy for rural areas:

1. It is important to reframe the narrative on rural areas from a discussion of their assumed shortcomings to a discussion of their advantages and explore how best to maximise the existing opportunities in rural areas. This would include not only obvious opportunities that can boost local economic development (e.g. renewable energy, tourism, forestry and local foods) but also less obvious solutions, such as cultivating small markets that facilitate greater collaboration across firms, and using non-traditional service providers to deliver services.

2. The need for a place-based approach is arguably greater in rural territories. The less densely populated a region is, the more the key determinants of its growth performance tend to be specific to that region. In part, this is because rural economies are more likely to be defined by their natural geography than are cities.
3. The potential of strategies based on investing in and promoting the natural, cultural and recreational amenities in rural areas calls for a complex approach, which may encompass infrastructure, private sector development and environmental policies.
4. Focusing on increasing productivity in rural areas can help to improve workforce skills, strengthen capital investment in firms and foster entrepreneurship.
5. Strategies focused on identifying and mobilising local assets – rather than relying on external subsidies and other support – can help improve rural performance.
6. Uniform, economy-wide policies – which are designed for the most part in urban environments and for predominantly urban populations – often fail to take account of the specific needs of rural places. This suggests the need for innovation in the governance of rural policy. New governance tools can help achieve a healthy balance of top-down and bottom-up input in the policy process.
7. An understanding of how to recognise innovation in rural areas is critical. Innovation is as vital for rural economies as it is for urban economies. It is crucial both for raising productivity and for meeting the challenges of improved public service delivery. Many rural economies are already very innovative. This is often overlooked, because innovation in rural places looks different.

Part I

The changing rural economy

Chapter 1

Modernising the rural economy

This chapter sets out a framework for thinking about modernising the rural economy. It begins with an overview of why this approach is important for rural development. The concept of the "modern economy" and its relationship to the urban economy is unpacked and explored. There is also an assessment of the key elements associated with the traditional rural economy, answering the key question: How does rural stack up? Finally, areas for targeted policy focus are introduced (as for example, enterprise, skills development and competition) that can help modernise the rural economy, as well as some examples of attempts at modernisation in OECD and non-OECD countries.

Introduction

If rural people, firms and places are to fully contribute to national growth, it is important to identify ways that rural economies can experience the kind of productivity increases that cities typically enjoy. The modern economy in urban centres has generated important increases in productivity in manufacturing and services, but this has not been the case in rural regions. In urban regions, the primacy of the constructed environment renders geography relatively unimportant. But in rural regions, natural resource endowments, changing prices, transport costs and other consequences of local geography become especially important. These elements help to determine the opportunities a rural region has to pursue its development.

The development of rural areas and their towns and small cities will be different from the processes that have been identified in large cities. This does not mean that the underlying imperatives of the modern economy do not apply to rural regions, but that they apply in a different way. The most successful paths to economic development are based upon local strategies, and on local competences and assets. However, these strategies have to be grounded in an understanding of the external environment in which the rural region is embedded. A region's capacity for development in turn depends on its ability to innovate and increase productivity.

This chapter sets out a framework for thinking about modernising the rural economy. It begins with an overview of why this is important. The first section explores the potential of rural areas to contribute more to national growth, supported by evidence from OECD research. The second section unpacks the underlying assumptions of the "modern economy". The notion that the modern economy is closely identified with the urban economy is discussed and the key elements associated with both the "modern" and the "urban" economy are identified. The third section continues with an assessment of the key elements of the traditional rural economy, answering the question: What can a rural region offer? The fourth section builds on this by introducing the areas for targeted policy focus (enterprise, skills development and competition) that can help modernise the rural economy. Finally, the last section provides concrete examples of modernisation initiatives from Canada, the Russian Federation, Scotland and developing countries.

Why it is important to modernise the rural economy

One cannot ignore the fact that most citizens live – and most economic activity is generated – in urban areas. As we look into the future, cities, and large cities in particular, are commonly seen as the main economic engines for industrialised nations (Glaeser and Gottlieb, 2009; Power and Scott, 2011; Crouch, 2011). The urban share of the national population (Box 1.1) is increasing. Correspondingly, the common tendency of policy makers is to focus exclusively on large cities as engines of national growth. This overlooks the economic significance of rural areas and the degree to which both the economic viability of cities and their quality of life depend on the rural sector.

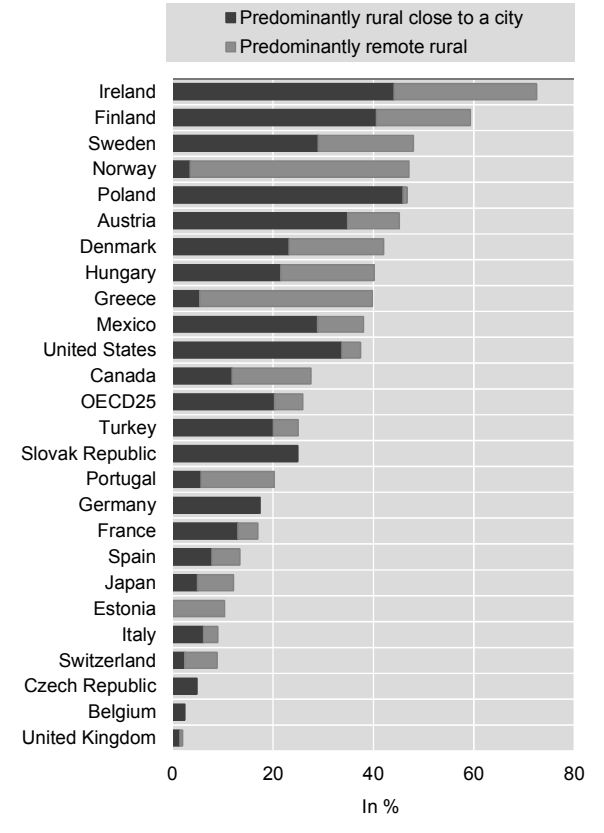
Rural economies provide essential goods and services that cannot be generated in an urban context, including important public or quasi-public goods, like a clean environment, an attractive landscape and a region's cultural heritage. Rural areas also have a critical role to play in addressing broader challenges, such as the shift to a more environmentally sustainable growth model. Most renewable energy technologies are primarily rural activities, particularly those reliant on agricultural feedstocks. Moreover, one clear area of strength in OECD economies in recent years has been primary

commodities, which come from rural regions. Countries with strong agricultural, energy and mineral exports have generally fared better than most others in recent years.

Box 1.1. **Rural by the numbers**

The share of urban population increased in 23 OECD countries over the period from 1995-2012 (OECD, 2013). Predominantly rural regions accounted for one-fourth of the total OECD population and more than 80% of the land area. In Chile, Poland and the United States, rural regions also gained in population share. In Ireland and Switzerland, the annual population growth in remote rural regions was higher than that in rural regions close to a city over the period; and in Finland, Norway and Slovenia, the share of the national population in rural regions was twice the OECD average.

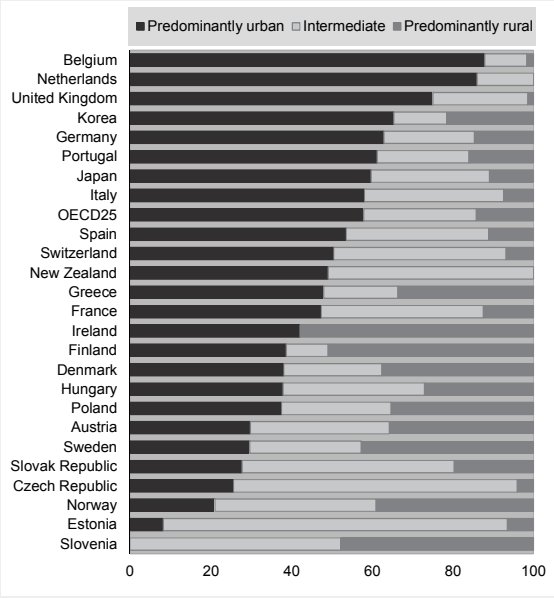
Percent of the national population in predominantly rural regions (close to a city and remote), 2012



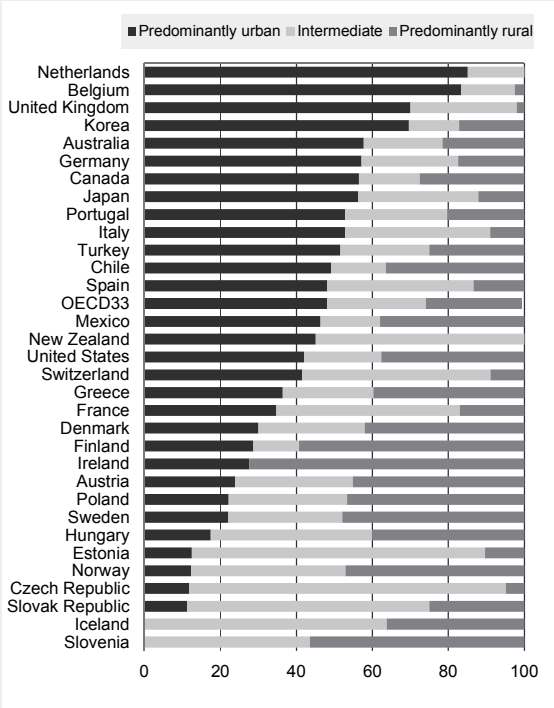
In most OECD countries, large city-regions have higher productivity in terms of output per worker, or output per person, and an increasing share of GDP. By contrast, except in the case of Finland and Ireland, where the GDP produced by rural regions was over half of national GDP, rural regions contributed 14% to overall GDP (OECD, 2013). Output per worker is at very high levels in the primary sector, agriculture, energy, mining, forestry and fishing; but workers in manufacturing and services typically have relatively low levels of productivity.

Box 1.1. **Rural by the numbers** (*cont.*)

Distribution of GDP across TL3 regions (2010)



Division of population across OECD TL3 regions (2012)



Source: OECD (2013), *OECD Regions at a Glance 2013*, OECD Publishing, Paris, http://dx.doi.org/10.1787/reg_glance-2013-en.

Modernising a rural economy is the process of identifying and developing those sectors and firms that support its competitive situation relative to neighbouring regions and its national and international peers (Freshwater, 2013). OECD work in two areas provides scope for thinking about the importance of modernising the rural economy: the New Rural Paradigm and promoting growth in different types of regions.

The New Rural Paradigm

For the last 30 years, the OECD has been engaged in examining rural development policies. During this period, it has developed, adopted and promoted the New Rural Paradigm (NRP) as an approach for member countries to follow in establishing their individual rural development strategies. The NRP, set out in 2006, analysed the evolution of rural development policy beyond the traditional, sector-based model, with its almost exclusive focus on agriculture. This more nuanced approach to rural development embraces more strategies that have a spatial context, that give priority to investments over subsidies, and encourage a partnership-based, multi-stakeholder approach. Grounded in current rural conditions and opportunities in rural areas, it is in essence an approach to rural development that can be best described as modernising and adapting". The most important aspects of the NRP are its emphasis on investment, locally determined strategies and economic modernisation. Embedded within this are a number of important premises about how rural policy should be designed (Table 1.1). While it has been almost a decade since the paradigm was formulated, it remains highly relevant. Recent analysis of national policy frameworks to promote rural development, through the prism of the NRP (OECD, 2007a; 2007b; 2008a; 2008b; 2008c; 2009a; 2009b; 2009c; 2010a; 2011), reinforce these trends.

Table 1.1. **The new rural paradigm**

	Old approach	New approach
Objectives	Equalisation, farm income, farm competitiveness	Competitiveness of rural areas, developing local assets, exploitation of unused resources
Key target sector	Agriculture	Various sectors of rural economies (e.g. rural tourism, manufacturing, ICT, industry, etc.)
Main tools	Subsidies	Investments
Key actors	National governments, farmers	All levels of government (supra-national, national, regional and local), various local stakeholders (public, private, non-governmental organisations)

Source: OECD (2006), *The New Rural Paradigm: Policies and Governance*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264023918-en.

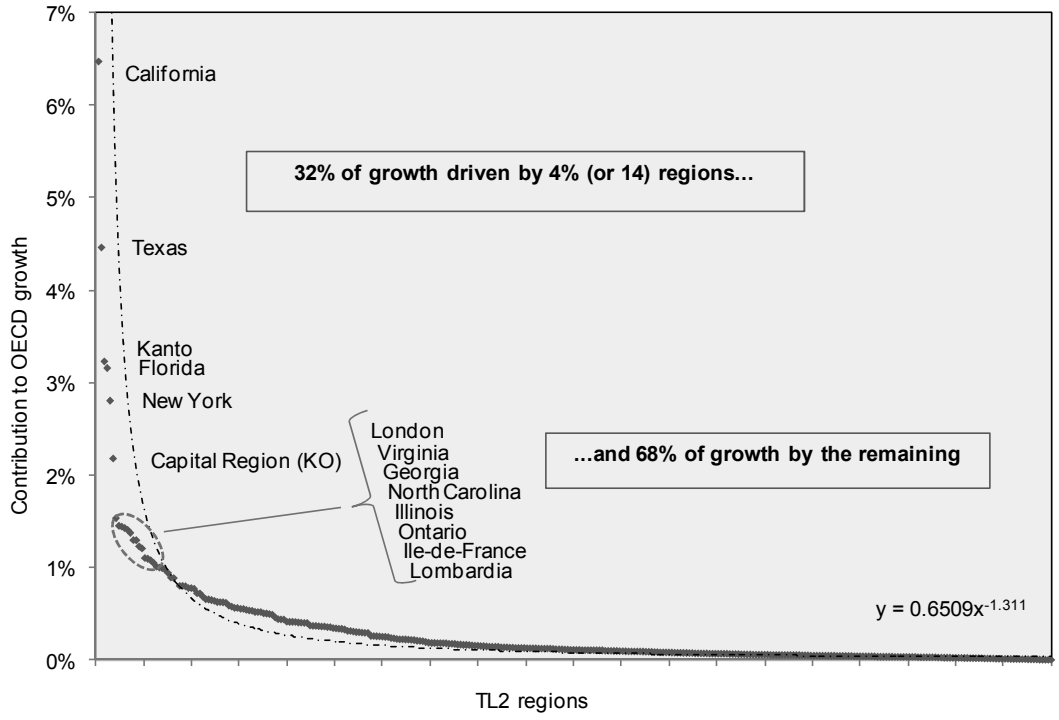
Promoting growth in rural areas

Rural economies have a key role to play in spurring economic growth, which is sometimes lost in the focus on cities. The OECD work *Promoting Growth in All Regions* (2012a) which analysed the policies and development strategies undertaken by 23 regions to revitalise fledgling rural and urban economies is significant in this regard. It provides evidence of two elements significant to the development of rural areas.

First, *predominantly rural regions have, on average, enjoyed faster growth than intermediate or predominantly urban regions* (Figure 1.1). The study observes that regions typically classified as lagging (GDP per capita below the national average) are in

fact "highly relevant for the aggregate growth". In ten OECD countries, these so-called lagging regions contributed even more to aggregate growth than regions with a higher level of GDP per capita (Table 1.2). In this regard, one task for rural policy is to identify ways to help rural communities tap their growth potential. However, when successful, rural economies can grow at a robust pace; but when unsuccessful, they can fall into a pattern of decline. This variation in the performance of rural regions –putting them among the fastest-growing regions in the OECD as well as among the worst-performing ones – signal the need for better understanding the dynamics.

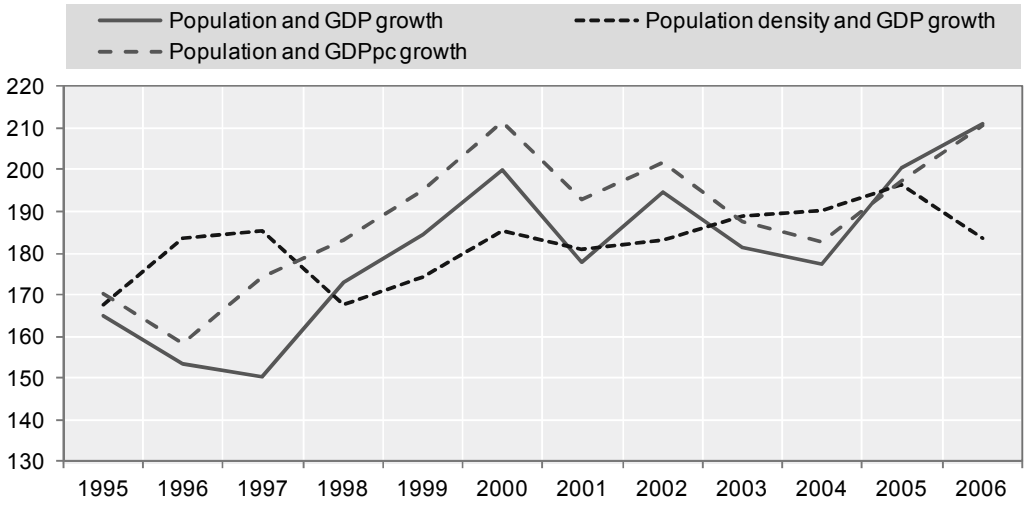
Figure 1.1. **Contribution to growth from OECD TL2 regions**



Source: Garcilazo, J.E. (2012), "Modernising the Rural Economy: Promoting Growth in All Regions", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Second, *density is not a prerequisite for high-performance*. An analysis of the fastest-growing OECD regions for each year according to their population size (Figure 1.2) reveals that the faster-growing regions are gradually becoming less populated and less densely populated over time. The most efficient growth appears to be occurring in less-populated regions. Thus, not only does it appear that growth is happening in less-populated regions, but population density is not a necessary or sufficient condition for high sustained growth rates (OECD, 2012a). This is a crucial finding. Low density is often viewed as challenge to developing rural areas. This was noted in the OECD study *Strategies to Improve Rural Service Delivery* (2010b) where low density is identified as a hurdle, one of the three "central dimensions" of the spatial challenges which make services more expensive to deliver in rural areas (see Box 1.2).

Figure 1.2. **Population and population density in the fastest-growing 25% of TL2 regions**



Source: OECD (2012), *Promoting Growth in All Regions*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174634-en.

Table 1.2. **Lagging regions' contribution to aggregate growth**

	Lagging (%)	Leading (%)
Australia	29	71
Austria	53	47
Canada	26	74
Czech Republic	62	38
Finland	35	65
France	68	32
Germany	27	73
Greece	16	116
Hungary	34	66
Italy	26	74
Japan	27	73
Korea	23	77
Mexico	44	56
Netherlands	49	51
Norway	61	39
Poland	44	56
Portugal	54	46
Slovak Republic	67	33
Spain	48	52
Sweden	58	42
Turkey	47	53
United Kingdom	57	43
United States	51	49
Average unweighted	43	57
Average weighted	44	56

Source: OECD (2012), *Promoting Growth in All Regions*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174634-en.

Box 1.2. **Distance, critical mass and density**

There are additional factors that contribute to the challenge of providing services in rural areas that must be overcome if the full potential of rural areas is to be achieved. One of the most important factors is a typically higher cost of providing services in rural regions with the underlying geography of distance, critical mass, and density.

Distance is a defining concept of rurality. Rural areas are far from major urban centres and this makes all forms of connectivity more expensive. Roads are longer and cost more to provide. Transport times are significant. Power lines have to be strung long distances and suffer line losses. Moreover within a rural area distance imposes similar burden because of the extensive geography. While some technologies (ICT) have reduced the distance penalty facing rural regions, the majority of the ways rural people exchange goods services and ideas are still subject to distance penalties.

Low levels of population in rural regions make it hard to achieve a critical mass. In many countries the rural population is falling, while in parts of other countries it is expanding. Even in those countries where the rural population is expanding we find that only certain regions are experiencing population growth. For many rural regions population is low enough that it is difficult to achieve scale economies of production of many goods and services, including public services. Even ignoring the burden of increased transport costs there are often too few people in a rural region to allow services to be provided in the same way that is done in urban areas.

Distance and low population levels result in low density. The low density of population is a crucial factor in many rural regions. In urban areas a concentration of population in geographic space facilitates connectivity. In rural regions people tend to be dispersed across much of the territory, which makes connectivity harder to achieve. In those rural region where the population is clustered in a small number of communities it is may be possible to reach some degree of critical mass, but in rural regions with a large but dispersed population the costs of connecting people through markets or government action are high.

Source: OECD (2010b) Strategies to Improve Rural Service Delivery, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264083967-en

Attributes of the modern economy

The modern economy has several features (Table 1.3). Typically services dominate employment and output. In particular, advanced services lead economic growth. These include: producer services (finance, marketing, legal, etc.), health care, higher education and computer and Internet services. The modern economy is a network economy, with the Internet as its most important network, supplemented by the efficient transport of goods by air, land and sea. Information and communications technology (ICT), which combines the Internet, computers and telecommunications, constitutes an information creation and dissemination network that affects all other industries, as well as government and society.

The modern economy places a high premium on workforce skills. Those with advanced skills, both formal and interpersonal, are highly rewarded, but the growing income gap between the skilled and the unskilled is increasing polarisation. This has resulted in the development of an insider and outsider workforce, where firms highly value skilled workers and provide them with a secure working environment, but unskilled workers are increasingly becoming contingent labour with low wages, limited job security and few benefits. The insider-outsider model for service industries, the major source of employment in OECD countries, has important implications. While producer

services offer high wages associated with advanced skills, the majority of service employment remains in consumer or household services, which typically involve low skills, low wages and episodes of unemployment.

Economic growth can be rapid in the modern economy, and is driven by innovation. Innovation is mainly seen as the result of large investments in formal innovation systems that amass human and physical capital to address technology gaps. This science-based process leads to new products and technologies that typically reinforce the premium on skilled workers and displace the unskilled. Innovation is focused in large corporations, research universities and government laboratories, which have the resources to assemble the large teams this formal process requires. In essence, a closely coupled corporate government complex of laboratories, funding schemes and joint priorities promotes innovation. Patents provide a mechanism to recoup these actors' substantial investments in research and development (R&D), and are the main measure of innovation performance.

Table 1.3. **Attributes of the modern economy**

The modern or new economy
– Led by the service sector.
– Network economy: Internet, computers, telecommunications (ICT).
– Core workforce is highly skilled.
– Driven by innovation and productivity.
– Entrepreneurs and small and medium-sized enterprises (SMEs) create the most jobs.
– Large cities lead economic growth.

Source: Freshwater, D. (2013), "Modernising rural economies: Strengthening economic growth in the 21st century", extended version of a plenary session presentation made at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

While large firms drive innovation in the modern economy, it is entrepreneurs and small and medium-size enterprises (SMEs) that create the most jobs. This reflects in part the dominance of the service sector, only a part of which has high productivity. Most consumer services remain labour intensive and consequently absorb a large share of workers. The firms providing these services are for the most part small. Large-scale manufacturing often involves a de-skilling of the workforce and a substitution of capital for labour. This, combined with cheap transport and the ability to use ICT to manage remote production sites at a distance, has meant that a large share of routine manufacturing has relocated to developing countries where labour costs are low. The relatively small share of manufacturing remaining in the modern economy is largely characterised by small volumes of highly customised output produced by skilled workers using sophisticated technology.

In the modern economy, information is a crucial source of competitive advantage and growth. The focus on patents by innovative firms is one example of the effort to protect the returns of knowledge creation. However, another characteristic of the modern economy is the exchange of knowledge. The ICT industries and the expansion of various networks improve the flow of knowledge. One key advantage of cities is that they provide for a wide variety of conversations and contacts that expose people to new ideas. This in turn allows innovation, as individual firms and governments identify better ways to solve problems or opportunities for new goods, services or technologies. Typically, the modern economy is seen as an urban economy, and in particular an economy driven by large

cities. Producer services are mainly found in large urban centres. A large local market makes it easier to provide specialised manufactured products at lower cost. And most importantly, while information spill-overs can be transmitted through ICT, they can also be achieved through face-to-face contact, especially when important ideas are exchanged through serendipitous meetings of people who may not have had any express intent to have a specific conversation (Marshall, 1890).

The combination of a large "home market" provided by cities, the presence of pools of skilled and unskilled labour, the potential for information spillovers and the ability to carry out innovation through formal science-based innovation systems constitute the last key characteristic of the modern economy: an endogenous growth process. While the modern economy still needs raw materials, these play an ever-smaller role in output and employment. In essence, the modern urban economy has reached a critical mass, where growth in internal demand enables a steady increase in production. Instead of economic growth requiring some external demand – exports to some other region, for example – the dynamic of growth reflects internal forces. This does not mean that cities are isolated entities, because trade is also an integral part of the modern economy, but it does imply that trade is part of the internal dynamic of growth, rather than an external force.

Attributes of the traditional rural economy

The features of the traditional rural economy are quite different from the modern economy (Table 1.4). At an aggregate level, employment in rural regions is mainly in services and manufacturing, as is in the modern economy. But crucially, the service sector in rural regions is limited to consumer services and basic producer services (bank branches, general accounting firms and general-purpose lawyers, etc.). Similarly, most rural manufacturing occupies an uncertain middle ground of firms that are not large enough to move off shore and firms that that are not sophisticated enough to compete in specialised markets. This may explain why rural regions have not seen the increases in productivity in the service and manufacturing sectors that have driven growth.

Workforce skills in rural regions tend to be much lower than are found in the modern economy. While less skilled workers do participate in the modern economy, economic growth is based mainly upon a highly skilled labour force. In rural areas, not only are these insider jobs much harder to find, but few workers are capable of filling them. Moreover, most OECD countries face an ageing and shrinking workforce, after an extended period of fertility rates below the natural replacement level, and this problem is even greater in rural regions. Rural regions tend to combine low birth rates with high rates of youth out-migration to urban areas. This compounds the problem of an ageing, and shrinking population. In addition, those who leave tend to have the highest formal and informal skills, which further skews the capacity of the local labour force.

However, rural regions are becoming part of the network economy and in some instances are even major beneficiaries of the rapid adoption of ICT technologies. In principle, the handicap of geographical remoteness can be mitigated by the reach of ICT. Indeed, initial claims for the Internet were that it would overcome the handicap of distance. In reality, the higher costs of installing broadband in areas of low population density and the synergies between electronic and face-to-face contact have often left rural regions on the periphery of networks. Meanwhile, limited access to airports and weak road and rail connections put rural regions at a further disadvantage.

Table 1.4. **Attributes of the traditional rural economy**

The rural economy
– Most employment is already in services and manufacturing, mainly at the low end.
– Weak skills and an ageing workforce.
– Low levels of innovation, as measured by patents and formal R&D.
– Low productivity, except in the primary sectors, and limited entrepreneurial activity.
– Lagging in Internet connectivity and computer use.
– Most firms are SMEs of limited growth potential.

Source: Freshwater, D. (2013), "Modernising rural economies: Strengthening economic growth in the 21st century", extended version of a plenary session presentation made at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Towards a modern rural economy

Moderninising the rural economy means adopting a more robust, holistic and innovative approach to developing rural areas. In the modern economy, the contribution of traditional rural industries (agriculture, mining, energy, forestry and fishing) to GDP and to employment is relatively unimportant. While this reduced role largely reflects the growth in other industries, the fall in employment is also driven by high rates of substitution of capital for labour and ongoing technical advances in these industries. Unlike the manufacturing and service sectors, rural firms in the primary industries have typically exhibited very high rates of productivity over an extended time period. The output of resource industries has steadily increased, but the number of workers they employ has steadily fallen (Scott and Pearse, 1992). As a result of falling employment, the role of resource industries now appears to be fairly minor, even in rural regions, but this masks the driving role of innovation and increasing productivity.

Given their low population density, high commuting costs and small populations, rural regions rely almost exclusively on SMEs. Large establishments cannot assemble enough workers to become viable in rural areas. In urban areas, multiple firms in a single industry can survive because the home market is large enough, but rural areas can typically support only one, or at most a few, firms that provide the same type of goods or services. This reduces competition, opportunities for information spillovers and the potential for developing pools of specialised labour. Distance and the small home market can also make it harder for firms to grow, as new market opportunities may be hard to identify.

Rural regions largely rely on exogenous forces for their growth opportunities. Rural economies are small, specialised and truncated, which gives them weak internal dynamics. Growth is initiated at the point where it becomes possible to increase exports to some other place. This provides an infusion of financial capital that can be used to expand the local economy. In urban areas, the potential for endogenous growth provides an opportunity for greater local control of economic development (Stough et al., 2011). In rural areas, the options for development will always be constrained by the necessity to identify external markets both for exports and for the necessary imports.

Rural regions have an absolute advantage in the production of natural resources. These remain essential to the economy of OECD countries, but in many cases, domestic raw materials are more expensive than imported raw materials. The mere presence of natural resources is not a sufficient condition for rural economic growth. Moreover, even

in regions where natural resources are abundant and sufficient investment has been made in production and transport to allow for efficient supply, the natural resource sector may not be able to drive sustainable rural economic growth. Natural resources are inherently unstable as a driver of rural development. The export of a natural resource, either in unprocessed or semi-processed form, provides a foundation upon which additional economic functions can develop. With strong exports, it is possible to construct a large secondary economy providing complex goods and services. However, the viability of these new functions hinges on the continued flow of primary exports. Any decline in exports leads to a decline in the whole economy.

Even in regions where natural resources are abundant, it is necessary to identify other engines for economic growth. The steady substitution of capital for labour in the natural resource industries makes them a minor source of employment, even in regions where they represent a major share of output. The majority of the capital goods used in the resource sector are provided by large multinational firms that optimise global production in a small number of large-scale assembly plants. This leads to significant financial leakages from rural regions and limited potential for upstream linkages. Natural resources may offer some opportunities for developing local semi-processing businesses in order to reduce the weight of output shipments, but these are limited to first-round processing. Once again, most value-added inevitably occurs outside the region.

Rural development involves a shift away from reliance upon the export of a single commodity. Meanwhile, adding more economic functions increases the resilience of individuals, firms and communities in a rural region (Kostov and Lingard, 2001; 2003; 2004). A clear illustration of the importance of this idea is the Balance Agriculture With Industry (BAWI) programme developed in Mississippi in the 1930s (Hudson, 2000) (Box 1.2).

Box 1.2. **The Balance Agriculture With Industry (BAWI) programme**

In the 1930s, the economy of the state of Mississippi was highly dependent upon agriculture and forestry, and both were facing falling demand. The result was a high unemployment rate and a weak economy. The BAWI strategy was to recruit industrial firms from the northern part of the United States to Mississippi, with the promise of low-wage labour and support from the state for the construction of new facilities for the firm. The programme had mixed success, but became the foundation for industrial recruitment efforts across the American South that led to a major relocation of manufacturing firms from the north. Importantly, most of the firms left industrial cities in the northern United States for smaller rural towns in the South, leading to significant diversification of rural economies.

The BAWI programme offers an important lesson. Mississippi took what could be seen as a significant development disadvantage – a labour force that was poorly educated and with few skills that were directly relevant to manufacturing, and turned it into a competitive advantage: an inexpensive labour force. This focus on converting a perceived weakness into a potential opportunity offers rural regions a crucial lesson. On its face, the modern economy seems an unlikely opportunity for rural regions. Indeed, the modern economy is typically described as an urban economy. However, for OECD countries, the modern economy is the future, and this is true both in rural and in urban areas. While some of the attributes of the modern economy are difficult to apply in rural areas, others, from the right perspective, have a rural relevance.

Source: Freshwater, D. (2013), "Modernising rural economies: Strengthening economic growth in the 21st century", extended version of a plenary session presentation made at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Economic drivers to modernise the rural economy

In an environment where the labour force is increasing in size, the focus of growth policy is almost always on increasing employment. This reflects the socio-political imperative to maintain high levels of employment in the workforce. Increases in the workforce come about not just because of population growth, but due to shifts in cultural preferences, such as increased participation of married females in the labour force. Institutional changes, such as, for example, reduced eligibility for welfare programmes, also have the effect of pushing people back into an active search for employment.

One consequence of demographic decline is that economic growth, or even maintaining the current level of economic output, will require significant increases in productivity. For decades, many rural regions have faced a surplus of labour. Fertility rates were significantly higher in rural regions than in urban areas. This was most evident in agriculture. Farm families were traditionally large because of the need for labour on the farm, but throughout the 20th century, farm consolidation and mechanisation steadily reduced the need for labour. As a result, waves of children left rural areas for cities, but enough children remained to create an excess supply of workers in many rural places.

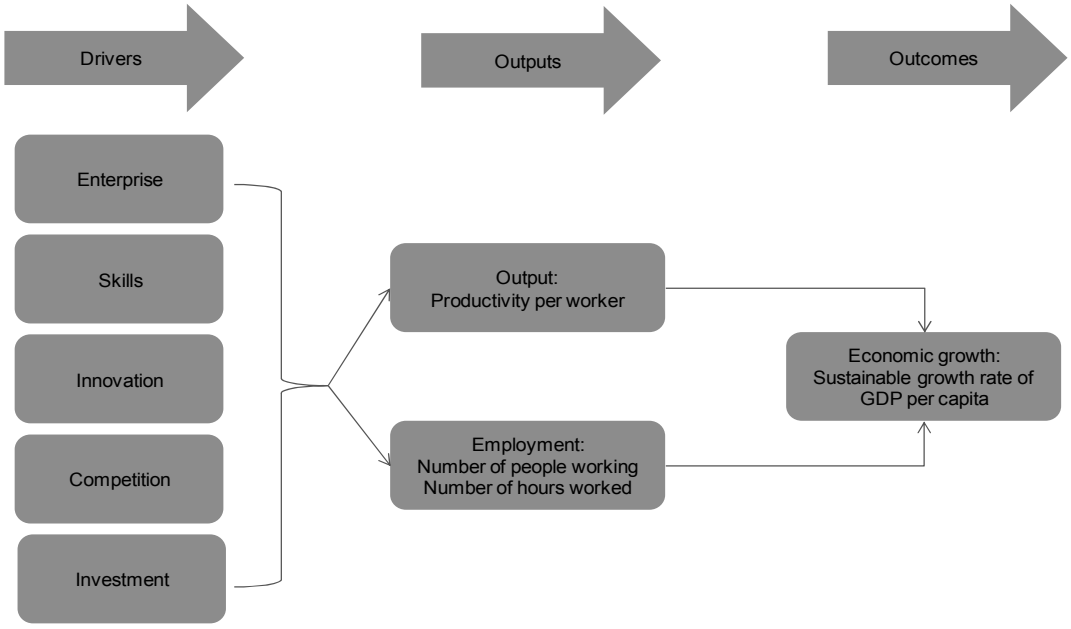
National and local development policies focused on searching for ways to reduce rural unemployment, either by encouraging migration to cities or by increasing the local demand for labour by developing manufacturing and later more services in rural regions. More recently, however, the fertility rates in rural households have fallen steeply, to match urban levels. And, while rural out-migration has slowed, it is still significant. Virtually all rural regions in OECD countries experience high rates of youth out-migration, and, in particular, higher rates of female than male out-migration. In addition, these regions have been relatively unsuccessful in attracting foreign immigrants. One consequence of this is an imminent shift from a problem of surplus rural labour to one of labour deficit. If rural regions have fewer workers, these workers will have to produce a higher output. If productivity in rural regions continues to lag behind that of urban areas, then out-migration will continue and rural decline will accelerate as workers leave for higher paying jobs in cities.

Productivity increases may be more important in rural areas than in urban regions. In urban regions, a large share of the economy is made up of non-tradable services that do not face any competition from outside the region. This, by itself, reduces pressure for productivity growth. In addition, urban regions have a large home market that allows for easy expansion of output to reach economies of scale. By contrast, in rural regions, the home market is small, and growth comes from exports that entail high transport costs, which makes high productivity essential.

Drivers of economic growth and rural areas

Rural areas should drive their own economic development, rather than depending on an impetus from national governments. Economic growth is driven by a combination of increased employment and increased worker productivity. The UK Treasury has identified five drivers of productivity: enterprise, skills, innovation, competition and investment (Figure 1.3).

Figure 1.3. **Drivers of economic growth**



Source: HM Treasury (2000), *Productivity in the UK: The Evidence and the Government's Approach*, HM Treasury, London.

These drivers can be helpful in structuring the discussion of how rural economies can complement the modern urban economy. For this reason, some indication of how they (with the exception of innovation) could be better implemented in rural areas is discussed below. The potential of rural areas to better tap their potential is covered in Chapter 2. For each of the five drivers, it is possible to identify attributes of rural regions that can make the particular driver either an opportunity or an impediment to growth. Given the particular circumstances of rural economies, the drivers will have different characteristics in rural spaces and provide the basis to:

- Move from increasing the number of jobs to increasing the quality of jobs.
- Maximise the opportunities presented by small local markets to create opportunities for entrepreneurs, especially start-ups, clusters and collaborations.
- Identify regions with a strong entrepreneurial culture and seek ways to replicate them elsewhere.
- Invest in new ways to prepare and train staff and explore the new opportunities presented by training. Fewer workers means that employers will increasingly have to pay more for training.
- Identify new ways to stimulate competition. Mobility from rural to urban areas creates competition, even if there is only one firm in the rural market.

- Recognise and understand the different types of innovation in rural areas and support it. Rural firms typically develop new products and processes, because they are rarely in a position to purchase solutions that have been developed elsewhere.

- Allow rural regions, rather than national governments, to drive their own economic development. Here the suggestion is to focus more on rural strategies that identify and mobilise local assets to improve economic performance.

To convert an impediment into an opportunity, a context has to be provided. Low-skilled labour was an impediment in Mississippi (Box 1.2), but if it could be combined with a lower wage than prevailed in competing locations, and with assistance in relocation in the form of financial support for a new factory building, the owners of prospective firms might revise their negative impression of the labour force. The crucial next step is for the region itself to undertake this process, because it is a specific combination of regional characteristics that convey competitive advantage. Local leaders and citizens are best placed to identify the individual attributes of the region and to develop ways to combine them into a viable modernisation strategy.

Enterprise

Expanding the size of the workforce by increasing the number of firms or enterprises has been the traditional way of increasing rural economic growth (Box 1.4). Most rural regions have faced an environment where the supply of labour exceeded local demand. Out-migration to urban areas has been an important response to the excess supply of workers. But mobility alone has rarely led to full employment equilibrium. As a result, the majority of past rural development policy has revolved around efforts to increase the demand for labour, either through inward investment or by stimulating the introduction and expansion of local firms. Already, many rural regions are facing a demographic transition. Several generations of childbirths at below replacement rate, combined with steady youth out-migration, have resulted in a labour force that is rapidly ageing and shrinking. In the majority of rural regions in OECD countries, this phenomenon will soon occur. From one perspective, this represents a major vulnerability.

A reduction in the number of unskilled workers reduces the need for rural regions to focus on finding ways to attract firms. In the modern economy, the demand for low-skilled workers is shrinking. Consumer services, health care and household services are an exception. But these make up a small fraction of the rural economy, because they require relatively large numbers of clients in close spatial proximity. Instead, rural regions will be able to look for employers that do not have to provide large numbers of jobs. Since the same demographic shift is affecting urban areas in OECD countries, it may be possible for rural regions to attract some firms from cities, especially given the historical reluctance of many rural people to leave their place of origin.

Box 1.4. **Putting in place jobs that last**

In their response to the crisis, national governments have put in place measures aimed at helping job seekers find work in the following areas:

- Better matching services: activities to quickly match displaced people with new jobs through "one-stop shops", mobility centres and emergency desks at the local level.
- Investment in education and training: retraining for employment in new and emerging sectors, along with broader schemes to upgrade skills and keep people economically active, particularly youth.
- Job creation: activities that stimulate both entrepreneurship and social entrepreneurship, which may be more sustainable in the long term.
- Support for business to raise productivity: schemes have been instituted in a number of localities and regions to invest in the productivity and adaptability of local industries, so that they are less vulnerable to economic downturns.
- Building local capacity: initiatives to build capacity and increase co-ordination at the local level, to create a joint approach to rebuilding local economies.

Source: Froy, F. and S. Giguère (2010), "Putting in place jobs that last: A guide to rebuilding quality employment at local level", *OECD Local Economic and Employment Development (LEED) Working Papers*, No. 2010/13, OECD Publishing, Paris, http://dx.doi.org/10.1787/5km7jf7qtk9p-en.

There are impediments to the formation of new businesses in rural regions. The first of these is a belief that people in rural regions cannot develop the ideas that lead to new business. Unfortunately, this belief is widely held among the rural population, and entrepreneurs may become discouraged by social attitudes. Certainly, it is more difficult to obtain finance for new businesses in most rural regions. In part, this reflects the underlying scepticism of the possibility that the new ventures can be successful. It is also a reflection of thinner financial markets, with less capacity and capability to fund new ventures. In part, it is a consequence of the dominant model of single-industry towns. Such firms often discourage independent thought of any kind because they see it as potentially destabilising to their leading role.

Businesses that serve spatially dispersed markets can be conducted in a rural region. This is especially the case for firms that do not need rapid growth to achieve economies of scale. Specialty products based in a rural location, such as customised business software, niche manufactured goods or focused retail establishments that serve a narrow customer base, may be able to fully serve global customers. Low transport costs and instantaneous communication led to the loss of routine manufacturing in rural parts of OECD countries, because it could be carried out more cheaply in developing countries. But a combination of websites, package delivery services and rapid air freight can allow new rural enterprises that focus on emerging markets to become successful start-ups. New firms are seen as a source of increasing

productivity, because a new firm typically provides a new good or service for which there is an expanding market. Alternatively, new firms can be more cost-efficient than existing firms, which may allow them to take market share. The modern economy tends to focus on "gazelles" – firms with high growth rates and rapid increases in employment and output. The crucial element is the type of production and the importance of bundling a product with tailored customer service.

Skill development

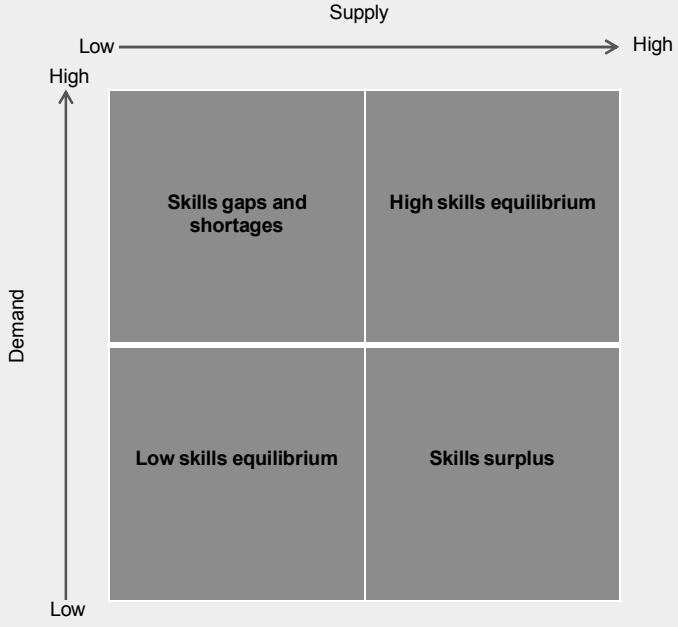
For the rural economy to modernise, a significant increase in average levels of skill is necessary. A region's most important asset – in terms of ideas, innovations, talents, skills, specialisations, culture, methods and approaches to work – is the local labour market pool (Froy and Giguère, 2010). In the majority of OECD rural regions, the workforce usually has lower levels of formal education and lower levels of technical training than urban regions. Some of this has to do with the fact that employment opportunities that require the highest levels of education and skills are concentrated in urban centres. As the economy shifts to an insider-outsider structure, the better jobs are those that require higher skills. Regions with only low-skilled workers will increasingly play a peripheral role in the economy and remain in intense competition with workers in developing countries for routine production work. Froy and Giguère (2010) point out that "all localities can work towards making their labour force more flexible and adaptable to change". However, they caution that adaptability needs to be considered at a number of different levels. While national governments set the legal framework, adaptability takes place at the level of local communities. This malleability is important, because "the more adaptable a local economy, the more likely it is to grow".

Local economies can become more adaptable in different ways. On the one hand, employers and other stakeholders can and should be empowered and incentivised to innovate and introduce change. On the other hand, there should be a focus on the skill levels and employability of the workforce (Box 1.5). Workers who receive higher wages can only earn these wages if they have high productivity, and that means either the ability to work effectively with sophisticated technology or the ability to apply human ingenuity. Both of these situations require a relatively high level of skill and training. Web-based education and training technology offers the chance for rural regions to introduce a large array of programmes in a way that is accessible to small groups and individuals. In the past, it was far more challenging to provide education and training in a rural environment. Small, widely dispersed populations made schools more expensive to operate, and demand for advanced courses was limited in any one place. Similarly, technical training programmes also faced the problem of small numbers and high travel costs for individuals who wanted to attend.

Box 1.5. **Rural areas and the low skills equilibrium**

In "Putting jobs in place that last", Froy and Giguère present a framework for thinking about the relationship between skills and labour supply and its potential effect on rural areas. They argue that adopting new technologies and adapting to changing markets takes time. This delay sets the stage for what they term a "vicious cycle", which allows employers to keep skill levels, and salaries, at a minimum, to achieve a competitive advantage. However, individuals are less inclined to remain or pursue higher education if local firms are not seeking higher-level skills. Correspondingly, managers will be reluctant to raise their level of productivity and better utilise skills if well-educated workers in their locality are in short supply. The problem for regions, and particularly rural regions, the report argues, is when these types of employers become concentrated in a particular area.

Further, in these instances, for policy makers, the focus is less on addressing skills shortages and more on labour shortages. The authors intimate that this is the less favorable approach. They point out that "when local governments 'fire-fight' to fill vacancies, they are subsidising business activity in a way that leads to poor efficiency in the use of public resources". Specifically, it results in poor job retention and labour-market churn and contributes to low productivity. Regions can broadly fall into four different categories: regions experiencing a "low skills equilibrium"; regions experiencing "skills gaps and shortages"; regions experiencing a "skills surplus"; and, lastly, regions experiencing a "high skills equilibrium". Improving the relationship between skills and supply can present a challenge.



Some tools identified by the OECD that can address problems of low-skilled equilibrium and improve the use of skills include:

- Supporting technology transfer: facilitating investment in new technology by employers, setting up partnerships for the sharing of innovation and new technologies.
- Providing technical assistance to improve working conditions and work organisation.
- Encouraging participation in training for both managers and workers.

Box 1.5. **Rural areas and the low skills equilibrium** (*cont.*)

- Ensuring the availability of "patient" capital (i.e. funds invested for medium or long term, generally for five to ten years), because in order to invest fully in their staff and upgrade their production processes, companies need long-term investment security.
- Developing a quality-driven supply chain. Public procurement can also be used to help local firms think in the longer term and therefore invest in increased productivity. This can include, for example, longer contracting periods, requiring a certain level of working conditions, and a certain level of commitment to training.
- Supporting social enterprise, so that they can in some cases take a longer-term perspective to developing and training their staff.
- Removing local disincentives to focus on quality in the public sector. This would mean changing incentive structures for local employment agencies so that they concentrate on the quality and not just the quantity of job matches.
- Ensuring that skills policies are embedded in economic development policies. Local partnerships are needed between business and policy makers in the sphere of economic development, education and employment, in order to ensure that skills policies are understood in the context of broader economic development.
- Working with intermediaries. Brokers and intermediary bodies can be particularly useful when working with employers on productivity issues, particularly since this is not a traditional domain for public policy.

Source: Froy, F. and S. Giguère (2010), "Putting in place jobs that last: A guide to rebuilding quality employment at local level", *OECD Local Economic and Employment Development (LEED) Working Papers*, No. 2010/13, OECD Publishing, Paris, http://dx.doi.org/10.1787/5km7jf7qtk9p-en.

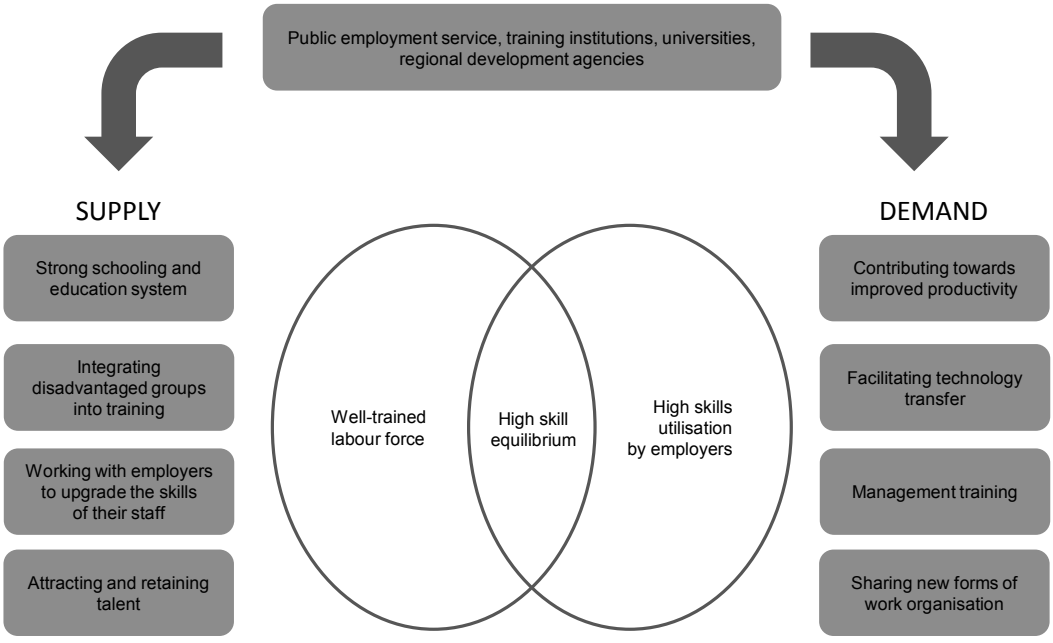
Recent research by the OECD also shows that investments in up-skilling for lower skilled workers have a greater impact on regional economic growth than do investments in increasing the number of highly skilled workers (OECD, 2012a). This is encouraging for rural regions because they have a large percentage of lower-skilled workers and because only modest investments in training may be needed to increase their qualification levels to the point where there are significant benefits to workers and to the region. Even in rural regions, the returns from education are evident, and are becoming larger as a shrinking labour force results in firms replacing labour with equipment and technology. Perhaps most importantly, in many rural regions in the past, formal education and technical training were seen as having limited benefits. As long as local employers placed little value on education, workers had little incentive to invest in improving their skills. Not only are employers altering the mix of skilled and unskilled labour they employ, but the wage differential between skilled and unskilled workers has been increasing, and this in itself provides a new incentive to individuals to invest in training.

To increase the number of jobs and the income of the population, it is necessary to invest in education. In the OECD in 2006, at a time of economic growth, 85% of those with a tertiary education who had graduated from vocational training institutions were able to find employment, as compared with 58% of those who had only a high school education. In the United States at the same period, the average weekly salary of a college graduate was 73% higher than that of a person with only a high school education (Travkina, 2012). Demand should meet supply, and graduates of college and vocational training have to be useful for employers (Figure 1.4). At present, workers who stay within

the same industry acquire qualifications and competences; they change companies but remain in the same industry. Single companies can no longer offer improvement in credentials, so the improvement system has to be built in such a way as to ensure operation of the entire industry. Vocational and college workers identify qualifications required for specific industries, and then build their educational credentials around these requirements. Another option is the career cluster model, which enables people to develop their careers not only in a single industry but in a cluster of industries. For instance, in the transport and logistics industry, the qualifications are essentially the same, and a cluster model can train people to work in these industries. Employers also benefit from this approach because they get the workers they need.

Employment services, vocational training systems and tertiary education should become active players in order to work with businesses. A different relationship between the central authorities and the other actors is called for. With more decentralisation and a less rigid budget allocation system, they will be able to adapt their programmes to the needs of local economies and businesses.

Figure 1.4. **Addressing labour supply and demand**



Source: Travkina, E. (2012), "Modernising rural: Skill building in rural areas", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Competition

Competition among firms drives each firm to control its costs and increase productivity, as a way to either gain market advantage or to remain profitable in the face of efficiency gains by its peers. Firms in rural areas have often not faced this sort of competitive pressure because in many rural places, the small local market and its distance from urban centres results in spatial monopolies. High transport costs and information gaps prevent local customers from seeking out distant suppliers and keep external firms from penetrating the local market. Where local firms have had monopoly power, they

have had little interest in increasing productivity. In a rural economy where a large percentage of local firms have effective monopolies, the costs for economic growth can be high. Costs for firms in the rest of the local economy are raised because firms with pricing power both limit output, to raise prices, and have little incentive to drive down their production costs. As a result, aggregate regional output falls below its potential, and those local firms that could be competitive in external markets may struggle to match competitors' prices.

However, the modern economy provides an important mechanism to expand competition, in the form of ICT. The Internet increases access to information on prevailing prices, so consumers know when they are being charged too much. Access to online information, combined with low-cost delivery services, also expose local monopolies to direct competition. Firms in rural areas that sell tradable goods or services must now find ways to meet the prices of external suppliers. Because a larger share of rural economies is composed of tradables than is the case in urban areas, this new form of competition has had a major impact.

When rural firms were restricted to a small home market, they had little incentive to increase productivity. Now, they face the stick of competition from external firms, and the carrot of being able to penetrate much larger markets if they can produce goods or services of high enough quality at low enough prices. For rural firms that could not push the cost of production down while they were restricted to serving local demand, the opportunity to expand into regional, national or international markets offers a chance to increase profits. While most rural firms are SMEs, they may still need a larger market than is available locally to reach minimum efficient scale. Without an export market, they may be able to survive if they have a local spatial monopoly, but only by being able to pass high production costs onto a captive market.

However, start-ups that are trying to perfect a product or a business model may be more successful in a rural region. First, they are shielded to a considerable extent from substitute products produced in other regions, as these face higher transport costs and may not be known locally. Second, the small local market may keep others in the community from imitating the innovator. A number of large global firms that originated in rural regions were able to perfect their product or process before expanding into larger urban markets. When they did expand, they had built up a first-mover advantage that made it difficult for others to challenge them. Perhaps the leading example of this phenomenon is the chain store Wal-Mart, which stayed out of urban areas while it perfected and expanded its supply-chain model. When it did move into cities, the existing chain store competitors were unable to adapt rapidly to Wal-Mart's cost advantage, and many failed.

Investment

The modern economy requires a high level of capital investment for each worker. In rural regions, most of the primary sector has made this transition. Capital investment per worker in commercial agriculture, modern forestry, mining and energy, and commercial fishing exceeds the levels found in most urban industries. The result is very high levels of output per worker. However, for much of rural manufacturing and rural services, this level of investment has not been made. In addition, public investment in platform infrastructure (roads, broadband, utilities), which provides enabling services to business, is below the levels found in urban regions.

Local governments in rural regions are fiscally constrained and depend upon transfers from national or provincial/state governments for a major share of their funding. Indeed, in most countries, the powers and responsibilities of local governments are determined by a higher level of government. The combination of highly restricted revenues and significant service delivery obligations can lead local governments to under-invest in their region because all their funds are committed to delivering current services. The result is not only insufficient new investment, but under-investment in maintenance of the existing capital stock, which further limits productivity. A clear consequence of the fiscal constraint imposed by the recession is a greater emphasis on the public return on all outlays, including those for rural development. If this leads to smaller, but more focused, public outlays that are designed to address the infrastructure constraints that limit economic development, rural regions may be better off.

A clear problem in rural regions is an absence of equity investors. Venture capital is virtually nonexistent in rural regions. This reflects the prevalence of slow growth investment opportunities in rural regions, the small size of most rural investments, the limited number of investment opportunities and the difficulty of monitoring geographically dispersed investments. Private firms in rural regions face investment challenges that are not common in urban centres. Not only are there fewer financial institutions in rural areas, so competition is limited, but rural lenders tend to provide fewer services and can be unwilling to fund novel business ideas because they lack the capacity to assess risks. Thin markets in rural areas may reduce the maximum debt-to-asset ratio a lender will accept. This reflects the greater difficulty in recovering loan losses from a failed business by selling its assets. In urban regions, the likelihood of finding a buyer for specialised equipment or buildings is higher than in rural regions, because it is more likely that similar businesses already exist.

However, it is clear that private investments are made in the primary sector, and these industries share the characteristics described above. This suggests that if rural businesses have a business plan that provides a clear strategy and market potential, investors will be found. In rural regions, the inability of entrepreneurs to provide this fundamental information has been a major impediment to investment. Because rural firms tend to be SMEs, they do not require massive financial investments to get them started, and many can grow from retained earnings, so they do not need to go public. While this limits growth potential, it can make financing easier.

Innovation

It is worth noting that by the conventional measure of innovation, that is, patents filed, rural regions are not innovative. Formal science-based innovation systems operated by corporations, universities and governments are rarely found in rural regions. And, if a patentable idea is identified in a rural region, the patent is typically filed using a corporate address in an urban region. It is important to recognise that rural innovations may not be patented for several reasons: because the originator does not have the resources to file and protect a patent, because a trade secret is seen as providing better protection, or because the innovation has limited value beyond the firm that generated it. However, when the idea of innovation is expanded beyond patents, rural regions can be seen in a different light.

Examples of modernisation efforts in rural regions

A few examples of rural economy modernisation efforts and challenges from Canada, the Russian Federation, Scotland and developing countries are set out in the following boxes.

Box 1.6. **Krasnoyarsk Krai's vision for 2020**

Krasnoyarsk Krai's surface area is almost 2.34 million square kilometres; it is the second-largest constituent entity of the Russian Federation. However, its population is only 2.8 million, which has implications for the region's development. The Krai is ranked eighth in terms of gross regional product among Russia's 83 constituent entities. Key sectors in the region's manufacturing industry are non-ferrous metallurgy, oil and gas, and fuel and energy. In the aggregate, they produce 80% of the Krai's industrial output, which has been growing consistently for the past 13 years. Krasnoyarsk Krai is one of the Russian Federation's richest areas in natural resources. Its base of mineral resources includes more than 1 500 mines producing more than 80 minerals. The Krai also has the largest timber resources in the country – its timber stock accounts for about 14% of the total stock in the Russian Federation. The geopolitical and economic significance of Krasnoyarsk Krai is determined by its ample capacity of natural resources. The Krai's mineral wealth, energy facilities, production capacity, strategic location at the intersection of transport routes from Europe and North America to Asia, skilled labour and developed education and science are competitive advantages that attract investors. However, the capacities of extractive enterprises are not unlimited, and the region's competitiveness cannot be guaranteed simply by exploiting its natural resources. Even today, taxes on extractive companies do not provide sufficient revenue for the regional budget, and public debt is extended each year to maintain living standards and social development.

In the effort to modernise the predominantly rural economy, the government of Krasnoyarsk Krai has established a series of objectives for 2020. The first priority is to increase the gross regional product by more than 150%. The processing efficiency of the raw materials production sector will be developed to provide added value. Growth will be ensured by an increase in productivity, since the population is not expected to grow. By 2020, Krasnoyarsk Krai aims to become a powerful industrial centre in eastern Russia, expanding the economic importance of both Siberia and the Russian forest. Investments are obviously vital, but economic growth depends on people. Health care and education are key factors that will ensure the region's competitiveness. Given the difficult conditions in Siberia, interesting projects are not enough, and the authorities have to establish good living conditions for the population. More than 70% of the region's annual budget is devoted to health care, education, sports and culture. Social development is a powerful incentive for the rest of the economy, given the high demand for infrastructure for goods and services. The state has offered incentives to the construction market for the production of various materials and equipment. In the past two years, Krasnoyarsk Krai has built both a perinatal centre and a cardiovascular surgery centre.

Source: Tomenko, V. (2012), "Strategic areas for territorial development of Krasnoyarsk Krai: Management of economic growth and urbanisation poles", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 1.7. **Vulnerability of towns in Scotland**

The Rural Policy Centre of the Scottish Agricultural College has been studying the vulnerabilities of rural as compared to urban local authorities. One of the objectives of the research was to assess the impact that public sector funding cuts have had on towns, especially on towns in the more remote parts of rural England and Scotland. These are towns where the proportion of employment in the public sector is high. Much has been made in the United Kingdom of the notion that towns, as the heart of the rural community, make a substantial contribution to national and regional growth. It is not clear, however, if this is viable and how they interact with rural areas around them.

The Scottish Agricultural College presented its findings in a report, *Rural Scotland in Focus 2012* (Atterton, 2012), that focused on the vulnerability of towns in Scotland. Towns are defined as places with a population between 3 000 and 10 000. In contrast, rural areas are classed as areas with a population below 3 000 and urban areas above 10 000 inhabitants. The rationale behind the report is that towns play almost no role in rural policy issues and debate in Scotland. They are generally a target of policy makers working in regeneration. Much of their work tends to focus on town centres and high streets, and much less attention is paid to the role of towns in the wider regional economy. *Rural Scotland in Focus 2012* analysed 90 settlements across Scotland in terms of their vulnerability. All of these places are different, but perform some kind of service function for the rural areas around them. Some face real challenges.

At the top of the list, and within the top six most vulnerable places, are four remote towns that lie some distance away from a big urban centre. The report notes that accessible rural areas seem to be the least vulnerable. In southwest Scotland, the urban areas are most vulnerable and the more accessible rural areas are less vulnerable. Additionally, in the northeast of Scotland, cities like Aberdeen, with its strong oil and gas sector and more diversified rural economy, tend to be less vulnerable. The south and southwest of Scotland face issues mainly related to the high number of employees in the public sector.

The report suggests that the bigger urban areas, the other urban areas and to a certain extent some of the remoter small towns, are particularly vulnerable. However, there is a need for more detailed analysis of the causes. Some of the least vulnerable places are tourist or retirement towns whose roles give them a greater sense of resilience at times of public sector cuts. *Rural Scotland in Focus 2012* advocates for a holistic, integrated and place-based approach to tackle the challenges for vulnerable towns, look at their future and their inter-relationships with other towns, the relationships between towns and rural areas and the relationships between towns and urban areas.

Source: Atterton, J. (2012), "The vulnerability of Scotland's towns", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 1.8. **Modernising the rural economy in rural economies in Newfoundland and Labrador, Canada**

The Department of Innovation, Business and Rural Development in Newfoundland and Labrador (Canada) is responsible for ocean technology, regional development, trade and export activities, innovation, strategic industries and business development. It has a corporate office in the capital city and 5 regional offices in 17 field or satellite offices. This structure allows the department to engage at the local level with communities and to communicate to provide direct programmes and service on a daily basis. The department supports programmes that invest in infrastructure, capacity building, research and marketing, and tries to develop suppliers and build capacity within small and medium enterprises (SMEs) and non-governmental organisations (NGOs). This presents a real opportunity, since small businesses can become part of the supply chain by getting the tools they need to become competitive and learning how to work in some of the regional industries. Most importantly, the regional government plays a significant role as a facilitator, bringing the stakeholders together to try to give communities the tools they need to make regional development happen.

Regional development in Newfoundland and Labrador involves empowering citizens to make things happen in their communities, and providing them with the necessary confidence and tools to become leaders. This might include, for example, working with women entrepreneurs for training in business-to-business communication and developing the skills and confidence they need to be able to work in a business-to-business environment. Skills transfers and retraining have been very important in the regional economy. Since traditional industries have closed, the province has had to work with displaced workers on retraining and transferring skills. The opportunity management process used by many multinational corporations can also produce good results for community development initiatives. Building those skills and providing good research to help develop initiatives is critical. Working with neighbouring universities, the department has developed sectoral strategies and place-based training to try to meet industry's needs. A cluster approach has been adopted to develop infrastructure focused on certain opportunities, such as the health sector. Investments with colleges have made it possible to offer specific programmes in health and social sciences. In addition, to attract immigrants, many temporary workers have been recruited into the economy.

Finally, and most importantly, the department's mandate is to support the growth and expansion of SMEs. Integration and co-ordination among government authorities is critical, since many departments in the provincial government have some responsibility for labour market development. Intra-governmental co-ordination has helped ensure that the various resources available are being used. Access to capital is a primary consideration for SMEs, but more than money is at stake. To create vibrant enterprises, much is required: improving cluster development, increasing the capacity for innovation, positioning companies to participate in the global economy, access to high-quality education and good-quality public infrastructure.

The department's workplace skills enhancement programme provides non-repayable contributions to SMEs. Training of employees can cut into the SMEs' bottom line if, as often happens, they have to leave to get training. Through this programme, employers have not only been educated, but their productivity and competitiveness have been enhanced by providing support for advanced skills training for their employees, as well as technical skill development, on-the-job training and workplace-specific skills. Most importantly, this training is brought to the local level, and it is also available for industry associations acting on behalf of SMEs. A project for the Canadian manufacturers and explorers of Newfoundland and Labrador helped train hundreds of employees in lean manufacturing, which resulted in significant savings for companies.

Box 1.8. **Modernising the rural economy in rural economies in Newfoundland and Labrador, Canada** (*cont.*)

For training and skills development, in-depth knowledge of local businesses and SMEs is necessary, beyond simply reading the research and statistics. Each business is unique, and representatives go into the field to talk to them one on one. A business retention and expansion diagnostic tool is used in working directly with companies, and a complete diagnosis of marketing, human resources, financial management, operations, etc. is conducted. Action plans are also formulated with the company. This has helped link the SMEs to more than CAD 3.5 million in programming in a very short period, the majority of which was spent on skills development.

The diagnostic approach has made it possible to identify what will make an operator more compatible and productive. In certain cases, new product lines have been introduced, leading to savings from lean manufacturing, savings in resources and so on. Finally, support for community organisations has been in place for more than a decade and has been well received by the community. Non-profits can benefit from this as much as businesses, since they must focus on building the capacity of their organisations if they want to maximise the impact in the regions. For this, a community capacity-building programme, at minimum expense, has yielded successful results. The department helps build capacity in non-profit organisations by assuming the role of partners in economic development. The programme recognises the role of volunteers, who may not have the necessary skills to run an organisation. Alternatively, social enterprise development can introduce specific skills if non-profit organisations so choose. A comprehensive orientation package has been developed, as have certified training models developed with collaborating colleges. The package is available to municipalities, industry organisations, educational institutions and other community-based organisations. This provides direct training sessions, brought to the local level by certified facilitators who deliver the training. Strategic planning and project management are key tools to make economic development happen at the community level. Governance training has proven critical in making stronger organisations and community leaders. Co-operative development training can also be a real tool for rural sustainability. The department helps provide citizens the skills to form co-operatives. If communities are to advance using different models, they need the tools and understanding that make it possible.

Source: Skinner, G. (2012), "Department of Innovation, Business and Rural Development: Government of Newfoundland and Labrador", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 1.9. **Rural economies in developing countries**

Rural areas in developing countries are mostly remote and sparsely populated and suffer from problems such as out-migration, labour shortages and poorly developed physical and social infrastructure. Human capacity and institutional capacity are limited, and the population is often heavily dependent on agriculture for internal consumption. Alternative economic development in rural areas is limited. In developing countries, rural areas are associated with poverty and hunger and seen as underdeveloped. However, opportunities and untapped potential exist in rural areas in developing countries. Rural areas need to be rediscovered as a category for development and an important subject of policy. They usually have abundant natural resources and are often rich in biodiversity. Also, they are not always isolated; there are rural-urban but also rural-rural linkages to build upon to find new development avenues. Many developing countries have implemented decentralisation policies for rural territorial development, which means that planning, decision making, financing and implementation of development projects is much easier than before.

Box 1.9. **Rural economies in developing countries** (*cont.*)

The role of the private sector is changing in developing countries. Private sector actors have become far more active. Investment in agriculture, and not just large-scale land acquisition, has been stepped up. However, the chief question at issue is how to create benefits for the rural population. Looking at the whole value chain rather than small segments of it (rural markets, production, intermediate linkages, etc.) allows the implementation of targeted assistance and strengthens rural markets. The value chain approach has proven successful in rural areas. An important issue is how to integrate smallholder farmers in value chains, because smallholder farming is the principal economic activity in rural areas.

Smart, inclusive business models provide a good instrument. For instance, there is a growing interest among transnational firms, like Wal-Mart or Metro, in buying from small farms, because the likelihood of sustainable sourcing is smaller compared to sourcing from large-scale farms. The use of new technologies, such as ICT and mobile phones, has improved market integration and transparency in rural areas. Mobile phone technology has made price information systems and banking easier. For example, in many African countries, the private sector has invested heavily in mobile phone technology. This has paid off for both sides, not only for the private sector, but also for the rural population.

New partnerships involving the private sector, civil society organisations and the public sector can trigger development and innovation in rural economies. This can really help to improve the local business environment, which, in turn, can change conditions at the local level. If communication with the national level is good, this can also influence policies there. Most importantly, it makes possible the participation of all stakeholders. The government itself must meanwhile set framework conditions and legal fiscal conditions.

Finally, vertical communication and co-ordination at all government levels is crucial. Often, the national level passes legislation for subordinate levels, but facilitating bottom-up planning that permits ideas to percolate to higher levels of government, has not been fully incorporated in regional and national planning. Communication and co-ordination are also necessary on the horizontal level. New partnerships are a good instrument for achieving this purpose.

Source: Kloeckner, A. (2012), "Modernising Rural I: Strengthening rural markets – Perspectives from developing countries", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Conclusion

Large cities have clear advantages in the modern economy and account for a disproportionately large share of national economic growth. The most urbanised regions, which make up about 8% of all Territorial Level 2 or TL2 regions, are estimated to account for 32% of economic growth across OECD countries (OECD, 2012a). This leaves the majority of growth to be produced elsewhere by a different process. Economic growth can occur in any type of region. Some rural regions grow faster than urban regions, and per capita earned incomes can be high in remote rural places. The lesson is that we should look beyond large cities for additional economic growth. For both large urban regions and small rural regions, the objective is first to reach the production possibility frontier and then expand that frontier. The issue in both types of place is finding an appropriate development approach.

Most rural regions are weak participants in the modern economy. As a result, they are often seen as inherently incapable of sustained economic growth. Yet, as noted, OECD evidence shows that there are rural regions with relatively high rates of economic growth.

Increasing the number of high-performance rural regions requires transforming rural economies so that they can take advantage of their underlying opportunities. Although the modern economy is conventionally believed to be best suited to an urban environment, it has important opportunities for rural regions if they can manage to take advantage of them. In particular, rural regions must increase productivity, not only because this is the main driver of economic growth, but because an imminent crisis in the availability of labour will lead to rural economic decline unless the remaining workers can become more efficient. While the necessary transformation should be mainly driven by local strategies, rural regions will require external funds and technical support from national governments to implement the modernisation process.

The two key explanations of rural growth revolve around productivity and innovation. Productivity is the central explanation of growth in most models of economic growth, but what causes higher productivity is less well understood. From endogenous models, we generate the idea that the driver of development is innovation, since that creates novelty (Dixit-Stiglitz) and facilitates increasing returns to scale. To enhance innovation, we invest in human capital, social capital and better forms of governance. Effectively, this model suggests that all places are in the same game, and that the game is a competitive process.

Where rural growth and incomes are strong, there is generally high productivity. Growth in these regions occurs in part because of absolute advantages in the form of natural resource endowments, but growth also occurs because of the replacement of labour with capital and ongoing innovations in production technology. Few regions can exploit a high-quality base of natural resources, but any region can potentially improve its productivity through improving workforce skills, increasing efficiency, making wise investments in infrastructure and encouraging local entrepreneurs to innovate.

Ultimately, the modern economy is neither urban nor rural. It is not even about rates of economic growth or the absolute level of GDP. It is mostly about identifying and performing a useful economic function in a way that evolves with demand and competition. Different places adopt individual strategies to improve regional economic competiveness, which reflect the local population's expectations of opportunities. Productivity is a hallmark of the modern economy, and it is crucial for rural places. In most rural regions, the local workforce is likely to decline and age, so economic stability and growth can only be ensured with increased productivity. Moreover, in rural areas, productivity is more important because most of the local economy is made up of tradables that must absorb significant transport costs in order to penetrate distant urban markets.

Finally, nations and large regions do not fail, so competiveness is not an issue, while small places can face financial failure and disappear, which makes competitiveness vital for their future prospects (Krugman, 1994). It is this difference that makes the transition to a modern rural economy essential. While the decline and eventual loss of specific rural places is of limited significance outside the immediate region, it is crucial to the people in those places. This is of course the central argument for a bottom-up rural development approach, as expressed in *The New Rural Paradigm* (OECD, 2006). The people in any place are the most affected by its growth or decline, both in terms of their livelihoods and in terms of the "community" as a shared experience. History shows that some rural places do disappear, but that those that are successful in redefining their function continue to prosper.

The following key points are worth considering in devising policies to strengthen the rural economy:

- Economic growth is driven by a combination of increased employment and increased productivity of workers.
- While large firms drive innovation in the modern economy, it is entrepreneurs and small and medium-size enterprises (SMEs) that create the most jobs.
- Rural regions are becoming a part of the network economy, and in some instances are major beneficiaries of the rapid adoption of ICT.
- In the modern economy, the traditional rural industries (agriculture, mining, energy, forestry and fishing) play a relatively minor role in terms of share of GDP and employment.
- For the rural economy to modernise, there must be a significant increase in average levels of skill.
- The modern economy requires a high level of capital investment, and rural regions often face an absence of equity investors.
- Modern rural economies require a high degree of integration amongst the different sectoral elements, which include infrastructure, human capital, business environment and innovation at the level of the local labour market.

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Chapter 2

Innovation in the context of rural areas

This chapter explores several aspects of the debate on rural innovation and offers some important considerations for policy makers. It begins with an overview of the link between innovation and rural areas, with a focus on rural innovations that are either overlooked or not recognised as innovation, or are not acknowledged as having emerged from a rural area. This is followed by a discussion of regional innovation systems and smart specialisation and the scope for applying them in the rural context. The third section explores the need for more adaptive and flexible governance strategies to better recognise and support innovation in rural areas. In the final section, the role of entrepreneurship as a critical stimulus of innovation in rural areas is discussed.

Introduction

Typically, innovation calls to mind an urban context, since it is usually associated with density and clustering effects. However, it can also be generated in sparsely populated rural areas. Rural innovation is influenced by the local market structure, which may be fragmented, segmented or involve niche markets. In a fragmented market structure, an increase in the size of the market can cause an increase in the number of enterprises, while in a segmented market structure, the market size tends to increase through firms' internal growth. In many rural areas, the tendency is towards a fragmented market structure of small and medium-sized enterprises (SMEs) that are associated with niche markets. In cities and big agglomerations, people generate innovation because they are exploiting market opportunities initially in that place. In rural areas, innovation is driven because people need to innovate to capture external markets or to ensure that basic services are provided. Rural innovation is also about entrepreneurship, that is, taking new ideas and transforming them into new markets, products and services. Rural areas can be a fertile ground for social innovation and social entrepreneurship, which brings local social capital together to provide missing services or to profit from local assets with a social purpose.

Economic growth happens when innovations are applied and diffused. Understanding how innovation can happen in rural areas and finding ways to foster it is central to modernising the rural economy. Innovation is just as vital for rural economies as it is for the economies of cities: both for raising productivity and for meeting the challenges of improving public service delivery. As recent research shows, innovation is a key factor in promoting growth, and lack of innovation is a bottleneck for growth (Table 2.1) (OECD, 2012a). A region's capacity to innovate, its resilience to shocks and the efficiency with which it delivers services all relate to the stock and quality of human capital in its workforce. It is hard to imagine a region engaging in a sustained path of technological improvement without an abundant supply of skilled labour.

Table 2.1. **Factors and bottlenecks for growth**

	Thematic areas	Growth factors ranked	Bottlenecks ranked
1	Policies	13	13
2	Human capital	12	11
3	Innovation	7	13
4	Infrastructure connectivity	11	8
5	Institutions	8	9

Source: OECD (2012), *Promoting Growth in All Regions*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264174634-en.

Drabenstott and Henderson (2006) identify two elements as pivotal to any rural development strategy: *i)* the "twin forces of innovation and entrepreneurship", and *ii)* "a critical mass of human, financial and social capital to support evolving innovative and entrepreneurial activity". In launching the Innovation Strategy in 2011, the OECD's Secretary-General emphasised the importance of a focus on intelligent growth driven by "new start-ups, innovative small and medium enterprises", new ideas, new entrepreneurs and new business models. Equally important is emphasis on a wider conception of innovation, one that "goes beyond supporting science and technology (S&T)". Instead,

"countries need whole-of-government innovation strategies, aligning different ministries, policies and reforms around a nation-wide 'innovation effort' ".

This chapter explores several aspects of the debate on rural innovation and offers some important considerations for policy makers. The first section provides an overview of the link between innovation and rural areas as well as examples of rural innovation that are either overlooked or not recognised as innovation, or are not acknowledged as having emerged from a rural area. The second section looks at two areas important to the innovation debate, regional innovation systems and smart specialisation, and the scope for applying them in the rural context. The third section, on innovative governance, explores the need for more adaptive and flexible governance strategies, particularly in rural regions, to better recognise and support innovation in rural areas. In the final section, the role of entrepreneurship as a critical stimulus of innovation in rural areas is discussed.

Why understanding rural innovation is important

There are several reasons to better understand the nuances of rural innovation. Rural economies face challenges linked to structural change, low accessibility, lack of critical mass, population ageing and limited access to information, business services and financing. Since the delivery of public services in rural regions is often costly and difficult, constraints on public budgets tend to have a disproportionate effect on rural communities. Finding more creative and innovative ways to deliver public goods and services allows national governments and rural communities to work together and do more with less. The changing political, technological and social landscape, coupled with the challenge of balancing equity and efficiency in service provision, makes innovation essential for rural areas (Mahorum et al., 2007). Innovation is also becoming more important because demographic change in most OECD countries has left rural areas that have been used to an excess of workers to confront an imminent shortage of labour.

In terms of competitiveness, the importance of innovation in rural regions is potentially greater than in urban regions. The high proportion of tradable goods in rural economies means that a higher share of the rural economy is directly, or indirectly, exposed to competition. Innovation can be an important way for rural regions to overcome the costs of exporting goods, either by providing cheaper ways to produce something or by creating a better product that customers in other regions are prepared to pay more for.

The scope of innovation has broadened

The widening conception of innovation policy in OECD countries is an opportunity, setting the stage for increased support for rural innovation (Box 2.1). *Regions and Innovation Policy* (OECD, 2011) stressed that "a focus on R&D as a source of innovation should not pre-empt regional opportunities that can tap into other sources of innovation." Following *Innovation Strategy: Getting a Head Start on Tomorrow* (OECD, 2010b), which aimed to help governments build coherent and far-reaching innovation strategies, this study emphasised that the notion of what innovation involves and what role innovation policies can play has changed considerably. Specifically, it acknowledged change in two areas:

- Types of sectors: Different types of innovation are not necessarily confined to particular sectors of the economy. Industries that may be regarded as less innovative, primarily because of their low R&D intensity, frequently have as much propensity to innovate as those in the leading innovation industries.

- Types of innovation: The concepts of innovation do not fully take account of the fact that firms today adopt mixed modes of innovation, both technological (products and processes) and non-technological (marketing and organisation).

Box 2.1. **Innovation from a broader perspective**

An OECD study based on firm-level data for 21 countries shows that 5 patterns of innovation are common to most of the countries analysed. The first is the more traditional technological innovation strategy, while the others extend the notion of innovation. They include:

1. some form of new-to-market innovation linked to own generation of technology (in-house R&D and patenting)
2. product innovation with marketing expenditures
3. upgrading of processes with spending on equipment, often with external or partnership-based development
4. broader innovation involving organisational and marketing-related innovation strategies
5. networked innovating, in which firms seek external sourcing of knowledge, often from the public knowledge base and through formal collaboration.

Source: OECD (2010), *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264083479-en.

The OECD Innovation Strategy stressed the need to improve the quality of existing metrics and increase the availability of indicators to measure innovation factors. Depending on a region's socio-economic profile and vocation, different forms of innovation may be more or less relevant (OECD, 2011). However, because some of these innovations are not easily measured by standard indicators, they are not always considered. Patent registrations and R&D expenditure, the two main indicators used in many studies of innovation, fail to take account of innovations that are not patented or generated by formal R&D expenditure programmes. For rural areas, the shift to the use of patents as an indicator of innovation has resulted in an increased perception of stagnation. Few patents originate in rural areas, largely because the large research centres that drive innovation systems are rarely located in rural places. Even when a patentable idea originates in a rural area, if it comes from a corporate or university subsidiary, the patent will be filed by the urban headquarters. Further, rural areas will always lack innovation by this standard, because they rarely house the major research institutions or corporate headquarters that undertake and register the results of patent-producing science. In addition, rural regions are less likely to host large-scale research facilities or big concentrations of high-tech firms.

Innovation in rural areas is grounded in the actions of individuals looking for ways to solve specific problems. This can result in different forms of innovation: creating a new product or process, or finding a way to modify existing products or processes to reduce costs or improve quality. They could happen in different spheres, including traditional rural activities such as land-based industries, tourism and crafts. Many of these innovations are not patented but nevertheless result in an increase in the competitive position of rural firms, which can subsequently support the local rural economy. In rural regions, whether it involves new recipes or new ways of packaging things, the goal is to

do what the business needs in order to be competitive, more profitable and more sustainable.

Acknowledging innovation in rural areas

Many rural economies are already very innovative. Indeed, there is some evidence that rural innovation is common in domains such as agriculture, forestry, food processing, water governance, information and communication technologies (ICT), education, health and renewable energy. For instance, interest in ecological sanitation and innovation arose out of the need to solve a problem in a rural area, as well as from green innovation and climate change issues. In water governance, innovation can emerge from bringing the related parties together to solve water pollution problems. Rural areas can play a key role in renewable energy (OECD, 2012b), in products, practices and/or policies (see examples in Box 2.2). In many cases, rural regions are not only the places where new renewable technologies are tested, but where the challenges are originally identified and solutions developed and tested.

Box 2.2. **Renewable energy: Examples of rural innovation**

Rural communities have played an active role in research and development related to renewable energy (RE). Some rural communities have specifically set out to create breakthrough innovations that can dramatically affect local economies and can be exported at the global scale. In Iowa (United States) and in North Karelia (Finland), research has focused on developing second- and third-generation biofuels. Both regions had the advantage of a major resource base, strong prior evidence of R&D success and substantial investments. The renewable energy research was embedded in an existing science base already connected to industry and was seen as a long-term process to construct a system intended to result in multiple related products and processes. Other rural regions have engaged in RE projects that may be able to provide novel extensions of existing technologies. In Maine (United States) and Abruzzo (Italy), the focus is on off-shore deep-sea wind as a means to develop the regional economy. In these places, a firm or group of firms may be able to make an engineering advance that can make the technology viable. The creation of testing facilities, as in the Shetland Islands (Scotland) and Region Sjælland (Denmark), where producers can verify the performance of their new apparatus, is another form of R&D activity. In Shetland, a group of researchers have experimented with storage systems to lower the cost of generating, storing and supplying hydrogen for power units. In Region Sjælland, the municipality of Lolland is experimenting in operation and maintenance for wind turbines, and hydrogen-based storage systems.

Source: OECD (2012), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264180444-en.

The service sector offers other examples of innovation. In rural regions in Finland confronting the ageing of the population, income-generating activities have been designed to incorporate the elderly into the workforce. Home care and other businesses are being run by older residents, and the community is designing structures to encourage more of them to participate in businesses. Telemedicine and distance education using ICTs also emerged as innovations in rural areas. In Iceland, Northern Canada and Northern Scandinavia, many such innovations have been introduced. Examples of different service delivery approaches can be found in Box 2.3.

Box 2.3. **Innovative approaches to service delivery in rural regions**

Many of the structural barriers to delivering services in rural areas can be reduced through the development of different approaches. For example:

- combining multiple functions, e.g. siting a citizens' service office in a library; and creating public service points with combined municipal and state services ("one-stop shops")
- mobile services, e.g. adult training (mobile computer classes and training units) and multiple-service bus experiments (health, culture, shopping or gyms for the elderly)
- information technologies, e.g. free Internet access points at local shops, libraries, cafes or public offices; PC-video conferencing for health2008services; peer training in local computer classes, Internet kiosks, cafes and at home
- different allocation of responsibilities, e.g. transferring power and responsibility from the municipality to the regional government level to improve the provision of services and reduce municipal spending.

Health service delivery in the Russian Federation

Social infrastructure development is high on the Russian agenda, since health care is a pressing issue. In the Russian Federation, 40% of new disabilities annually are borne by rural areas across the country. It is not economically feasible to build medical facilities in a traditional way. Rural regions in the south have difficulty attracting young specialists to work in the health care sector, even if they offer a competitive salary. It is even more difficult to ask a successful specialist to work in a rural area. One solution some rural regions have adopted is mobile medical services. Using innovations in communications and transport, Russian health care experts and policy makers have been able to bring services to areas where this had previously been impracticable. Medical services are provided by "medical trains" that provide services such as diagnostic clinics. From an economic perspective, early diagnosis can provide a cost-effective solution. If cancer is diagnosed early, for example, not only is it possible to avert loss of life, but savings on treatment can be realised.

For remote rural towns with no access to railways, health care experts have also designed "medical buses" that can serve up to 20 000 people per year. Trains and trucks can be connected to a medical centre elsewhere. Both methods, in conjunction with telemedicine, have proven very successful. Technical solutions from other areas enabled rural areas in the Russian Federation to solve an issue that would have required far more funds using classical approaches. The federal government has approved a programme to develop medical trains and buses at an accelerated pace. In 2010, former Soviet Union countries and the Russian Federation signed an agreement that was accepted by the Russian parliament in 2012. Such trucks have also been successful in Africa. Rural inhabitants of African villages were the first to benefit from this innovative approach.

Source: OECD (2011), *Strategies to Improve Rural Service Delivery*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264083967-en.

Innovations not attributed to rural areas

Promoting innovation in rural areas is not just about strengthening rural economies but recognising that innovations in rural areas can be of benefit beyond their territory. Five examples of disruptive rural innovations show how rural ideas can spread globally, often without the use of patents. Wal-Mart, the largest retailer in the world, was founded in the

United States in Bentonville, Arkansas, in 1950. Its main innovation consisted of a novel system of logistics and inventory management. These processes were not patentable, but they allowed Wal-Mart to displace larger competitors. Bombardier was founded in Canada in Valcourt, Quebec, in 1942 to make snow machines. The initial technology was patented, but Bombardier's growth was based on personal snow machines. By inventing and popularising snowmobiles and then jet skis, the company generated the income to purchase aircraft and rail equipment manufacturing plants that have made it the third-largest commercial aircraft manufacturer in the world. LEGO, the fourth-largest toy manufacturer in the world, was started in Billund, Denmark, in 1916. It initially made furniture, but switched to wooden toys during the 1930s and to plastic injection after World War II. The LEGO block is patented, but the company's success comes from designing novel ways to combine blocks into a variety of figures and structures. Torquay, Victoria, in Australia, was the origin of two global companies founded in the same year. Rip Curl started producing wetsuits for local surfers in 1970 and is now a dominant firm in the global surf-wear sector. Quiksilver was also started in 1970 by one of the early employees of Rip Curl, who left to start making surfing shorts. Quiksilver now produces clothing for both winter and summer board sports. The success of both companies hinges on their ability to continuously produce new designs that attract customers. Kentucky Fried Chicken, now KFC, was started in the United States in Corbin, Kentucky, in 1930, as a supplemental business at a gasoline station. Harland Sanders developed a seasoning method for fried chicken that remains a trade secret, but he was also one of the early adopters of franchising and used the process to expand KFC to become the largest retailer of fried chicken in the world.

These examples, while they are atypical of rural innovation, show that rural firms can have a global impact. Crucially, they show that major forms of innovation can exist outside the formal science-based innovation system approach, and that patents are not the only measure of innovation. If innovation is to be fully developed in rural areas, there has to be a wider recognition of this potential. Innovation may well be the best opportunity for rural firms to increase economic growth. It can offset limitations in the number and skills of the local workforce and play a role in opening access to external markets, by reducing costs, improving quality or by introducing new products. When Sam Walton set up his company in 1950, Bentonville's population was 2 900. The Arkansas town now has a population of about 35 000, largely because Wal-Mart's corporate head office is located there. Because innovation in rural regions is tightly coupled with entrepreneurship, a high rate of innovation can also be associated with the formation of new firms and a strengthening of existing firms. Wal-Mart, with stores in both developed and developing countries, is widely credited with revolutionising the logistical process for managing inventory. Its principal innovation did not involve a patent or a trade secret, but the creation of a sophisticated logistics system that lowered its costs. This continues to give it a crucial advantage over its competitors in cost control, because of its scale and tight integration with the firm's operations.

Agricultural innovation is often overlooked

Agriculture remains the quintessential rural industry. Indeed, rural areas benefit from formal innovation systems research that takes place outside rural areas but is intended for implementation in rural regions. This is evident in all the natural resource industries, but especially agriculture. For well over 100 years, scientific advances in farming have endowed this sector with one of the highest rates of productivity of all industries in the OECD countries. Increasingly, such formal research takes place in an urban setting, but the research results remain implemented in rural areas.

Box 2.4. **Examples of successful innovations in rural areas**

- Bombardier is the third-largest global producer of commercial aircraft and one of the leading manufacturers of rail equipment. It was started in 1942 by Joseph-Armand Bombardier in Valcourt, Quebec, to manufacture tracked snow machines. Bombardier filed the first patents for the drive technology, which gave the firm an initial advantage. In the 1960s, it popularised recreational snowmobiles and later jet skis, allowing the company to grow rapidly. Other manufacturers developed similar technology, but Bombardier continued to innovate through style and new features. In the 1970s, the Bombardier family began to purchase a number of failing aircraft and rail manufacturers that soon became the main activity of the company. The corporate head office was moved to Montreal after the company went public. In 2003, the snowmobile, jet ski and motorcycle division was spun off as Bombardier Recreational Products (BRP). A controlling interest was bought by the Bombardier family, and the BRP corporate office was relocated in Valcourt, whose population is less than 2 500.

- LEGO is the fourth-largest manufacturer of toys in the world. It began in 1916, in a wood-working shop operated by Ole Kirk Christensen in the village of Billund, Denmark. Christensen started making furniture, but switched to making wooden toys during the Depression. In 1937, the firm purchased a plastic injection machine and began making plastic blocks that became the company's signature product. LEGO patented the basic design of its blocks, but the patent is not a major impediment to competitors. Instead LEGO relies upon continuously introducing new designs that lead to new sales. Descendants of the founder continue to run the company from its Billund headquarters.

- Rip Curl makes wetsuits for surfers and is a leading company in its market segment. It was founded in Torquay, Australia, in 1969, by Doug Warbrick and Brian Singer. Initially, the firm made surfboards, but within a year refocused on wetsuits because there was less local competition. Rip Curl succeeded not by securing patents but by producing wetsuits that were continuously modified to produce more desirable products. The firm now produces a complete line of surf wear and accessories, in addition to wetsuits. Rip Curl licenses its designs and techniques to firms outside Australia that serve specific markets. The firm is headquartered in Torquay.

- Quiksilver was also founded in Torquay in 1969, by Alan Green, an employee at Rip Curl at the time. Green's initial focus was on surfing shorts, and by 1970 he was successfully selling board shorts in Australia. By the end of the decade, the firm was exporting its surf wear to multiple countries and had established licensed production around the world. In 1976, Quiksilver USA was founded in Huntington Beach, California, and in 1986, the US company went public. Over time, the US operation gradually absorbed the other licensees and the Australian originating firm. Trademarks are important to Quiksilver, including its logo and various pattern designs. In the 1990s, the company expanded into clothing for skiing and snowboarding as well as wetsuits. In the late 1990s, it expanded into skateboarding with boards and clothing, to make it the world's leading board-sport clothing company.

- Kentucky Fried Chicken originated as a supplemental business found by Harland Sanders in Corbin, Kentucky, in 1930. It began as a restaurant associated with a gasoline station, but the fried chicken became a global success. KFC is the largest chain of fried chicken restaurants in the world and is now part of Yum! Brands, the second-largest global fast-food chain. The KFC chicken recipe remains a trade secret, and the growth of the company can be traced to a highly successful marketing strategy, including some of the earliest use of franchises introduced by Sanders in the 1950s.

Source: Freshwater, D. (2012), "Growth patterns in rural regions and promoting innovation in rural regions", 14th Session of the Working Party on Territorial Policy in Rural Areas, GOV/TDPC/RUR(2012)5, OECD, Paris.

Innovations in agriculture and related technology have the potential to increase productivity sustainably. Agriculture is a critical producer of rural assets, providing food, water, land and ecosystem services, such as biodiversity, landscape and renewable energy. However, the agricultural sector is entering a new era of declining productivity. Global commodity prices are increasing, raising concerns about food security. Many countries are reviewing their agricultural knowledge systems and shifting from a transitional supply-driven, top-down, linear approach. Instead, a research, development and innovation approach, with demand-driven systems, is being introduced. This is a response to such factors as the increased absorption capacity of farmers, agricultural knowledge systems' capacity to address emerging issues, budget constraints and an increased acceptance of innovation.

The main challenge to agricultural innovation is policy coherence. Recent reforms in agricultural policy have attempted to strengthen multidisciplinary co-ordination and governance, develop interactions within the systems, improve cross-country co-operation, strengthen mechanisms for diffusion of innovation, increase the role of the private sector to leverage resources and provide matching funds for R&D. Public resources are focusing on areas that have more public character and long-term benefits. One example is the creation of centres of excellence to develop R&D competences. The need to formulate a long-term vision, a challenging proposition, can be facilitated by good practice recommendations (Box 2.5).

Box 2.5. **Good policy practices in agricultural innovation**

- Securing appropriate framework conditions, particularly in developing human capital.
- Building an innovation culture by funding for benchmarking and diagnostic tools.
- Enhancing technology diffusion through the co-financing of technology uptake through public-private partnerships.
- Promoting networking and clustering with brokering and procurement policies.
- Fostering competition among regions for funding cluster initiatives and co-funding centres of excellence.

Source: Diakosavvas, D. (2012), "Green growth in agriculture and rural innovation systems – Issues and challenges for policy", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Rural innovation systems and processes

An innovation system is a set of distinct institutions that jointly and individually contribute to the development and diffusion of new technologies and provides the framework within which governments form and implement policies to influence the innovation process (Box 2.6). As such, it is a system of interconnected institutions to create, store and transfer knowledge and skills and define new technologies. An innovation system consists of a production structure, an institutional infrastructure and the interaction between the two. The innovation system is an interactive model, which is actually more appropriate in the case of SMEs, because it represents the interaction between the firm and external actors. It relates to rural areas because most businesses there are SMEs. This type of systems approach is more holistic, but it is also more difficult to monitor and evaluate.

Box 2.6. **What regional innovation systems involve**

Most research on innovation now recognises that innovation is usually a co-learning process, involving many actors, and not simply a single inventor or entrepreneur. Innovation normally involves joint and mutually supporting activities for a range of producers, consumers or users of goods and services. This brings them together with universities and research institutes with relevant expertise and government agencies (Freeman, 1987; Lundvall, 1992).

As Foray notes, "Design and technology are not subordinate to science and R&D" and "knowledge is often a joint product" that results from both learning and doing (Foray, 2004). A regional innovation system can be said to exist if there are strong institutional links between regional authorities, regional universities and research institutes, regional enterprises and regional customers, all of whom share a common goal or intent. Often these links are supported at the national and even supra-national levels. A regional innovation system usually refers to a specific territory or region, but does not necessarily exclude relationships with other regions, or with suppliers, customers and national or international levels of governance (Cooke et al., 2005).

Source: OECD (2012), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264180444-en.

Regional innovation systems in rural contexts mean looking at new knowledge and learning processes and understanding the interaction between producers and end users, local government and research institutes (Box 2.7). An innovation systems perspective is helpful in analysing pathways of change and understanding the interaction between different stakeholders, from which new ways of doing business or policy making emerge. Networks and systems for innovation are able to connect rural innovations with a broader productive framework. While government and international organisations acknowledge the benefits of moving towards an innovation system approach, and experiences have been positive so far, this shift has taken place at varying speeds in different countries (OECD, 2012c).

Typically, regional innovation systems are based on a consensus and involve joint activities that include regional and local governments, businesses, universities and/or research institutes and users. They engage a large number of people and interests, such as farmers, employees, enterprises, regional associations and non-governmental organisations (NGOs), local government, research and training institutes, and the general public. They usually develop around a key regional specialisation – an industry in which the region is recognised as a national or international leader. In the case of renewable energy, regional innovation systems have involved producers and users, as well as universities, research institutes and local government, in a non-hierarchical way.

Rural innovation systems can: address an unsatisfied demand, promote an interactive innovation process, focus on actors rather than the state and give all of them an important role to play. They focus on research for development rather than research and development.

The role of smart specialisation in rural innovation

Innovation is not just about new products, it also about new processes and "doing old things in a new way" (Box 2.8). Rural regions can engage in complex learning processes that can have a dramatic impact on innovation capacity and on the success of a given business activity. In particular, while rural regions rarely produce learning related to R&D activities ("learning through research") they have a fundamental role in the other dimensions of learning (by doing; by using; and in particular by interacting) (OECD 2012b: 58).

Box 2.7. **Regional innovation systems in rural regions**

There are some good examples of innovation systems in rural regions:

- North Karelia in Finland operates a district heating system based on forestry bioenergy, with several plants and equipment related to the renewable energy sector.
- Prince Edward Island in Canada has developed tourism based on its distinctive natural and cultural resources. The population of this rural province includes a high proportion of the creative class.
- The remote town of Holtsfred, Sweden, has become a music metropolis. Holtsfred's colleges organise a popular rock festival and musical activities throughout the year. This specialisation has been the basis for a cluster of economic activity, from education to small enterprise and tourism.

Source: Freeman, C. (1987), *Technology Policy and Economic Performance: Lessons from Japan*, Pinter, London; Lundvall, B. (1992), *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, Pinter, London; Foray, D. (2004), *The Economics of Knowledge*, MIT Press, Boston; Edquist, C. (2004), "Final remarks: Reflections on the systems of innovation approach", *Science and Public Policy*, December, Vol. 36, No. 6; Cooke, P., N. Clifton and M. Oleaga (2005), "Social capital, firm embeddedness and regional development", *Regional Studies*, Vol. 39, No. 8; Foray, D., P. David and B. Hall (2009), "Smart specialisation – The concept", *Knowledge Economists Policy Brief*, No. 9, June, http://ec.europa.eu/invest-in-research/pdf/download_en/kfg_policy_brief_no9.pdf (accessed on 28 February 2013); OECD (2012), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264180444-en.

Box 2.8. **Learning processes in rural innovation**

Learning is a complex activity that can involve the action of a single actor or multiple actors. It is possible to classify learning activities in the following four categories:

1. Learning through research: Typically thought of as R&D or "learning by studying", its results are commonly in the form of articles, scoping studies, monographs, books, prototypes, etc.
2. Learning by doing: Takes place at the manufacturing stage and increases production skills in individuals, organisational routines and manufacturing practices. Practical experience is gained by trial and error. Rules of thumb are important. Generates mainly tacit knowledge.
3. Learning by using: Diffusion and increased adoption of a product leads to improvements requiring active and prolonged use. Especially important with products that consist of complex, interdependent components, which make it difficult to predict how they will interact.
4. Learning by interacting: Results from close producer-user contacts. The more complex the technology, the more difficulty producing firms have in developing all the skills and knowledge needed.

Source: Andersen, E. and B. Lundvall (1988), "Small national systems of innovation facing technological revolutions – An analytical framework", in C. Freeman and B.A. Lundvall (eds.), *Small Countries Facing the Technology Revolution*, Pinter, London; Boon, M. (2008), "Why did Danish entrepreneurs take the lead in the wind turbine industry and not the Dutch? A study on the interaction between evolution and strategy of two communities in an emerging industry", Master's Thesis, Erasmus University, Rotterdam; Kamp, L.M. (2002), "Learning in wind turbine development: A comparison between the Netherlands and Denmark", PhD thesis, University of Utrecht; Kamp, L.M., et al. (2004), "Notions on learning applied to wind turbine development in the Netherlands and Denmark", *Energy Policy*, Vol. 32, No. 14, pp. 1 625-1 637; Rosenberg, N. (1982), *Inside the Black Box: Technology and Economics*, Cambridge University Press, Cambridge, MA; OECD (2012), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264180444-en.

Smart specialisation recognises that each rural region is different, with its own set of opportunities and constraints. It also demands a local knowledge-building process to discover how best to use local resources, and it focuses on social and institutional contexts for innovation. Each region must discover its own smart specialisation and innovation pathways. Rural areas need a learning process to discover the research and innovation domains in which they can hope to excel and in which entrepreneurial actors can flourish. Local scales, materials, environmental conditions and market access conditions must be explored, and acquiring this knowledge will involve gathering localised information and the formation of local social capital. In rural regions, complex learning processes can have a dramatic impact on innovation capacity and on the success of a given business activity. In particular, while rural regions only rarely produce learning related to R&D activities ("learning through research"), they have a fundamental role in the other dimensions of learning, by doing, by using and in particular by interacting. In innovative rural regions, the innovation process, involving a large number of actors, encourages a common learning activity. A policy that fosters such a learning process may have a strong impact on the success of a given industry.

Since the social value of discovering a regional smart specialisation is high, regional public authorities should take a strong interest in this process. The regional innovation knowledge process is likely to involve significant market failures for first movers. They face important costs, which they will not recoup. It is hard to start the process of smart specialisation that leads to a rural innovation system without strong regional and local governments, actively engaged with knowledge and learning institutions and relevant groups of enterprises. The three key roles for the public sector at the national and regional level are incentivising the interaction of different sectors and actors in an innovation platform; monitoring and evaluating the effectiveness of the process and its outcomes; and making complementary investments in education research and development, skills training and addressing new knowledge needs. Regional public authorities must be free to act and to develop their own policies and responses to national and international policies and conditions. This cannot occur in highly centralised countries where top-down policies prevail. Uniform economy-wide policies – designed for the most part in urban environments and for predominantly urban populations – too often fail to take proper account of the specific needs of rural places. For example, a recent OECD study of renewable energy and rural development shows how top-down, spatially blind policies that target rural areas can have unexpected and undesirable consequences. A place-based approach, involving bottom-up input as well as top-down direction, can help to reduce transaction costs and improve outcomes (OECD, 2012b).

Innovative public policies

Innovation is also about the way governments act and interact with players in other sectors. The governance framework needed to develop innovation focuses both on governance and government. Innovation in governance focuses on creating the right environment, and innovation in government focuses on the integrated package of services that governments can offer. Community initiative and innovation are often blocked by regulation. Governments are concerned about innovating because they want to improve their performance and reduce their costs. They also want to increase local level and central government capacity, mitigate the impact of demographic trends and meet their citizens' expectations and desired quality of life. Institutional innovation is thus a key issue in rural development. Innovative rural governance models can change the narrative that

constrains and defines rural development. Innovative governance tools can be key drivers, worth investing in for the development of rural areas.

Meaningful rural policies will have to be innovative to address the array of interdependent challenges in the current rural context. Rural areas have limitations, but changes in the way governance is conducted in rural areas can reframe the narrative and bring it in line with what is necessary for regional and national growth (Table 2.2). Successful regional development depends not only on policy coherence at any given moment but on creating institutions and governance arrangements that make it easier to sustain policy coherence. The challenge for rural areas and for rural governments is to articulate a common vision, to discover how to draw on resources, talents and capacities from all sectors and to develop new institutional partnerships and ways of working. The capacity of rural decision makers and rural actors varies. They are often disadvantaged and under-staffed, and have smaller budgets and different levels of capacity, while their urban and suburban counterparts are better able to compete and find funding.

Table 2.2. **Moving from conventional to innovative policy responses in rural areas**

	Conventional	Innovative
Financing rural activities	Emphasis on public finance as the main source of investment	– Participatory approach – mobilise savings and local investment
	Savings and local capital are not retained in the region	– New job-creating activities
	Call for outside capital loans and subsidies	– Collective investment approach
Low population density	Creation of services that do not correspond to an area's real needs	– Multifunctional services – Creation of mobile services
Ageing	Emphasis on building retirement homes	– Adaptation of transport services – Setting up distant assistance services – Considering the elderly as "contributors"

Source: Bryce, B. (2012), "Rural governance and innovation: Refining how rural regions reach decisions", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

As a result, rural regions must think about innovation in a broader context (Box 2.10). The first prerequisite is to ensure that the supply of services matches the characteristics and the assets of the region. The second is to ensure that equity and efficiency targets for these areas are balanced. Thirdly, bridging the rural-urban divide requires a collaborative approach. The fourth is encouraging investment instead of just spending, by considering regional assets and how best to enhance them. The fifth aspect is to build an effective and inclusive governance framework to engage with local communities and use appropriate mechanisms to promote growth. The sixth concerns supporting non-conventional approaches to delivering services.

Innovative governance approaches can take different forms in rural regions. They include:

- Recognising the changing role of the highest level of government: Ordinary citizens must be involved in leadership roles, and more bottom-up approaches are needed, with less orchestration from higher levels, as noted in the New Rural Paradigm.

- Facilitating knowledge pooling and simplifying decision-making processes: Different areas of knowledge and competence are required. Tacit and explicit knowledge from both experts and laypersons and from "outsiders" and "insiders" (Leeuwis, 2004) need to engage in an innovation feedback system.
- Engaging local communities and integrating local expectations: Across rural regions, local expectations are changing. The consultative process is vital for delivering services. Further investment in education and training is often key in many rural areas. Rural development is triggered more effectively by investing in local capacity to assimilate knowledge spillovers generated elsewhere, than in actually producing that knowledge.
- Recognising that there is no panacea for rural innovation and creativity: Rural places have their own strengths, weaknesses, threats and opportunities. A key issue for policy today is how to secure flexibility while ensuring fiscal accountability and moderate policy implementation costs.

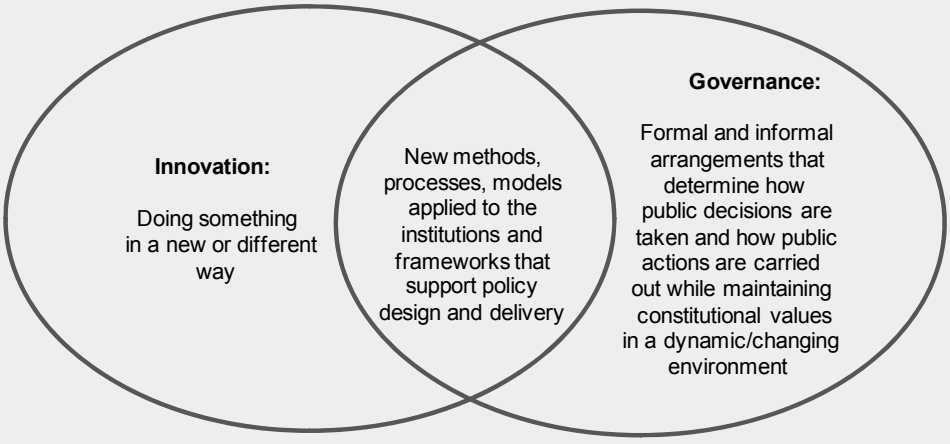
Following these guidelines can allow communities to do more with less, by making innovation and governance systems more flexible and adaptable and by increasing rural residents' creativity. Rural citizens must make more decisions, become part of what is being done in rural areas and make the most out of the opportunities they have. Innovation in governance can have different meanings. For instance, a more innovative approach to financing rural activities can be introduced if the emphasis shifts from using public funds to using local capital. This can help create new rural jobs and find new uses of land and other assets already in place in rural areas. Innovation in governance also means moving away from loans and subsidies to a collective investment approach and bringing firms together to act in a co-operative manner. This will help rural areas evolve and play a stronger part in decision making.

In the public sector, innovation involves the implementation of new products, processes or ideas that result in doing things better (Box 2.9), for example, by enhancing cost efficiency, service quality and citizen and employee satisfaction. Innovation in governance is important because citizens, both in urban and rural contexts, are expecting more, better, faster and different. The challenge may be greater in rural areas because rural residents are expecting what their urban counterparts have, creating more pressure and expectations. No single ministry, agency or municipal government can by itself manage the global challenges of population ageing, unemployment, social inequalities, etc., let alone meta-policy challenges such as climate change, globalisation and large-scale dynamic policy concerns. They have to work together. Governance models are changing. Traditional governance frameworks cannot handle the responses these governments need, and this complexity requires a greater degree of flexibility. The traditional hierarchical, top-down model does not create the conditions for the dynamic information flows that are necessary to innovate and meet the new challenges.

As indicated earlier, rural innovation and rural innovation systems exist and are important, but they do not exist everywhere. They can be actively encouraged; policies can make a difference. What is called for are more nuanced policies to promote innovation, policies that reflect the ways in which innovation takes place today and the wider conception of innovation (OECD, 2010b). The OECD suggests as a starting point policies that move beyond supply-side policies focused on R&D and specific technologies, to those that incorporate a systemic approach that allows for the many

Box 2.9. **Innovation in governance**

Innovation in government means doing something new in a different way, and innovation in governance means creating the conditions or the environment for more innovation by providing the framework and structure to take action in a new way.



Source: Michalun, M.V. (2012), "Innovation in governance to improve policy performance", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

factors and actors that influence innovation performance. Rural regions also need learning organisations to develop innovation platforms. Targeted rural innovation activities include facilitating the formation of innovation platforms that involve different systems and people. Instruments that regional and local governments can use for this purpose include: municipal shares of ownership in utilities, marketing, branding and promotion and cross-sectoral collaboration.

Table 2.3. **Renewable energy: Innovations in products and policies in rural regions**

Region	Products	Practices and policies
Tennessee, United States	Electric vehicles, cellulosic ethanol	Collaboration between universities and national energy research centres
Maine, United States	Deep-sea floating windmills, tidal energy	*Ex ante* evaluation of the impact off-shore installations will have on maritime communities
Vermont, United States		Branding of electricity; small-scale farm-based biogas for decentralised ("cow power") electricity production
Iowa, United States	Ethanol from maize, cellulosic ethanol	Focused systemic research strategy
Oregon, United States	Small-scale energy integrated into existing activity	Community-based co-ordination approach – "energy has to have a job"
Quebec, Canada	Low-temperature turbine blades for wind installations	*Bureau d'audiences publiques sur l'environnement* (BAPE) to protect the interests of rural communities with respect to renewable energy (RE) deployment
Prince Edward Island, Canada	Smart RE energy systems and integration into the optical-fibre network by a municipally owned energy company	

Table 2.3. **Renewable energy: Innovations in products and policies in rural regions** (*cont.*)

Region	Products	Practices and policies
Tromsø, Norway	Low-temperature turbine blades, tidal energy, extraction of heat from water and sewage	
North Karelia, Finland	Wood-based biofuels, efficient wood burners, related machinery and equipment, combined heat and power (CHP), and district heating	
Mellersta Norrland, Sweden	Bioenergy from wood, with CHP and district heating. The "green highway" for transport between Sweden and Norway.	
Region Sjælland, Denmark	Wind, wind installation maintenance, testing facilities; algae production for biofuels; straw-based bioenergy	Formation of local consortia to organise land use and to link demonstration processes to regional economies
Friesland, Netherlands	Solar-powered boats and related systems for battery control, etc.; green gas, based partly on cow manure	Develop niche opportunity (photovoltaic-powered boat industry)
Extremadura, Spain	Mounts for solar installations	
Puglia, Italy	Small wind generators; emerging policies to encourage small-scale decentralised renewable energy	RE policy has been modified several times to reduce distortions and rent-seeking behaviours
Abruzzo, Italy		Guidelines for siting RE installations in rural landscapes expressly invoke aesthetic principles
Shetland Isles, Scotland	Hydrogen from wind; energy storage systems; tidal generators	

Source: OECD (2012), *Linking Renewable Energy to Rural Development*, OECD Green Growth Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264180444-en.

Innovation by governments can help improve service quality, accessibility, transparency and decision making. Evidence from Estonia and Finland shows governments are consolidating organisations, agencies and units. They are building shared services among ministries and executive agencies and increasing the use of front office or "one-stop shops". Innovation in government is related to finding new and better ways to deliver services, for example, public-private partnerships, civil society organisations and co-production. Citizens and public users' participation in the development of public services can expand how governments are innovating. Three ways citizens can become more involved in policy making include participation, consultation and crowd sourcing. Participation puts more emphasis on meeting the preferences of individual citizens, with a greater variety of supply and tailor-made solutions. Consultation is a much more dynamic way of engaging citizens, with a view to effecting change at a low cost. For example, in the remote Kuopio region in Finland, health care managers held a series of local meetings with employees and patients to improve health care delivery. As a result of these meetings seeking input from those involved, the regional government was able to develop a response suited to the particular circumstances. The third option, crowd sourcing, attempts to look beyond traditional government boundaries and activate citizens at large (Box 2.11).

Box 2.10. **Innovation policy and a framework for regions**

Innovation policy refers to a set of policy actions that promote innovative activity in order to reach social goals; while innovative activity refers to the creation, adaptation and adoption of new or improved products, processes and services. Innovation can take different forms:

- Working in new ways: This might involve rural development approaches that apply new ideas, use new techniques, focus on alternative markets, bring diverse sectors and stakeholders together via new networking methods, support new priority groups, or find new solutions to social, economic and environmental challenges.
- Developing new products and services: These often result from testing innovative ways of working and can be created through the application of new or novel techniques, partnerships, technology, processes, research and thinking.
- Adapting proven approaches to new circumstances: This is also recognised as an effective means of creating locally significant innovative rural developments. Such innovative action is often facilitated by knowledge transfer between regions.

The strategic dimensions of an innovation policy framework for regions may take several forms. These different choices introduce variation in policies even across regions that present similar economic, innovation and institutional profiles.

They include:

- identifying and building on the region's existing asset base and its current advantages (a push for science, technology-led or a mix)
- supporting socio-economic transformation (reconversion or seeking new specialisations, training, attracting and retaining human capital)
- catching up (through the creation of knowledge-based capability, upgrading or expanding strategic infrastructure in the region).

Policy experimentation implies a certain tolerance for failure. Regions can be excellent laboratories, and policy makers need to be given space to learn from mistakes.

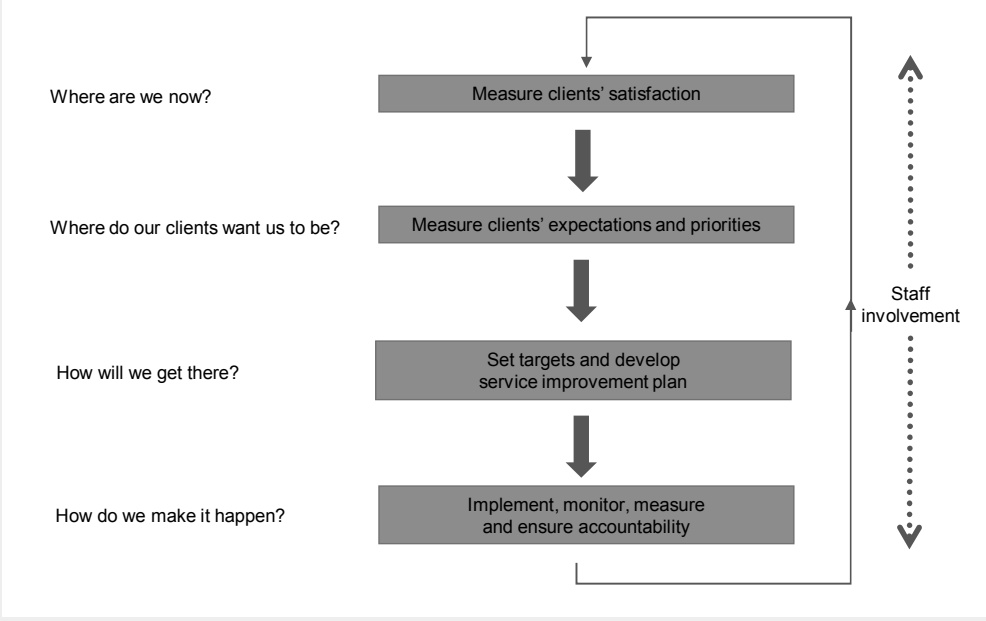
Source: OECD (2010), *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264083479-en; OECD (2011), *Regions and Innovation Policy*, OECD Reviews of Regional Innovation, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264097803-en.

In rural regions, there are often barriers to business creation and development. However, institutional support can help address those obstacles (Box 2.13). A key output from institutional support is network creation. Networks have to include several different actors and generate interactions to work as promoters of development. Once critical mass is achieved, networks can act as sources of information and learning. They can promote new opportunities and potential creators of new ideas and projects, and support change by promoting socio-political legitimacy. In terms of rural development, local and global networks across rural and urban areas are key. Rural-urban networks link individuals and institutions with more central and cosmopolitan regions. In this sense, marketing can also be used to link individuals and institutions, whether internal or external. Internally, this can inspire regional pride. External marketing will validate the perception of the value of the territory in global markets.

Box 2.11. **Measuring innovation in government: An example from Canada**

Canada's "Common Measurement Tool" offers a way for governments to learn what citizens and customers want through a dynamic feedback loop. It creates solid links between government staff and their involvement and citizens, and opens space for listening, learning and adjusting governance.

Canadian Common Measurement Tool



Source: Michalun, M.-V. (2012), "Innovation in governance to improve policy performance", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 2.12. **Finland's innovative rural governance**

Finland offers two innovative governance models. The first is the Rural Policy Committee, a network of rural policy actors at different levels of society, including a group of about 30 members from different ministries and other organisations. A horizontal co-operation body, it works mainly on the national level, dealing with national rural policy issues, but it also has connections to actors at the regional and local level. The committee's main tasks include promoting diversified multilevel rural policy at the national and international level. It also implements growth in rural areas in co-operation with different administrative sectors, prepares and implements rural policy programmes and reinforces rural research and expertise. The Rural Policy Committee works to ensure that the rural viewpoint is acknowledged and expressed in Finland.

The network uses three tools, including the national Rural Policy Programme, which has a strategic perspective and implements the programme's proposals. The second main method is the national research and development project, funded by the Rural Policy Committee. The third practical tool is theme group work. Twelve theme groups are working with rural policy issues such as enhancing civil society participation in rural development, social services and rural housing. An evaluation of the Rural Policy Committee in 2011 concluded that it is doing unique work in under-served rural areas in Finland. The committee has earned a place as the voice for the horizontal rural development approach in society.

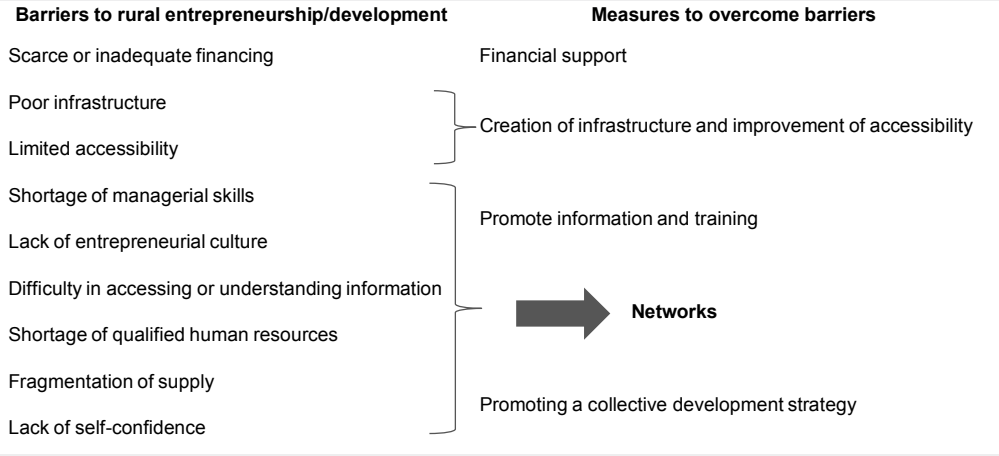
Box 2.12. **Finland's innovative rural governance** (*cont.*)

The second model is the LEADER method as practiced in Finland. LEADER is a bottom-up method and a founding instrument of the European Union, implemented through local action groups (LAGs). There are 55 LAGs in Finland, covering all the rural areas in the country. The LAGs create local initiatives, encourage local people to participate in social development and take part in regional development. The LEADER method is guided by principles such as bottom-up, local partnership, inter-territorial co-operation, networking, and decentralised management and financing. Finland's experience with the LEADER method has proved so helpful that regional authorities are considering extending it to cities.

These two models aim at rural development in an integrated way. Both models work across sectors. There are networks connecting the public, private and voluntary sectors. These partnerships are an essential part of rural development policy in Finland. However, there is a need to develop the methods further and review how rural development is communicated and marketed throughout society to mainstream the rural approach in regional policy.

Source: Janis, L. (2012), "Innovative governance models: Examples from Finland", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 2.13. **The role of institutional support**



Source: Dinis, A. (2012), "Entrepreneurship and innovation in rural areas: Strategies and processes", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Stimulating rural innovation: The role of entrepreneurship

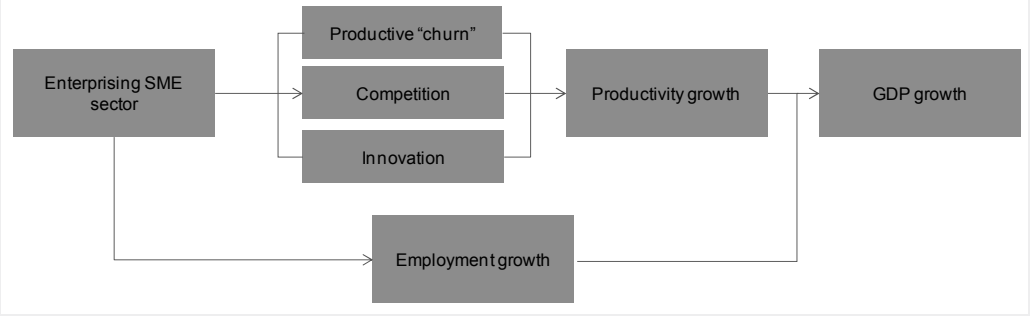
Innovation and entrepreneurship are seen as central to rural development, as are collaboration among firms and forging stronger rural-urban linkages (Box 2.14). Firms in rural regions can identify sectors where space and low density are advantages, and find ways to collaborate across distance. Innovation and entrepreneurship go hand in hand. Entrepreneurship applies not only to businesses but to support to organisations. Because rural entrepreneurs tend to be more isolated and have less immediate access to markets and other resources, networking, sharing resources and pooling can be especially helpful in contributing to building social capital for economic purposes. Policy makers can help foster entrepreneurship in rural areas by facilitating the formation of linkages between

participants to help develop a networking culture. This can include cultivating a process-oriented approach to business incubation linked to networking activities, formulating a sector-focused enterprise-development strategy and taking a bottom-up approach that facilitates learning and focuses on adding value through co-operation.

Rural areas display a particularly strong connection between innovation and entrepreneurship. The innovator tends to directly implement the innovation rather than sell it to a second party. For the most part, innovative firms remain small, but in a small rural economy, the employment and income effects of successful small firms are significant. Globally significant firms originated by a single entrepreneur in a rural community nevertheless exist. The disruptive innovations of these rural entrepreneurs either altered their industries or in some cases, created new industries.

Box 2.14. **How entrepreneurship and innovation foster development and competitiveness**

Innovation, competition and productive "churn", that is, the relationship of productivity in terms of firms leaving the market and the new firms entering the market, contribute to productivity growth. A key point to note in this diagram is that employment change is a consequence and not the heart of the model.



Source: Smallbone, D. (2012), "Innovation, entrepreneurship and rural development: Some key themes", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Support for innovation in rural regions comes mainly through support for entrepreneurs who create new innovative businesses and by helping existing firms to modernise their technology (Box 2.15). Innovation in rural regions is more likely to be driven by the actions of individual entrepreneurs and business owners. Because most firms in rural regions are SMEs that do not have formal research activity, innovation in rural regions is more likely not to involve a brand-new product or technology but instead to reflect new ways to produce existing goods or services, or alternatively, refine an existing good or service to better meet buyers' needs. Most definitions of entrepreneurial behaviour tend to emphasise the importance of innovation. An entrepreneur creates a new product, process or technology that has commercial value. It is a combination of this creation and of commercial value that defines an innovation. For rural regions, entrepreneurial activity offers the best chance to stimulate economic growth (Box 2.16). This, too, suggests that individuals will be the main source of innovative ideas. In the United Kingdom, for example, increasing international competition and Common Agricultural Policy reforms resulted in farmers taking on multiple new roles as environmental project managers and rural entrepreneurs, as well as food producers.

Box 2.15. **Guidelines for supporting rural entrepreneurship**

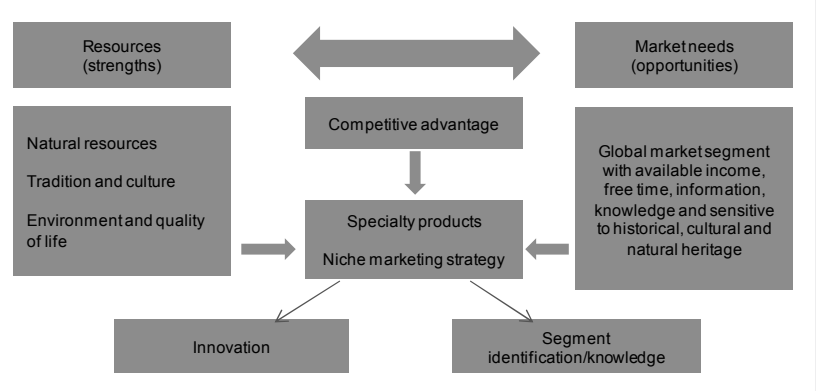
- Identifying, engaging with and supporting local individuals with the motivation and drive to create successful enterprises.
- Facilitating support networks that include access to mentors and role models.
- Helping entrepreneurs access capital to support different stages of business development.
- Helping entrepreneurs access distant markets, for example through participation in trade shows.
- Providing access to technical assistance of various types.
- Developing long-term partnerships with entrepreneurs.

Source: Smallbone, D. (2012), "Innovation, entrepreneurship and rural development: Some key themes", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 2.16. **Fostering endogeneous entrepreneurship: Marketing strategies and innovation in rural areas**

Rural residents in Portugal tend to think they are not as capable as their urban counterparts. Fostering endogenous entrepreneurship could help to meet these challenges. Endogenous entrepreneurship is the ability of the region to generate its own projects, bringing value to local regions by focusing on their competitive advantages. The competitive advantages can then evolve into specialty products and become valuable locally and internationally through a niche marketing strategy. Major challenges lie in developing endogenous innovation capabilities and integrating the local economy into the global economy. Two steps in the right direction would be to: *i)* develop effective local and global networks to facilitate the process; and *ii)* establish a more professional marketing approach. Finally, the promotion of a successful strategy depends not only on the choices of individual entrepreneurs but also on those of the collective, represented by the government and other institutions involved in regional development.

The global market includes a segment of people with higher incomes, more free time, more information and more knowledge and who are sensitive to cultural and natural heritage. This growing demographic segment appreciates natural and cultural resources in rural areas. Niche-marketing strategies with specialty groups can be developed for this market. The concept of innovation embraces the idea of value creation, and considers the relationship between benefits and costs. The goal is to increase the perception of benefits and to reduce the perception of costs. This is a potential answer to rural development.



Source: Dinis, A. (2012), "Entrepreneurship and innovation in rural areas: Strategies and processes", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

The social enterprise model can foster development in rural areas

The social enterprise model is particularly suitable in rural contexts. A social enterprise is an organisation run as a business, with the goal of generating surplus for re-investment in the community, not maximising profits for shareholders and owners. The key goal is to create social capital, one of the most important assets rural regions have. Social enterprise involves: bringing the community together for a common purpose, drawing on social capital within rural communities and, at the same time, contributing to it. Social enterprise by definition implies entrepreneurship, because local people must come forward to take the lead in getting such an organisation off the ground (Box 2.17).

Box 2.17. **Social enterprise in the United Kingdom**

Services are declining on a daily basis in the United Kingdom. Shops and service stations are closing, which can mean that rural residents need to make a round trip of 70 kilometres simply to refuel their vehicles. This problem has been the subject of social enterprises in rural Britain. The social enterprise model starts by raising awareness in a rural community about the need for certain services, such as shops, gas stations and post offices. Local people then come together to form a business that can maintain and deliver these services. This includes services that were provided by the private sector in the past but are no longer sufficiently profitable to interest providers. It could also include public services, such as transport, which has been heavily subsidised, or some of the softer end of health care, care facilities for children and care for the elderly. In rural areas in the United Kingdom, social enterprises can provide community transport, village shops, post offices and child care, where neither the private nor public sectors find it economically viable to provide such services. In cases of environmental recycling, the local community may conduct collections and environmental recycling in five or six neighbouring rural districts. All these examples show that the social enterprise model can be successful in rural regions.

Source: Smallbone, D. (2012), "Innovation, entrepreneurship and rural development: Some key themes", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Empirical evidence is limited on the innovative potential of rural businesses and the benefits of engaging with regional knowledge institutions. For this reason, researchers from Newcastle University and the Scottish Agricultural College undertook research on seven innovation connectors noted in North East England as having the greatest potential for using innovation to stimulate regional economic development. The aim of the research was to: *i)* identify the role of rural areas and actors in generating innovation and participating in a regional innovation system in North East England; and *ii)* develop recommendations about how rural businesses might engage with rural actors to further more comprehensive regional development. An overview of the work is provided in Box 2.18.

Public sector innovation: Lessons from the Nordic countries

The Nordic countries have strategies for stimulating innovation through public procurement. There is great potential for success if the public sector does more to meet specific societal needs. Nordic welfare clusters allow public institutions to co-operate with private actors to stimulate sustainable innovation. Public-private partnerships are increasingly seen as the way forward for innovation in the public sector, as long as positive pre-conditions can prevail at a time of strained public budgets, environmental

problems and an ageing population. It is clear the Nordic welfare states cannot progress by offering more of their well-known services. Innovation will be needed in the effort to create sustainable societies. Nordic citizens can be good partners in developing innovation. They are generally well educated, demand a high quality of life and are inclined to adopt new technology. A focus on user-centred innovation can establish new partnerships between public institutions and citizens, opening up new ways of designing public services and shifting from a welfare state to a welfare society, where the state delivers a few solutions and empowers citizens to take the lead.

Box 2.18. **Innovation connectors in North East England**

Innovation connectors are mainly business clusters and partnerships with a clear geographical and sectoral focus. There are seven innovation connectors in North East England. Their role is to stimulate economic regeneration, competitiveness and knowledge transfer through innovation across regions. Another goal is to enable the development of world-class facilities and new approaches to integrating businesses and universities and engaging with the community through education. In 2005, the Labour government designed six science cities as innovation connectors: Newcastle upon Tyne, York, Manchester, Nottingham, Birmingham and Bristol. They were envisioned as partnerships between the regional development agency, local authorities, universities and private sector organisations, and their role was to foster innovation and regional development. Part of the rationale for designing these science cities was that the government hoped to promote scientific and research excellence outside the "golden triangle" of London, Cambridge and Oxford.

The research focused on Newcastle Science City, a partnership between the One North East Regional Development Agency, the Newcastle City Council and Newcastle University. Its goal is to create an innovation strategy to stimulate regional economic growth. It has 23 employees working on science business creation, science infrastructure, science networks, education and community. Newcastle Science City aims to position Newcastle globally as a city of science excellence in ageing and health, sustainability and stem cell research. Other goals include creating prosperity for the city and wider region by supporting the creation of new businesses and jobs, assisting existing businesses to innovate and grow, and to ensure that local communities play their part in the development of science. No national funds were used in building these partnerships. It was up to each connector to define and adopt its own model of development, based on existing partnerships and skills. Newcastle Science City's demand-driven model helps entrepreneurs identify their unmet needs and find solutions so they can set up their business in a sustainable way. If an entrepreneur has an idea, experts at Newcastle Science City can help the entrepreneur develop a model and test the idea.

Other important innovation connectors include:

- The National Renewable Energy Centre (Narec), a centre of excellence for delivering world-class innovative technology for new and renewable energy. Its main roles are to support companies within the region looking to invest in energy technologies and supply R&D for the private sector at the regional and national level. Narec is a key national player in the United Kingdom's Low Carbon Industrial Strategy, focused on engineering and industry consultancy. It provides business support services and testing and demonstration facilities for the renewable energy and electrical power sector.

Box 2.18. **Innovation connectors in North East England** (*cont.*)

- The North East Technology Park (NETPark) is a science park established to attract businesses through inward investment and to sustain indigenous companies in the region. It provides business support, infrastructure, high-tech, R&D facilities, help finding financial support and networking. NETPark has strong links with the five universities in the region.

The innovation connector study concluded that there must be an understanding of the specific characteristics and the challenges rural businesses face in shaping rural innovation policy. It also called for raising awareness, improving information sharing and giving universities a wider role in regional and rural development by sharing expertise and facilities. Role models could be used as examples to encourage other rural businesses to engage actively in regional institutions and programme design. The key findings from the study are:

- First, innovation policy is spatially blind; there is no distinction in policy innovation between urban and rural.
- Second, there is a limited geographical extent of knowledge spillovers from urban-based actors and institutions in the innovation system.
- Third, rural businesses do engage in innovation and may be more innovative than their urban counterparts.
- Fourth, innovation is not a linear process – shared learning is critical.
- Finally, traditional approaches to defining innovation have tended to exclude much of the innovation that occurs in rural areas, but there is considerable potential for rural areas to be important sources of innovation in the future.

Source: Hubbard, C. and J. Atterton (2012), "Unlocking rural innovation in the North East of England: The role of innovation connectors", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

The Nordic countries have tried to implement innovative ideas from professionals, since this may be one of the key ways to create solutions to global challenges. Professionals in firms are seen as being able to draw upon common strengths, such as employees' free access to their immediate boss (Box 2.19). Within health care, it is widely acknowledged that employees are the main source of innovation, and not only from utilising insights from employees. A truly open process of innovation must also focus on the needs of users. Just as employees in Nordic countries benefit from relatively close power relations in the workplace, Nordic citizens have easy access to public employees and institutions. The EU Commissioner on Research, Innovation and Science has said that public sector innovation has suffered from negative perceptions because the emphasis has been on losing jobs and cutting services. Instead, the aim is to deliver policies in a more efficient way and responding to users' needs through a clear understanding of their needs and experience.

Box 2.19. **SWOT analysis: The relationship between the Nordic societal model and innovation in green growth and welfare**

Innovation flourishes in Nordic countries, but none of the countries excels in using the gained knowledge from projects and initiatives on a national scale. This is partly due to a lack of strong networks. The SWOT analysis below explores the relationship between the public sector and innovation within green growth and welfare. In the years ahead, the aim of a new Nordic innovation policy will be to link innovation capacities to key challenges and turn them into opportunities. If societies are to become sustainable, they will need an innovation policy that exploits the potential for synergy between economic, social and environmental challenges.

Rather than discrete welfare states, the Nordic countries must henceforth be seen as welfare societies. This shift in perception is a prerequisite for finding synergies between green growth and welfare. Welfare societies see social services not only as a means of tackling social challenges, such as ageing and social exclusion, but as a way to enhance national competitiveness and cultivate human capital. In welfare societies, the public sector invites other actors, companies, NGOs and citizens to help solve social challenges by providing new technology and solutions. A new awareness of the synergies between green growth, innovation and welfare must be promoted, and, at present, this does not exist in the Nordic regions. A new innovation strategy should engage all sectors of society in confronting the changes and challenges ahead. The public sector must become a driver, through measures such as public procurement, R&D, smart regulation, cluster creation, user involvement, permission of test markets and scaling.

The relationship between the Nordic societal model and innovation in green growth and welfare

Strengths

- Values and visions
- Good governance
- A history of promoting innovation
- Empowering users and customers
- Trust, flat hierarchies and the power of employees
- Network succeed institutions
- Nordic countries as global test markets

Weaknesses

- Innovation only flourishes locally
- Lack of co-ordination
- Not-Invented-Here syndrome
- No-fail culture impedes innovation
- Public institutions are rewarded for stable operation – not innovation
- Scale is lacking

Opportunities

- Technology and IT can facilitate change
- Innovative public procurement
- Fighting fragmentation by rewarding early adopters
- Branding Nordic strengths to boost exports

Threats

- High costs in Nordic countries
- A crowded market – everybody wants to solve such global challenges as climate change and ageing populations
- Small Nordic markets – global growth lies in Asia
- Austerity dominates rather than innovation

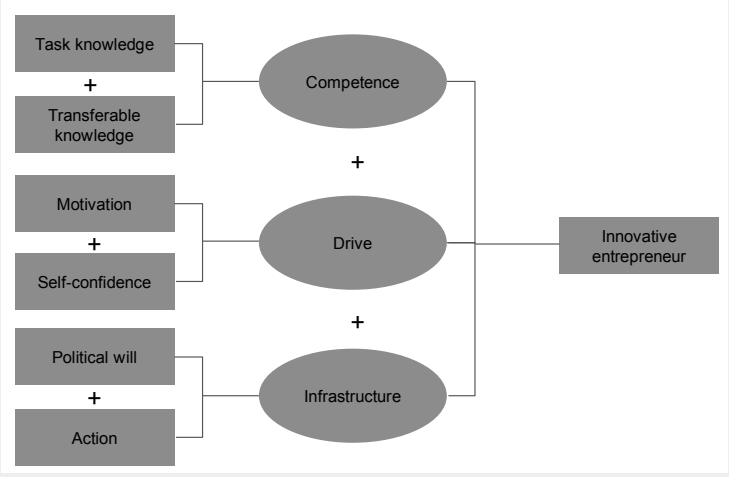
Source: Neraal, M. (2012), "Nordic Council of Ministers – Stimulating innovation", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Box 2.20. **Rural innovation and entrepreneurship: The Faroe Islands**

The self-governing Faroe Islands, an archipelago associated with the kingdom of Denmark, is a predominantly rural region consisting of 18 islands with 48 000 inhabitants. These territories are highly dependent on a reduced number of primary commodities, mainly fisheries, oil and gas. The public sector is relatively large and the chief employer in the region. The area is characterised by sparse settlements and suffers from significant difficulties in communications and accessibility. In recent years, more and more Faroese have made their living from businesses other than those in the fishing sector. A significant part of their human capital is directly or indirectly involved in the oil and gas industry around the world, especially in the North Sea. Others are involved in various services and trade, making their income in domestic and foreign markets. What they have in common is a certain competence and know-how that qualifies them to participate in the global marketplace. Faroese industries negotiated terms with international oil and gas companies as a condition of Faroese participation. At issue was how the oil and gas companies could ensure and promote Faroese companies in the industry or help them to enter other knowledge-based industries. As a result, the Faroe Islands today have companies such as Tour Offshore, with more than 20 vessels operating in the offshore industry. Two Faroe oil companies operate in the global markets and are listed in the stock market: Faroe Petroleum and Atlantic Petroleum. Atlantic Airways, the national airline company, is expanding its fleets and routes. These examples show that it is possible to put in place a policy that can encourage knowledge-based industries and innovation as existing industries enter a new area.

Some key lessons of the Faroe Islands' experience:

- A good practice is to have rural business platforms to collaborate as rural regions, to ensure that local industry can participate in future activities.
- It is important to identify local strategic competitive advantages. Rural areas can use important local assets to penetrate new markets, and to develop into areas that are attractive to young people.
- A second step is to identify the innovative enterprises in rural settings.
- A third step is to find the funds to experiment with novel business concepts. It is impossible to conduct significant experimentation without significant funding, which should come from private and public sources.
- Finally, there must be an evaluation and valuing of commercial transactions in the market. The innovative entrepreneur is a sum of competence, drive and infrastructure. The competence of the individual entrepreneur derives from knowledge of the task and transferable knowledge (see figure below).



Source: Gregersen, O. (2012), "Innovation in rural communities – The challenge of identifying competitive advantages", presentation at the 8th OECD Rural Development Policy Conference held in Krasnoyarsk, Russian Federation, 4 October.

Conclusion

Rural regions innovate; however, there seems to be a need to prove that policies that foster rural innovation can make a difference for countries. It is essential to find the link between the performance of rural areas and aggregate performance. In terms of innovation, the compound effect of all these regions is important because of the potential growth that small and medium-sized regions can generate. Policies should be differentiated and integrated. One size does not fit all, and rural development policy should be integrated with other relevant policy areas. It is important to focus on entrepreneurship, encourage trial and error and provide business services to rural enterprises to support interactions and increase the self-confidence of entrepreneurs.

Innovation is not restricted to new practices or behaviour; it also concerns upgrading and improving existing processes. The development of new opportunities requires a lot of voluntary work, creativity and local consultation; it is an interactive process involving multiple stakeholders and different sources of knowledge and information. Public investments may be needed to scale up and scale out rural innovation and to build the institutional configuration that will sustain innovation in rural areas and move it beyond pockets of success. A broader analysis of how innovation works suggests that it is an important impetus for development in rural areas. Regional competitiveness is driven by gains in productivity, and advances in productivity result from sustained innovative activity. However, it is not always easy to identify the innovative nature of actions and initiatives in rural areas.

The following four key points emerge for consideration:

- Rural communities should have the right to identify their own strengths and potential and be authorised to encourage local innovation. Empowering people and helping them to feel able to have ideas and follow them through is paramount, but so is using challenges to help people to think about the future they want and formulate an ambitious plan to achieve it.
- Policy makers need to provide the space for innovation and capitalise on the willingness of rural communities to play a role.
- Uniform economy-wide policies, designed in urban environments and for predominantly urban populations, too often fail to take proper account of the specific needs of rural places. This points to the need for innovation in the governance of rural policy.
- New governance tools can be critical in achieving a healthy balance of top-down and bottom-up input in the policy process. So can new metrics of innovation, as patent registrations and R&D expenditures cannot sufficiently capture innovation activity in rural regions.

There should also be a focus both on the innovation of governance systems and in terms of the government. Innovation in governance is about creating the conditions and the structure to promote new ways to act. One suggestion is that the government foster bottom-up activity by acting as a facilitator, co-ordinating partnership creation and providing a good institutional environment. This would allow communities to do more with less by making the innovation and the governance systems more flexible and adaptable, so that rural areas can take part in the decision-making process. Finally, innovation and entrepreneurship are linked to rural development, but there are different kinds of entrepreneurship, and each has specific characteristics.

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Part II

The modern rural economy and innovation: A perspective from four experts

This part of the report contains four chapters that address how modernisation and innovation have occurred in the rural territory of OECD countries. Prior to the Krasnoyarsk Rural Conference, the OECD solicited proposals for papers by academics and government officials on the topics of rural innovation and modernising rural economies. From the papers submitted, the following four were selected to be presented at the conference. The versions published here incorporate additional ideas and clarifications triggered by the presentations made during the conference.

The four chapters are not case studies in the sense that the term is usually considered, but they can be interpreted as reflections on different aspects of rural development that show that innovation and modernisation do occur in rural regions. Because each paper was developed individually, and reflects the ideas and perspectives of each author or authors, the chapters do not have a common approach, or even a single sense of what modernisation and innovation entail in a rural context. In a sense, this is one of the strong points of this part of the book. The OECD has long accepted the importance of an individualised bottom-up approach to rural development, and these chapters demonstrate that across OECD countries there is considerable diversity in ideas and approaches.

Chapter 3, by Thomas Dax, reflects on results from a series of major rural research projects carried out in the European Union. Dax concludes that closer integration of rural and urban regions and modernisation of rural economies demand a different approach to rural policy that recognises the joint dependency of rural and urban territories. Chapter 4, by Carmen Hubbard and Jane Atterton, examines how well regional innovation strategies for the North of England accommodate rural innovation. They find that there is considerable evidence that rural firms can innovate but that they are often not well integrated into regional innovation strategies. Chapter 5, by Bruno Jean, explores how innovation occurs in the communities of rural Quebec, Canada. He points to opportunities for self-organisation that are common in rural communities and finds that the potential for reciprocity in a small, well-connected, rural place can be leveraged into a variety of innovative actions. Chapter 6, by Eleni Papadopoulou, Athanasios Pappas, Ioannis Giannelos and Nikolaos Hasanagas, looks at the effects of the LEADER programme in Greece. LEADER is itself an innovative tool for rural development, and the authors find that, while there is considerable variability across Greece in terms of local action group performance, the strength of LEADER is that it encourages modernisation and innovation at the local level.

Chapter 3

A new rationale for rural cohesion policy: Overcoming spatial stereotypes by addressing inter-relations and opportunities

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Rural areas are increasingly affected by a wide set of drivers arising from very different fields. Consequently, in most industrialised countries, rural regions can no longer be referred to simply as "underdeveloped" or weakly developed, but should rather be viewed as areas of significant opportunities and emerging perspectives. Such new perspectives particularly demand an evidence-based assessment of contemporary rural regions' development options.

This chapter focuses on the rationale for a re-oriented rural policy that takes into account these substantial changes. It draws on the findings of the European Development Opportunities in Rural Areas (ESPON EDORA) project, which emphasises the need to overcome entrenched stereotypes that can misinform policy concepts. The complexity of spatial connections can be elucidated by a new view of rural development. A synthesis of "meta-narratives" of rural change (an agricentric narrative, an urban-rural narrative and narratives of globalisation and capitalist penetration) provide more realistic guidance for assessing rural challenges and opportunities. They take into account the increasing inter-relation of rural and urban regions, as well as connectivity of spaces and the need for differentiation of rural areas.

While classifications of rural regions are considered an important tool for supporting a comparative assessment of spatial dynamics, their actual value only becomes plain when addressing their various dimensions. The intensifying relationships between spatial units and actors do not favour clear-cut divisions between rural and urban spaces, but rather demand a flexible spatial assessment. The focus of a new rural Cohesion Policy should reflect this shift in perspective. Rather than hew to a fixed policy programme, interventions should be attempted at two levels: a macro-level, to address broad, systematic spatial patterns of differentiation, and a micro-level, to respond to localised, aspatial variations in territorial capital. In this respect, it is crucial for each rural region to find place-specific approaches to develop its specific local (intangible) assets, making use of the translocal networks that play a key role in innovation and development.

Introduction

The objective of this chapter is to show that a sound appreciation of current spatial processes is a prerequisite for a new rationale for rural Cohesion Policy that takes account of the specificities of rural areas. This implies a thorough analysis of the changes in regional inter-relations, which are too often seen simply as urban-rural inter-relations, and a fresh interpretation of the role and potential of rural regions within spatial development. Analysis of rural change might thus be understood as the aspiration to overcome long-established generalisations about rural areas, aptly described as "stylised fallacies" in the literature, which often lead to the perpetuation of traditional views, power relations and approaches in rural policies.

This chapter draws on the findings of a recent European Observation Network for Territorial Development and Cohesion (ESPON 2013 programme) project that was commissioned to analyse the European Development Opportunities in Rural Areas (EDORA). Starting its analysis from the process of differentiation of rural regions, it elaborated an overview of "meta-narratives" in order to synthesise the main perspectives of discourse on rural development. An overarching theme that emerged was the strong influence of global phenomena exogenous to the local/regional development process. In recognition of the increasing inter-relation of spaces, attention is paid to place-specific challenges and opportunities, with a particular regard to "softer" or intangible territorial assets. Although the need for greater orientation towards such measures has been expressed for some time, policy implementation has been slow to embrace it. Cohesion Policy might help to play a guiding role in rural regions for nurturing local development opportunities. This finding coincides with that of many recent field studies and experiences that highlight the importance of place-specific approaches, which nevertheless stress the potential and interconnectedness of the individual areas.

The chapter concludes by identifying the main elements for rural Cohesion Policy in Europe, which are partly addressed in the proposal documents for the current policy reform. These aspects can be discussed as building blocks for a general rural Cohesion Policy of industrialised countries and are relevant beyond the sphere of the European Union. They provide arguments for a broadening of existing policy schemes to include more innovative measures. These would be informed by the need to raise competences and participation, and would prioritise activities to harness local and regional assets.

Narratives of rural change

Given the extreme complexity of rural, and also spatial changes, a simplified interpretation can help guide stakeholders and policy makers. Rural policy literature is often populated by generalisations, with some more or less representative and accurate, and others that are anachronistic stereotypes with an inadequate evidence base. The so-called "stylised fallacies" (Hodge, 2004) are sometimes perpetuated by powerful interest groups, which has resulted in rural stereotypes that are often quite negative and defensive. The most familiar tropes of such discourse are:

- The "agrarian countryside", in which the role of land-based industries is overestimated at the expense of other forms of economic activity that are of greater and increasing importance to socio-economic development.

- The "rural exodus", characteri[s]ed by out-migration and demographic ageing. This ignores the fact that many rural areas show in-migration, population increase and relatively young age structures.
- Rural "dependency culture" – an attachment to policy supports and compensation for disadvantage as the main policy option. In reality, many rural areas, even remote ones, show evidence of dynamism, innovation and growth, even without policy support.
- Rural labour markets are commonly associated with segmentation, in which a dominant "secondary" component is characterised by low levels of human capital, insecurity, low activity rates (especially for females), disguised unemployment and high levels of self-employment. All of these characteristics are certainly present in some (but by no means all) rural areas.
- Similarly, sparsity of population is often perceived as a barrier to entrepreneurship, due to an absence of agglomerative economies. As a result, the impacts of globalisation processes are believed to be predominantly negative in rural areas. Nevertheless it is important to recognise that information and communication technology (if associated with appropriate human capital conditions) are facilitating new forms of economic activity, which enable some rural areas to sidestep these handicaps (Copus, 2010: 39).

The EDORA project analysis suggests that the debate is beginning to move away from anachronistic stereotypes, and is now informed by generalisations soundly based upon up-to-date evidence. In the contemporary literature of rural change, the notion of "connexity" arises as a general concept. The term describes the increasing interconnectedness, over longer distances, of all aspects of rural economic and social activity (Copus *et al.*, 2011a: 28ff.). This means that linkages to sources of information, innovation and business opportunities, and the capacity to exploit them, can become more important than proximity to resources per se. Within this overarching theme, three meta-narratives of contemporary rural change can help us to understand the complexity and variety of individual development paths:

- The agri-centric meta-narrative, which groups various ideas relating to the move away from food and fibre production as the sole focus of European farming, towards a more multifunctional industry, redirected towards provision of countryside public goods and diversification into a range of new activities, such as food processing, recreation and tourism. Some have used the term "consumption countryside" to describe the kind of rural economy that results from this change (Marsden, 1999). This move from "productivist" to "post-productivist" approaches has a parallel in a shift from agricultural policy supporting modernisation and structural change to a greater emphasis upon rural development and the role of farmers as custodians of the rural environment. However, not all rural regions have responded to these changes in the same way. Two development paths commonly result from them. Some regions show increasing specialisation, increasing farm size and the increasing dominance of agribusiness, moderated only by the constraints imposed by agri-environment and animal welfare policy. This has been termed "para-productivism" (Crowley et al., 2008). Other areas have smaller, diversified farms, and more fully embrace the commodification of countryside public goods, which is described as a "peri-productivist" model.

- The rural-urban meta-narrative draws together various story lines relating to migration, rural-urban relationships, access to services, agglomeration (or its absence), and highlights the vicious or virtuous circles of decline or growth, which intensify disparities between accessible and remote or sparsely populated rural regions. Indeed, it reflects the widespread understanding of the effects of the core-periphery model.
- The meta-narrative of globalisation emphasises implications of increasing connexity and global trade liberalisation, in terms of the geographical segmentation of labour markets (in which high- and low-status employment opportunities tend to be concentrated in different parts of the world), and the associated structural change of European rural areas.

While these meta-narratives might be seen as broadly explaining drivers of rural change, it is important to keep in mind that it is risky and perhaps simplistic to speak in terms of linear cause-and-effect relationships. It is more appropriate to consider the meta-narratives primarily as heuristic devices that are not mutually exclusive. They are better considered as testimonies of the status of discourse and of an inherently dynamic nature. Moreover, most localities show evidence of several meta-narratives concurrently. Thus, they provide useful generalisations about common vectors acting upon rural regions across Europe. As such, they are part of an interactive web of socio-economic changes and trends that are global in scope and impact. Each of them is associated with a wide range of both opportunities and challenges.

Inter-relation of spaces

Urban-rural interaction has been a key concept in the policy debate for many years. Although inter-relations seem evident and tended to increase with the rising mobility of our societies, evidence of urban-rural trickle-down benefits remained scanty, and improving co-operation activities is considered a challenge. Despite the paucity of contributions from the academic regional/rural development community, the concept was transformed into a principle for better governance, through which rural-urban interaction could benefit from the co-operation of local administrations and third-sector institutions such as business associations (Courtney et al., 2010). At the European level, a series of documents and programmes referred to this concept, in particular the European Spatial Development Perspective (ESDP; European Commission, 1999), the European Union's Interreg programmes, the ESPON programme and the Territorial Agenda, interpreting rural-urban co-operation as a complement to their core vision of "polycentricity". This could be summed up in the following passage: "In predominantly rural areas with single urban centres, the question is how rural-urban partnership can help to strengthen the urban centres as growth poles for the entire region on the one hand, while on the other hand providing services for rural areas and enabling endogenous and sustainable development, without making the surrounding area completely dependent on the urban centre" (COPTA, 2007, 63). In parallel with this, the European Commission Directorate General for Regional Policy, in 2008-09, explored the issue of urban-rural co-operation in its broadest sense through a series of seminars. Following the discussion on increasing spatial interaction, the updated Territorial Agenda enlarged the scope, claiming: "The growing interdependence of regions generates demand for better connectivity at the global, European and national level. Integration barriers at local and regional level can result in the underutilisation of human, cultural, economic and ecological resources" (European Commission, 2011: 6).

There has, however, been a disappointing lack of evidence of quantifiable "spread effects" from urban-rural interaction. One reason might be that in the context of the increasing connexity of the rural economy, it has become evident that the traditional concept of local rural-urban linkages is far too simplistic. In the 21st century, the performance of most rural economies is contingent upon interactions at a wide range of spatial levels: local, regional, national, European and global. Local urban-rural interaction cannot be considered a principal driver for rural economies in Europe today.

As Lee et al. argue, we have been alerted:

> …to the increasingly interconnected world in which we live, and this provides an overarching context for the changes affecting rural areas of Europe. For example, Castells (1996) introduced the concept of 'Network Society', while Healey (2004) argues that mid-twentieth century 'Euclidean' concepts of planning have been challenged by a relational conception of spatial planning which understands place as a social construct, continually co-produced and contested; views connections between territories in terms of 'relational reach' rather than proximity; sees development as multiple, non-linear, continually emergent trajectories; and recognises the changed context of a network society and multi-scalar governance. In this context … Mulgan (1997) … defines connexity as connectedness and interdependence, and his central theme is the increasing tension which arises between freedom and interdependence in this networked world. A crucial feature is that the inter-relatedness of places is no longer to be considered only in 'Euclidean' terms of physical distance, but rather in terms of their relational interdependence, often across considerable distances (Lee et al., 2010: 17).

The understanding that increasing connexity is disrupting long-established spatial hierarchies of interaction is not, of course, peculiar to the discussion of rural-urban linkages. Some have argued that organised proximity and relational space are becoming more important than geographical proximity and Euclidean space.

With regard to rural regions, ideas subsumed in the concept of "sustainable rural development" emerged, which draw together the concepts of multifunctionality, short supply chains, quality products and new forms of marketing under a process of relocalisation. This has some similarities with the concept of industrial districts (Piore and Sabel, 1984) and is held up as an alternative to "delocalisation" processes taking place in "productivist" regions characterised by large-scale farming and agribusiness.

The analysis of business networks throws light on the interaction of rural businesses. They underpin the observations of relocalisation processes by indicating that rural small and medium-sized enterprises (SMEs) may survive and indeed flourish independently of local rural-urban relationships, due to effective business networks. They can function as a core vehicle to minimise transaction costs and to provide useful information for innovative processes. Business networks play a vital role in the transmission of information, which in turn promotes innovation. This analysis emphasises that the "effectiveness of a region's business network depends not only upon its local network 'density', degree of 'embeddedness' and the associated human and social capital, but upon its connections to more distant sources of specialist information" (Copus et al., 2011b: 126). These two capabilities can be acknowledged as "bonding" and "bridging" respectively. While the bridging aspect focuses on the capability to channel information into the local network, the bonding attribute characterises the distribution of information among local firms and entrepreneurs, facilitating collective learning. The essential

conclusion from this analysis is that high levels of local interaction have to tap exogenous knowledge in order to support local innovation.

In a dynamic perspective, it is important to take account of the "path dependence" of regional development. Many rural areas with stronger community traditions, levels of trust and reciprocity may provide an appropriate context for endogenous development in the future, i.e. a concentration of development aspirations and strategies on locally experienced opportunities. It is suggested that "those rural areas that hold a reservoir of traditional farm-based economic forms, which are integrated with kinship and other close connections, may be best placed to grasp the new economic opportunities" (Murdoch, 2000: 414).

These perspectives on the interaction of rural areas convey an understanding that the rural economy is less and less tied to that of adjacent urban areas. Complex networks gain influence, and "organised proximity" seems more important than geographical proximity. Networks tend to connect localities, no matter whether urban or rural, according to their common motivation, and regardless of the physical distance separating them. This can be described as "translocal" interaction (Hedberg and do Carmo, 2012). The competence to participate in such interactions becomes more and more crucial for spatial development. A simple focus on adjacent intra-regional urban-rural co-operation misses the point and would not address the elements that are conducive to strong translocal networks and innovative development processes.

Recognition of local asset patterns

In the past, activities to define the opportunities for and constraints on development tended to concentrate on deficiencies in physical infrastructure and buildings, including mainly "hard" features of capital creation. Gradually, it came to be recognised that the "soft" aspects of development are equally important and that issues like skills and capacities of the local workforce, its entrepreneurial culture, the effectiveness of business networks and innovativeness, the quality of local institutions and regional governance are crucial components of local territorial assets. This shift in perspective is also visible in the thematic focus of international research, including that of the OECD. While in the early days of the OECD's commitment to rural development in the early 1990s, an understanding of the characteristics of "rural" areas within the overall spatial framework and thus the formulation of a regional typology (OECD, 1994) was crucial and positive, performance of rural regions was primarily seen from the perspective of utilising options for "niche production". Later work extended the scope and turned attention towards capturing more comprehensively the potential of rural amenities (OECD, 1999). In summarising ongoing shifts in conceptualising rural development, the *New Rural Paradigm* (OECD, 2006) provides a framework that includes substantial perspectives for rural policy. Nowadays, many study area reports underline the necessity of nurturing a wide array of development aspects and local assets in a strategic way.

A more comprehensive account of "hard" and "soft" aspects of territorial assets seems therefore crucial to an appraisal of innovative rural development (Dax et al., 2010). The scope and role of these different place-specific assets has been recognised within a practical development policy context, starting with discussions in the developing world, but is also, increasingly, associated with local development initiatives in Europe. The approach known as "Asset-Based Community Development" (ABCD) is founded on a conceptual framework that defines seven forms of capital (Braithwaite, 2009).

Table 3.1. **The Seven Capitals approach**

Capital	Definition	Examples and comments
Financial	Financial capital plays an important role in the economy, enabling other types of capital to be owned and traded.	The liquid capital accessible to the rural population and business community, and that held by community organisations.
Built	Fixed assets that facilitate the livelihood or well-being of the community.	Building, infrastructure and other fixed assets, whether publicly, community or privately owned.
Natural	Landscape and any stock or flow of energy and (renewable or non-renewable) resources that produce goods and services (including tourism and recreation).	Water catchments, forests, minerals, fish, wind, wildlife and farm stock.
Social	Features of social organisation such as networks, norms of trust that facilitate co-operation for mutual benefit. May have "bonding" or "bridging" functions.	Sectoral organisations, business representative associations, social and sports clubs, religious groups. "Strength" relates to intensity of interaction, not just number of members.
Human	Citizens' health knowledge skills and motivation. Enhancing human capital can be achieved through health services, education and training.	Health levels are less variable in an EU context. Education levels are very much generational. "Tacit knowledge" is as important as formal education and training.
Cultural	Shared attitudes and mores, which shape the way we view the world and what we value.	Perhaps indicated by festivals, or vitality of minority languages. Some aspects – e.g. "entrepreneurial culture" – closely relate to human and social capital.
Political	The ability of the community to influence the distribution and use of resources.	Presence of, and engagement in, "bottom-up" initiatives, the most local part of "multi-level governance". Relates to local empowerment vs. top-down policy, globalisation.

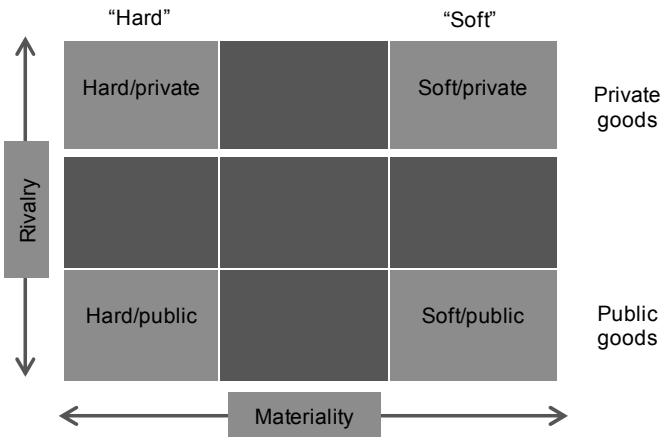
Source: Copus (2010: 56), based upon Braithwaite, K. (2009), *Building on What You Have Got: A Guide to Optimising Assets*, Carnegie UK Trust, Dunfermline, Scotland.

While some of this capital echoes the discussion of "rural amenities" as the main strengths and indicators of "uniqueness" in rural areas over the 1990s (OECD, 1999), more recently, Camagni (2008) has proposed a more theoretical economic perspective, mapping out different forms of territorial capital in a two-dimensional matrix (Figure 3.1). The materiality dimension (hard-soft) is already evident in the ABCD approach mentioned above. The second axis distinguishes between private and public goods (in a simplified view).

It is argued that regional policy has, until now, tended to focus upon different policy sectors, attributable to the four corners of this typology, and that further consideration should be given to the intermediate categories. In terms of rural policy, activities were concentrated mainly on the left side of the figure (concerned with "hard" assets, such as farm investments or public infrastructure). The first suggestion from this conceptual framework is to reinforce policy efforts with respect to the righthand side of the figure, by supporting "softer" forms of capital, such as human capital, or the protection/exploitation of environmental amenities.

The intermediate space is labelled "Innovative Cross" in order to insinuate the rising need for networking in regional development action. It seems not always self-evident to relate practical activities to this place in the figure (Figure 3.2), but what appears important is the nurturing capacity of networks, as it is also captured in the concept of the "Rural Web" (Van der Ploeg, 2008).

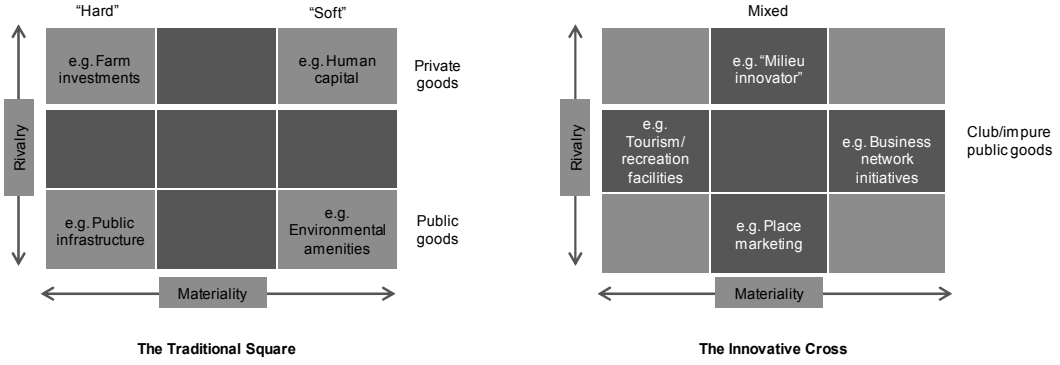
Figure 3.1. **A typology of territorial assets**



The Traditional Square

Source: Copus, A. (2010), "Dispelling stylised fallacies and turning diversity into strength: Appropriate generalisations to underpin 21st century rural Cohesion Policy", in ESPON Co-ordination Unit (ed.), *Scientific Dialogue on Cities, Rural Areas and Rising Energy Prices*, First ESPON 2013 Scientific Report, Luxembourg, pp. 36-61, based upon Camagni, R. (2008), "Towards a concept of territorial capital", paper presented at the 47th European Regional Science Association Congress, Paris.

Figure 3.2. **The Territorial Capital Framework in a rural policy context**



The Traditional Square **The Innovative Cross**

Source: Copus, A. (2010), "Dispelling stylised fallacies and turning diversity into strength: Appropriate generalisations to underpin 21st century rural Cohesion Policy", in ESPON Co-ordination Unit (ed.), *Scientific Dialogue on Cities, Rural Areas and Rising Energy Prices*, First ESPON 2013 Scientific Report, Luxembourg, pp. 36-61, based on Camagni, R. (2008), "Towards a concept of territorial capital", paper presented at the 47th European Regional Science Association Congress, Paris.

The elements amenable for territorial co-operation are core to this structure and are to be found in the bottom right-hand quadrant of the matrix, encompassing in particular co-operation networks (in the centre of the "Innovation Cross"), relational capital and social capital (Courtney et al., 2010). These are specific examples that should be intensified in future policy considerations.

"New" rural Cohesion Policy

The analysis of macro- and micro-scale patterns of rural change and differentiation provide a set of policy implications for principles, but also for consultation in the current policy reform discussion. There are three broad propositions derived from the findings of the EDORA project for the foundation of a coherent policy rationale:

- Since inter-relations and "non-Euclidean" space are becoming increasingly important as a base for local economic and social activities in a globalised world, intangible assets will become the key to enabling rural regions to fulfil their specific potential and achieve innovative development pathways. For example, quality wine production in the Rioja region in Spain provided an early access to external markets (Noguera and Mar García-García, 2009).
- The general processes of change that affect rural areas (i.e. the meta-narratives) may be considered exogenous, and more or less similar throughout Europe (and beyond the industrialised world). Rural differentiation would thus be primarily a consequence of local and regional differences in the capacity of regions to respond to the challenges and opportunities perceived by the local population and businesses. In contrast to exogenous impacts by macro-scale forces (often experienced as consequences of globalisation), local activities of rural differentiation can be interpreted as endogenous answers that make the difference. The Ice Hotels in Northern Scandinavia, and other examples that turn difficult climatic conditions into an attraction, are significant examples of this approach.
- Responses might be initiated at various geographical scales and could be divided into two components: some exhibit broad macro-scale patterns of differentiation. These reflect the fact that different types of rural areas reveal different development trajectories. These patterns may to some extent be captured by regional indicators and typologies. Others, particularly the intangible assets, seem to vary in an aspatial way, which can only be captured on a region-by-region (or even lower unit) basis, by some form of qualitative auditing. The case of the Isle of Skye in Scotland could achieve a turning point in regional development through refocusing the area's strong cultural identity (Shucksmith, 2009).

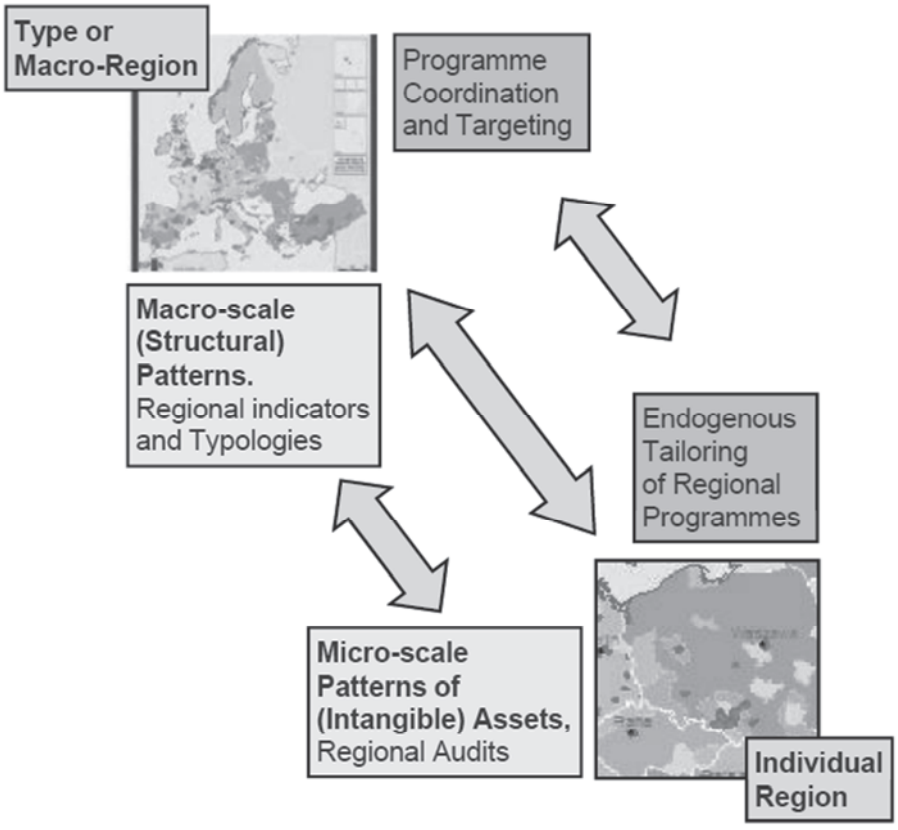
These propositions demand a two-tier policy arrangement that combine targeted horizontal programmes, which take account of the general regional context, with neo-endogenous local development approaches (Figure 3.3). In this sense, the EDORA findings are supportive of the "place-based" approach outlined by Fabrizio Barca in his report for the European Commission (Barca, 2009). They also contribute substantially to core aspects for assessing the relevance of the New Rural Paradigm in OECD discussions and international reflections on the progress of rural development policies.

The EDORA project concluded that:

> As the specific constellation of local and regional assets (both tangible and intangible) vary in a more unsystematic way across Europe, these would have to be assessed through local or regional audits. ... The proposed regional audits suggest a process to take full account of development assets and explore required and most effective activities for each region. These considerations ought to be supported by general guidelines that translate the framework of regional typologies and meta-narratives into a set of relevant intervention priorities… (Dax et al., 2010: 24).

Since global socio-economic trends tend to be the consequence of deeply rooted exogenous processes and thus may be considered effectively immutable, they can hardly be altered substantially by short- and medium-term policy intervention. The realm of territorial capital is therefore the main place for policy intervention. In the past, rural policy has tended to support the more tangible forms of capital, on the lefthand side of Figure 3.2. However, as the study area analysis in the EDORA and other case studies (Steiner et al., 2012) has shown, it is important to consider the full range of types of territorial capital. Whilst in some peripheral regions, and in certain EU new member countries, deficiencies in tangible infrastructure are still a major constraint, in the context of the north and west of Europe, soft factors associated with human and social capital seem to be very important as determinants of performance. It can be assumed that the need for the development of the "soft" or intangible factors in a longer-term perspective is less frequently taken into account in peripheral regions because of the priority given to the immediate tasks of "hard" investments (Copus and Dax, 2011: 127).

Figure 3.3. **Neo-endogenous rural Cohesion Policy**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Source: Copus, A., et al. (2011), Final Report, ESPON 2013 project EDORA (European Development Opportunities for Rural Areas), Project 2013/1/2, Luxembourg, www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/EDORA/EDORA_Final_Report_Parts_A_and_B.pdf.

Given the strong path dependency of policy evolution, there is a risk of remaining in the prevalent sectoral bias. A particular effort is needed to make use of "good practice" to enhance innovative action and creativity in rural development in the future. Some guiding principles emerge from the findings presented above:

- Policy design and implementation structures should be differentiated for intervention aspects on an EU-wide scale, reflecting large-scale differences in economic performance. On the other hand, those aspects that are essentially aspatial should be addressed by local development instruments.
- Careful consideration should be given to the geographical targeting of resources, which has to be oriented more explicitly in favour of regional allocations based upon objective indicators and typologies of potential and absorption capacity.
- The limitation of the mainstream rural policy debate on agricultural and regional policies has to be overcome by setting a wider view of influential policy domains for rural development. The narrow agricultural notion of the concept within the EU and policy implementation in its member countries is restricting the scope of rural development and holding back a stronger integration of rural aspects into other policy areas.
- The local development component should be based, as far as possible, upon "diagnostic audits" of regional challenges and opportunities. It has to be expected that not all the quantitative indicators that might be desired will be available, but these audits should at least follow standard guidelines in the use of qualitative information.
- Local development programmes should be encouraged as far as possible to address less tangible issues that determine the development of translocal networking as a support to innovation and entrepreneurship, and should avoid continuing to prioritise support for "hard" infrastructures.
- Such a policy concept is only feasible within the context of effective multi-level governance. This includes: support to facilitate regional capacity building; a schedule to improve programme design, in particular through encouraging and accompanying rural audits; and the creation of indicators of intangible assets, along with activities to further develop systematic monitoring and evaluation of impacts.

The EDORA working papers (particularly Dax et al., 2010) and the ESPON "Scientific Paper" (Copus, 2010) provide more details about which opportunities and constraints are relevant for different types of rural regions, and what kinds of intervention would be an appropriate response in each context. As this analysis was done in the initial stages of shaping the Territorial Cohesion Policy, it focuses on Cohesion Policy and the CAP after 2013. The project analysis emphasises, in particular, that a tremendous challenge faces European policy discourse in overcoming outdated generalisations and elaborating a rural Cohesion Policy that actually complies with its ambitious objectives (Copus and Hörnström, 2011).

This complex policy framework requires a realistic assessment of the potential and the pace of policy reform. Given the prevalent inertia towards policy changes, it is crucial to expect a reform process of incremental steps towards a policy framework that increasingly includes elements of this approach. One important aspect is to address the gap between public "rural development" discourse and policy implementation by

increasing the links between research and policy through strengthening impact assessment. This discussion has to extend beyond the mainstream rural policy dimensions to make explicit reference to emerging rural opportunities (Dax, 2011: 23).

Conclusion

This chapter sought to advocate replacing existing inaccurate stereotypes with more accurate generalisations about contemporary rural Europe, in order to establish a clear rationale for rural Cohesion Policy. It therefore aimed at broad principles that underpin the need for interventions at two levels, a macro-scale level to address broad systematic spatial patterns of differentiation, and a micro-level, to respond to localised, aspatial variations in territorial capital. It seems important to repeat that capacity development in each rural locality with a vision towards the development of translocal networks is crucial.

However, the evolution of rural development policy is currently slowed down by the straitjacket of agricultural policy. In contrast, this study, and a series of similar case studies, emphasises the relevance of a wide range of policies influencing spatial dynamics in rural regions. Also, the discussion of EU2020 priorities and its flagship policies relate to the framework of coherent policy strategies, including of "soft" factors in policy instruments and their relevance for different regional types, in particular rural regions. The main aspects for cohesion policy in rural Europe can therefore be summarised as follows (Dax, 2011: 25ff):

- The "rural" is increasingly perceived as a social construct, addressing all non-urban regions. With an enhanced understanding of the high diversity of rural regions, the main task is not a fixed spatial typology, but inspired insights on the main rural processes (meta-narratives), aiming to interpret various dimensions of the socio-economic reality of spatial allocation.
- Moreover interaction between places has progressed substantially, so that it is now the main characteristic of virtually all types of regions. The overarching narrative of "connexity" weakens the effect of existing boundaries and indicates an increasing need to take account of "relational" aspects.
- Rural regions are confronted with the enhanced concern for solidarity in recent territorial cohesion discourse for lagging regions. This objective, and the focus on regional assets, can be understood as a specific requirement to address opportunities for rural regions in a range of policy domains.
- In realising this potential, policies have to remain realistic. The pitfall of "stylised fallacies" about the agrarian and "consumption" countryside should be avoided and more realistic generalisations promoted. Actions should focus on concepts for rural assets as main development opportunities and pro-active support for empowerment and co-operative action, taking the shape of "enabling" policies.
- It is important to aim for place-based strategies that seek to enhance the particular amenities and respond to the development needs of specific regional contexts. A menu of policies referring to the different dimensions of social, cultural, economic and natural assets and institutional development of a region would provide a range of innovative instruments from which priority measures could be selected.

Rural Cohesion Policy would thus engage in a flexible, place-based policy to ensure that tangible and non-tangible assets are exploited. This requires considerable adaptations in various policy fields and a focus on governance issues aiming at stronger coherence of programmes. As territorial cohesion involves offering balanced opportunities to people irrespective of their geographic location, it is a particularly relevant concept for linking rural areas with natural handicaps, such as mountains, islands and sparsely populated areas, into the general spatial framework. If respective opportunities are seized by future cohesion policies, innovation and growth processes might also be nurtured more effectively in remote, rural regions.

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Chapter 4

Unlocking rural innovation in the North East of England: The role of innovation connectors

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Recent academic studies and UK policy documents have recognised the increasing role of innovation as a key driver of economic growth, both regionally and nationally. However, there is an assumption in policy making that successful innovation requires concentration of scientific and technological expertise and proximity to knowledge resources, particularly universities, hence the designation of six science cities in England in 2005. Moreover, innovation is generally regarded as a one-directional linear process, involving the translation of knowledge and information generated by high-tech science to end users.

"Rural" per se has largely been missing from national and regional innovation debates. This is not to say that policy makers actively exclude the rural, rather that the characteristics that make rural areas and rural actors (such as businesses) different, and the extent to which they engage with urban-based actors, are largely unrecognised. This raises important questions regarding the role of rural areas and actors in generating and implementing innovation.

This chapter investigates the extent to which rural businesses in the North East of England (United Kingdom) are engaged with key regional innovation actors, including seven "innovation connectors". These are sites highlighted as having the greatest potential for using innovation to stimulate economic regeneration across the North East region. Based on a review of relevant literature and policy, an analysis of findings from a large-scale rural business survey and a series of interviews and focus groups with key actors in the innovation system, the chapter discusses the innovative potential of rural businesses and the likely benefits of engaging with knowledge institutions, including the designated innovation connectors, in the region. However, the chapter also highlights several challenges faced by rural firms in seeking support to develop their innovative potential. The chapter concludes by drawing some implications for future strategies and policies to promote rural innovation.

Introduction

Innovation is increasingly recognised as a key driver for economic growth at the heart of the knowledge economy (OECD, 1996). Moreover, given the severe economic and social challenges that have confronted the world in recent years, there is growing recognition that "innovation will be increasingly needed to drive growth and employment and improve living standards" (OECD, 2010: 9). At the EU level, the Commission intends to make innovation its overarching policy objective. Innovation Union has been created to drive this initiative. In the United Kingdom, innovation is also high on policy makers' agendas. This is confirmed not only by the existence of the Department for Business, Innovation and Skills (BIS) and the Technology Strategy Board, the United Kingdom's innovation agency, set up to accelerate economic growth by stimulating and supporting business-led innovation, but by key policy documents. The "Innovation White Paper" (2008) sets out the political ambition to make the United Kingdom an "Innovation Nation". The latest "Innovation and Research Strategy for Growth" (2011) "sets out the [g]overnment's approach to boosting investment in innovation and ensuring UK success in the global economy" with "universities and research, entrepreneurship and risk taking, greater connections between people and organisations, … at the heart of [this] approach" (BIS, 2011: 5). Nevertheless, innovation policy in the United Kingdom tends to remain "spatially blind", making no differentiation between urban and rural locations (Nesta, 2007a). Indeed, "rural", per se, does not feature in any national and/or regional innovation debates. Worse still, rural areas tend to be overlooked, though arguably not deliberately excluded, by urban-focused policy makers. They are typically perceived as playgrounds or dormitories for city dwellers rather than areas capable of generating innovative economic activity (Nesta, 2007a).

Some recent studies (e.g. Atterton et al., 2010; Defra, 2010; Nesta, 2009; Commission for Rural Communities, 2008) stress the key role of innovation in the development of rural economies, particularly the innovative potential that characterises rural businesses and the likely benefits of engaging with regional knowledge institutions. This raises important questions regarding the role of rural areas and actors in generating innovation. In the North East of England, seven "innovation connectors"[1] have been highlighted as having the greatest potential for using innovation to stimulate economic development. Each innovation connector is different, but their functions include providing facilities, support and networking opportunities.

This chapter investigates the extent to which rural businesses in the North East of England are engaged with key innovation regional actors. More specifically, it explores ways in which innovation connectors and Newcastle University work with rural businesses and the extent to which their involvement in the innovation system is truly regional in scope. The chapter develops some recommendations about how rural businesses might engage better with key actors in the regional innovation system, so that together, they can contribute to wider regional prosperity. In doing so, the chapter aims to contribute to the limited empirical evidence regarding the role of innovation connectors and universities in encouraging innovation in rural areas, particularly in more peripheral regions such as the North East of England.

To achieve these objectives, a three-stage methodological approach, i.e. a desk-based review of the literature and policy context, has been employed, as well as an analysis of a 2009 rural business survey database and a series of interviews and focus groups with key actors in the innovation system.

The chapter is organised as follows. The first part reviews the literature and policy context for innovation in rural areas and the role of innovation connectors and universities in generating innovation. The methodology is described in the following section, followed by the main findings. The final section concludes and highlights some policy implications.

Innovation in rural areas: A literature review

Before reviewing key literature on innovation in rural areas, it is worth noting that numerous definitions of innovation exist in both literature and policy. Some definitions are narrowly focused, regarding innovation as a linear, scientific and technical process. Taking a broader definition, innovation can be regarded as having many forms, including working in new ways (e.g. applying new ideas or bringing people together via new networking methods), developing new products and services, or adapting proven techniques to new situations. Using this definition, innovation may be incremental or radical, and often involves many different stakeholders in a dynamic, interactive process (the latter is sometimes described as an innovation system). When reviewing relevant literature, it is important to note that different researchers take different approaches to defining innovation.

In the 1990s and 2000s, a considerable body of research focused on exploring the characteristics of rural businesses and their innovative behaviour, usually broadly defined and often in contrast to their urban counterparts. For example, Keeble et al. (1992), Hoffman et al. (1998) and Smallbone et al. (2002) found that rural businesses are more innovative than their urban equivalents. North and Smallbone (2000a, 2000b) also acknowledged that rural small and medium-sized enterprises (SMEs), including those from more remote areas, displayed significant levels of innovative activity. For some businesses, remoteness appears to be a stimulus for innovation (North and Smallbone, 2000b). While some researchers (e.g. Keeble and Tyler, 1995) suggested that businesses in "accessible" rural locations were more likely to target new markets and were more frequently involved in innovation than businesses in urban and remote rural locations, others (e.g. Smallbone et al., 1999) argued that characteristics of the rural environment, such as low population and business density, drive rural businesses to become more innovative. Keeble et al. (1992) and Keeble and Tyler (1995) also found that rural firms exploited niche markets more successfully than urban firms.

More recently, the United Kingdom's *Sub-national Review of Economic Development and Regeneration* acknowledged that overcoming the problems associated with scarcity and distance has led local businesses to explore novel working practices and new ideas (HM Treasury, 2007). The Commission for Rural Communities (2007) also admitted that rural businesses make more extensive use of information and communications technology (ICT). Other researchers (e.g. Henderson, 2007) argued that rural areas lag behind when it comes to innovation – here based on a more tightly defined, linear innovation process – with size and distance limiting rural entrepreneurial ability to produce radical innovation. A recent report on business innovation in rural areas, produced for the Department for Environment, Food and Rural Affairs (Defra, 2010) also stressed that "rural firms appear to be performing less well when it comes to some aspects of innovation, such as patents, proportion of knowledge-intensive businesses, innovation intensity". These might be regarded as more "traditional," linear forms of innovation. The report highlighted the variation in business innovation within rural areas, with some evidence of weak performance in more peripheral areas such as the North East and South West of England.

It is often argued that rural areas lack the benefits of agglomeration, for example as a result of a lack of critical mass of businesses to benefit from knowledge spill-overs (OECD, 2006). However, more recent research has highlighted the considerable potential that exists for innovation in rural areas, if a broader definition of innovation is taken, beyond formal, science-based innovation based on patents or large R&D spending. For example, Nesta[2] (2007a) showed that traditional rural industries are increasingly important sources of innovation for urban communities, such as biofuels and materials based on fibre crops. Demands from current challenges such as climate change have driven innovation in both rural and urban areas, for example, in terms of new weather monitoring systems (Nesta, 2007b). Often innovation occurs almost spontaneously as an offshoot of other activities (e.g. agriculture and local crafts) and various demonstration projects achieve innovation in the social and cultural milieu, new forms of organisation or co-operation, or building social capital (Dargan and Shucksmith, 2006). Innovation in peripheral regions is often small-scale and incremental in nature (Doloreux and Dionne, 2008) and mostly based on modifications to traditional practices or products rather than radical change.

Recognising the potential breadth of new roles for rural areas in terms of contributing to innovation, the 2008 UK Rural Advocate's report to the Prime Minister (Commission for Rural Communities, 2008: 9) highlighted the need for innovation in rural economies "to boost product and service development, to deliver consumer needs … to harness environmental qualities and services and to empower and increase the resilience of communities". The report also stressed evidence of an urban bias in innovation policy, with too much of a focus on technology and on urban-located innovation institutions, assets and drivers, leaving rural areas overlooked. Many small firms in rural areas do not reach their potential; hence, boosting innovation amongst small rural firms is a clear imperative, as is devising more appropriate means to identify and measure it.

Whilst rural areas continue to face key challenges in terms of a thin economic base and a weak knowledge economy, partnerships, a distance-neutral infrastructure, investment in knowledge transfer and support for the individual were put forward as drivers for rural innovation (Nesta, 2007a). Hauser (2010) also highlighted the need for rapid innovation and technological change in the 21st century, spurred on by the challenges we face, including climate change and the demands of an ageing society. These are two challenges where rural areas could be at the forefront of developing innovative approaches, first, given their natural resources and the potential to contribute to climate change adaptation and mitigation, and second, given that the rural population is ageing faster than the urban population.

Innovation policy, universities and science cities

There is a strong assumption in policy making that the "UK innovation policy revolves largely around creating innovation hubs and technology clusters in and around cities and urban economies" (Nesta, 2007a: 5). Successful innovation, the argument goes, requires concentrations of scientific and technological expertise and proximity to knowledge resources, particularly universities. This perspective has been accompanied by debates about competitiveness of city regions and by major national initiatives such as science cities in the United Kingdom. Indeed, it has been argued that universities play a key enabling function in bringing together regional learning and innovation and constructing regional advantage through knowledge commercialisation, innovation licensing and spin-outs (Jaffe, 1986; Anselin et al., 2000; Dargan and Shucksmith, 2006; Nesta, 2009). Etzkowitz (2005) stressed that the basic attributes of universities make

them especially propitious sites for innovation, including the high rate of flow of human capital (i.e. the students, who are a continual source of potential inventors), since the university, as a natural incubator, provides a support structure for teachers and students to initiate new intellectual, commercial and conjoint ventures. Universities are also seen as seedbeds for new interdisciplinary scientific fields (a source of economic growth and intellectual distinction) and new industrial sectors (*ibid*.). Conceptual perspectives on the innovation process differ, however, amongst researchers. For example, while "triple helix" models of innovation envisage positive collaboration between university, industry and government within a region (Etzkowitz, 2002; Etzkowitz and Leydesdorff, 1997) "innovation systems" models tend to focus on organisational capabilities, networks and the boundedness of innovation systems (Edquist, 2004). However, given the urban location of almost all universities, this would appear *prima facie* to be an oversight, which might give preferential opportunities to urban businesses. Furthermore, there is little empirical evidence regarding the role of universities in encouraging innovation in rural areas, particularly in more peripheral regions such as North East and South West of England, generally characterised by a weaker performance of business innovation (Defra, 2010). This will depend on a number of factors, including the extent of spill-over effects from urban-based universities, the absorptive capacity of rural businesses and their limited understanding about how to engage with higher education institutions (Atterton, 2005).

The central role of universities in the innovation process is clearly a fundamental part of the rationale behind the UK government's designation of six science cities (SC)[3] in 2005. Designed by the former Labour government as partnerships between the regional development agencies,[4] local authorities, universities and the private sector, the SCs were heralded "to foster innovation in the British economy by creating closer partnerships between academics, researchers, entrepreneurs and business leaders" (UK Trade and Investment, 2009: 9). Part of the rationale for designating the SCs was to draw scientific and research excellence outside the "golden triangle" of London, Cambridge and Oxford, where such activities have tended to concentrate and, hence, to reduce economic disparities between the north and south of England.

However, Garner (2006) argued that the science city status was presented as a challenge to the designated places to step up their economic performance. Initially, no new funds were identified to support development, and each of the six cities had the scope to examine which model it wished to adopt, according to its own characteristics and taking global best practice into consideration. Hence, each of the six science cities is slightly different in terms of the focus of its activities and the way in which activities are carried out. Each builds on existing partnerships and skills bases to create advantages.

All of the above points raise the question of whether the role of universities and science cities in stimulating innovation is limited to cities or urban areas, or whether the benefits can be spread across both the cities and rural areas of regions. The findings of Roper et al. (2006) on the Scottish innovation system suggested that the benefits do not spread widely and that the links between rural businesses and the country's universities were limited, thus excluding rural areas (in this case rural local authorities' districts) from the positive dynamics associated with the national innovation system. In contrast, other research has found that knowledge generated at universities does spill over into the surrounding locality (Acs et al., 2005) whilst Anselin et al. (2000) indicated that positive spill-overs from university research can have a positive impact on the levels of innovation up to 75 miles from the university itself. Critically, Castells and Hall (1994) recognised that the isolation of research activities has little effect on innovation if the surrounding

"milieu" (including economic, social, political and institutional features) is not supportive of linkage to the regional economy. Hence, universities and science cities must embrace connections with firms and communities and other key players if they are to be a success (Garner, 2006: iii).

The Newcastle Science City (NSC) initiative draws on these theoretical approaches. Emphasis is placed on linking together key elements of the region's learning infrastructure with designated "centres of excellence" and the region's businesses in order to capitalise on science expertise and generate new ideas, innovations and businesses. The aim of NSC is threefold: *i)* to position Newcastle at a global level as a city of science excellence in ageing and health, sustainability and stem cells; *ii)* to create prosperity for the city and wider region by supporting the creation of new businesses and jobs and assisting the existing businesses to innovate and grow; and *iii)* to ensure that the local communities, particularly young people, play their part in the development of science (Newcastle Science City, n.d.).

Alongside the designation of Newcastle as a science city, seven "innovation connectors" were designated in the North East region. These are locations that have received significant ongoing public sector investment, and are regarded as having the greatest potential for using innovation to stimulate economic development. They are effectively business clusters, each with a clear geographical and sectoral focus, but each aiming to stimulate economic activity, competitiveness and knowledge exchange across the region. Each of the seven locations in the programme is different, but between them, they: provide leading-edge facilities for R&D and commercialisation (by businesses and universities); provide support geared towards the needs of SMEs with high growth potential (and their supply chains); engage in community awareness and engagement actions related to science, energy, technology and innovation; create and promote employment opportunities; and facilitate networks to enhance co-operation between SMEs in key sectors. Interestingly for this study, while the majority of the seven locations are in urban centres, two are rural in their location, and these form the focus of the analysis in this chapter.

Methodology

To address the aims of this study, a three-stage methodological approach was employed. This included a desk-based review of the literature and policy context, an analysis of the 2009 *Rural Business Survey Database* and a series of in-depth interviews and focus groups with key actors in the innovation system, including a small number of rural businesses. The qualitative methods were employed to discuss the key findings from the two previous stages and to explore ways in which rural businesses could engage with innovation players, particularly Newcastle Science City (NSC). The review of relevant literature and policy documents informed the analysis of the survey database and the selection of topics to be covered in the interviews and focus groups. This was followed by an in-depth analysis of a large database of (957) rural businesses from the North East of England. The database was created following a Rural Business Survey (RBS) carried out in early 2009 by one of the authors.[5] In the survey, businesses were asked *inter alia* to indicate if they had introduced any form of innovation in the last five years. They were also asked if they had worked with any external organisations or partners in introducing the innovation (e.g. another business, university staff and innovation centre). Analysis of these responses made it possible to ascertain the extent and type of innovative behaviour

undertaken by the rural business sample, and different sectors within it, and the extent to which rural businesses worked with external organisations in introducing innovation.

Following on from the database analysis, in-depth interviews and focus groups were conducted between December 2009 and April 2010 with: *i)* three "innovation connectors" – Newcastle Science City, the National Renewable Energy Centre (Narec) and the North East Technology Park (NETPark); *ii)* Newcastle University; *iii)* rural businesses; and *iv)* national and regional policy makers, i.e. representatives from BIS, Defra, the Northern Way and the Regional Development Agency One North East (ONE).[6] Narec and NETPark were deliberately chosen, as they are not located in urban centres in the region.[7] Representatives of three rural businesses were selected to be interviewed due to their existing links with NSC. Overall, 25 people were consulted.

The interviews and focus groups followed a semi-structured discussion guide. This consisted of a set of "house rules" for conducting an interview/focus group and a checklist of questions and topics for discussion. However, where appropriate, the interviewer allowed for broader exploration of topics of particular interest or relevance to the interviewee or focus group participants. The discussion was structured around two major sets of questions. First, a set of general questions emerged from the literature and policy review and the RBS analysis. This was addressed to all selected key innovation players, thereby allowing for comparisons. The general questions were grouped around the following major topics: *i)* How does "rural" fit with the aims/objectives of each key player and within the broader innovation policy context? *ii)* How do regional innovation connectors engage with each other? *iii)* How do key players in innovation engage with rural businesses? and *iv)* What are the major challenges that innovation key players face when working with rural businesses?

The second set included specific questions targeted to draw out issues of particular relevance to the individual or organisation being interviewed, thereby generating a better understanding of the aim and functioning of key players and their role within the innovation system. The interviews with the rural businesses were mainly focused on their understanding of and engagement with NSC and Newcastle University, but links with other regional innovation connectors were also explored. The interviews and focus groups lasted for one to two hours. Some were recorded to allow for full transcription, whilst in others, the researchers took detailed notes for subsequent write-up. Participants are not referred to by name in the analysis but instead, quotes are coded as follows: "NSC" for Newcastle Science City participants, "Narec" for Narec participants, "NU" for Newcastle University, "PM" for policy makers and "RB" for rural businesses. Each of these codes is followed by a number. Quotations are intended to enhance the depth of understanding and reflect the views of participants, unless indicated otherwise.

Findings

Rural Business Survey analysis

Across the total sample of 957 businesses, 46.4% (444 respondents) reported that they had introduced an innovation in the last five years. The innovation ranged from introducing new products, new methods of working (such as new accounting or bookkeeping systems), new equipment, new IT systems, changing the way of working with customers or targeting new markets. Only 15.4% (147) of total businesses reported that they had worked with an external organisation in introducing the innovation. The organisations mentioned included private and public sector business advisors, IT

consultants and web designers, universities, public sector organisations (including local authorities) and various funding bodies. Exploring the characteristics of the sample further, it was revealed that "newcomers" were the most innovative business owners (people who had moved to the rural North East as an adult; 48% of those surveyed reported that they had introduced an innovation in the last five years). This is compared to 41% of locals (people who were born and had always lived locally) and 11% of returnees (who were born locally, moved away and then returned as an adult). This reinforces other evidence regarding the importance of in-migrants as sources of innovative activity in rural economies. The most innovative sectors were "professional, scientific and technical" (19%), "wholesale and retail" (16%) and "manufacturing" (11%). Almost three-quarters of the owners were male, 60% were aged 50 or older and 61% reported that they had at least a first degree.

Analysis was also carried out to ascertain the numbers of businesses in the sample that could be classified as operating in the three major scientific themes that constitute the core of the NSC (ageing and health, sustainability, and stem cells and regenerative medicine). Some 15 businesses were identified as operating within the first theme, 12 in the second and 2 in the third theme, perhaps reflecting the potential relevance of the first and second themes to rural areas (given the speed of demographic ageing in rural areas, and the importance of sustainability issues). Of these 29 businesses, 15 were operating in the "health" sector and 11 in "professional, scientific and technical" activities. Most of the owners (21) were male, over 50 years old (14) and had a postgraduate degree (18). Innovations undertaken by this sub-sample included introducing new IT systems, new products and new training schemes. Less than half (12) of this sub-sample planned their business expansion in the short term (2 years) and only 9 had a long-term view (10 years).

Representing only 5.3% of the total RBS sample, 51 businesses reported that they had had a connection with the university. The highest proportions were in "manufacturing" (18%); "professional, scientific and technical" activities (18%); "wholesale and retail" (14%); and "agriculture" (12%) sectors (reflecting the largest sectors in the sample as a whole).

It is also important to note a range of other characteristics of rural businesses that were analysed throughout the entire sample of 957 businesses. These features are important to take into account when devising policies designed to support rural businesses, including with regard to innovation. Over 38% of total respondents reported that their business was attached to or part of their home. This excluded businesses in which farming was the main activity. Microbusinesses and sole traders made up 88% of survey respondents. While 82% of respondents reported that their broadband provision was adequate for their current business needs, only 65% of respondents said that it was adequate for their future business needs. While the highest proportion of respondents was motivated by the need to generate a main income, sizeable proportions were also motivated by a desire to change their work-life balance, to take on a new challenge, to develop a personal interest and to exploit a new market opportunity. These results suggest that rural businesses and their owners may have some characteristics that differ from urban businesses and, thus, that policies require modifications to ensure that they serve both urban and rural businesses effectively.

Interview and focus group analysis

The role of "innovation connectors" in the regional innovation system

Within the focus group carried out with five top managers from the NSC, there was an overall feeling that the designation of "Newcastle upon Tyne" as a science city represented a good opportunity for ONE, its Regional Development Agency, Newcastle City Council and Newcastle University to come together to create an innovation strategy that will stimulate regional economic growth. In addition, the purchasing of the Scottish and Newcastle Brewery site as the location for Science Central helped to strengthen the partnership. In the view of one of the participants: "Newcastle was designated as a science city because of scientific excellence that came from our universities and centres of excellence and industrial engagement through our science excellence" (NSC1).

The NSC is run by a company limited by guarantee, Newcastle Science Company Ltd, which was set up in April 2009 to co-ordinate the efforts of all regional partners. The provision of a "vehicle" through which to channel funding, implement tangible projects, build partnerships and deliver added-value services was seen as essential by all founding partners. All 3 partners provided funds for the company, and at the time of the research, the company employed 23 people. The staff covered five major strands of activities: science business creation, science infrastructure, science networks, education and community, and the Newcastle Innovation Machine (NIM). "Science business creation" linked science with businesses, aiming to support the businesses in generating high-growth revenue and employment opportunities. "Science networks" enabled collaborative working regionally and internationally. "Education and community" fostered the engagement of the whole Newcastle local community, particularly young people, with science and technology. The "Innovation Machine", supported by a team of six business and innovation experts, was perceived as the "flagship project which is aimed at promoting high-growth companies" (NSC1). Its uniqueness and strength lie within its creation, a demand-driven business model that assists entrepreneurs to identify unmet needs, find solutions and set up high-growth, sustainable businesses.

To achieve its aims, the NSC has to engage and connect with its founding partners, but also with other local, regional and national innovation actors. The role of Newcastle University within the partnership was seen as crucial. The university not only contributes financially, but provides infrastructure and leadership and is involved through science and technology expertise across the five strands of work. Moreover, the university took the lead in the identification of the areas of excellence, the science themes that constitute the core of the NSC: " … the university has aided in identifying the themes and building a science credibility. Our role … is to make sure that we understand the offer in the context of the region and the global direction" (NSC1).

The NSC fits within the wider innovation policy context through an active engagement with other key innovation players at both national and regional levels. The NSC's staff met regularly with the other five science city teams to inform each other about their activities and share experience and ideas. All science cities wanted to ensure that their voice is heard by the government. At the time of the interview, they were working on a collective policy paper, which identified and highlighted the important areas of support required from any incoming government. By working in partnership, the "science cities can add value to other innovation hubs, and this will reinforce national quality" (NSC5). Working in collaboration with the other regional innovation connectors was also perceived as very important, and small steps were taken to support partnerships:

> We believe we have a core offer of innovation support services that are unique to Newcastle Science City, and we offer more peripheral services that are not unique to us, but part of a package. That is why we work with the innovation connectors. Also they offer things unique to them. For the past year, we have been actively looking for partnerships with the innovation connectors through formal partnerships, a memorandum of understanding (NSC1).

The second interviewed innovation connector was Narec, the National Renewable Energy Centre. Ten senior staff members agreed to take part in the focus group. Narec was established by early 2000 by ONE and envisaged as a "centre of excellence" for delivering world-class innovative technology for new and renewable energy. As renewable energy was becoming a "hot" issue on policy makers' agenda, the creation of a company to deal with this issue was considered by regional policy makers as a good opportunity. The company was set up at Blyth (in Northumberland), because of its "history of heavy engineering … with shipyards and the docks" (Narec3), but also because the space became available with portside access. It employed around 120 people, with half of the funding provided by ONE. However, as public funding was only temporary, the company had to expand and develop its commercial side. During the focus group, Narec was described as an innovation connector with two different roles: a supplier of public goods, more precisely support for those companies within the region that are looking to invest in energy technologies, and as a supplier of R&D for the private sector at the regional and national level. Given its profile, Narec fits well within the broader national innovation context. Indeed, Narec features amongst the most important national players in the UK's Low Carbon Industrial Strategy.[8] Its focus is primarily on engineering and industry consultancy, but the company also provides business support services and world-class testing and demonstration facilities for the renewable and electrical power sector. Four major sectors constitute Narec's work: offshore and onshore wind energy, marine renewables, electrical networks, and wave and tidal distributed energy.

> Narec engages to a greater or lesser extent with other regional innovation key players. There was no overarching strategy guiding work with the university, but in the opinion of the participants, there was considerable room to strengthen this relationship. Its links with Newcastle University tend to be on an individual or project basis rather than anything formal. Amongst participants there was also a perception that universities have a different role in terms of innovation development: "… universities have a very different role in terms of innovation development. Things may not be technically applicable and research may have not any application. Whereas … all the work we do is pretty much focused on product" (Narec6).

In contrast with the NSC focus group, where participants were happy to stress the existence of strong links between them and other innovation connectors (including Narec), participants at Narec did not feel that their relationship with NSC was well developed. Some did not fully understand its role within the innovation system:

> We know of it on the periphery. There is no real tie-up between us and science city (Narec3).

> You have mentioned science city a few times, and I'm still struggling with the concept of science city. What does it do (Narec8)?

The lack of understanding of the NSC's role and the poorly developed relationship between the two led some participants to perceive the NSC as a regional competitor rather than as a collaborator. However, it should be acknowledged that at the time of the interviews, the NSC was one year into its three-year programme of building regional partnerships, and that this work has continued since then.

The third selected innovation connector was the North East Technology Park (NETPark), located in a rural location outside Sedgefield in County Durham. A senior manager responsible for innovation agreed to be interviewed face to face. The company's history goes back some 20 years, when County Durham Development Company was established as a solution to the closure of traditional (mining and heavy) industries. It was used to attract businesses through inward investment and sustain indigenous companies in the region. However, with the transfer of many (manufacturing) businesses to Eastern Europe, a new approach was required. A science park model, based upon the North Carolina Research Triangle Park, was chosen as a way of attracting high-quality jobs to the area and increasing supply chain jobs in construction, housing, retail and schools. Its area of strength was electronics. It developed into an innovation connector site only after ONE was looking for the formation of "centres of excellence" within the region. Funds were provided by ONE, the Technology Strategy Board and the European Union, but businesses also pay for the services available. A virtual version entitled NETPark NET, which supplies the same services as the "mother-firm" (e.g. intelligence services, business support, fund finding and looking at investment readiness) has extended the business beyond the region.

NETPark has strong links with the region's universities in both formal and ad hoc ways. Durham University leases a building on site. The five North East university chancellors are on the company board, but experts are also engaged on an ad hoc basis when necessary. In contrast to Narec, NETPark has better links with the other innovation connectors, including Newcastle Science City. The connectors meet up once every quarter.

Overall, the three innovation connectors play an important role in the regional innovation system and in the wider national system. Each has a relatively well-defined role in the region, based on particular sectoral strengths. It is apparent, however, that relationships between them could be strengthened to the benefit of the system as a whole, including private sector businesses, and those in both urban and rural locations. Links exist between the innovation connectors and the region's universities, although many of these relationships exist on an ad hoc basis, and there is some sense in which additional benefits would accrue if they could be formalised. Given the need to tie all regional actors into the region's innovation system, the location of two of the seven innovation connectors in rural areas is perhaps significant, although there was no sense in which either of them is in its location because it is "rural". Location could be seen as a weakness (e.g. in terms of transport availability and costs) but also as a strength, as it serves to attract a variety of companies and businesses to a location that is different from traditional urban centre locations. While the rurally located innovation connectors are certainly not precluded from working with businesses in the local area around them, it is certainly true that more could be done to tie the connectors more proactively and positively into the rural context in which they are situated, perhaps by drawing local businesses more closely into their work, or even having an event or a stream of work focused on innovation in the local rural area. There is also the potential for the two rurally located innovation connectors to work together to jointly boost their links with rural businesses, perhaps sharing best practice ideas and approaches.

Innovation connectors and rural businesses: Do they connect?

In line with findings from the literature, engaging and working with rural businesses is not a specific focus for any of the consulted regional innovation players. However, although rural areas and businesses are not an explicit focus, they are also not explicitly excluded. The location of the business does not matter when it comes to making an approach and offering support. Nevertheless, the three selected innovation connectors struggled particularly with the definition of "rural" and what defines a business as "rural". Some respondents recognised the traditionally held perception of rural businesses as mostly agriculture-based, but acknowledged that rural economies encompass much more than this.

> Whether it is urban or rural it should not matter. It is where they can do their business. It is like talking about a car, whether it is a blue or green car, but a car. This urban rural thing is not a feature for us. (Narec9)

Just as the innovation connectors did not attribute significance to a firm's location, Newcastle University does not have a separate strategy of engagement with and support for rural businesses. The interviews suggested that business location makes no difference: "Rural businesses are welcome to come along and ask for support, as any other businesses" (NU2). The university connects with businesses in different ways and at different levels (e.g. through its Business Development Directorate, commercial projects and specific faculty and school programmes), no matter where they are located.

It is interesting to note, however, that the three regional innovation actors acknowledged the potential for entrepreneurship in rural areas, with rural businesses perceived as being very innovative. This is in line with previous studies, e.g. Keeble et al. (1992), Smallbone et al. (2002), Nesta (2007a) and Atterton and Affleck (2010). Moreover, participants recognised that this potential is not always automatically accepted by those who are practicing it as being innovation per se. This was particularly the case for small businesses, which often do not capitalise on their innovation. Farmers are also good examples in this respect. It was suggested that innovation tends to take place in well-defined and organised rural communities. Those participants who worked more closely with rural communities saw great potential for them to come together as likely innovation incubators, hence making them different from urban communities.

Overall, participants felt that there were no particular challenges in working with rural businesses when compared with urban businesses. However, some barriers were mentioned in terms of working with small businesses, including the lack of an up-to-date register of SMEs, a lack of critical mass or critical capacity, and the limited number of capital grants available for small businesses.

The perspective of rural businesses

Three businesses, i.e. a biomass boiler producer, a branding and design company and a consultancy business, located in three different rural areas (Alnwick, Hexham and Whittingham) from the North East of England were also interviewed. They were chosen due mainly to their existing links with Newcastle Science City. The business owners were identified as having attended at least one "First Friday" networking event.[9] In addition, one of them approached science city staff to talk about a specific business idea he had and worked it through the Innovation Machine. All three business owners found the "First Friday" event useful and effective. It brings together an "eclectic, good-quality mix of people and creates a great opportunity to network and exchange business cards" (RB2).

Meeting new people and connecting with those who share the same interest in innovation is clearly the most important benefit of attending these meetings. "Informal networking amongst rural business owners leads to a groundswell of wealth creation" (RB3). However, the owners acknowledged the distance that they were required to travel to attend these meetings in the centre of Newcastle, but all felt that it was worth it.

Some less optimistic views were expressed when the respondents were asked about their connections with other regional innovation actors, such as Narec and Newcastle University. The relationship of one of the businesses with Narec, for example, was described as "long and stressful … not good at helping SMEs, but rather tended to trample all over them" (RB2). The evidence of links between rural businesses and Newcastle University was also limited. One interviewee noted that, "from previous experience, the working style and timings [the operating environment] of businesses and universities were not compatible" (RB1). Businesses do not have time to wait for the university to come forward and cannot wait for funding decisions that may take considerable time to come through, or will not come at all. Newcastle University is good at spinning out business ideas; however, it was acknowledged to be easier to do this if individuals/businesses were physically present on site, or at least closer to the university. The interviewees stressed that universities need to look more closely at what they are and what they are there for, but accepted that it is hard to change the behaviour of academics, due to the pressure to publish. Academics need to be incentivised to work in different ways. There were some examples of good working relationships, with one interviewee (RB3) recalling working closely with a researcher in marine engineering at Newcastle University.

Overall, it was acknowledged that awareness of innovation connectors, including NSC, in the rural parts of the region is low. It is certainly the case that the three business owners interviewed were exceptionally well networked and engaged in highly innovative businesses and, thus, perhaps do not represent the average small business owner in a rural (or indeed an urban) location. The interviewees felt that the NSC needed to be more pro-active in advertising the services on offer to rural businesses, through the local/regional media. This would help to boost awareness of the NSC initiative and what it has to offer. Despite their positive views, the interviewees questioned whether the NSC would see enough value in rural areas, not least as a result of its own targets and funding requirements. The feeling was that all regional innovation actors will struggle to be genuinely rural unless they pro-actively target rural businesses. There was certainly a sense that "more could be done to help rural businesses to unlock the innovative ideas that are land-locked in rural areas" (RB2). This implied not only business support (including access to finance) from policy makers but also support within the business environment itself. The creation of a peer group of forward-thinking rural business owners to lead others was a good example in this respect. Additionally, more could be achieved by working collaboratively, including through existing networks, such as the National Entrepreneurs Forums, where examples of good practice can be shared. It was also important to have greater rural involvement in all kinds of regional institutions and programme designs. More broadly, as an implication that applies equally to urban and rural businesses, it was felt necessary to stop chasing the grant funding and encourage long-term strategic investment in companies that will benefit them and the region in the longer term.

Conclusions and policy implications

This chapter aimed to explore how key regional innovation players from the North East of England engage with rural businesses and the extent to which their involvement in the innovation system is truly regional. The literature review outlined the existing research on innovation by rural businesses, identifying similarities and contrasts, with some finding rural firms to be more innovative than others. Existing evidence on innovation, based on patents, for example, has tended to reinforce the notion that urban areas are the generators of innovation. However, this may be largely because the definition of innovation that is used is based on formal, science-based innovation, using data on patent numbers and R&D spending levels, for example. This kind of innovation tends to occur in large-scale businesses in urban locations, supported by the "innovation infrastructure" of urban locations, such as universities and other knowledge providers and generators.

More recently, the innovative potential of rural areas has come to the fore, e.g. in terms of climate change-related technologies and new crops, particularly as researchers and policy makers have started to take a broader, more flexible definition of what constitutes innovation. Moreover, rural areas are at the forefront of key socio-demographic processes such as ageing, and therefore have the potential to be at the leading edge of devising and implementing innovative responses to the challenges and opportunities that these processes bring. Rural areas are also important sites for the installation and application of renewable energy technology. These findings were supported by the analysis of the database of the 2009 Rural Business Survey (RBS), which showed that almost half of the businesses surveyed had undertaken a form of innovation, broadly defined, in the last five years.

The interviews and focus groups brought evidence that key players in the regional innovation system did engage with rural businesses, but that an urban-rural distinction was not important to any of them. A business is a business, no matter what its location. However, there is no clear understanding of what makes a business "rural". During the interviews and focus groups, participants could recall specific examples of businesses in rural areas (Hexham or Rothbury) that they had supported, but neither of the innovation connectors, nor Newcastle University, kept a record of the location of the businesses with which they interacted. A recording of the location of these businesses would be helpful in demonstrating the region-wide (i.e. rural and urban) impact and reach of the regional innovation system. Additionally, some may argue that a clear definition of what a "rural business" means is also essential.

There was recognition amongst participants that much innovation occurs in rural areas, and that this is likely to be even more so in future, offering opportunities to be tapped into. However, there was a danger that small-scale, incremental innovation in rural areas (by sole traders and microbusinesses) might be overlooked in favour of large-scale, urban-based projects. There was certainly a sense amongst the rural business owners and the focus group participants at the NSC that more could be done to help rural businesses to unlock their potential.

From these key findings, a number of implications can be highlighted for the regional players engaged in innovation. It is clear that there is no distinction between rural and urban areas when it comes to innovation. However, work is needed to ensure that the traditional perceptions of rural areas as less innovative and dominated by the primary sector are countered, and that account is taken of the differing characteristics of rural

businesses, such as the lack of critical mass or the motivations of rural business owners. For example, in many cases, less emphasis is placed on profit generation, while greater emphasis is placed on taking on a new challenge or changing the owner's work-life balance. Many rural areas now encompass a wide range of economic activities, and have seen large-scale investment in infrastructure (including broadband) and an influx of well-educated, highly skilled, resource-rich and forward-thinking in-migrants in recent years. All of these can be capitalised on to boost innovative activity. The innovative nature of many activities undertaken by rural businesses may not be recognised by the owners themselves or by the institutional support infrastructure around them. Hence, the need for a broader definition of innovation, which will go beyond patents, R&D spending and high-technology, and high-profit activities. Innovation may also involve the adoption of a technique that is new to a specific business, sector or geographical area. However, rural businesses also face a number of challenges, including distance from markets and centres of research, their dispersed nature and poor infrastructure in some areas. These challenges need to be recognised by policy makers when devising innovation policies. The policies themselves, and the methods used to engage with rural businesses and deliver the support, may need to be more sophisticated.

In the North East of England, the NSC and Newcastle University should ensure that their role as key players in the regional innovation system do not stop at the fringe of the urban areas. Two of the NSC's scientific themes (e.g. ageing and health and sustainability) offer great potential for improved working relationships with rural businesses. The NSC's events targeted at businesses operating in these sectors and at businesses located in close proximity to Narec (Blyth) and NETPark (Sedgefield) should help to raise awareness amongst the region's rural businesses about the work carried out by these innovation connectors. The NSC needs to raise awareness of its services beyond Newcastle. Staff could explore the potential for information-sharing events or "roadshows" in rural parts of the region, perhaps tapping into existing business networks and forums. Engaged rural business owners, such as those interviewed for this research, could act as "role models" in encouraging others to engage more pro-actively, both through such events and on a one-to-one basis. The NSC, and indeed the other innovation connectors, could collect more detailed data about the businesses with which they work and which attend events, including their geographical location (ideally their postcode), their size, age and sector. Key innovation players in the region should see each other as partners rather than competitors. This would allow for an improved monitoring of their engagement with different actors and enable specific businesses, geographical areas or sectors to be targeted if remedial action was needed.

Notes

1. Newcastle Science City (NSC), Digital City Teesside, Sunderland Software City, Narec, Wilton Centre, the Northern Design Centre and NETPark.
2. Formerly NESTA, the National Endowment for Science, Technology and the Arts.
3. Birmingham, Bristol, Manchester, Newcastle upon Tyne, Nottingham and York.
4. All (nine) regional development agencies were closed on 31 March 2012 and abolished by 1 July 2012. Their main role was to promote economic growth and innovation at the regional level.
5. For more information, see Atterton and Affleck (2010).
6. Given the dissolution of the ONE and Northern Way and the changes in the political spectrum, the findings of the interviews with national and regional policy makers will not be presented in this chapter.
7. Rural areas are defined as areas forming settlements with populations of less than 10 000 (Defra's definition of 2004).
8. See www.berr.gov.uk/files/file52002.pdf for more information.
9. This is an informal forum that brings together entrepreneurs, science and technology companies, academics and investors to discuss innovation and entrepreneurship. It takes place between 8 and 10 a.m. on the first Friday of each month.

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Chapter 5

A new paradigm of rural innovation: Learning from and with rural people and communities

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In current discussions of innovation, rural people are typically excluded from the creative class. However, the history of Quebec's rural communities shows that they have been and still are very creative, and that we can learn from them. Their innovation is manifested in three basic dimensions of sustainable development: managing natural environments, building instruments or institutions for economic development, and facilitating social life. Under this new paradigm of rural innovation, these innovations are studied as they emerge from within rural communities, as demonstrated by the Quebec Rural University initiative. Rural communities should also be seen as living examples (or living labs) of innovation, as illustrated by the Quebec government's "Rural Laboratory" programme. "Rural clusters" are additional models for rural innovation.

Introduction: Innovation at the heart of the new rurality – we can learn from the rural world

Both scientists and the general public agree that the rural world is characterised by strong attachment to traditional values, and is often lacking in a sense of initiative, creativity and innovation. This, supposedly, is why the rural world is lagging behind in development. We need to change this outlook, imbued as it is with a sort of urban ethnocentrism, and start to recognise the emerging paradigm of rural innovation. Rural communities are innovative places; indeed, innovation is at times vital for them. Their experience can thus be useful to society as a whole. We can learn from rural communities, in particular because they have acquired skills in three major areas that collectively ensure sustainable development: *i)* making productive use of their natural environment; *ii)* managing their economic development; and *iii)* structuring their social organisation.

Forecasting tools identify several strong indicators emerging from these new ruralities. Whether as a result of globalisation, new urban demands, government activism, environmental change or the mobilising action of rural inhabitants themselves, these emerging forms all aim in the same direction: revitalisation of rural communities contributing to the sustainable development of the entire society.

Dominant economic development theory postulates that only large urban centres are capable of innovation because they harbour a creative class that propels economic growth (Florida, 2005). Historically, however, rural areas have also been highly innovative. The new paradigm of rural innovation deals with innovation as a holistic reality.

Rather than clinging to the idea that rural inhabitants need to be taught, a lesson could be learnt from rurality: there is much to learn from country dwellers and their capacity for innovation and creativity. They are continually formulating novel organisational or institutional arrangements to meet the challenges of adapting to a new economy, to adjust local governance or to maintain basic services in small communities spread over a vast territory.

Quebec's rural history illustrates the creativity and inventiveness of rural inhabitants. The country road (*rang*) was their settlement and blueprint for organising their sparsely inhabited rural space. Some examples of their innovative capacity include: working bees to raise barns and maintain public roads; farming circles to provide technical training; fire insurance mutual associations to manage risk; and forest co-operatives to create jobs. Other innovations that emerged from Quebec were joint plans for marketing farm products, implementing fair trade before it became a household term, and the *Caisses populaires*, credit unions that are still a major economic force today.

Contemporary rurality is a living laboratory where devices are invented and institutions founded to meet the challenges of today's development issues. In Quebec, the residents of three small rural villages from the Bas-Saint-Laurent region (Saint-Juste-du-Lac, Auclair and Lejeune in the Témiscouata area, known as JAL), implemented a vanguard co-operative known as the "development co-op". In other forest towns under threat, the formula known as the *sociétés d'exploitation des ressources* (societies for the exploitation of resources) was invented. In agricultural areas, co-ops were created to pool farm machinery, agro-environmental advisory clubs emerged, and the *tables de concertation agroalimentaire régionales* (regional agri-food advisory boards) were set up. To maintain health and education services, public-private and public-public partnerships were created. Moreover, to support such local development,

new agencies were established, including the *centres locaux de développement* (local development centres or CLDs), *sociétés d'aide au développement des collectivités* (aid societies for the development of collectivities, or SADC) and the *fonds locaux de développement* (local development funds).

Rural innovation encompasses not only social innovation but also technical innovation, which is highly visible in rural enterprises. Several farm machinery producers prospered in the region before being subsumed by mergers. However, many leading manufacturers that arose from the rural milieu went on to become international corporations: Bombardier, Tembec, Cascades, Prévost Car and Canam, to name a few. The current demand for access to high-speed Internet from all over rural Quebec is an indication of rural dwellers' willingness to learn and profit from the latest technology.

Rural areas are highly sensitive to contemporary economic and social change, for example globalisation or the new knowledge economy. They are required to restructure and readjust, probably to a greater extent than the rest of society, which imperils social cohesiveness in their small communities. For rural communities, whose economies are lagging, the road to a modern economy and society is a long one. Rural people are more than farmers: they occupy the countryside and shape it for their own purposes, performing the essential geopolitical function of affirming political sovereignty over the regions in which they live. It is precisely rural residents' occupation of the land that is jeopardised by the dynamics of the contemporary economy. This makes a political response to this situation justifiable.

Realising that one can learn from rural communities has several implications. Instead of seeing rural people as part of the problem, they should be seen as part of the solution. Rural development is not an objective to be reached through the application of action and specialised knowledge brought in from outside, but a goal for which rural people themselves are responsible. In other words, it is essential to understand that rural people are perfectly able to embark on social learning processes that will sustain the progress of their own development.

Rural innovation: A key feature of long-term rural history

Recent theories on regional economic development have identified innovation (mainly technical) as a major driver of wealth creation and socio-economic development measured by the growth of GDP. Although this interpretation of economic growth makes sense, much of the research on the associated theories of "local or regional innovation systems" look at present rather than past innovation. Nonetheless, innovation has always been present, in both urban and rural settings, but the intensity of the innovation has varied across historical periods. Many innovations have occurred in agriculture, increasing production per surface and per worker.

Rural innovations in the past might be characterised as innovation more by necessity than by opportunity, under the classical distinction made by the General Entrepreneurship Monitor (GEM). Quebec's rural history includes many examples of innovations arising from necessity. The settlement of landowners in colonial society followed an interesting pattern. The homestead was demarcated as a long, narrow piece of land for each family. At the end of the plot, a road served these households. The road linked both sides, which meant that a single road served many homesteads. Because each family built their house along the road, public investment was efficient and the taxes per farm for that public utility were low, even in a country recognised as large and under-populated.

Another rural innovation that occurred by necessity in Quebec's rural history is the *Mutuelle-incendie*, a co-operative devoted to insuring against fire damage to farm buildings. Because farm buildings were made of wood, they would often be destroyed by fire; volunteer fire-fighting became part of this rural society. Along with impressive solidarity resulting from the entire community donating time and resources to rebuild damaged barns (an initiative known as a *corvée*), people started contributing regularly to a common fund to acquire resources to mobilise in case of fire. This arrangement continues today in the form of risk insurance. The local fire-mutuals gradually merged and became part of the co-operative financial institution Caisses Populaires Desjardins, credit unions that are an important component of Quebec's banking system and of the provincial economy as a whole.

Rural Quebec also produced an agricultural co-operative sector that grew out of its historical circumstances. Given that many regions were isolated and had low population density, the private sector was not interested in doing business in those areas in farm input and output. Farmers consequently had no choice but to organise themselves collectively to buy the necessary inputs and to sell their products. Over time, with many mergers, all the local co-ops became partners of the *Coop Fédérée* (federated co-operative), a major player in the Quebec agri-food business.

Small farmers in Quebec were also innovators in the post-World War II period, instituting the system of *plans-conjoints* (marketing boards) to organise collective trading of each farm's production into a larger amount of products offered to buyers. The small producers thus gained real bargaining power with the large industrial corporations that processed their agricultural production. This innovation has reinforced the sustainability of family farms, which now get a better return from their production. In the classical case of milk, the return now ranges from 30%-40% of the final price paid by the consumer, instead of 10%, which is often the case in agricultural production. However, the marketing boards created an unexpected conflict of interest in the agri-food system, as large co-operatives started to play a significant role in the processing of agricultural products, especially milk. Farmers were both sellers of their own production (as partners of the marketing board) and buyers (as members of the co-operative). This conflict was solved in an interesting way. To maintain the high price for the milk demanded by producers, the co-operatives rapidly became high-tech. This allowed them to reduce their production costs and pass the productivity gains along both to farmers and to the consumers of their milk products.

Rural Quebec is characterised by forests; one-third of rural communities are forest-dependent. The forest is partly private, but in some regions, public forest (crown lands) predominates. The government then grants "harvesting rights" to large corporations that can afford them. In the past, such corporations looked to small contractors to do the forest work. Many communities started approximately a century ago *chantiers coopératifs*, a kind of worker labour-supply co-operative that contracted with the corporations. Once they are organised in a co-operative, rural workers can negotiate better conditions for the same work they used to do for small private contractors. A network of forestry co-operatives is still active in Quebec.

In the late 19th century, Quebec agriculture became more commercial, with the production of butter and cheese (the famous cheddar) for the British market. It became clear that farmers needed to improve their production methods, especially to improve the quality of the milk they provided to small milk factories in each village. This need led to the creation of *cercles agricoles* (agricultural associations) in almost every village, which

provided training based on the concept of *enseignement agricole mutuel* (collective agricultural training). Because there were no agronomists at that time, farmers decided to take it upon themselves to learn, sharing their own experiments in educational farming clubs.

Rural innovation contributes to sustainable development

These significant recent rural innovations in Quebec can be categorised into three basic dimensions of rural sustainable development: *i)* making productive and sustainable use of the natural environment; *ii)* managing economic development; and *iii)* structuring social organisation. For the most part, these innovations can be characterised as social innovations, that is, the creation and implementation of a new institutional arrangement to solve a problem, deliver a service or take advantage of a new opportunity.

Making productive and sustainable use of the natural environment

- *Organisme de gestion en commun* (OGC) *de la forêt privée* (Collective management of private forest) and the *Regroupement des sociétés d'aménagement forestier du Québec* (Association of Quebec forest management societies, or RESAM): These organisations ensure better management and productivity of many private forests and are also in charge of restoring forests to create jobs in rural forest-dependent communities.
- The Réserve Duchénier (wildlife reserve) organises the management of a large portion of public land for recreation, tourism and wildlife conservation, while creating job opportunities. It is unique in being the only wildlife reserve managed by citizens.
- *Clubs conseils agro-environnementaux en agriculture* (agricultural agronomy and environment clubs): A group of 50 farmers came together and hired an agronomist to implement best practices in soil and natural resource conservation.
- *Organismes de bassin-versants* (OBV) (watershed management): Various stakeholders of a watershed join together to manage a watershed sustainably.

Managing economic development

- *Crédit populaire* and *Caisses populaires*: *Caisses populaires* have been instrumental as innovators in Quebec's rural history, and these credit unions continue to play a primary role in the economic development of the rural sector.
- *Coopératives de développement* (for example, the JAL): A form of co-operative in which all the citizens of one or a few communities enrol to allow collective enterprises to develop activities to improve local economic and social conditions.
- *Coopératives d'utilisation du matériel agricole en commun* (agricultural machinery cooperatives or CUMA): Small farmers join together to buy and use agricultural machinery collectively to reduce costs.
- *Sociétés d'exploitation des ressources* (SER) (resource harvesting companies): Created after a rural social struggle in the 1970s, these give rural residents in

communities living close to the large Quebec public forest access to forest resources, mainly by working to restore public forests.

- *Réseau des sociétés d'aide au développement des collectivités*: A network of local development agencies put in place by the federal government (known as community future development corporations in other provinces), with devolution of management to local stakeholders, acting as a community bank and offering technical and financial support to small business start-ups.
- *Conseil local de développement* (local development agencies, or CLDs): Local (municipal) authorities provide incentives and support for local economic development. Investments are supported both by central and by local development agencies. This innovation is described in more detail below.
- *Fonds locaux de développement* (local development funds): In connection with the CLD and municipalities, these local investment funds have helped finance small enterprise start-ups.
- Rural cluster: A local innovation system in a rural setting, such as the small town of La Pocatière, Quebec, described below.

Structuring social organisation

- *Coopératives de solidarité et de santé:* Solidarity co-operatives (usually to set up a health centre in a small community to attract doctors) are a new form of co-operative whose membership is open to all citizens.
- Public-public partnerships for local delivery of services: Two public agencies, such as a school board and a municipal council, orchestrate mutually beneficial projects to reduce the operating costs of public buildings in the community and to use the spaces more effectively. Public-private arrangements have typically been used to deliver public services, but what is new and innovative in this case is the capacity for public-public partnerships (PPPs).
- Internet access as a public service: The local government offers high-speed Internet (broadband) in remote rural areas using WiMAX technology, for example in the municipality of Nouvelle, located in the Gaspé region.
- Agri-food consultation roundtables: Agri-food stakeholders from specific regions join together to organise R&D to improve opportunities in the field of producing, processing and marketing new food.
- Multi-level primary schools: Designed to deal with low school attendance in small communities. Often, the six grades of primary school are combined into two groups of students, to result in a sufficient number of students to keep a school open in the community.
- Products that showcase regional agricultural resources.
- Inter-municipal service agreements: Under these new institutional arrangements, municipal governments (usually small rural communities) join together to order a service (such as fire protection or waste disposal) to improve technical and economic efficiency, for the benefit of taxpayers.

Many of these innovations are widespread in rural communities (such as the *Caisses populaires* or inter-municipal service agreements), while others are unique (like the

Réserve Duchénier) and difficult to reproduce in other rural contexts. This list is not exhaustive; it shows that rural innovation is a reality and that there is much to learn from the rural experience. Innovations that make productive and sustainable use of the natural environment, manage economic development and structure social organisation can contribute to real, sustainable rural development and create vibrant rural communities.

A place-based development organisation: The *Centre local de développement* (CLD)

Like the federal government in the 1990s, the Quebec government adopted a place-based development approach as a general framework for public policy. This included the establishment of a new agency devoted to local development, the *Centre local de développement*, or CLD (local development council), in each regional county municipality (MRC). The CLDs were first established as non-profit organisations managed by local socio-economic representatives, but in a recent reform, they became an integrated part of the regional municipality. They offer support for local entrepreneurs, who are tasked to create and formally adopt a local action plan for economic development and job creation (*plan d'action locale pour l'économie et l'emploi*, or PALÉE). The jurisdiction of a CLD appears to overlap with the mandate and territory of the community futures development corporations (CFDC)[1] put in place in the 1980s. The complexity of these organisations and institutional arrangements, with their inevitable degrees of overlap, duplication, competition and tension, is not atypical in rural development contexts. Ireland has just gone through a radical cohesion process to reduce the number of rural development agencies from more than 100 to 55. The European Union continues to address the proliferation of development agencies. The institutional rearrangement of the CLDs, shifting them to the jurisdiction of the regional county municipalities, has many other consequences, which are discussed below. Regional county municipalities must entrust the exercise of their new local development responsibilities to a non-profit organisation incorporated under Part III of the Quebec Companies Act.

In rural areas, the CLDs' business affairs are managed by a board of directors composed of elected municipal officers from local municipalities already on the county council and representatives of the business and social economy sectors. All the members of the CLD board of directors are appointed by the council of mayors in the MRC. The territory's member of the National Assembly (MNA), the head of the CLD and the director of the local employment centre are also members of the board of directors, but they do not have voting rights. The Quebec government and each municipality contribute jointly to funding the activities of the CLD, which must submit an activity report and its audited financial statements to the county each year, in accordance with the terms set out by the county.

The CLDs offer frontline assistance and technical or financial support services to prospective or active entrepreneurs, as well as to individuals or groups, including social economy businesses. These services include consultation, guidance and referral services; assistance in preparing business plans, including pre-feasibility studies; help with financing; financial management assistance for businesses, primarily through *fonds local d'investissement* (local investment funds); entrepreneurship training; mentoring and follow-up for entrepreneurs and businesses; and referral to more specialised services, such as export or technological development services. The mandate of the CLD overlaps with that of the CFDC. In some MRCs, the adjustment was quite difficult, although, in most cases, the CLDs and the CFDCs have learnt to work well together. Sometimes the

two organisations are located in the same building, offering local entrepreneurs a "one-stop shop".

The CLDs are responsible for designing and implementing various financial assistance measures to support business development and local development projects. These measures constitute part of a CLD's local plan of action to stimulate the economy, create employment and develop entrepreneurship. The measures largely target young entrepreneurs, the development of social economy businesses and economic diversification. The *fonds local d'investissement* (local investment fund, or FLI) is the main financial tool of the CLDs. It provides funding (e.g. loans, financial assistance) to entrepreneurs to start up and expand businesses, including social economy businesses. Planning in a CLD is mostly about local economic development, whereas the political brief of the MRC's mandate is physical planning, mainly in relation to land use. Nonetheless, it is clear that the discussion around the construction of the plan often acts as a learning process in which various stakeholders gain a better understanding of their region and its assets and challenges, as well as a view of what might be done locally to create more sustainable rural development. It is also expected that this process will lead to more strategic and integrated development action.

A rural cluster: The case of La Pocatière

The next two sections present two rural innovations, one focusing on local job creation and the business development of a specific area, and the second on informal education and training of rural actors. Both can be understood not only as technical, educational or entrepreneurial innovations, but as social innovations.

The widespread academic assumption is that a regional innovation system must radiate out from a large urban setting. Nonetheless, the research of a leading Canadian scholar in the field, David Doloreux, demonstrates what rural residents can contribute. The example of La Pocatière, a town of about 5 000 inhabitants surrounded by small agricultural and rural communities, shows the development trajectory of a local innovation system in a rural region from an extended historical perspective (1830-2005) and the institutional context from which it emerged (Doloreux et al., 2007).

The attributes of a local innovation system as identified in the recent literature are all evident in La Pocatière. They underline the relevance of institutional actors and their capacity to respond to economic and technological change. La Pocatière's institutional actors, as the long-term analysis shows, have adapted to continual and radical changes in the institutional configuration, and in particular, in the contemporary period, to the burgeoning of institutional structures of all sorts, often public or quasi-public. The predominance of public sector actors in this institutional configuration has been observed in other local innovation systems (Cooke et al., 2004). What is noteworthy in this case is the importance of concerted action between public and private actors, founded on a legacy of structures of local support and economic assistance that underpin the local innovation system.

La Pocatière's local innovation system follows an original and remarkable development trajectory. Unlike many local innovation systems in regions with long industrial traditions, La Pocatière has no evident manufacturing past. It emerged from within a solid tradition of agricultural-science research and knowledge transfer around public teaching, applied research and technology transfer. This nexus involved a production system consisting not of enterprises, but rather of a multiplicity of isolated

producers. The farming class not only continually assimilated and integrated all the innovations associated with the development of agriculture since the mid-19th century, but lived through its transition from subsistence and domestic farming to a commercial and industrial agriculture integrated into the global agri-food system. Only subsequently, and indeed rather recently, did this local innovation system diversify into industrial production, with the advent of the Bombardier factory in La Pocatière in 1974, the applied physical technology research activities of the CÉGEP (*Collège d'enseignement général et professionnel*), and the emergence of several specialised firms as subcontractors. The analysis of this case shows how a local innovation system can depend on inter-institutional co-operation rather than co-ordination among firms.

The functioning and dynamics of La Pocatière's innovation system underlines the importance of local networks, which were able to mobilise outside resources, both political and economic, on varied scales (regional, provincial, federal and international) in pursuit of their innovation activities and to strengthen and strategically position their institutional framework.

Rural and peripheral areas are often regarded as somewhat averse to the introduction and development of innovation systems. La Pocatière, from the mid-19th century onward, was indisputably a significant centre of technological development, strongly integrated with central Quebec and connected to other important international centres, particularly in Europe. In the second half of the 20th century, La Pocatière's relative loss of importance on the technological front did not reduce its ability to sustain its development as an innovation system without descending into technological, institutional and social isolation. Over a long period, La Pocatière's many local public institutions, unusually, were able to deploy shared strategies aimed at a territory-wide economic development project, more or less explicitly expressed, but no less conscious or effective.

From the perspective of long-term development, however, through all the breaks and changes of direction, the various agents and organisations were able to transform themselves and to influence the functioning and evolutionary capacity of the innovation system. For instance, the relocation of the Faculty of Agriculture to Quebec City did not end the research activities of the Federal Experimental Farm. Instead, a regional agri-food and agri-environment techno-cluster centred on La Pocatière has been developed, and a network of small centres of agri-food know-how and technology transfers has flourished for about a decade around the Quebec Bioalimentary Development Centre (CDBQ). The arrival of the Bombardier factory and the creation of a public institution like the CÉGEP and its technology transfer centres, which were not initially part of the government's plans but were secured by the mobilisation of local elites, are other examples. They clearly illustrate a new expansion in the techno-cluster, this time with the help of a major actor from the private manufacturing sector and technological liaison bodies co-ordinated with industry.

Université Rurale Québécoise, a new way to showcase rural innovation

The Université Rurale Québécoise (Quebec Rural University, or URQ)[2] is an informal organisation established in 1997 by Professor Bruno Jean and other professors of the University of Quebec and members of three networks of actors devoted to rural development, including *Solidarité rurale du Québec*, the *Réseau des SADC* (*sociétés d'aide au développement des collectivités* – Community Futures in Canada) and the *conseils locaux de développement* (CLD). Every two years, the URQ organises a forum of training exchange for rural development actors. Its mission is to support the development

of rural areas and communities by initiating ongoing training activities for rural development players and agents, based on a "knowledge-sharing" approach designed to generate well thought-out, practicable action. Over time, although this is not expressed explicitly in its mandate, the URQ, already an innovation in its unique institutional configuration, was able to showcase rural innovation.

The URQ model is based on a "cross-fertilisation of knowledge" approach, defined as an informal, user-friendly pedagogical approach built on the premise that it is possible to "learn from and be moved to action by" rural life. Its aim is to make possible an exchange between "academic" knowledge (emerging from reflection) and "experience-based" knowledge (emerging from action). Its perspective is decidedly long term, since community capacity development, its stated goal, cannot be measured over the short term. Lavergne and Saxby (2001: 3) emphasise that the main challenge in matters of capacity development consists in reconciling the immediate need for tangible results (i.e. for purposes of accountability) and the long-term requirements for capacity building in a context of sustainable development.

Of pressing concern to the URQ initiative are questions of its relevance, whether in its current form it meets a real community need and should be maintained, and whether it constitutes the best way to reach its objectives. The URQ is a unique event and more than just a symposium that participants attend to receive information. The data gathered show that its mixed-activity formula (conferences, workshops, field trips, etc.) and the exchanges it makes possible between partners from diverse circles and settings are very productive. The URQ is considered a major event in rural life, and is recognised as one of a kind. In this sense, the URQ seems to truly meet a need in rural communities. It also provides a relevant means of moving closer to its objective: community capacity development.

The URQ's apolitical aspect is another interesting feature. Community development is often coloured by political struggles that emerge in development organisations, pulling the players apart, rather than bringing them together. Many people have noted the "neutral ground" that the URQ affords and the advantages this provides, especially in terms of richer exchanges and more concrete sharing.

Lastly, the model's flexibility is one of its assets. Aside from a steering committee made up of University of Quebec professors and representatives from the activity and development networks at work in rural settings, the URQ has no permanent organisational structure. To date, each instantiation of the URQ has been designed to use existing structures (development organisations, universities, etc.). With fewer checks and balances, this organisational method makes it easier to challenge certain aspects of the model or, if necessary, the model itself. The relevance of holding a URQ can therefore be reassessed before each event. This organic organisational approach is not without its challenges. For example, it is difficult to pool and co-ordinate information, especially information useful for evaluations. Fund-raising is also cumbersome, because requests must be reiterated by different individuals and organisations.

These two cases demonstrate that the rural population has the internal capacity to deal with the challenges it faces. La Pocatière's local system of production shows that the leaders of this rural town can set up local or regional innovation systems in a rural setting. Its example can be helpful for local development in many other regions. The URQ shows how rural citizens can mobilise an initiative that gives them access to lifelong education and training in rural development by sharing their knowledge. These two experiences

validate the notion that rural development will occur, given capacity building among rural populations.

Rural inhabitants: An innovative or a creative class?

Recent theories in economic development stress the effects of proximity, as evident in urban and metropolitan settings, and innovation, which has been reconceptualised as creativity in the work of Richard Florida. Creativity has been linked to high levels of education as well as open-mindedness, which is more prevalent in multicultural urban contexts. One might ask: are rural inhabitants less creative?

There is ample evidence that rural people are creative and innovative, despite the general assumption that an education is a prerequisite for innovation. The paradigms must be shifted, asking what the rural experience has to offer. As indicated above, much can be learnt from rural populations' capacity to innovate, stimulate economic development and improve the quality of life in the countryside.

Nonetheless, innovation in a rural setting differs from the pattern observed in urban environments. The economy of rural areas is based on natural resources. Given the trend toward industrial plants moving to the countryside, it is not surprising to see rural innovation in agriculture, and that innovation continues, with new forms of agriculture designed to produce high-quality products or reconnect farmers and city-dwellers directly in "community-based agriculture." A new agriculture, focusing on the production of so-called speciality products, is emerging. Firmly rooted in the regions, it is helping to revitalise and generate growth in rural areas.

Opportunities offered by changes in consumer habits, such as the trend towards "eating local" and the opening of local public markets, have sharpened the innovative capacities of a new generation of producers, in some cases, newcomers with an urban background. This renewal of interest in agricultural products, for example, in the case of cheese, now offers an array of products that compete with the finest imported varieties. Agriculture in harmony with the land and its people, which shows an interest in local markets and in those farther afield, can enhance agricultural potential and help redefine the terms of a new social contract between farm producers and the rest of society.

Forestry is another major rural natural resource, and a leading one for Quebec. Considerable innovation in this area has occurred, and persists, in the form of new innovative models of management of public forests by rural communities. The current challenge of the Quebec forestry sector is to recognise the potential of a multiple-use view of the forest as a diversified source of products, and to better understand its role in the environment, recreation and tourism. Examples of such untapped potential include floor coverings using previously discarded wood residues and the use of wood siding for home exteriors.

Diversification of the forest economy also includes non-timber forest products (NTFPs). These are products other than wood that come from biological sources in the forest and require little processing. They may allow forest communities to benefit from the natural resources located at their doorstep. This category also includes maple farming, the production of Christmas trees, wild blueberries from both blueberry patches and the forest, mushrooms and essential oils extracted from softwood trees. More than 400 potential products could be harvested from forests and be introduced into a market increasingly sensitive to new consumer interest in biopharmaceuticals or nutraceuticals (natural food supplements). Along with the NTFPs, the potential of forest biomass to be

used for energy and biofuel production has also become a reality. The NTFPs may well reduce dependency on oil and diminish greenhouse gas (GHG) emissions, while broadening the range of the socio-economic benefits that forests offer society.

Finally, industrial jobs can be exported to the countryside. The manager of a large brewery outside Vancouver has found that rural manpower can be an asset that can compensate for distance and transport costs. Not only do rural workers tend to log fewer absences from work, but when machines break down, they can find immediate solutions or do temporary repairs while waiting for new replacement parts. As a result, the production line does not stop as often as in a city, where workers would typically wait for parts and technicians. Such resourcefulness shows how rural culture is distinctive, despite evidence of the supposed merging of urban and rural culture.

To assess rural innovation, it must be noted that the rural population makes up only 20%-25% of the total population. It is thus not surprising that the rural sector generates less innovation. Often, technical innovations are developed by urban engineering firms for use in a rural setting. One example is traditional peat moss, which can serve as bio-filtration for sewage systems in isolated homes. All this shows how rural natural resources can be reimagined and repurposed. Extensive R&D is needed to find new uses for those resources. Innovation is at the heart of future developments in the rural economy.

Conclusion

According to the classical General Entrepreneurship Monitor distinction, some people become entrepreneurs by necessity, others by opportunity. Applying this distinction to innovation in the rural sector, it would appear that past innovations typically occurred in response to necessity. For example, people created co-operatives because no private enterprises were willing to offer the products or services they needed. Today, however, innovation in the rural setting corresponds more to innovation through opportunity. There is insufficient space here to discuss property models linked to those rural innovations, but they are diverse, ranging from classical private enterprises to co-operatives and social economy associations. Such enterprise characterises many start-up businesses in the cultural domain. The development of rural culture with eco-museums, interpretation centres and summer theatres is becoming a vibrant economic sector in some rural regions.

Rurality can thus be seen as “rural laboratories”, in the sense of the model of monitoring innovation, used as a methodology to implement innovation in various domains. The second phase of Quebec’s Rural Policy, acclaimed in an OECD report and the previous OECD Rural Conference, set up a “Rural Laboratory.” The aim is to offer a subsidy or grant to a project with expected structural social or economic returns. Innovation is central in this programme. About 30 projects are now under way. Although many of them will not pass the “reality test,” the Rural Laboratory programme can be considered a success because innovations that survive and prosper will contribute greatly to the quality of life and prosperity of the rural communities where they are established. Many might also be transferable to other places.

All the innovations described above indicate that new realities are emerging that reflect a rural world with a place in contemporary society, and that can contribute to collective prosperity. Rural areas are places with a future, not mere vestiges from a past era surviving in a post-modern world. Rural communities are changing, adapting, innovating, inventing new rural forms and emerging as multi-faceted. In Quebec, new

ways of looking at rural life are surfacing, notably through the URQ, which has become a forum for social and institutional innovation by rural populations.

Quebec's rurality, committed to a process of revitalisation, has become a living laboratory where traditional economic sectors like agriculture and forestry have begun to restructure, marketing new products and implementing new production processes. New urban-rural relations, based on more harmonious land development, are also surfacing. The rural renaissance in Quebec features culture as a factor in economic diversification. Rural communities are mobilising to become players in their own development, an effort supported by a sound rural policy.

Notes

1. Community futures development corporations (CFDCs) are a local development organisation established in the 1980s, financed by the federal government and acting at the MRC level. They support local development planning, technical services and financial support for small and medium-sized enterprises. They were recognised as one of the more efficient government programmes to improve rural development in OECD countries.
2. To learn more about the URQ, visit www.uqar.ca/urq.

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Chapter 6

Evaluation tools for integrated EU rural development initiatives: The case of LEADER+

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The objective of this chapter is to study the utilisation of European Union resources and to evaluate the effectiveness and efficiency of the assistance and its impact, which are becoming increasingly relevant as Common Agricultural Policy (CAP) budget constraints increase. Although the LEADER Initiative absorbs a relatively small percentage of EU Rural Development Policy funds, its innovative characteristics, combined with its Rural Development Policy (RDP) mainstreaming, are well-suited to a framework of formal evaluation procedures. Local action groups (LAGs), as the main actors in the design, monitoring and implementation of integrated local development plans, deserve special attention in this context. This chapter discusses the application of a model for evaluating the performance of the LAGs in designing and implementing the EU LEADER+ Community Initiative. The special characteristics of the initiative, such as the emphasis on territorial rural development, together with its "bottom-up" approach, lends itself to a Shift-Share Analysis (SSA) approach, a method that was initially applied in a regional analysis context. The degree of impact on the funds' absorptive capacity by each LAG is parameterised in a regional analysis quantitative framework of the SSA, applied for the first time in the case of LEADER+, highlighting aspects relating to both internal (i.e. managerial ability) and external factors (i.e. the national planning framework of the LEADER programme). A classification of the LAGs into regional "LEADER types" is also developed, according to the estimated degree of impact of these factors.

The case of all 40 Greek LAGs operating under the third programming period was examined as soon as data became available from the national Integrated Data System, right after the completion of the LEADER+ Community Initiative implementation period (2009). Since the discussion of rural policy impacts and the fourth generation of evaluation methods are well under way, the suggested approach can also be combined with other qualitative and qualitative approaches in order to better understand the impact of the EU Rural Development Policy.

Introduction

LEADER (*Liaison entre actions de développement de l'économie rurale*) was developed as an EU Rural Development Initiative following a debate concerning, among other things, the instruments used and the necessary tools for interventions under the EU Structural Policy, in 1988. It was introduced as an endogenous, territorial/terrestrial model of rural development (Ray, 1998) to encourage experimental pilot projects for promoting innovation in rural development in the economically lagging rural areas of Europe (Saraceno, 1999). The LEADER approach embodied seven basic characteristics (AEIDL, 1999):

1. local development strategies based on the region
2. a bottom-up approach
3. collaboration between the public and private sector in local action groups (LAGs)
4. innovative action
5. integrated and multi-sectoral actions
6. networking
7. management and financing methods.

The impact assessment of the initiative's special characteristics is considered rather complicated, making evaluation of the process difficult. Since the LEADER Initiative's adoption in 1988, it has not been possible to demonstrate its importance as an innovative approach to rural development, because evaluation by conventional means (that is, the evaluation of the mainstream programmes) cannot fully account for all its interactions and its individual characteristics. As Saraceno (1999) argues, the evaluations of previous LEADER Initiatives have been complicated by four particularities arising out of the specific nature of this approach. These are:

- the appointment and the assessment of the special characteristics of the LEADER approach, individually
- the association of those characteristics with their consequences on rural development
- the aggregation of LEADER results at the national as well as at the European level
- the need for evaluations at different administrative levels (at the level of the EU, member countries and regional administration organisations).

The European Commission's Guidelines (2002) for the evaluation of the LEADER+ Initiative (Doc. STAR VI/43503/02-REV.1) provide the possibility of assessing the initiative's less material results, but the process remains strongly top-down (Moseley, 2003). While the four factors mentioned above are taken into consideration, the evaluation framework lacks detailed procedures and/or incentives for a new approach. Despite the emphasis placed during the implementation of the LEADER Initiative on endogenous development and decision making at the local level, the institutional base for the programme's evaluation misses this logic, making

it a somewhat exogenous procedure (High and Nemes, 2007). Thus, the LAGs are considered a key factor during the implementation of the LEADER Initiative, but evaluating their performance becomes complicated.

This chapter focuses on LEADER's third special characteristic, local action groups (LAGs) and is based on the notion that the LAGs' performance plays a crucial role in the LEADER Initiative's design and implementation, affected by both endogenous and exogenous factors. Endogenous factors are associated with the flexibility that each LAG has to plan, monitor and implement its own integrated local programme of rural development, based on its priority theme, according to the innovative bottom-up procedures of the LEADER Initiative. These factors mainly influence the implementation phase of the programme. Exogenous factors are derived from the influence of many top-down procedures that still affect LEADER, even though it is already in its fourth generation, with its mainstreaming in rural development policies. These factors mostly influence the LAGs during the planning phase. The purpose of this chapter is to set a starting point for the four factors proposed by Saraceno for evaluating the initiative, considering the LAGs as a key factor. In order to distinguish the LAGs' performance among endogenous and exogenous factors, a regional analysis method of Shift-Share has been applied for the first time in this context, using as a variable the financial flows of public funds in each LAG, both as they were initially budgeted and as they were finally allocated. The method offers the opportunity to attribute local changes to either local/internal or national/external factors. The Greek LEADER+ (2000-06) is used as a case study, and the resulting analysis ranks the LAGs according to their relevant performance.

During the third programming period for EU Rural Development Policy, utilisation of EU resources and the effectiveness and efficiency of the assistance and its impact in relation to the eight following themes, are the objectives of the LEADER + evaluation exercise (Metis, 2010):

- Theme 1: Relevance and community added value
- Theme 2, Action 1: Integrated territorial rural development strategies of a pilot nature
- Theme 2, Action 2: Support for co-operation between rural territories
- Theme 2, Action 3: Networking
- Theme 3: Implementation of the LEADER method
- Theme 4: Impacts
- Theme 5: Governance and rural citizenship
- Theme 6: Managing, controlling and financing systems
- Theme 7: Monitoring and evaluation
- Theme 8: Rural activity/excellence clusters.

Although the role of the LAGs is crucial in the framework of LEADER, "innovative LAG evaluation activity appears not to have been greatly developed or extended throughout the course of LEADER+. The LAGs should develop and employ high-quality and dynamic local territorial strategies, which they actively monitor,

update and improve through ongoing reflection and revision. This should lead to a culture of greater accountability and ownership of the process of continuous improvement" (Metis, 2010).

Methodology

Despite its low budget, LEADER is regarded as more ambitious than traditional mainstream programmes of rural development – such as the Integrated Programmes of Rural Development – because of its "laboratory type" of twin focus, both on economic development and on democratic learning and widening the "local" (endogenous) governance aspect of the initiative (Papadopoulou et al., 2011). This dual character has been emphasised both in the academic literature (e.g. Shucksmith et al., 2005; Connelly et al., 2006; Binder et al., 2007; Papadopoulou et al., 2008) and in official EU policy documents (e.g. European Commission, 2008). Despite the emphasis on LEADER (e.g. Goodwin, 1998) in both the research and policy literatures, research has so far focused largely on qualitative approaches and descriptions. The quantitative Shift-Share Analysis (SSA) applied in this chapter is a widespread method used in regional quantitative analysis. It measures the change of a particular variable, in a specific region, during a particular time period, taking into account the causes of this change (Papadaskopoulos, 1995).

SSA is typically applied in sector employment data, at the national level, within a specified period of time, in order to estimate changes in regional economic structure. These changes are attributed to three components: the National Effect (EN), Structural Effect (ES) and Regional/Competitive Effect (ER). The National Effect (EN) component corresponds to the regional employment estimated change, if this were to follow the same trend of the variable at national level. The Structural Effect (ES) component represents the change of employment due to external factors, while the third component refers to changes of local/regional employment that can be attributed to local/regional specific characteristics. The sum of these three components is equal to the real change of employment, at any level, at the time period under study. This type of methodology is applied for the first time in the context of the EU Leader+ Initiative, and the LAGs' local rural development programme in particular, in order to identify both internal and external factors of the LAGs' budget absorption capability rate.

In the case of LEADER+, the corresponding variable is the funds' absorption rate of each LEADER+ measure at LAG level. Initially budgeted funds during year 2000 and those finally allocated by the end of 2008 period, when the initiative completed its implementation period under the third programming period, are used in this study. Next, SSA determines whether the funds' absorption rate of each LAG can be attributed to its own unique set of circumstances or to the national planning of LEADER.

Budgeted and allocated funds or Measures 1.1, 1.2, 1.3, 1.4, 2.1 and 2.2 from all 40 local action groups in operation during the third programming period in Greece (2000-06) are considered in the present analysis.

In terms of SSA methodology, the following identities apply (Pappas, 2009):

$$CH_r = EN_r + ES_r + ER_r \quad (1)$$

$$EN_r = A_{ro} \times \left(\frac{A_{nt}}{A_{no}} \right) - A_{ro} \quad (2)$$

$$ES_r = \sum \left[A_{iro} \times \left(\frac{A_{\text{int}}}{A_{ino}} - \frac{A_{nt}}{A_{no}} \right) \right] \quad (3)$$

$$ER_r = \sum \left(A_{irt} - A_{iro} \times \frac{A_{\text{int}}}{A_{ino}} \right) \quad (4)$$

where:

CH_r	deviation between allocated and budgeted funds of LAG *r*
EN_r	National Effect of LAG *r*
ES_r	Structural Effect of LAG *r*
ER_r	Regional Effect of LAG *r*
A_{ir}	funds of measure *i* of LAG *r*
A_{in}	funds of measure *i* at the sum of the country's LAGs
A_r	sum of the funds, of LAG *r*
A_n	sum of the funds of the country's LAGs
0	funds at the budget
t	realised/allocated funds

More specifically:

The deviation between the initially budgeted funds in year t_0 and eventually absorbed funds by year *t*, depends on three components, namely the National Effect, the Structural Effect and the Regional Effect. More specifically:

- The National Effect component (EN) depicts the deviation between budgeted and finally allocated funds in each measure, by each LAG from the respective absorption rate of LEADER+ measures at the national level programme. If EN is 0, it means that the implementation of the programme carries on smoothly, in the way it was initially scheduled, without the absorption rate being affected either by the LAG's specific programme characteristics and individual structure, or influenced by any other local specific conditions. In this case, the budgeted funds are equal to the ones allocated by the end of the period under study. While EN represents the LAG's expected fund absorption rate – in other words, the expected allocation of the funds, the Structural and Regional Effect components depict any variations from each LAG's LEADER+ programme anticipated absorption of funds.
- The Structural Effect component (ES) depicts the deviation from National Effect, due to LEADER+ national programme-specific structure and orientation. The absolute value of this parameter measures the size of change, while its sign shows the direction of change in the parameter. A positive sign means that the national programme's structure tends in the right direction and that the implementation of

a measure continues smoothly, while a negative sign means that the programme's structure is designed in the opposite direction and the implementation of this measure is problematic. A "good" structure of LEADER+ programme measures suggests that the particular LAG invests in measures whose track record is better than those in the corresponding LEADER+ at the national level. ES depicts the LAG's external effects, during the LEADER+ Initiative implementation period.

- The Regional Effect component (ER) depicts the deviation from the National Effect, which is attributed to the particular choices made in every LAG's LEADER+ programme. It reveals the extent of the problems of a particular measure, due to the management capacity of the LAG that comes up during the implementation of the programme at a local level. As above, the absolute value shows the extent of change, while the sign reveals the direction of change. If the sign is positive, the planning and the management of the local LEADER+ programme is designed in a way that supports a smooth absorption rate of funds by each measure. Thus, the planning and the decisions made at local level positively influence and support the measure's implementation procedures. A negative sign implies that the management at the local level has an adverse effect on the measure's implementation phase, suggesting that difficulties arise in the absorption of funds at the local level. ER indicates internal/endogenous effects, which are related to the LAG's specific capacities and performance directly related to the efficiency of the LAG's management and policy on the implementation of the measures selected for investment. These are attributed to the fact that according to their local strategic plan and the adopted "priority theme", each LAG decides upon the actions necessary for the efficient implementation of the measures chosen to be incorporated in its programme.

Using the results of this method (absolute value and the sign of Structural and Regional Effect components), a classification of the LAGs is made, following Boudeville's (1966) criteria and Stilwell's classification method (1969). The LAGs that belong to the first three types perform better than the average, while those that belong to the last three present the opposite behaviour (Table 6.1).

Table 6.1. **Regional LEADER types**

Regional LEADER Type	Boudeville's criteria
1	ES>0 ER>0
2	ES<0 ER>0 and |ES|<|ER|
3	ES>0 ER<0 and |ES|>|ER|
4	ES<0 ER>0 and |ES|>|ER|
5	ES>0 ER<0 and |ES|<|ER|
6	ES<0 ER<0

Source: Boudeville, J. (1966), "Problems of regional economic planning", University Press, Edinburgh in Papadasklopoulos, A.D. (1995), *Methods of Regional Analysis*, Papazisi Publications, Athens; Stilwell, F.J.B. (1969), "Regional growth and structural adaptations", *Urban Studies,* Vol. 6, No. 2, pp. 162-178.

Results

The overall budget absorption for all Greek LAGs is 133%. This is depicted in a positive National Effect component, which is always positive for each measure separately.

Measure 1.1 relates to the technical support of the LAGs. The effect of the programme's structure (ES) at this measure's absorption is favourable. The programme's structure most favours the following LAGs: Karditsa, Heraklion and Serres, followed by Etanam, Epirus, Anko and Thessaloniki, while the least favoured LAG is Fokiki. Regarding local management (ER), only 15 LAGs demonstrate positive values. Among them, Akomm demonstrates the highest value and Kavala the lowest. Among the remaining 25 LAGs with local management below the average, Epirus demonstrates the least promising potentials. LAG Pieriki also displays negative potentials, but with the lowest absolute value. Finally, only 8 out of 40 LAGs present actual change (CH), lower than the optimum (EN) (Table 6.A1.3).

Measure 1.2, which relates to the support to investments and business flexibility, presents negative ES for all LAGs. The programme's structure seems mostly unfavourable for Karditsa and slightly less for Fokiki. Regarding local planning and management (ER), 17 LAGs present positive value, while LAGs Heraklion and Elasona present the highest and lowest absolute value respectively. Cyclades presents the worst performance among the 23 LAGs with negative ER. The negative impact of ES is so intense that 27 out of the total number of LAGs display lower actual change (CH) than the optimum (EN) (Table 6.A1.4).

Measure 1.3 regards supportive actions. The budgets of this measure are rather low; while ES is negative for all LAGs, an indication of the defective planning from above. The most intensive impact appears for the LAGs of Elikonas, Lemnos and Lesbos. Thus, the preconditions for the smooth progress of the measure are ominous, and implementation is left to local managerial potential. ER is positive for half of the LAGs. Imathia demonstrates the highest ER and Heraklion the lowest, but is also positive. By contrast, Elikonas displays the highest negative value and Evros the lowest. However, the ES is so defective that only 5 LAGs present higher actual change (CH) than the optimum (EN) (Table 6.A1.5).

The progress of Measure 1.4 is evaluated as good. This measure's planning from above (ES), which is directed towards the financing of the protection, appointment and exploitation of natural and cultural heritage, favours all LAGs. The planning most favours LAG Dodekanese and least favours LAGs Trihonida, Cyclades and Pilio. Local management (ER) appears satisfactory for 17 out of 40 LAGs. Halkidiki and Xanthi present the best potential, far out-ranking the rest, while Aitolia and Epirus present good potentials, but low absolute values. In contrast, Kefalonia displays the worst local management and Etanam presents poor management, but with low absolute value. However, the positive effect from above seems so intense that only 18 out of 23 LAGs with low local potentials display actual change (CH) below the optimum (EN) (Table 6.A1.6).

Measure 2.1 supports inter-regional collaboration. Its budgets appear quite low. The structure of the programme appears to be defective for all LAGs. The LAG that is worst placed is Karditsa, while LAGs Lesbos and Dodekanese fare best. Regarding ER, 17 LAGs display satisfactory local management. Among them, Elikonas, Parnon and Xanthi are distinguished for their excellent performance, while Lemnos and Halkidiki

present low positive values. LAGs Etanam and Zakinthos present the highest and lowest absolute values, respectively, among the remaining 23 LAGs with low local management. The negative values of ER affect all of the 23 LAGs mentioned above, so that they allocate less funds than the optimum (EN) (Table 6.A1.7).

Measure 2.2, which refers to international collaboration, displays the lowest budgets; remarkably, four LAGs appear to have zero budgets. Although the budgets are low, this is considered not to be a good sign for the LAGs in general. The most affected LAG is Lesbos. Concerning local management, Pilio is distinctive for its great performance among the 17 LAGs with satisfactory local potentials. Four LAGs mentioned above demonstrate neutral local potentials. Among the remaining 19 LAGs with negative ER, LAGs Kefalonia and Cyclades present the lowest local management. The programme's structure is so defective that the optimum allocation (EN) is exceeded only by 13 LAGs (Table 6.A1.8).

The rank of LAGs in Regional LEADER Types (RT) is necessary for the evaluation of their overall performance. The absolute value and the signal of Structural and Regional Effect components provide the tack of each LAG, compared to the sum. The structure of LEADER+ nationally is positive for 17 out of 40 LAGs. The most favoured LAG is Dodekanese, while the least favoured LAGs are Xanthi and Achaia. Serres, Kefalonia, Anvope and Zakinthos also show great positive effect. Planning from above negatively affects 23 LAGs. Among them, the LAG with the most intense effect is Cyclades, and Lemnos, Trihonida and Lesbos follow. Less affected LAGs are Kastoria, Halkidiki, Pella, Rodopi, Drama and Pilio. Major differentiations appear between ES and ER. The absolute values of ER are much higher than ES, and thus local management most determines the final performance of each LAG. Local management seems right for 18 LAGs. Heraklion displays the best performance, far ahead of the next in line, Xanthi. LAGs Thessaloniki, Halkidiki, Anvope and Akomm follow, while the last LAG, but with good performance, is Serres. Regarding the remaining 22 LAGs with local management below the average, Kefalonia and Lasithi present the lowest potential, followed by Cyclades, Kastoria, Imathia and Pella. The LAGs of Rodopi and Karditsa also display low performance, but in lowest absolute values, among those 22 LAGs. These 22 LAGs display local management that does not permit them to reach the optimum allocation (EN). Respectively, the remaining 18 LAGs exceed the values of EN (Table 6.A1.9).

Concerning Structural and Regional Effect components, the rankings follow: 9 LAGs rank in LEADER Regional Type (RT) 1 (Anvope, Anko, Dodekanese, Heraklion, Thessaloniki, Xanthi, Oadyk, Serres, Fokiki). Eight LAGs rank in RT 2 (Akomm, Drama, Kenakap, Kilkis, Lesbos, Parnon, Pilio, Halkidiki), 9 LAGs rank in RT 5 (Achaia, Zakinthos, Imathia, Kavala, Karditsa, Kerkira, Kefalonia, Lasithi, Pieriki) and the remaining 14 LAGs rank in RT 6 (Aitolia, Evros, Elasona, Elikonas, Etanam, Epirus, Kastoria, Cyclades, Lemnos, Olympia, Pella, Rodopi, Trihonida, Florina). LAG Heraklion is distinguished for its excellent performance. It is remarkable that Heraklion far exceeds the optimum allocation. Its performance is followed by Xanthi, Thessaloniki, Anvope and Halkidiki. In contrast, LAGs Cyclades, Lasithi and Kefalonia, of RT 6, are far from reaching the optimum allocation (EN). These two variables refer to the same amount, in total. However, EN, added to the budget funds, depicts the optimum distribution of public funds, while CH, added to the budget funds, depicts the actual distribution due to Structural and Regional Effect components (Tables 6.A1.2 and 6.A1.9).

Table 6.2. **Rank of local action groups in regional LEADER types**

Regional LEADER type	Local action group
1	Anvope, Anko, Dodekanese, Heraklion, Thessaloniki, Xanthi, Oadyk, Serres, Fokiki
2	Akomm, Drama, Kenakap, Kilkis, Lesbos, Parnon, Pilio, Halkidiki
3	
4	
5	Achaia, Zakinthos, Imathia, Kavala, Karditsa, Kerkira, Kefalonia, Lasithi, Pieriki
6	Aitolia, Evros, Elasona, Elikonas, Etanam, Epirus, Kastoria, Cyclades, Lemnos, Olympia, Pella, Rodopi, Trihonida, Florina

Each LAG's rank is depicted in Figures 6.1 and 6.2. Except from the rank of LAGs, the relative position of each LAG is depicted overall and for each RT separately. The LAGs ranked higher and to the right present better performances, while those that lie lower and to the left are of unequal performance. Figure 6.1 depicts clearly the very high, compared to the total, managerial effectiveness of LAG Heraklion, as well as the defective management of LAG Cyclades.

Figure 6.1. **Rank of local action groups in regional LEADER types**

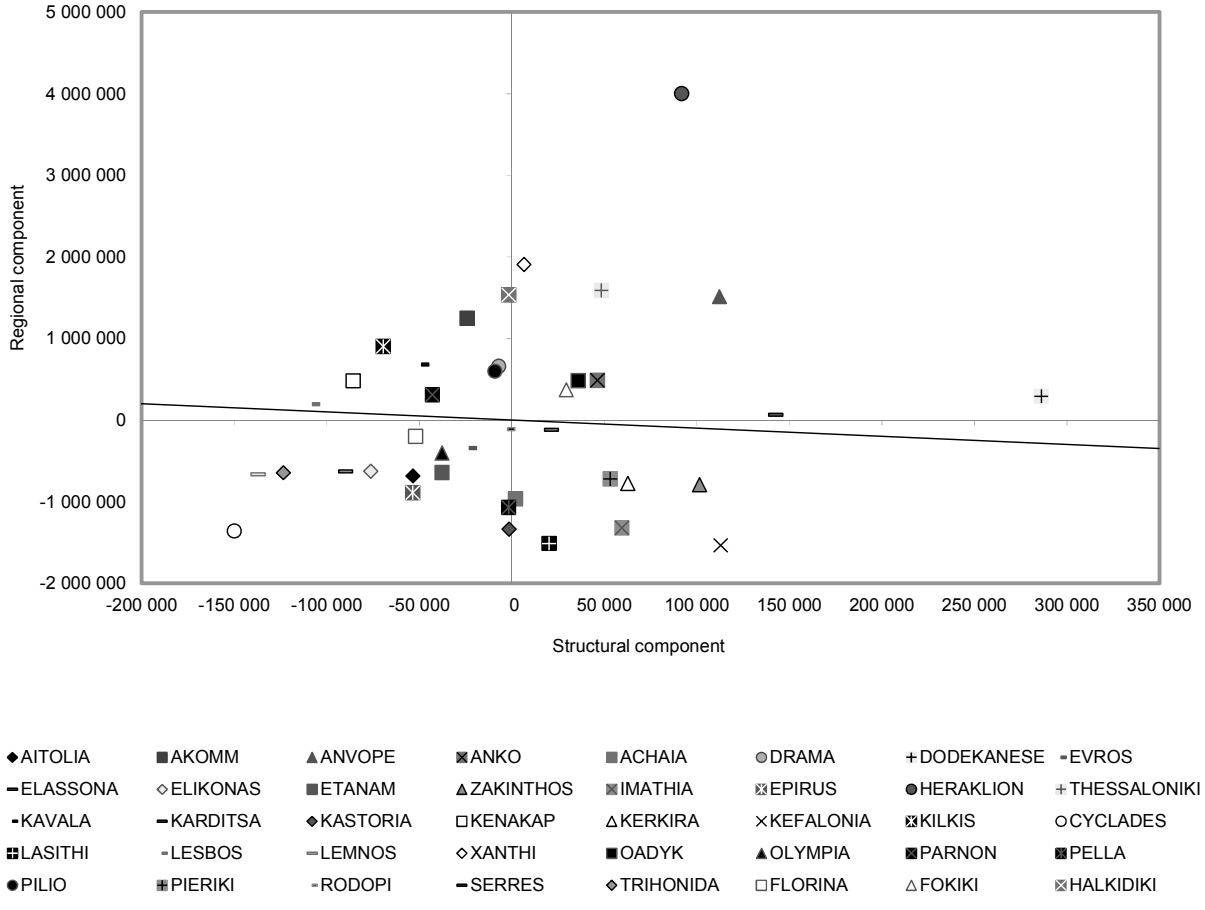
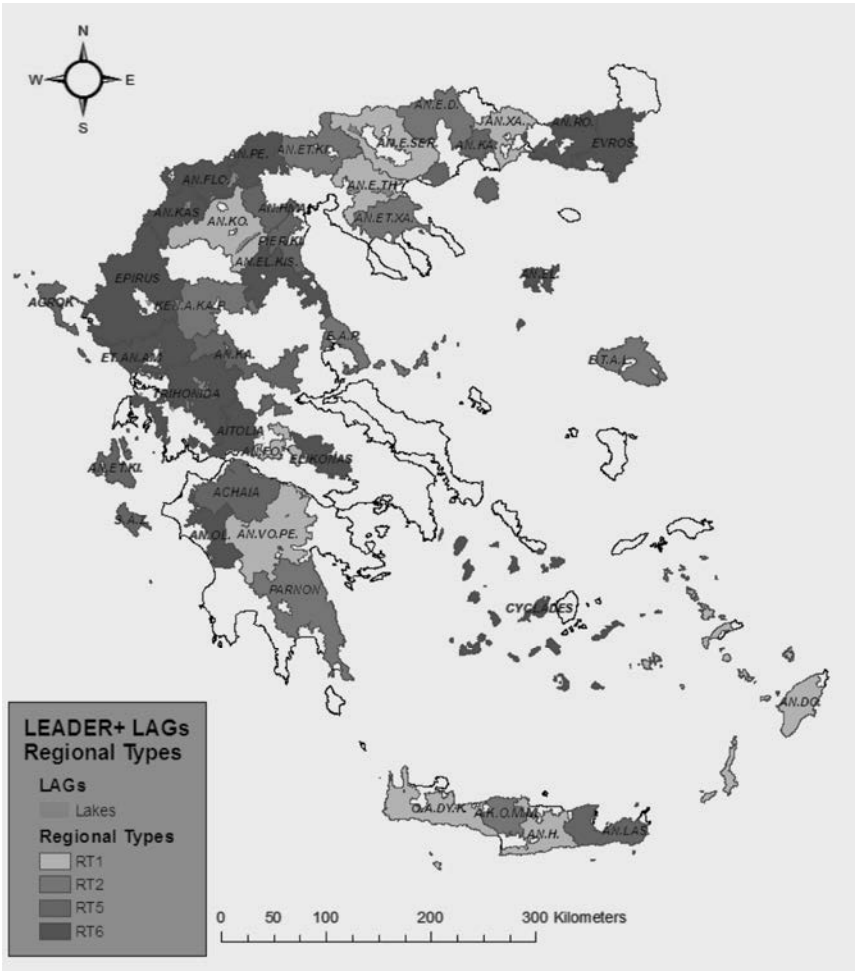


Figure 6.2. **Geographical mapping of local action groups and their classification according to regional LEADER type**



Note: This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

Conclusions and recommendations

After the application of the Shift-Share Analysis, external factors (national level LEADER planning) have been distinguished from the internal factors (LAGs' decision making and implementation). Regarding the external factors, the National Programme planning seems adequate only for Measures 1.1 and 1.4, while it is considered to be inadequate for Measures 1.2, 1.3, 2.1 and 2.2, undermining the programme's cohesion as well as the LAGs' action. In absolute numbers and for the sum of LEADER's measures, the National Programme's planning structure favours 17 and disfavours 23 LAGs, comparatively. Concerning the internal factors, significant variations appear among the LAGs. More specifically, 18 LAGs showed local management above the average level and the remaining 22 below, while divergences in absolute numbers seem considerable. The absolute numbers, as noted, reveal the intensity of the phenomenon and, in this case, show that local management and implementation

become the more decisive factor than the LEADER national planning in the LAGs' total performance. Moreover, this fact results in quite substantial variability, concerning total performance (SSA results of all measures), as shown in Table 6.2 and Figure 6.1. Thus, some LAGs that are disfavoured from the National Programme planning overcome these barriers due to great local potential, others manage well, but not enough to overcome these hurdles, others are neither favoured nor good managers and others fail to benefit from favourable LEADER structure. Previous research reveals several external as well as internal factors that may undercut the LAGs' performance (RuDI, 2010). Although this chapter examined the level of their influence to the LAGs, reference to them does not fall within the purview of this study.

SSA consists of an inexpensive method, responding to criticism about LEADER's high cost of evaluation, in relation to its low budget. At the same time, it can be applied on different administrative levels, whether on the level of the EU, member countries or the LAGs, It can function as a self-evaluation experiment in order to develop and employ high-quality and dynamic local multi-sectoral development strategies that they actively monitor, update and improve through ongoing reporting and revision. Moreover, the above results can be aggregated at the national and European level, to obtain a clear picture at every level. In this way, one can reach an answer to Saraceno's (1999) third and fourth particularities regarding LEADER evaluation. A combination of SSA with multi-variable methods may open the way for further explanation of weaknesses and good practices, even more for associating their consequences to rural development, contributing to the effort of valuation of Saraceno's (1999) first and second particularities. While the capacity of LEADER to enhance social capital is already evident, further steps are necessary to adopt new and more reliable approaches and methodologies to assess the LAGs' success or failure. Building evaluation capacity, awareness, structures, resources and commitment needs active management and real accountability at all levels.

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Annex 6.A1

Table 6.A1.1. **Budget and allocated public funds of LEADER+ local action groups (in EUR)**

Local action group	Budget							Allocated						
	Measure						Sum	Measure						Sum
	1.1	1.2	1.3	1.4	2.1	2.2		1.1	1.2	1.3	1.4	2.1	2.2	
Aitolia	945 148	2 587 782	230 558	689 869	134 621	45 379	4 633 357	1 278 496	2 698 142	166 901	1 053 711	167 782	61 510	5 426 541
Akomm	937 827	2 216 025	323 900	963 284	104 400	75 600	4 621 036	2 113 157	3 343 534	204 885	1 489 102	90 493	129 932	7 371 103
Anvope	1 143 930	2 950 635	122 400	1 237 050	150 880	33 120	5 638 014	1 800 670	5 609 401	40 043	1 504 286	141 201	28 550	9 124 152
Anko	1 197 800	3 171 221	254 240	1 286 550	142 120	47 880	6 099 811	1 741 092	5 488 745	220 248	1 042 878	98 310	56 676	8 647 949
Achaia	978 609	2 399 360	237 515	909 500	144 000	36 000	4 704 984	1 184 430	2 556 142	259 739	1 081 986	139 661	74 937	5 296 894
Drama	1 022 345	2 670 475	167 490	736 200	136 000	57 600	4 790 110	1 735 950	4 496 893	129 015	557 372	57 348	48 564	7 025 140
Dodekanese	999 212	1 891 409	190 169	1 878 422	31 500	0	4 990 712	1 469 161	2 053 595	113 247	3 479 966	100 000	0	7 215 969
Evros	672 300	3 089 600	44 550	693 550	59 600	66 400	4 626 000	1 419 482	3 369 257	32 689	939 053	30 085	0	5 790 565
Elassona	897 225	2 461 907	280 562	607 500	74 901	105 099	4 427 194	1 175 546	3 157 583	25 678	585 638	119 705	104 690	5 168 842
Elikonas	1 033 928	2 656 500	471 000	1 092 500	54 400	76 000	5 384 328	1 372 969	2 700 699	141 083	2 014 426	222 062	7 862	6 459 102
Etanam	1 218 955	3 250 463	282 849	937 932	150 000	50 000	5 890 199	1 650 102	3 792 998	236 233	1 419 262	19 252	36 763	7 154 610
Zakinthos	796 300	1 678 500	202 900	1 126 000	90 400	0	3 894 100	1 191 861	1 840 799	117 794	1 251 330	88 566	0	4 490 349
Imathia	950 000	2 633 000	146 100	937 500	80 000	0	4 746 600	1 335 655	2 666 441	267 673	746 256	39 005	0	5 055 030
Epirus	1 217 945	3 288 693	233 944	705 150	144 000	36 000	5 625 731	1 454 858	3 566 474	302 712	1 070 948	31 463	114 109	6 540 565
Heraklion	1 283 000	3 236 326	220 000	1 346 000	104 000	72 000	6 261 326	2 377 475	6 949 439	180 357	2 744 352	82 155	85 453	12 419 232
Thessaloniki	1 186 560	3 132 970	223 200	1 160 960	68 800	108 000	5 880 490	2 091 105	4 930 782	201 250	2 009 707	143 041	83 419	9 459 304
Kavala	1 031 670	3 019 610	230 090	800 125	136 000	48 000	5 265 495	1 559 604	4 316 153	262 051	1 374 052	59 930	64 400	7 636 190
Karditsa	1 313 500	3 706 250	115 000	837 500	152 800	20 000	6 145 050	1 895 004	3 940 384	149 802	1 944 811	144 239	0	8 074 239

Table 6.A1.1. **Budget and allocated public funds of LEADER+ LAGs (in EUR)** (*cont.*)

LAG	Budget							Allocated						
	Measure						Sum	Measure						Sum
	1.1	1.2	1.3	1.4	2.1	2.2		1.1	1.2	1.3	1.4	2.1	2.2	
Kastoria	962 680	2 879 320	151 925	850 500	151 200	28 800	5 024 425	1 304 310	2 844 445	206 851	878 114	57 081	54 345	5 345 146
Kenakap	1 121 265	3 396 800	245 575	686 375	137 143	34 286	5 621 444	1 926 404	5 167 123	138 525	547 983	94 345	0	7 874 380
Kerkira	1 020 471	2 381 887	171 000	981 445	95 076	84 924	4 734 803	1 573 925	2 606 325	72 120	1 146 528	134 236	52 771	5 585 905
Kefalonia	912 530	2 388 137	148 694	1 294 514	90 000	90 000	4 923 875	1 386 991	2 573 029	81 196	1 007 084	79 806	0	5 128 106
Kilkis	1 061 792	3 054 250	272 650	807 500	130 400	69 600	5 396 192	1 705 153	4 169 454	171 015	1 822 090	121 542	21 673	8 010 927
Cyclades	894 900	2 782 060	251 410	331 579	90 000	90 000	4 439 950	1 080 062	2 157 446	233 827	751 896	175 058	0	4 398 288
Lasithi	1 053 250	2 901 550	227 000	1 080 625	108 000	72 000	5 442 425	1 271 906	3 128 158	99 515	1 057 426	82 437	107 873	5 747 313
Lesbos	774 714	2 019 384	405 350	792 820	28 800	151 200	4 172 268	1 393 667	2 489 753	333 405	1 117 998	100 000	201 480	5 636 304
Lemnos	889 500	2 286 000	413 500	611 000	78 000	52 000	4 330 000	1 080 036	2 973 352	263 315	515 962	89 600	39 126	4 961 391
Xanthi	935 300	2 773 525	155 000	876 375	122 400	57 600	4 920 200	1 389 506	3 568 444	171 378	2 983 084	257 086	90 662	8 460 159
Oadyk	950 656	2 481 771	158 550	910 372	106 400	72 000	4 679 749	1 173 059	3 732 272	255 410	1 454 036	55 215	74 116	6 744 107
Olympia	1 014 035	2 836 096	212 755	715 500	116 212	38 016	4 932 614	1 383 228	2 996 086	310 878	1 260 273	83 365	87 538	6 121 369
Parnon	988 784	2 642 841	225 771	673 400	96 000	64 000	4 690 796	1 679 885	3 510 408	140 237	873 139	259 581	45 203	6 508 453
Pella	1 125 250	3 096 035	212 200	909 920	78 320	99 680	5 521 405	1 519 175	2 913 614	160 198	1 455 252	139 367	87 205	6 274 811
Pilio	958 541	2 427 285	106 065	420 750	55 976	79 024	4 047 641	1 434 135	2 300 197	100 701	1 625 832	133 457	380 021	5 974 344
Pieriki	1 095 654	2 990 394	160 885	1 058 375	90 000	90 000	5 485 308	1 651 359	3 508 820	182 515	1 017 400	123 068	145 632	6 628 794
Rodopi	1 104 859	2 878 894	178 000	791 791	136 000	57 600	5 147 144	2 140 179	3 222 896	96 446	1 055 266	134 725	83 913	6 733 424
Serres	1 239 967	3 065 600	166 900	1 422 500	88 000	72 000	6 054 967	1 821 216	4 371 232	265 644	1 581 789	129 037	93 104	8 262 022
Trihonida	944 363	2 976 265	144 869	250 000	150 000	50 000	4 515 497	1 326 925	3 346 432	151 299	234 228	121 942	56 361	5 237 186
Florina	883 775	2 580 468	241 965	793 780	151 200	28 800	4 679 988	1 314 993	3 632 627	223 881	731 912	41 845	27 399	5 972 657
Fokiki	568 503	1 429 571	86 104	604 842	135 000	0	2 824 021	990 784	2 120 001	62 553	815 785	169 347	0	4 158 470
Halkidiki	1 104 680	3 081 043	275 135	1 086 067	63 750	106 250	5 716 925	1 635 201	2 993 629	177 932	4 157 697	69 498	100 909	9 134 866
Total	40 431 724	109 389 901	8 587 770	35 895 622	4 256 298	2 364 859	200 926 173	61 028 715	137 803 203	6 950 239	54 399 911	4 425 936	2 646 195	267 254 198

Table 6.A1.2. **Constant values of mathematical identities for the computation of shift and share components**

Identity element	Value
A_{nt}/A_{no}	1.330111
$A_{1.1nt}/A_{1.1no}$	1.509426
$A_{1.2nt}/A_{1.2no}$	1.259743
$A_{1.3nt}/A_{1.3no}$	0.809318
$A_{1.4nt}/A_{1.4no}$	1.515503
$A_{2.1nt}/A_{2.1no}$	1.039856
$A_{2.2nt}/A_{2.2no}$	1.118965
$A_{1.1nt}/A_{1.1no} - A_{nt}/A_{no}$	0.179315
$A_{1.2nt}/A_{1.2no} - A_{nt}/A_{no}$	-0.070368
$A_{1.3nt}/A_{1.3no} - A_{nt}/A_{no}$	-0.520793
$A_{1.4nt}/A_{1.4no} - A_{nt}/A_{no}$	0.185391
$A_{2.1nt}/A_{2.1no} - A_{nt}/A_{no}$	-0.290256
$A_{2.2nt}/A_{2.2no} - A_{nt}/A_{no}$	-0.211146

Table 6.A1.3. **Values of components and change in Measure 1.1**

	Measure 1.1			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER) (M=EN+EΣ+ER
Aitolia	312 004	169 479	-148 136	333 347
Akomm	309 587	168 167	697 577	1 175 330
Anvope	377 624	205 124	73 991	656 740
Anko	395 407	214 784	-66 900	543 291
Achaia	323 050	175 479	-292 709	205 820
Drama	337 488	183 322	192 796	713 605
Dodekanese	329 851	179 174	-39 076	469 949
Evros	221 934	120 554	404 695	747 182
Elassona	296 184	160 886	-178 749	278 321
Elikonas	341 311	185 399	-187 669	339 041
Etanam	402 391	218 577	-189 820	431 147
Zakinthos	262 868	142 789	-10 096	395 561
Imathia	313 606	170 349	-98 300	385 655
Epirus	402 057	218 396	-383 540	236 913
Heraklion	423 533	230 061	440 881	1 094 475
Thessaloniki	391 697	212 768	300 080	904 545
Kavala	340 566	184 994	2 374	527 934

Table 6.A1.4. **Values of components and change in Measure 1.2**

	Measure 1.2			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER) (M=EN+EΣ+ER
Aitolia	854 256	-182 097	-561 799	110 360
Akomm	731 535	-155 937	551 911	1 127 509
Anvope	974 038	-207 630	1 892 359	2 658 767
Anko	1 046 856	-223 153	1 493 820	2 317 524
Achaia	792 056	-168 838	-466 436	156 782
Drama	881 554	-187 916	1 132 780	1 826 418
Dodekanese	624 376	-133 095	-329 095	162 186
Evros	1 019 912	-217 409	-522 847	279 657
Elassona	812 703	-173 240	56 213	695 677
Elikonas	876 941	-186 933	-645 809	44 199
Etanam	1 073 015	-228 729	-301 752	542 535
Zakinthos	554 092	-118 113	-273 680	162 299
Imathia	869 183	-185 279	-650 463	33 441
Epirus	1 085 635	-231 419	-576 434	277 782
Heraklion	1 068 348	-227 734	2 872 498	3 713 113
Thessaloniki	1 034 229	-220 461	984 044	1 797 812
Kavala	996 808	-212 484	512 219	1 296 543
Karditsa	1 223 475	-260 802	-728 540	234 134
Kastoria	950 496	-202 612	-782 760	-34 875
Kenakap	1 121 322	-239 026	888 026	1 770 323
Kerkira	786 288	-167 609	-394 241	224 439
Kefalonia	788 351	-168 049	-435 411	184 892
Kilkis	1 008 243	-214 922	321 883	1 115 204
Cyclades	918 390	-195 768	-1 347 236	-624 615
Lasithi	957 835	-204 176	-527 051	226 608
Lesbos	666 622	-142 100	-54 152	470 369
Lemnos	754 635	-160 861	93 578	687 352
Xanthi	915 572	-195 168	74 514	794 919
Oadyk	819 261	-174 637	605 877	1 250 501
Olympia	936 228	-199 570	-576 666	159 991
Parnon	872 432	-185 972	181 106	867 566
Pella	1 022 036	-217 862	-986 596	-182 421
Pilio	801 274	-170 803	-757 559	-127 088
Pieriki	987 163	-210 428	-258 310	518 425
Rodopi	950 356	-202 582	-403 772	344 002
Serres	1 011 990	-215 720	509 363	1 305 632
Trihonida	982 499	-209 434	-402 899	370 167
Florina	851 842	-181 582	381 900	1 052 159
Fokiki	471 918	-100 596	319 109	690 430
Halkidiki	1 017 087	-216 807	-887 694	-87 414

Table 6.A1.5. **Values of components and change in Measure 1.3**

	Measure 1.3			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER) M=EN+EΣ+ER
Aitolia	76 110	-120 073	-19 693	-63 657
Akomm	106 923	-168 685	-57 253	-119 015
Anvope	40 406	-63 745	-59 017	-82 357
Anko	83 928	-132 406	14 487	-33 992
Achaia	78 406	-123 696	67 514	22 224
Drama	55 290	-87 228	-6 538	-38 475
Dodekanese	62 777	-99 039	-40 660	-76 922
Evros	14 706	-23 201	-3 367	-11 861
Elassona	92 617	-146 115	-201 385	-254 884
Elikonas	155 482	-245 294	-240 106	-329 917
Etanam	93 372	-147 306	7 318	-46 616
Zakinthos	66 980	-105 669	-46 417	-85 106
Imathia	48 229	-76 088	149 431	121 573
Epirus	77 228	-121 837	113 377	68 768
Heraklion	72 625	-114 575	2 307	-39 643
Thessaloniki	73 681	-116 241	20 610	-21 950
Kavala	75 955	-119 829	75 835	31 961
Karditsa	37 963	-59 891	56 730	34 802
Kastoria	50 152	-79 122	83 895	54 926
Kenakap	81 067	-127 894	-60 223	-107 050
Kerkira	56 449	-89 056	-66 273	-98 880
Kefalonia	49 086	-77 439	-39 144	-67 498
Kilkis	90 005	-141 994	-49 646	-101 635
Cyclades	82 993	-130 933	30 356	-17 583
Lasithi	74 935	-118 220	-84 200	-127 485
Lesbos	133 811	-211 104	5 348	-71 945
Lemnos	136 501	-215 348	-71 338	-150 185
Xanthi	51 167	-80 723	45 934	16 378
Oadyk	52 339	-82 572	127 092	96 860
Olympia	70 233	-110 801	138 692	98 123
Parnon	74 530	-117 580	-42 483	-85 534
Pella	70 050	-110 512	-11 539	-52 002
Pilio	35 013	-55 238	14 861	-5 364
Pieriki	53 110	-83 788	52 308	21 630
Rodopi	58 760	-92 701	-47 613	-81 554
Serres	55 096	-86 920	130 569	98 744
Trihonida	47 823	-75 447	34 053	6 430
Florina	79 875	-126 014	28 054	-18 084
Fokiki	28 424	-44 842	-7 132	-23 551
Halkidiki	90 825	-143 288	-44 740	-97 203

Table 6.A1.6. **Values of components and change in Measure 1.4**

	Measure 1.4			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER) M=EN+EΣ+ER
Aitolia	227 734	127 896	8 213	363 842
Akomm	317 991	178 584	29 242	525 818
Anvope	408 364	229 338	-370 466	267 237
Anko	424 705	238 515	-906 891	-243 672
Achaia	300 236	168 613	-296 364	172 486
Drama	243 028	136 485	-558 341	-178 828
Dodekanese	620 088	348 243	633 213	1 601 544
Evros	228 949	128 578	-112 024	245 503
Elassona	200 543	112 625	-335 029	-21 862
Elikonas	360 647	202 540	358 740	921 926
Etanam	309 622	173 884	-2 176	481 330
Zakinthos	371 705	208 751	-455 126	125 330
Imathia	309 479	173 804	-674 527	-191 244
Epirus	232 778	130 729	2 292	365 798
Heraklion	444 330	249 537	704 486	1 398 352
Thessaloniki	383 246	215 232	250 269	848 747
Kavala	264 130	148 336	161 461	573 927
Karditsa	276 468	155 265	675 577	1 107 311
Kastoria	280 760	157 675	-410 821	27 614
Kenakap	226 580	127 248	-492 220	-138 392
Kerkira	323 986	181 951	-340 855	165 083
Kefalonia	427 334	239 992	-954 756	-287 430
Kilkis	266 565	149 703	598 322	1 014 590
Cyclades	109 458	61 472	249 386	420 316
Lasithi	356 727	200 338	-580 264	-23 199
Lesbos	261 719	146 982	-83 523	325 178
Lemnos	201 698	113 274	-410 010	-95 038
Xanthi	289 301	162 472	1 654 935	2 106 709
Oadyk	300 524	168 775	74 364	543 663
Olympia	236 195	132 647	175 931	544 773
Parnon	222 297	124 842	-147 401	199 739
Pella	300 375	168 691	76 265	545 332
Pilio	138 894	78 003	988 185	1 205 082
Pieriki	349 382	196 213	-586 570	-40 975
Rodopi	261 379	146 791	-144 696	263 475
Serres	469 583	263 719	-574 014	159 289
Trihonida	82 528	46 348	-144 648	-15 772
Florina	262 036	147 160	-471 063	-61 868
Fokiki	199 665	112 132	-100 855	210 943
Halkidiki	358 523	201 347	2 511 760	3 071 630

Table 6.A1.7. **Values of components and change in Measure 2.1**

	Measure 2.1			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER) M=EN+EΣ+ER
Aitolia	44 440	-39 074	27 796	33 161
Akomm	34 464	-30 303	-18 068	-13 907
Anvope	49 807	-43 794	-15 693	-9 679
Anko	46 915	-41 251	-49 474	-43 810
Achaia	47 536	-41 797	-10 078	-4 339
Drama	44 895	-39 475	-84 073	-78 652
Dodekanese	10 399	-9 143	67 245	68 500
Evros	19 675	-17 299	-31 891	-29 515
Elassona	24 726	-21 740	41 819	44 805
Elikonas	17 958	-15 790	165 493	167 662
Etanam	49 517	-43 538	-136 726	-130 748
Zakinthos	29 842	-26 239	-5 437	-1 834
Imathia	26 409	-23 220	-44 184	-40 995
Epirus	47 536	-41 797	-118 276	-112 537
Heraklion	34 332	-30 187	-25 990	-21 845
Thessaloniki	22 712	-19 970	71 499	74 241
Kavala	44 895	-39 475	-81 490	-76 070
Karditsa	50 441	-44 351	-14 651	-8 561
Kastoria	49 913	-43 887	-100 145	-94 119
Kenakap	45 272	-39 806	-48 264	-42 798
Kerkira	31 386	-27 596	35 371	39 160
Kefalonia	29 710	-26 123	-13 781	-10 194
Kilkis	43 047	-37 849	-14 055	-8 858
Cyclades	29 710	-26 123	81 471	85 058
Lasithi	35 652	-31 348	-29 868	-25 563
Lesbos	9 507	-8 359	70 052	71 200
Lemnos	25 749	-22 640	8 491	11 600
Xanthi	40 406	-35 527	129 807	134 686
Oadyk	35 124	-30 883	-55 426	-51 185
Olympia	38 363	-33 731	-37 479	-32 847
Parnon	31 691	-27 865	159 755	163 581
Pella	25 854	-22 733	57 926	61 047
Pilio	18 478	-16 247	75 250	77 481
Pieriki	29 710	-26 123	29 481	33 068
Rodopi	44 895	-39 475	-6 696	-1 275
Serres	29 050	-25 542	37 530	41 037
Trihonida	49 517	-43 538	-34 036	-28 058
Florina	49 913	-43 887	-115 381	-109 355
Fokiki	44 565	-39 184	28 966	34 347
Halkidiki	21 045	-18 504	3 207	5 748

Table 6.A1.8. **Values of components and change in Measure 2.2**

	Measure 2.2			
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change(EN+ES+ER) M=EN+EΣ+ER
Aitolia	14 980	-9 582	10 732	16 131
Akomm	24 956	-15 963	45 338	54 332
Anvope	10 933	-6 993	-8 510	-4 570
Anko	15 806	-10 110	3 100	8 796
Achaia	11 884	-7 601	34 654	38 937
Drama	19 014	-12 162	-15 889	-9 036
Dodekanese	0	0	0	0
Evros	21 919	-14 020	-74 299	-66 400
Elassona	34 694	-22 191	-12 913	-409
Elikonas	25 088	-16 047	-77 179	-68 138
Etanam	16 506	-10 557	-19 185	-13 237
Zakinthos	0	0	0	0
Imathia	0	0	0	0
Epirus	11 884	-7 601	73 826	78 109
Heraklion	23 768	-15 203	4 887	13 453
Thessaloniki	35 652	-22 804	-37 429	-24 581
Kavala	15 845	-10 135	10 690	16 400
Karditsa	6 602	-4 223	-22 379	-20 000
Kastoria	9 507	-6 081	22 119	25 545
Kenakap	11 318	-7 239	-38 365	-34 286
Kerkira	28 034	-17 931	-42 256	-32 153
Kefalonia	29 710	-19 003	-100 707	-90 000
Kilkis	22 976	-14 696	-56 207	-47 927
Cyclades	29 710	-19 003	-100 707	-90 000
Lasithi	23 768	-15 203	27 307	35 873
Lesbos	49 913	-31 925	32 292	50 280
Lemnos	17 166	-10 980	-19 060	-12 874
Xanthi	19 014	-12 162	26 209	33 062
Oadyk	23 768	-15 203	-6 449	2 116
Olympia	12 550	-8 027	44 999	49 522
Parnon	21 127	-13 513	-26 411	-18 797
Pella	32 906	-21 047	-24 333	-12 475
Pilio	26 087	-16 686	291 596	300 997
Pieriki	29 710	-19 003	44 925	55 632
Rodopi	19 014	-12 162	19 461	26 313
Serres	23 768	-15 203	12 538	21 104
Trihonida	16 506	-10 557	413	6 361
Florina	9 507	-6 081	-4 827	-1 401
Fokiki	0	0	0	0
Halkidiki	35 074	-22 434	-17 981	-5 341

Table 6.A1.9. **Values of components, change and rank of local action groups in regional LEADER type**

Local action groups' ranking					
LAG	National effect (EN)	Structural effect (ES)	Regional/competitive effect (ER)	Change (EN+ES+ER)	Regional LEADER Type
Aitolia	1 529 524	-53 451	-682 888	793 184	6
Akomm	1 525 457	-24 137	1 248 746	2 750 067	2
Anvope	1 861 173	112 300	1 512 665	3 486 137	1
Anko	2 013 617	46 379	488 142	2 548 138	1
Achaia	1 553 169	2 160	-963 419	591 910	5
Drama	1 581 270	-6 974	660 735	2 235 031	2
Dodekanese	1 647 491	286 140	291 626	2 225 257	1
Evros	1 527 095	-22 798	-339 732	1 164 565	6
Elassona	1 461 467	-89 775	-630 045	741 648	6
Elikonas	1 777 428	-76 125	-626 530	1 074 774	6
Etanam	1 944 422	-37 669	-642 342	1 264 411	6
Zakinthos	1 285 487	101 518	-790 756	596 249	5
Imathia	1 566 907	59 566	-1 318 043	308 430	5
Epirus	1 857 118	-53 529	-888 756	914 834	6
Heraklion	2 066 935	91 900	3 999 070	6 157 906	1
Thessaloniki	1 941 217	48 525	1 589 073	3 578 814	1
Kavala	1 738 200	-48 593	681 087	2 370 695	5
Karditsa	2 028 551	21 529	-120 891	1 929 189	5
Kastoria	1 658 620	-1 403	-1 336 496	320 721	6
Kenakap	1 855 703	-85 658	482 892	2 252 937	2
Kerkira	1 563 013	62 745	-774 656	851 102	5
Kefalonia	1 625 427	113 008	-1 534 205	204 231	5
Kilkis	1 781 345	-69 362	902 752	2 614 735	2
Cyclades	1 465 678	-149 886	-1 357 454	-41 662	6
Lasithi	1 796 607	20 255	-1 511 974	304 888	5
Lesbos	1 377 313	-107 589	194 311	1 464 036	2
Lemnos	1 429 382	-137 054	-660 937	631 391	6
Xanthi	1 624 214	6 606	1 909 139	3 539 959	1
Oadyk	1 544 839	35 947	483 573	2 064 358	1
Olympia	1 628 312	-37 651	-401 906	1 188 755	6
Parnon	1 548 485	-42 783	311 954	1 817 657	2
Pella	1 822 679	-1 689	-1 067 585	753 406	6
Pilio	1 336 172	-9 090	599 621	1 926 704	2
Pieriki	1 810 763	53 339	-720 616	1 143 485	5
Rodopi	1 699 131	-2 011	-110 840	1 586 280	6
Serres	1 998 814	142 678	65 563	2 207 055	1
Trihonida	1 490 617	-123 290	-645 638	721 689	6
Florina	1 544 918	-51 930	-200 319	1 292 669	6
Fokiki	932 241	29 451	372 757	1 334 449	1
Halkidiki	1 887 222	-1 600	1 532 319	3 417 941	2

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