

Vestlandsforskning notat nr. 4/2014

INNOVATION IN RURAL PLACES – CONDITIONS AND BARRIERS Status of knowledge

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Vestlandsforsking Notat

Tittel Innovation in rural places – conditions and barriers: Status of knowledge	Notatnummer 4/2014 Dato 15.10.2014 Gradering Open
Prosjekttittel Innovation in rural places – conditions and barriers	Tal sider 62 Prosjektnr 6235
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Oppdragsgivar Norges Forskningsråd, Sogn og Fjordane Fylkeskommune	Emneord Regional development

Samandrag

In this report, we present our understanding and interpretation of a selection of state-of-art literature on regional innovation and development. The project was financed by the NRC, the County Municipality, and the research institutions themselves, which in this case are Vestlandsforsking and Sogn og Fjordane University College. Our ambition is not to present a complete coverage of this field of knowledge as the our research question directs our search for literature. It is also a snapshot of the initial phase of the project that is why this report is in English while the other reports from the project is in Norwegian.

Andre publikasjonar frå prosjektet

VF rapport 2/2014 Innovasjon i Sogn og Fjordane – vilkår og barrierar – Sluttrapport
VF rapport 3/2014 Innovasjon i Sogn og Fjordane – vilkår og barrierar – Dokumentasjonsrapport
VF notat 1, 9, 10 og 11/2014 Funksjonell analyse av nettverk
VF notat 2/2014 Bedriftsutviklingstiltak: Evaluering av tre ulike tiltak
VF notat 3/2014 Arbeidsmarknad
VF notat 5/2014 Artikkelsamling

Content

1.	BACKGROUND AND RELEVANCE OF THE RESEARCH PROJECT	7
1.1.	SOGN OG FJORDANE	7
1.1.1.	<i>History</i>	7
1.1.2.	<i>Demography</i>	8
1.1.3.	<i>Geography, infrastructure and communication</i>	8
1.1.4.	<i>Industry, trade and production</i>	9
1.2.	VRI SOGN OG FJORDANE	9
1.2.1.	<i>VRI programme</i>	9
1.2.2.	<i>VRI Sogn og Fjordane The Collaboration projects</i>	10
1.2.3.	<i>VRI Sogn og Fjordane – The Innovation Research project</i>	11
2.	STATUS OF KNOWLEDGE.....	12
2.1.	REGIONAL THEORY AND POLICY.....	12
2.1.1.	<i>Economic theories</i>	13
2.1.2.	<i>Sociologic theories</i>	13
2.1.3.	<i>Political theories</i>	13
2.1.4.	<i>Regional Innovation Systems’ position in Theory and Policy</i>	14
2.2.	CORE TERMS	15
2.2.1.	<i>Region</i>	15
2.2.2.	<i>On regional differences and the terms which describe them</i>	17
2.2.3.	<i>‘Innovation’ and related terms</i>	25
2.2.4.	<i>System; systemic</i>	27
2.2.5.	<i>Networks: Etymology and definitions</i>	28
2.2.6.	<i>Clusters - Related, but not the same</i>	29
2.3.	NETWORKS AND REGIONAL INNOVATION SYSTEMS: SOME UNDERLYING CONCEPTS	32
2.3.1.	<i>The role of knowledge and learning</i>	32
2.3.2.	<i>Social capital</i>	34
2.3.3.	<i>Institutional capacity</i>	42
2.4.	REGIONAL INNOVATION SYSTEMS	42
2.4.1.	<i>Regional Innovation Systems: Origin</i>	42
2.4.2.	<i>Regional Innovation Systems: Definitions and distinctions</i>	43
2.4.3.	<i>Regional Innovation Systems in the Regional development literature</i>	44
2.5.	REGIONAL CONDITIONS FOR INNOVATION, AND INNOVATION POLICY.....	45
2.5.1.	<i>Typology of three types of ‘problem regions’ and their corresponding weaknesses</i>	46
2.5.2.	<i>Other descriptions of peripheral and rural regions - problems and potential</i>	47
2.5.3.	<i>Some common issues in ‘geographically specific areas’:</i>	48
2.6.	FACTORS INFLUENCE REGIONAL INNOVATION AND DEVELOPMENT	50
2.6.1.	<i>Vulnerability</i>	50
2.6.2.	<i>Robustness</i>	51
2.6.3.	<i>From a problem oriented to a pro-active perspective</i>	52
2.6.4.	<i>Policy Advice</i>	52
2.7.	SOME FINAL CONSIDERATIONS.....	54
	REFERENCES.....	55

Introduction

In this report, we present our understanding and interpretation of a selection of state-of-art literature on regional innovation and development. The background is a research programme that in Norwegian was called VRI (“Virkemidler for regional FoU og innovasjon”); in English this could be translated to “Programme for Regional research, development and innovation”. This is a national programme run by the Norwegian Research Council (NRC) promoting regional development through “collaboration between trade and industry, R&D institutions and the government authorities. The programme was financed by the NRC, the County Municipality, and the research institutions themselves, which in this case are Vestlandsforskning and Sogn og Fjordane University College.

The main research question in our part of the programme was: “In a rural context like Sogn og Fjordane County; what are the dynamics of, and the conditions and barriers in,

- ... the existing and emerging innovation systems and networks
- ... the knowledge and relational resources for mobilisation of innovations
- ... the development of innovative and competitive enterprises”

Of course, our research question directs our search for literature, so our ambition is not to present a complete coverage of this field of knowledge. In spite of that, we think that such a literature review might be of interest, not just for other researchers, but for any person with an interest in digging deeper into the theories of regional innovation.

We have organized the remainder of this report as follows: First we define the most important concepts used in the report. In chapter 1 we explain the background and the relevance of the VRI project in Sogn og Fjordane County. So, in chapter 2, we present and discuss theories on regional innovation and development. Chapter 2 is divided in seven parts: Regional Theory and Policy, Core Terms, Networks and Regional Innovation Systems: Some Underlying Concepts, Regional Innovation Systems, Regional Conditions for Innovation and Innovation Policy, Factors Influencing Regional Innovation and Development, and Some Final Considerations.

Sogndal, 20.10.2014

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Definitions and Delimitations

VRI

VRI is the abbreviation of 'Virkemidler for regional FoU og innovasjon'; in English 'Programme for Regional research, development and innovation'. This is a national programme run by the Norwegian Research Council promoting regional development through "collaboration between trade and industry, R&D institutions and the government authorities, and to establish close ties to other national and international network and innovation measures" (NFR, 2012a).

Region

We refer to Sogn og Fjordane as a region. Sogn og Fjordane is an *administrative unit* providing the geographical limitations of where to search for our networks and interview subjects. This is in line with the organization of VRI projects which generally follow region borders. The administrative aspect is also among the common distinction criteria (Britannica, 2012a) mentioned when defining the term 'region'. At the same time, Sogn og Fjordane with its variations in geography, settlement and industrial patterns, defies another central aspect of the definition of 'region' as being "a cohesive area that is homogeneous in selected defining criteria"(Britannica, 2012a).

Innovation, R&D, and entrepreneurship

Our definition of *innovation* is: «introduction of new inputs, products, services, markets, processes or organisational forms that creates economic value or other kind of value creation both in private and public sectors». This is in accordance with the VRI-definition of innovation (NFR, 2010, p. 3), and Schumpeter's (1934,1983) perspectives on renewal, entrepreneurship and economic development (Spilling, 1998, p. 16). Schumpeter related such renewals not only to economic growth, but to qualitative changes. He called the initiating individual an *entrepreneur*, and frequently the changes would lead to new enterprises (Spilling, 1998). Today *entrepreneurship* refers to the creation of new enterprises (Nesse, Trengereid, & Mundal, 2009). It is recognized as a form of innovation. A stated goal in VRI is to promote *R&D (research and development)* which generally refers to systematic innovation activities in businesses.

Networks and clusters

In our project we focus on business networks, which concern formal and informal relations between businesses and related organisations in order to enhance learning, innovation activity and competitiveness. We use the definition Skogseid (2007) presents of 'network: "a network is a set of interconnected but discrete nodes... (in which the nodes are) individuals or groups of actors (both human and technical) and the network links together different capabilities and knowledge. Common interest or relations and the communication of ideas and impulses along the links in the network are what connect the nodes"'.

A related term which is much used, and often confused with network, is '*cluster*' (Cooke, 2002). Clusters are associated with large scale industry relationships, and it has been claimed that Norway only has 2-3 business environments which qualify to be called clusters; the furniture industry in Sunnmøre being one example. Having Sogn og Fjordane as our scope we will therefore mainly focus on smaller scale networks, but as the cluster notion is so widely used both in the literature and in the language of policy formulation, we find it necessary also to present and discuss this concept to some extent.

In addition we present a different use of the term cluster. Based on the *descriptive clusters* of Schön (1991), Skogseid (2007) provides a framework of thematically grouped ('clustered') questions as a tool for context analysis and process planning.

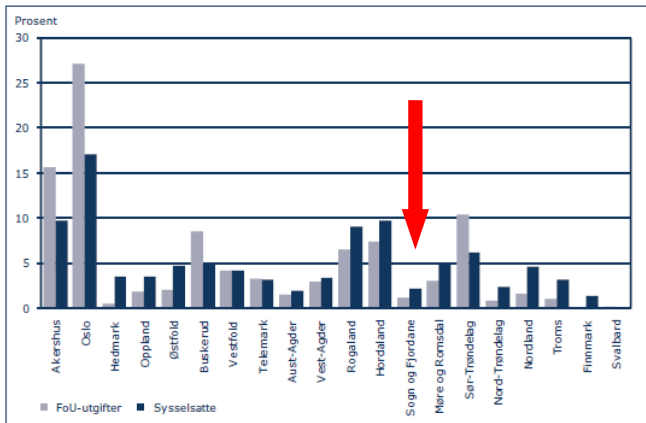
Regional Innovation System

A 'system' can denote a method for doing something, or indicate a linear relation between a group of objects or ideas. In either sense the word can stand for phenomena of varying degrees of complexity. When it comes to innovation and production, though, it seems that recent literature (Edquist, 1997; Tödtling & Tripl, 2005) tend to use the term 'innovation systems' about rather complex relations and processes in the 'real' world. Part of our scope is to explore whether and how the concept of innovation systems may serve as a tool to analyse collaborative innovation activities in Sogn og Fjordane.

1. Background and Relevance of the Research Project

Sogn og Fjordane is a region that scores low compared to other regions in Norway on almost all innovation indicators such as R&D experiences in the business community, see figure below (Foyn et al., 2010) and with regard to new businesses.

Figur 5.1.8
FoU-utgifter i næringslivet og sysselsatte i 2008 etter fylke. Andel av total.



Kilde: SSB/FoU-statistikk

The rurality gives the region challenges with regard to innovation. Both in public sector and in the business sectors not enough attention has been given to the innovation challenges. In the struggle to take steps up the “innovation ladder” the region is seeking more knowledge about conditions and barriers for the predominantly rural system of innovation in the region. Theories on regional innovation are perceived to not sufficiently describe the dynamics of the current innovation systems (Tödtling & Trippel, 2005). Earlier no complete analysis of the innovation system have been performed, only studies of isolated initiatives. This project is an important part of developing the general innovation competence in the region, and the findings will serve to inform policy decisions in this field.

1.1. Sogn og Fjordane

Innovation activities, business networks and regional innovation systems develop in interaction with the various conditions in each individual region. Here we will look at some central characteristics of Sogn og Fjordane, related to the region’s history, demography, geography, infrastructure and communication; and industry, trade and production.

1.1.1. History

Sogn og Fjordane is one out of four regions constituting Western Norway. The region has long traditions, and celebrates its 250th anniversary in 2013. According to Store Norske Leksikon (2012c) Sogn og Fjordane was established as a region in 1763 under the name Nordre Bergenhus Amt and got its current name in 1919. Some places, like the inner parts of Nordfjord, were populated already in the stone age 6000 years ago (NRK, 2002; UiB, 2006).

In the Iron Age the whole region was settled; the coast facing the ocean, the central fjord villages and the inner parts of Western Norway (SNL, 2012c, 2012f).

Early traces of industrial and innovative activity, also of international character, have been documented in the region. Norsk Kvernsteinsenter (2012) describes the mill stone production site in Hyllestad, which covers 27 km², as one of the largest areas of archaeological findings in Norway, and it is also the oldest finding of such production in the country. Already 700 A.D. there was an extensive production of mill stones, but also stone crosses and other stone objects Norsk Kvernsteinsenter (2012).

1.1.2. Demography

The region covers 18.623 square km and is organized in 26 municipalities (SNL, 2012c, 2012d), with a totality of 108 624 inhabitant (SSB, 2012b). This makes Sogn og Fjordane the eight largest region in Norway while having the second lowest number of inhabitants (Wikipedia, 2012g), which gives an average number of 5,8 inhabitants per sq km, the national average is 15 inhabitants per sq km (SSB, 2012e).

According to SSB (2012d) many municipalities in the western and northern parts of Norway have had a net out migration in the period since 1950. In Sogn og Fjordane this particularly concerns young persons in the 20-29 age groups. (Jakobsen, Idsø, & Skogseid, 2012; SSB, 2012a). As a result of increased immigration all counties now experience population growth (SSB, 2012d). Sogn og Fjordane has had a lower population growth than the national average in the period since the Second World War (SNL, 2012e), between 1950 and 2006 its proportion of the country population was reduced from 3,0 % to 2,3 %. A few municipalities, Sogndal, Førde and Flora, have had a continuous growth in the same period (SNL, 2012e). At the same time Sogn og Fjordane has a positive fertility rate (Eide, Idsø, Jakobsen, Simonsen, & Skogseid, 2011).

Sogn og Fjordane is the less urbanized region in Norway (SNL, 2012e). Førde, Flora, and Måløy are the only registered towns in the region. With regard to inhabitants only two municipalities have about 12000 inhabitants (SSB, 2012c), and nine municipalities have between 4-7000 inhabitants. The remaining 15 municipalities have less than 3000 inhabitants each. Most of the municipalities have one main agglomeration.

1.1.3. Geography, infrastructure and communication

The region is mountainous with several fjords and glaciers. The largest glacier on the European mainland Jostedalbreen, are dividing the southern and northern parts of the region. Along with several major fjords this makes communication and infrastructure development a challenge. Traditionally the fjords, glaciers and mountain passes were important transportation routes, but today they are seen as transportation barriers that hinder or slow down transportation. Reduction of communication barriers is an important issue in Sogn og Fjordane, despite recent developments such as new bridges, tunnels and better roads, along with access to broadband infrastructure continues to be an important regional policy issue. And no doubt mountains, fjords and road conditions contribute making the region difficult to develop, and the region consist of fragmented and relatively small living and

working regions, many of them being rural or peripheral (Jakobsen et al., 2012). Commuting is difficult; the distances in time between the outskirts of the region are up to 4-5 hours travel.

1.1.4. Industry, trade and production

Compared to national value creation in different sectors the region have a higher proportion of businesses within construction and building, maritime industry, tourism, fishing and maricultural industry; and lower proportion of value creation in more knowledge intensive sectors such as oil and gas, finance, knowledge based services, ICT and media. The value creation per employee is low compared to the national average (Eide et al., 2011). Two percent of Norway's inhabitants live in the region while it only accounts for 1 percent of the national value creation. This is due to the combination of factors (Jakobsen et al., 2012); dominating business sectors have low value creation and low level of wages, lower than the national average, and that there are too few employment opportunities and every day several thousand workers are commuting out of the region. At the same time the growth in value creation is higher than in other regions (Jakobsen et al., 2012). This indicates that the businesses have been late starters in utilizing growth periods and in emphasizing R&D and innovation, and that they are now struggling to catch up on development. When it comes to export Sogn og Fjordane is the 9.th most important region in Norway (Bukve & Gammelsæter, 2004a, p. 11).

Even with many commuting out of the region there is a low unemployment rate, it has remained low at around 1-2% for several years. The current work force is dominated by low levels of education, 17% of the inhabitants have a minimum of one year of higher education, while the national average is 21% (Eide et al., 2011). And there is a lack of skilled specialized workers in many sectors, these are hard to recruit nationally as well and many companies have to import such workers from other cultures.

1.2. VRI Sogn og Fjordane

Sogn og Fjordane has several characteristics which can be described not only as challenges, but also as assets. In order to steer development patterns in a positive direction specific knowledge is required as a base for politicians to make good decisions at local, regional and national level. This research project is designed to address some of these challenges. We will first present the national VRI programme, and then present the research project with topics and research questions.

1.2.1. VRI programme

The VRI programme is a large national research programme managed by the Research Council of Norway (NFR, 2012a, 2012b). VRI is an abbreviation for 'Virkemidler for regional FoU og innovasjon'; ('Programme for Regional research development and innovation'). According to VRI's home page in English (NFR, 2012c) the programme shall promote regional collaboration between trade, R&D institutions and public authorities. It shall also strengthen the interaction with other network and innovation initiatives, both on a national and international level, such as the Arena programme, Norwegian Centres of Expertise (NCE) and the Regions of Knowledge initiative. Some fundamental activities to obtain these

goals include research, cooperation, learning and exchange of experience across boundaries – whether they are scientific, professional or administrative (NFR, 2012c).

The programme had a ten year timeframe implemented in 3 year program periods. The first program period, VRI 1, lasted from 2007 until 2010. The current project is part the second program period, VRI 2 (2011-2013), and a third period is planned, VRI 3, covering the period 2014-2017.

The VRI programme fund two types of projects; *collaboration projects* and *innovation research projects*. The collaboration projects (NFR, 2010) are in charge of activities to promote collaboration and flow of knowledge between businesses, research organisations and public sector. It also has as an aim to mobilise for and increase the quality of research based development projects in businesses, public sector and in networks of such. The program sets an overall aim, while the implementation is dependent on regional priorities and target areas.

The innovation research projects are conducting research on innovation processes that have a regional focus and with a nationally and internationally relevance. The main thematic research areas (NFR, 2010) are:

1. “Prerequisites for regional cooperation to promote innovation. What is needed to influence the framework for regional development and innovation processes? How can effective interaction be created across professions, sectors and subject areas? How can innovation and interaction between different geographical levels be achieved? How can regional advantages be developed in a global economy?”
2. “The Nordic model. How can the Nordic model be further developed in a society where new industries with weaker traditions for cooperation between employers’ and employees’ organisations are becoming increasingly important?”

1.2.2. VRI Sogn og Fjordane The Collaboration projects

Sogn og Fjordane Fylkeskommune (the regional government) is the project owner and stakeholder, and has signed a partnership agreement with Norges Forskningsråd. The partnership also includes Innovasjon Norge, Sogn og Fjordane University College, Kunnskapsparken i Sogn og Fjordane (the Knowledge park), Confederation of Norwegian Enterprise (NHO), The Norwegian Confederation of Trade Unions (LO) and Western Norway Research Institute.

The collaboration project has the following overall objective:

VRI Sogn og Fjordane 2011-13 will contribute to strengthen the competitiveness of enterprises and increase value creation in business in the region through research-based innovation, with particular emphasis on the industries renewable energy and marine industries. This will be achieved by mobilizing and facilitating dynamic interaction and knowledge flow between enterprises, public sector and R&D institutions in and outside the region.

There is a close connection between the goals and strategies of VRI Sogn og Fjordane and the regions R & D strategy for economic development. The R & D strategy sets out two type of actions:

- a) Mobilize companies to define their research needs.

- b) Ensure a systematic and long-term R & D activities within the prioritised sectors.

Action for VRI project reflects this dichotomy. In addition to systematic and long-term research that is oriented towards priority sectors, the VRI competence brokers will proactively visit businesses and facilitate the definition of R&D need, make connections to R&D institutions that can support the company's needs (VRI_SFj, 2011).

1.2.3. VRI Sogn og Fjordane – The Innovation Research project

The research project is established with support of the VRI-partnership and coexists with the collaboration project. The research project called; "Innovation in rural places – conditions and barriers" will explore the existing innovation system in the region; the development of innovation networks and how they interact with each other. Our research project will contribute to the development of theories on rural innovation systems, and explore the dynamics involved in rural regional innovation. Our interest is to study how the actors utilize knowledge and relational resources and to mobilize for innovations, and we will through that create new research based knowledge about the region. The main goal of the project is:

To understand the innovation system in the rural region Sogn og Fjordane. Based on the findings the project will suggest policy implications for rural innovation systems.

The project will investigate the dynamics of, the conditions and barriers in...

- the existing and emerging innovation systems and networks
- the knowledge and relational resources for mobilisation of innovations
- the development of innovative and competitive enterprises

In order to find out more about the rural innovation system, we will focus on the following research questions:

- Which innovation systems and networks exist in the region, and how do they operate?
- Looking at emerging innovative network, who are involved, which links do they have to internal and external actors, what are the expectations?
- How can innovation systems and networks secure transfer of knowledge between themselves and to new initiatives? What can be learned and transferred to other settings?
- Matching of supply and demand in rural labour markets: Do the companies have access to sufficient new competence, and are young people motivated for careers in Sogn og Fjordane? Are there gender differences?
- The effects of different types of business development projects: How do businesses in Sogn og Fjordane operate their development projects? What are the success factors? How do they take part in and influence the innovation system?

In the following status of knowledge we will look into the literature addressing issues of relevance for the research objective and research questions.

2. Status of Knowledge

In the research project 'Innovation in rural places – conditions and barriers' we are focusing on business networks and the regional innovation system in Sogn og Fjordane. We are aiming to learn more about the special conditions and barriers that affect such systems in rural regions. In order to achieve this we will explore network relationships and activities that are stimulating innovation. As our starting point, we use mainstream regional development literature. In this chapter we sketch out the status of knowledge in this field, as found in existing theory and research. The presentation is by no means complete, but we have searched to include both classical and recent work with national and international perspectives. As many of these theories are developed based on urban regions which have different characteristics than the object of this project, we have also included literature that argues for taking the specificity of individual regions into consideration.

In regional innovation and development theory one can often find terms from agriculture, such as 'organic' or 'growth', to describe a certain 'path of development. But as Bukve and Gammelsæter (2004a, p. 56) state, "today's flora of terms and theories (...) may to most of us resemble a tangle of shrubs rather than a garden made by architects" (our translation). They even describe the situation as a "jungle of terms" (Bukve & Gammelsæter, 2004a, p. 19).

We will here organize our introduction to this 'jungle' in seven sections. In the first section we give a general overview over regional theory and policy, and conclude the section by indicating where innovation systems stand in this picture. In the second section we go more in depth concerning some core terms and concepts which were briefly defined initially in this document: 'region', 'innovation', 'system', 'networks' and the related concept of 'clusters'. In section three we present some central underlying concepts; the role of learning and knowledge, as well as social capital and institutional capacity. These are keys for a deeper understanding of networks and regional innovation systems, which we treat separately in section four - seven.

2.1. Regional Theory and Policy

Economic development, trade and industry are essential topics in the regional innovation and development literature. According to Bukve (2001) theories in this field may be grouped as economic, sociologic or political. With increasing internationalization and the presence of multinational companies, also geography has become important in explaining the 'dynamics of regions and their external connections' (Maskell, Bathelt, and Malmberg (2006) among others, referred in Herstad (2008, p. 60)). The new interest in regional and contextual conditions has also to a great extent been inspired by institutional theory (Amin, 1999).

One may claim that the distinction between different theories can be somewhat artificial, as most theorizing on regional development would include some elements of such perspectives. Still, it may be useful to be aware that different theoretical traditions have highlighted different topics, and that these traditions draw upon each other in the development of more specific, but also more integrated theories. For example, when the purely economic term 'capital' was combined with the term 'social', one got a powerful new concept which has been, and still is,

widely used within the social sciences. The idea of 'social' capital has later returned to the economic field; and is now seen as crucial for economic development in the modern globalized economy. Being scientific interpretations of reality, theories will in turn affect this reality by influencing political reasoning and action. In the following three sections, which are based on (Nesse, 2009, pp. 46-48), we give examples of economic, sociological and political theories and their relationship with policy intervention. The examples indicate that different theories focus on different sets of actors, and that they recommend policy intervention at different levels of society.

2.1.1. Economic theories

Nesse (2009, pp. 46-48) points to the wide span between different economic theories. *Neoclassical economics* emphasize the 'perfect market' which in principle regulates itself. But as reality turns out to work somewhat different, some political direction is accepted in order to correct for imbalances in the economy. Still, policy interventions should be restricted to the *macro* or national level, aiming to ensure equal competition. Examples would be deregulations and preventing the development of monopolies. Politicians who follow this tradition would be reluctant to influence change-over processes (Nesse, 2009). At the other end of the scale, Nesse (2009) mentions the Austrian "*Human Action*"-tradition, which sets focus on the individual as an actor. In this perspective imbalances can be interpreted positively because they open up for entrepreneurship, as stated by Kirzner (1973), or it can even be a goal to create imbalances through innovations, in line with Schumpeter (2005). Policy in this spirit would intervene at the *micro level*, supporting persons who see opportunities and who have the will to act upon them. Nesse (2009) mentions the entrepreneurial supporting activity of Innovasjon Norge as an example.

2.1.2. Sociologic theories

According to Bukve (2001) sociological theories will also focus on individual actors. In addition, they will supplement economic theories by introducing interventions at the *meso level*, emphasizing the local culture and network relations. Policy following this theoretical tradition would be to create industrial incubators and similar, which in Norway would be the task of SIVA (Nesse, 2009).

2.1.3. Political theories

Stöhr (1990) divides policy on regional and local development in three main types which do not necessarily exclude each other: Central or so-called 'top-down' initiatives by the state, private initiatives (market solutions) and local or regional 'bottom up'-initiatives. *Central initiatives* include supporting less privileged regions by investing in infrastructure, establishing state businesses or –offices, and granting favourable conditions for businesses who wanted to start up in certain regions. This policy was common in Europe from the post war period until the 70/80-ies. Economic stagnation then led to awareness of this model's lack of flexibility and possibility of local adaptation (Stöhr, 1990). Pike, Rodríguez-Pose, and Tomaney (2006) mention some additional problems with corner stone industry; dependency on external actors and difficulties of creating innovative environments where this did not

already exist, and where the business was not well integrated in the local context. Trends shifted towards a focus on neoclassic economic ideas. *Private or market regulated initiatives* should be the solution in bringing more mobility, more efficiency and faster adaptation in the economy. On the other hand, deregulations could lead to new problems, such as creating a wider gap between regions (Pike et al., 2006), and subsequent depopulation (Higgins & Savoie, 1997).

Stöhr (1990) states that supporting individual entrepreneurs is of little help if they are not part of a supportive network. He concludes that both macro- and microeconomic theory ignore the importance of the meso level in regional policy, while the best solution could be found just here – in the form of broad, local or regional bottom-up development processes. Arbo and Bukve (1990) divide local initiatives in three groups according to the actors initiating them: *Political initiatives* made by the municipality, *corporate initiatives* by the private business sector, and *local community based initiatives* by local nongovernmental organisations.

2.1.4. Regional Innovation Systems' position in Theory and Policy

The idea of 'Regional innovation systems' is still a young theoretical field, and several authors underline this by not using the term 'theory', but instead *systems of innovation approaches* (Edquist, 1997), or slightly different; the *regional innovation system-approach* or *RIS-approach* (Tödtling & Trippl, 2005). Edquist (1997) has identified nine common features of these approaches, here somewhat summarised (see section 2.4 for a more complete presentation): The systems of innovation approaches are diffuse and to be seen as conceptual frameworks rather than theories, and they are holistic and interdisciplinary. They focus on learning, product- and organizational innovation, institutions, non-linearity and reciprocal dependency. Also, these approaches point to 'non-optimality' or the fact that there is no one single 'best' system or practice, and that one therefore has to study differences between systems and find out what works better. Edquist (1997) also underlines the historical and evolutionary perspectives that these approaches have on innovation.

When it comes to innovation policy, Tödtling and Trippl (2005) similarly emphasize that the regional innovation system approach represents a shift towards focusing on systemic interactions and interdependencies, both within and between companies and institutions. Here we see parallels to the thinking of (Stöhr, 1990) on the importance of the meso level in policy planning. According to Tödtling and Trippl (2005) this change in focus came after 1990, and stands in contrast to traditional models of innovation policy which they describe as *linear*, with a "Schumpeterian view of firms innovating in isolation". As examples they mention measures similar to those (Stöhr, 1990) describes in relation to central initiatives or 'top-down' policy; provision of infrastructure and technological and financial support for companies. The problem was that one tended to ignore the importance of firms absorption capacity (Tödtling & Trippl, 2005), as well as behavioural patterns and organizational deficits particularly in small and medium size enterprises; SME's (Lagendijk, 2000, referred by Tödtling & Trippl, 2005; p.1203).

2.2. Core Terms

One can only get to a deeper understanding of a phenomenon when seeing its individual parts in relation to the totality or the wider context, and vice versa. This is a central thesis in the hermeneutical tradition, which originally was developed in the 16th century as a method of searching the truth in juridical and theological texts, and which later has developed to a more general theory of interpretation of symbolic communication (SNL, 2012b; Stanford, 2012). In the initial 'Definition and delimitation'-section we gave a brief introduction to the individual terms *region*, *innovation*, and *system*; and the notion which binds these together to an innovation system; *networks*, before we gave a short description of *regional Innovation systems* as a whole. While the concept of regional innovation systems will be treated separately in section four - seven, we will here follow the same structure when going more in depth presenting etymology, definitions and theorizing on these concepts. Going to the roots of the words is in line with the discussion of 'periphery' and 'marginality' in Danson and De Souza (2012c), which according to the editors, is the first volume to give a systematic and scientific perspective on the periphery. Danson and De Souza (2012c) also argue that since the terms are used in several different ways implying varying meanings according to the context, it may be relevant not only to present definitions used in the academic literature, but also to look at how words are used and defined in an everyday perspective, including frequently used online sources. We have also followed this procedure to some extent.

2.2.1. Region

As Bukve and Gammelsæter (2004b, p. 13) state, even the simple word 'region' may be understood in several different ways. It may therefore be useful to go to the origins of the term as well as looking at some current definitions. We will then see how 'region' is used in the literature, along with terminology and distinctions relating to different types of regions.

Region – etymology and definitions

The term 'region' originates from Latin *regio(n)-* 'direction, district', and was taken up in Middle English via Old French. The sense of the word is derived from Latin *regere*; 'to rule, direct' (Oxford_Dictionaries, 2012). The use of the word has been extended since:

- A region can be a (*geographic*) *area*, "especially to (denote a) part of a country or the world having definable characteristics but not always fixed boundaries", as in 'The equatorial regions; a major wine-producing region'. A region can also be "an *administrative district* of a city or country", as in 'Lothian Region Saxony was divided into four large regions'. The fixed expression 'the regions' means "the parts of a country outside the capital or chief seat of government", as in 'the promotion of investment in the regions'. At an *abstract level* 'region' can mean "an area of activity or thought", as in 'his work takes needlework into the region of folk art'. Finally 'region' can be "a *part of the body*, especially around or near an organ", as in 'the lumbar region' (Oxford_Dictionaries, 2012).
- 'Region' is thus often associated with a somewhat unspecific area. This is clear when the term is used in the phrase 'in the region of'; in this context the

meaning is 'approximately', as in 'annual sales in the region of 30 million' (Oxford_Dictionaries, 2012).

Under the heading 'region (geography)' Britannica (2012a) also gives a long definition of the term. More than the former it focuses on the homogeneity and cohesiveness of a given area defined as a 'region':

- **region**, in the social sciences, a cohesive area that is homogeneous in selected defining criteria and is distinguished from neighbouring areas by those criteria. It is an intellectual construct created by the selection of features relevant to a particular problem and the disregard of other features considered to be irrelevant. A region is distinguished from an area, which is usually a broader concept designating a portion of the surface of the Earth. Area boundaries are arbitrary, established for convenience. Regional boundaries are determined by the homogeneity and cohesiveness of the section. Regions may be nodal, defined by the organization of activity about some central place (e.g., a town and its hinterland, or tributary area), or uniform, defined by the homogeneous distribution of some phenomena within it (e.g., a tropical rain forest)

According to Britannica (2012a) the most common distinction criteria are *ethnic, cultural, or linguistic, climatic or topographical, industrial or urban, economic specialization, administrative units, and international political areas* (such as the Middle East). Many historical, political, and sociological analyses focus on *regionalism*, i.e. regional consciousness or a feeling of identity within the region. Britannica (2012a) also underlines the importance of the region concept in current *analysis, planning, and administration of public programs* at national and international level. This brings us to the question of how the term is used in regional development theory and -policy.

'Region' in Regional development theory and -policy

The rather unspecific character of the 'region' notion seen above is also obvious in regional development theory and policy. The geographic delimitations implied by the term vary a lot according to the context. With reference to the Barcelona objective, that Europe should be a world leading knowledge based economy by 2010, a European regional development project (TeRIS, 2012) state that in order to ensure equal development possibilities for all parts of Europe one has to leave the traditional emphasis on nation states, and rather focus on "Europe in regional level". In contrast, the Norwegian 'regional' VRI projects define their focus areas neither within European nor national borders, but region borders.

Johnstad (2012, p. 208) describes 'region' as a relative concept, which is used both about geographical areas at *subnational* and *supranational* levels. At the subnational level he identifies regions at three different administrative levels: One regional level comprises a number of municipalities, another is at county level and a third use of the term 'region' covers parts of the country such as Southern Norway. With reference to Langeland (2012) Johnstad (2012) also mentions a *functional* sense of the region concept, for example when used to

describe work market regions, similarly, Isaksen and Asheim (2008) use the term functional regions to describe the organization of health care regions in Norway.

Considering the distribution of knowledge intensive technology in Norway, Isaksen (2008, pp. 185-186) use the term 'region' related to larger and smaller towns and urbanisations: While looking at the capital separately as 'the Oslo region', he identifies 14 medium size town regions of more than 50 000 inhabitants, 47 000 small town regions of 10 000 – 50 000 inhabitants, and 'the rest of the country' consist of 96 regions of less than 10 000 inhabitants; most of them also being peripheral. In a new book Danson and De Souza (2012a, pp. 247-263) discuss border issues from various perspectives. In much of the regional development literature, though, the focus has perhaps not been so much on the *boundaries* of regions, as on their *character*, how do regions differ from each other, and which impact do these differences have on innovation conditions and regional innovation policy? The latter questions will be treated in section 2.4. Regional Innovation Systems. First, we will here look at some distinctions mentioned in the literature.

2.2.2. On regional differences and the terms which describe them

As regional research and theory mature, new topics are included, and more specific terms introduced as a means for more precise descriptions and discussions. We will here briefly mention some terms that we have identified in the literature, and then look closer at those which are most relevant for our study of Sogn og Fjordane.

Terms denoting regional differences: An overview

It seems that in the literature two similar dimensions, the *peripherality – centrality* dimension and the *rurality – urbanity dimension*, are considered as fundamental, whereas other concepts frequently are seen in relation to these.

According to Crone (2012) the idea of core – periphery is found in classical models of economic development and land use (with reference to Alonso, 1964 and Myrdal 1957). Danson and De Souza (2012b) state that 'regions' have been much studied in central Europe, but traditionally in the sense of *cities*, *region-cities* and *old industrial areas*, including phenomena relevant to these regions – such as clusters, agglomerations and innovation systems. Other terms to denote central areas are *core*, *metropolis* and *secondary urban centres* (Crone, 2012, p. 58), as well as *urban*, *residential and suburban areas* (Halfacree, 1993). According to Danson and De Souza (2012b) the topic of *peripherality* and *marginality* was introduced in 2008, and has received considerable attention since. An example of this is found in a European research and development project called TeDi, where the focus has been on *geographically specific areas*, *territorial diversities* or *specificities* in peripheral regions including *remote*, *mountainous*, *sparsely populated*, and *insular areas* (Gløersen & Dubois, 2010). In a Norwegian research program the expression *specific territorial context* was used (our translation). Other terms are *rural areas* (Halfacree, 1993), *rural particularities* or *rural and cultural landscapes* (Born, 2012), as well as *non-core areas* (Danson & De Souza, 2012b) and *extreme periphery* (Crone, 2012, p. 58). Gløersen and Dubois (2010); Tödting and Trippl (2005) refer the term *Less favoured areas (LFA)* used in European policy.

Similarly, Lorentzen (2012, p. 17) mentions *peripheral disadvantage*; Skogseid (2007, p. 1) says *disadvantaged areas*, and Nesse (2009) uses ‘*retarded regions*’ (tilbakeliggjande regionar). Discussing a rural-urban continuum, Frankenberg (1966, referred by Halfacree, 1993) uses terms like *very remote rural areas*, *transitional areas* and *the modern city*.

As some of the examples indicate, several of the notions mentioned above tend to be associated with each other. For example, Herrschel (2012, p. 30) says that ‘the Nordic countries are frequently seen, from a metropolitan western European perspective, as ‘on the edge of the continent’, as inherently peripheral. This includes a close association with rurality, sparseness of population and remoteness’. The literature thus seems to draw a distinction between central or urban regions at one hand, and peripheral, rural and sparsely populated regions at the other. This picture is complicated by the fact that the core – periphery distinction does not fully correspond with similar dimensions like rurality – urbanity. Labrianidis (2004, referred in Lorentzen, 2012, pp. 17-18) mentions that today rural or non-core areas may encompass small and medium towns, as well as other characteristics such as manufacturing and tourism based businesses, and coastal areas. Similarly Halfacree (2002, referred in Lysgård & Berg, 2004) says that the *post production countryside* (our translation) is pluralistic, and is characterized by consumption rather than production.

With so many different terms and concepts used to describe various regional characteristics and differences, it may be useful to look at the mentioned terms in a schematic form:

Table 1. Schematic overview: Terms denoting regional differences

Expressions (mostly) associated with peripherality / rurality	Expressions which are unclear or applicable to both peripherality / rurality and centrality /urbanity according to context	Expressions (mostly) associated with centrality / urbanity
Agricultural	Cultural landscapes	Central
Extreme periphery	Historical	(modern) City
Insular	Old industrial areas	Core
Mountainous	Post-production countryside	Metropolis
Periphery/-al	Residential areas	Metropolitan
Remote	Region	Region-cities
Rural	Semi-periphery	Secondary urban centres
Sparsely populated	Semi-urban	Suburban
Very remote rural areas	Transitional areas	Urban
Expressions which denote regional differences in more explicitly normative ways, and expressions which seem to be conscious attempts of achieving neutrality (both groups tending to be associated with periphery/rurality):		
Disadvantaged areas		
Geographically specific areas		
Less favoured areas (LFA)		
Marginal		
Peripheral disadvantages		
Regional or territorial specificities / diversities / disparities / particularities		
Retarded regions		
Specific territorial contexts		

Regional differences: Elaboration on terms relevant to Sogn og Fjordane

Sogn og Fjordane is a multi-faceted region both geographically and structurally, and several of the terms mentioned above are relevant for our study of regional innovation systems and networks. Here we will look closer at 'Peripheral, remote and marginal regions', 'Sparsely populated areas', 'Mountainous regions', and last but not least, 'Rural regions'. This concept is of special focus in our study, and is associated with several of the mentioned terms. The term has also received much attention in the literature concerning definitional-philosophical questions.

Peripheral, remote and marginal regions:

Markusen (1999, referred in Danson & de Souza, 2012) state that both periphery and marginality are 'extremely fuzzy concepts'. The Swedish Academy's authoritative Thesaurus (Blom, 1996, referred in Danson & de Souza, 2012) defines peripherality in both concrete and metaphorical sense in terms of something being 'outer', 'in the outskirts', circumference and 'unimportant'. 'Margin' is exemplified in similar ways as in the margin of the page, a zone of certain with, room to act, elbow room. Similar to periphery and border 'margin' is also used in symbolic ways like 'living on the margins of society' (Blom, 1996, referred in Danson & de Souza, 2012). Danson and De Souza (2012b, p. 5) also refer a long definition of periphery from Wikipedia, here summarised as derived from Greek, meaning circumference or outer surface, generally a 'boundary or outer part of any space or body', 'away from the central or core regions', 'near the edges', 'outskirts or suburbs', 'not mainstream or central'.

In a classic article, Stöhr (1982, referred in Lorentzen 2012, p. 16-17) defines peripheral areas as "areas of low accessibility to large-scale (national, continental, world wide) interaction centres regarding access to markets, to production factors (including technological innovation), to private and public services, cultural facilities, to sources of social innovation and of economic and political power". Also Arzeni, Eposti, and Sotte (2002, referred in Lorentzen, 2012, p. 18) refer to *accessibility* (distance) and *structural* (urban, industrial and rural development) criteria when they recommend analysing peripheries according to four categories: Peripheries 1) near urban centres, 2) with natural, historical and leisure values, 3) dominated by agriculture, or as 4) remote, distant areas with much migration flow.

Gløersen and Dubois (2010) mention Northern Iceland and the island Gozo as concrete examples of what they call *peripheries within a periphery*. They are places located in the outskirts of Europe, and at the same time dependent on connections to Reykjavik and Malta in order to reach international markets. This phenomenon was described by Stöhr (1982, referred in Lorentzen 2012, p. 17) as he pointed to peripherality as a term covering different *geographic scales*. Crone (2012, p. 51) similarly characterizes peripherality as *multi-scalar* in the sense that it can be applied on the urban scale (with reference to Alonso 1964), on the inter-regional and at the national scale (with reference to Myrdal 1957, Christaller 1964) or in relation to the world economy (with reference to Wallerstein 1974). These descriptions are similar to what we have seen concerning 'regionality'. Thus one may say that both regionality and peripherality share a certain 'matryoshka doll' element.

Along with the multi-scalar element, Crone (2012, pp. 50-51) mentions three other facets related to the term peripherality: Within regional studies the term should be seen as fundamentally *geographical*. This is consistent with most previous use, and widening the concept (e.g., ‘aspatial peripherality) might increase the diffuseness of the term (Copus, 2001). Crone (2012, pp. 50-51) says the listed synonyms and antonyms presented by Danson and De Souza (2012b) confirm the relevance of a geographic interpretation, as well as they imply a *relational* aspect: Peripherality must be defined in relation to something else; the ‘core’ or the ‘centre’. In the continuation of this, Crone (2012, p. 51 citing Anderson (2000)) also argues for including *connotations of power or inequality*: “the periphery is best understood as the subordinate of the core”. Crone (2012) does not discuss whether this is a mere observation or an acceptance of this perspective.

Danson and De Souza (2012b) have assessed the interest in the topic of peripherality concretised as search results or ‘hits’ in Google, which was probably the most used search engine at the time. For comparison we have performed the same searches, and the number of hits indicate radical changes in use of these terms: ‘Periphery’ and ‘peripheral’ have both almost tripled, ‘peripheral areas’ have more than quadrupled but still has almost been caught up with by ‘peripheral regions’, which has increased by more than seven times since 2008. That means that the search results of this expression have gone up more than 600% in four years.

Table 2. increasing popularity of terms related to peripherality

Google search	Results 2008 (Danson & de Souza 2012)	Results 2012 (our search)
Periphery	8 560,000	22,400,000 results (0.30 seconds)
Peripheral	35 700,000	94,700,000 results (0.35 seconds)
Peripheral areas	730,000	3,330,000 results (0.32 seconds)
Peripheral regions	471,000	3,300,000 results (0.16 seconds)

‘Sparsely populated areas’.

This became a topic in European policy-making due to the EU membership negotiations of Finland, Norway and Sweden (Gløersen & Dubois, 2010). NUTS 2 regions that had a population density below 8 inhabitants per km² were granted Structural Funds supports. With a population density below 12,5 inhabitants / km² national and regional investment aid is allowed, contrary to the general European legislation (Gløersen & Dubois, 2010).

Mountainous regions

According to Gløersen and Dubois (2010) the concept is not only describing physical realities, but also represents *mental categories*; perceptions of what ‘mountains’ are will be different in Switzerland than in Poland. A European definition must be a compromise between different national perspectives. In addition to *high altitudes* one must also include criteria such as *slope* (for example including mountains by fjords, and the Mediterranean dry mountains) and local *variations in altitude*; ‘ruggedness’ (Gløersen & Dubois, 2010). It is estimated that 20% of the European population live in mountainous areas, which cover 40%

of Europe. Since 1975 mountain areas are included in the European aid scheme to support farmers in Less Favoured Areas (LFA), but many mountain regions also have assets such as hydro-electricity as a base for industrial development, and good possibilities for tourism and small scale farming of high quality food (Gløersen & Dubois, 2010).

Rural regions: Definitions of the rural

A short definition of the adjective 'rural' is given by Oxford Dictionaries (2012), as related to the countryside and an opposite of 'urban'. Two examples of usage are given; '*rural scenery*' and to '*live in rural seclusion*'. The noun 'countryside' is similarly defined as rural areas, contrasted with urban areas; and exemplified by '*The English countryside looks its best in May and June*' and '*The preservation of the countryside is important.*'

That there may be more to rurality than being the opposite of urban, is indicated by Britannica (2012b) which defines *rural society* as *agriculturally related production* as a basic economic activity, as well as including several sociologic perspectives. Here we reproduce a shortened version (with some key words set in bold by us):

- **rural society**, [society](#) in which there is a **low ratio of inhabitants** to open land and in which the **most important economic activities** are the production of **foodstuffs, fibres, and raw materials**. Such areas are **difficult to define** (...), for, although in non-industrialized nations the **transition from [city](#) to countryside** is usually abrupt, it is **gradual in industrialized societies** (...). A second, related problem is that **governments do not use the same statistical criteria** for rural and urban populations; in **Japan**, for instance, any cluster of **fewer than 30,000 people** is considered **rural**, whereas in **Albania** a group of **more than 400** inhabitants is regarded as an **urban [population](#)**.
- **In the past**, rural societies were typified by their adherence to **farming as a way of life** (searching) **subsistence, not surplus** (and they were often) regulated by **kinship** customs and **ritual** (... These characteristics are designated by) the term **gemeinschaft** (introduced by Ferdinand **Tönnies, in [contrast to](#) urban life (and) gesellschaft**, a state characterized by **impersonal bureaucracy, rationalized specialization, and mechanization**. **Gesellschaft** is typically associated with modern industry, where people are employees who perform **specific, goal-oriented functions in a rational and efficient, as opposed to a traditional and organic**, manner. The two terms are sometimes translated as "**community**" and "**society**." **Rural inhabitants work with people they know well** and are accustomed to **relationships** of great **intimacy** and **small scale**, whereas urban dwellers know each other in narrow, segmented ways that have little to do with **family** or friendship. (...)

'The rural' in the regional literature

There is no simple relationship between the physical world (the 'rural landscape'), encyclopaedia definitions like the examples above, every day conceptions of 'the rural', and scientific definitions and discourses of the same. Here we will first present two relatively short examples from the Norwegian literature; a definition and an index of rurality, respectively.

Then we present Halfacree's (1993) overview over four approaches to the defining of the rural, followed by some complementing comments and conclusions by Lysgård and Berg (2004) and Coleman (1988).

In her thesis on information infrastructure and rural information systems in Sogn og Fjordane, Skogseid (2007, p. 2) uses the term *rural areas* to describe "sparsely populated areas; the inhabitants live in small towns, villages or farms and other more isolated locations". She sees rural areas in contrast to urban areas understood as densely populated towns and cities. In contrast to the Oxford Dictionaries (2012) definition, which completely leaves out the aspect of agricultural production, Skogseid indirectly points to this ('...or farms') as a possible element in rural areas.

Again leaving out the aspect of agricultural production, but including some of the sociologic perspectives mentioned in the Britannica definition, Almås (1999, referring Aarsæther, 1994) presents an 'everyday speech' definition of what a rural *community* is: A sparsely populated society with stable interaction arrangements and a "we"-sense among the people who live there. This definition, which implies that a rural community is 'more than a neighbourhood, a district or a geographical area', is an institutional approach to the concept (Almås, 1999, referring Aarsæther, 1994). Almås (1999) agrees that some level of solidarity and interaction is inherent in the term. In addition, he says (with reference to Almås, 1985, p. 177), rural communities may be defined according to a rural index which combines four dimensions or factors:

- A. Population per area unit
- B. Distance from an economic / administrative center
- C. Proportion of those who work in primary industries
- D. Proportion of those who run their own businesses

Almås (1999) argues that when rating each dimension on a scale from 0 – 1, these can be summed up to an index or degree of rurality which both accounts for the fact that rural communities develop dynamically and no longer are what they used to be, at the same time as they still differ from cities.

Halfacree (1993) on four approaches to defining of 'the rural'

It seems that the notion of the 'rural' does not escape the general conceptual confusion within regional theory. Halfacree (1993, p. 28) refers to Hoggart (1998, among others) who has suggested to "do away with the rural"; which he finds to be "a confusing 'chaotic conception' lacking explanatory power". The topic of how rurality should be defined has been debated for at least a hundred years (based on a reference to Gilbert, 1982, by Halfacree, 1993).

Halfacree (1993) mentions four types of definitions, and recommends the fourth as the best means to define rurality: Descriptive definitions, socio-cultural definitions, rurality defined as 'locality', and rurality defined as 'social representations'.

Descriptive definitions centre on observable and measurable aspects, and the question becomes which parameters to choose (Halfacree, 1993, with reference to Pratt, 1989). An important example is Paul Cloke's (1977, 1978, referred by Halfacree, 1993) 'index of rurality' which included 16 'census variables' such as employment, population, land use and

remoteness. Other authors have focused on single aspects representing 'the essence of rurality' such as built-up area, functional regions, agricultural area, population size and - density. Descriptive definitions have been criticized for issues like historical relativism, choice of variables, data quality and neglect of qualitative data. As they are tailored to serve specific needs in planning and research (with reference to Craig, 1988, among others), these definitions define aspects of the rural rather than defining the rural (Halfacree, 1993).

Socio-cultural definitions assume that environmental aspects, such as population density, determine socio-cultural characteristics, such as behaviour and attitudes (Halfacree, with reference to Hoggart and Buller, 1987). Halfacree (1993) summarises this view as 'an assumed correlation between social and spatial attributes' which has had strong impact in rural studies, but which has changed over the years. An early example is Wirth's 1938 *dichotomy of urbanism and rurality* as 'distinct ways of life'; the 'urban' being seen as dynamic, unstable and impersonal, with distinct contact situations such as work, home and leisure. The 'rural' was considered to represent stability, integration and with overlapping social spheres – people would meet each other's in several settings.

This thinking was challenged by the realization that places hardly could be defined according to a simple dichotomy, the situation was rather that 'a variety of communities (are) conforming to various levels of urbanism and ruralism' (Halfacree, 1993). In order to account for this, Redfield (1941, referred by Halfacree, 1993) suggested that settlements could be placed along a *continuum* from 'very remote rural areas' via 'transitional areas' to 'the modern city'. This solution quickly was criticized by Pahl (1966, 1970, referred by Halfacree, 1993), later also by others, for overlooking 'urban' elements in rural society. Pahl's solution was to focus on the people who lived in rural areas - '(social) groups' or classes – instead of the areas themselves. A problem with this was that "such a focus manages to avoid providing any definition of the rural itself" (Halfacree, 1993). Another criticism against analysing places according to a sociological continuum was that one could end up with surprising results like Young and Wilmott's (1957, referred by Halfacree, 1993) finding of 'rural societies' in the East End of London, and the identification of 'urban' societies in Surrey and Hertfordshire (Pahl, 1965, and Connel, 1978, referred by Halfacree, 1993).

According to Halfacree (1993) the main problem with both descriptive and social-cultural definitions is their 'flawed' theoretical belief in geographical/environmental determinism, or the 'causal powers' of space – which is a 'misconception' of 'space and society'. In the 70's many social scientists took the opposite stance, looking at space as a "mere 'reflection' of society" (Massey, 1985, referred by Halfacree, 1993). Halfacree (1993) calls this a 'spatial indifference'; a view which holds that societies are defined by production modes rather than being produced by the environment (with reference to Gilbert, 1992). Critics (Soja, 1995, referred by Urry, 1995) claimed that space and (social) structures are affecting each other mutually, and cannot be seen independently of each other (Halfacree, 1993).

A third approach to the defining of the rural is to look at the rural as '*rural localities*' (Halfacree 1993). It is not clear how he sees this approach as distinct from the descriptive definitions (but see (but see Lysgård & Berg, 2004 in a later section), as these localities need to be "carefully defined according to that which makes them *rural*" (Halfacree, 1993, referring to Urry, 1986, among others). Different authors (all referred by Halfacree) mention different aspects such as the agricultural (Newby, 1978); which is associated with primary production

(Gilbert, 1982) or the competitive sector (Hoggart and Buller, 1987). Another aspect concerns consumption and how this is affected by low population density (Urry, 1984). None of these seem to remain without counterarguments, but Halfacree (1993) is not giving in to Hoggart's (1988) urge to get rid of the whole rurality concept.

Instead Halfacree (1993) points to *the theory of social representations* as a way to solve the definition problem of rurality. A back-ground for this alternative to work, he says, is that " 'the rural' and its synonyms are *words and concepts understood and used by people in everyday talk*" (Halfacree, 1993, pp. 29, italics in original); the "rural is just a symbolic shorthand (as are all concepts) by which we mean to encapsulate something" (Falk and Pinhey, 1978, referred by Halfacree, 1993, p. 29). The theory of social representations is mainly developed by Moscovici (1976 and more, referred by Halfacree, 1993), and concerns the way people transform complex social and physical experiences in their environment into an understanding, explanation and articulation of these experiences (Halfacree, 1993, cf. Schutz, 1967). This happens through the use of social representations, which are mental constructs (both concrete images and abstract concepts) that guide and organize impressions and responses related to the social world (Halfacree, 1993, with reference to Moscovici, 1984).

According to Halfacree (1993) this theory focuses on peoples 'practical consciousness' (with reference to Giddens, 1984) and their 'paramount (social) realities of everyday life' (with reference to Schutz, 1970). This stands in contrast to the previous academic mistake of attributing a 'scientific' character to people's everyday behaviour and understanding (with reference to Moscovici, 1984); assuming that people's behaviour and thinking is mechanically logic, systematic and rational (with reference to Thrift, 1986). In this context Halfacree (1993) also discusses the dangers of overlooking the fact that academic discourses are based in lay discourses on rurality: Many descriptive definitions, he says, refer to intuitive, common sense thinking about what rurality is. The consequence is that academic discourses and definitions of rurality have an element of *non-objectivity*. Overlooking this is serious in that one tends also to overlook how "different interest are promoted through the objectifications of these discourses" (Halfacree, 1993, pp. 31, with reference to Rodwin and Hollister, 1984, and Habermas, 1972, among others). Unfortunately Halfacree (1983) does not discuss how this statement contrasts with his perspectives on 'concepts understood and used in everyday talk' as a solution, as referred above.

Hans Kjetil Lysgaard and Nina Gunnerud Berg (2004) on rurality

Building on Halfacree (1993) and others, Lysgaard and Berg (2004) complement the overview given by Halfacree (1993) above. The two first approaches to the defining of the rural, descriptive and socio-cultural definitions, are frequently categorized together as *functional definitions* (Lysgård & Berg, 2004, with reference to Cloke & Goodwin, 1993). The third approach, focusing on rurality as 'locality', Lysgård and Berg (2004) see as an example of *political-economic* approaches. These approaches challenged the functional definitions claiming that changes in rural areas should not be understood only in terms of factors within the rural areas themselves, but rather as consequences of overall (economic) changes nationally and globally. The fourth way of defining the rural, social and cultural construction

or *representations* focuses on (popular) myths and perceptions of the rural. These are postmodern/-structural perspectives which imply a dematerialization of the rurality concept (Lysgård & Berg, 2004, with reference to Murdoch & Pratt, 1993, and Pratt, 1996); the object of analysis are popular and academic discourses on rurality rather than the rural places themselves.

In a situation where rural areas change and share several characteristics with the urban, such as plurality of life styles and consumption, Lysgård and Berg (2004) find that 'rurality' and 'urbanity' still may be useful categories in regional research. This presupposes an understanding which includes both material and immaterial aspects of the terms.

We have looked at various terms denoting different characteristics of regions; differences which form important conditions for regional innovation and development. Tödtling and Trippel (2005) underline that in general regions differ with respect to industrial specialization, institutional architecture and patterns of innovation. In section four - seven we will look at this with special attention paid to the conditions for innovation in rural, peripheral and sparsely populated regions, but first we need to look closer at what is meant by innovation and some related terms.

2.2.3. 'Innovation' and related terms

We will here first present some basic information on the origin and meanings of 'innovation', some related terms, and then look at innovation with respect to its use in regional development literature.

Etymology and definitions

The latin word 'nova' means "new, fresh, young; unusual, extraordinary" (Latindictionary, 2012c). 'Innovare', also latin, means to "alter, make an innovation in; renew, restore; return to a thing" (Latindictionary, 2012a).

According to how innovations occur and develop, they can be divided in two different groups: *radical* and *incremental* (stepwise) innovations (Bukve & Gammelsæter, 2004a).

'Innovations' are frequently associated with new (often technological) products. Our definition has a wider scope, in accordance with the VRI-programme definition: new inputs, products, services, markets, processes or organisational forms that create economic or other kind of value both in private and public sectors. This is in line with Schumpeter (1934,1983) early definition of what he originally called entrepreneurship, but which later has been used about innovation (see Johnstad, 2012 further below). The VRI programme also builds on the idea of collaboration in regional partnership as the anchoring of the activities, with R&D as part of the focus. Webster Dictionary (2012) defines R&D as "*research and development*, used mostly to refer to the division of a corporation responsible for performing research and developing new products; - a commonly used abbreviation". R&D is used about planned innovation in companies and other institutions.

The term *intrapreneurship* is used about innovations within existing enterprises, as opposed to *entrepreneurship* which is associated with the establishment of new enterprises (Nesse et al., 2009, p. 16). Adams (2012) specifies that intrapreneurship has a planned and organized

character in “setting up internal organizations to foster innovation”. He also underlines the *team* aspect of intrapreneurship: although the term occurred some 25 years ago, the practice of organizing internal groups to promote innovation within a larger company dates back much longer. Adams (2012) mentions ‘Skunk Works’ as an example; in 1943 Lockheed used these groups, which were granted a high degree of autonomy, to work on secret projects. Later several companies have used similar groups to promote innovation or to translate research and development projects into products in the market (Adams, 2012).

‘Innovation’ in the regional innovation and development literature

There is much focus on innovation in the regional development literature, something which has been spurred by the increasing globalisation of the economy and subsequent strong competition between companies. According to Johnstad (2012, p. 208), the term ‘innovation’ is complex and the content has changed over time: Originally the term was used by (Schumpeter, 1934,1983) on entrepreneurship, later it has turned into a concept for management in larger businesses (Tidd, Bessant, & Pavitt, 2005) or a concept for cooperation (Kline & Rosenberg, 1986), and in recent years the concept includes a systemic perspective. (Johnstad, 2012, p. 208) comments that in many ways these perspectives complement each other.

In the literature the terms ‘*linear*’ and ‘*interactive*’ (innovation models) are used to describe both production and innovation processes, and it seems that they in both cases are used to denote traditional versus modern procedures, respectively. Johnstad (2007), with reference to Kline and Rosenberg (1986) and B. T. Asheim (1996), argue that in the modern, globalized knowledge economy innovation rarely follow linear processes leading from pure research via development to new products. Rather, it happens through interactive learning processes through collaboration between various actors such as customers, suppliers, competitors or network partners.

Etzkowitz (2008, p. 7) mentions *The Triple Helix* as a new and interactive innovation model; the collaboration between industry, universities and policy makers. He says there are several path-ways to enter this kind of interactive relationship, and that most such initiatives take place at the regional level .

Another classification of different innovation models is the distinction between *STI* (science, technology, innovation), *DUI* (doing, using, interacting) and *PCI* (project, communication, infrastructure) as presented in the typology of Isaksen and Asheim (2008, p. 30)

Innovation and related terms in (regional) innovation policy

To increase R&D and innovative activity in businesses is a stated goal not only in Norway, but in Europe as a whole. A European regional development project, (Johnstad, 2012; TeRIS, 2012), refers to the Barcelona objective; that Europe should be “the world's foremost knowledge based economy by 2010”. There is still a way to go. According to TeRIS (2012) “The only EU-25 countries to achieve the goal of 3 % of GERD (General Expenditure in R&D) by 2002 are Sweden (4,27 %) and Finland (3,51 %) EU-25 average being 1,93 %. As to the goal of BERT (Business Expenditure in R&D) the EU-25 average was 55,4 % in 2002

with four countries passing the "threshold" of 66 % (Luxembourg, Sweden, Finland and Ireland)". Norway is lagging behind when it comes to research expenditures as a percentage of the Gross domestic product (GDP). As we can see from the figure (Statinfo, 2012) below, in the ten year period from 1997 to 2007 the Norwegian expenditures in R&D were quite stable at around 1,6 – 1,7 % of GDP, which is below the European average.

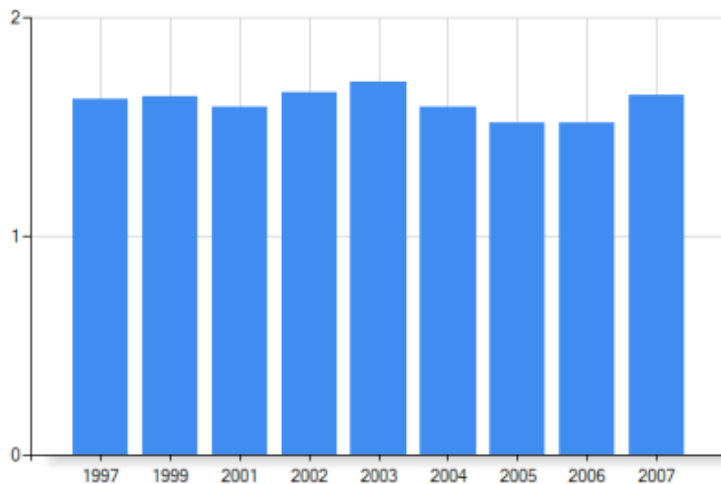


Figure 1. Norway \ Economics and finance. Gross domestic expenditure on R&D (GERD) - Percentage of GDP, % Statinfo.biz (2012)

In the previous sections we have looked at innovation and related terms, and we have seen that over the last decades there has been a growing interest in the *systemic* and interactive, collaborative character of innovation processes. The terms 'system', 'systematic' and 'systemic' will be defined in the next section.

2.2.4. System; systemic

Somewhat summarised Cambridge Dictionaries (2012a) defines a 'system' in terms of either

- a) a *method* (intentional and organized way of doing things), such as the legal system or the metric system, or
- b) a *set of 'connected things or devices which operate together'*, often *'for a particular purpose'*; such as a central-heating system, the immune system, the nervous system or the way that the body works.

The adjective '*systematic*' means "using a fixed and organized plan" (Cambridge Dictionaries, 2012b), whereas the adjective '*systemic*' means "relating to or affecting the whole of a system, organization, etc. rather than just some parts of it" (Cambridge Dictionaries, 2012c) .

From the examples above one sees that systems can vary from very simple to highly complex methods or entities of interrelated elements. This is also the case concerning strategies and interaction applied for initiating and carrying out innovation processes. Businesses may collaborate with a multitude of actors to enhance their competitive capacity,

or with just a few; and the interaction may vary with respect to frequency and level of formality. The fact that they *do* interact in an intentional way makes them part of a network.

2.2.5. Networks: Etymology and definitions

What is a network? Again, in order to better understand new and more abstract meanings of 'old' terms, it may be useful to go to the original significations of the word, as well as looking at the individual elements of composite expressions.

According to (Etymonline, 2012b) the Old English noun '*net*' originally comes from PIE (that is, Proto-Indo European language; (Wikipedia, 2012e)). It means "something knotted..." and is associated with "netting, network, spider web, mesh used for capturing..."; also figuratively, in the sense of "moral or mental snare or trap" (Etymonline, 2012b). The noun '*work*' means "something done, deed, action, proceeding, business, military fortification" to (Etymonline, 2012b).

'*Network*' is a combination of 'net' and 'work', and used as a noun it means a "net-like arrangement of threads, wires, etc.," and dates back to the 1550s (Etymonline, 2012b). From 1839 the word is also used in a wider sense of "any complex, interlocking system", originally related to transport by rivers, canals, and railways. In 1914 the meaning "broadcasting system of multiple transmitters" appeared; and from 1947 it was used about an "interconnected group of people" (Etymonline, 2012b). As a verb '*to network*' means "to cover with a network", and it has been used since 1887. From 1940 it has also been used in the sense "to broadcast over a (radio) network;" since 1972 including computers, and from the 1980s '*to network*' has also been used with reference to persons. Related words are '*networked*' and '*networking*' (Etymonline, 2012b).

Etymonline (2012b) also mentions some examples of these modern significations of 'networks'. The predecessor of the Internet, ARPANET, was created in 1969 by the U.S. Department of Defense in partnership with four universities. The acronym stands for 'Advanced Research Projects Agency Network'. Internet itself came in 1985 as "the linked computer networks of the U.S. Defense Department". Internet is a short version of 'internetwork', which is derived from 'inter-' and 'network' (Etymonline 2012b); *inter* meaning "between; among; during" (Latindictionary, 2012b).

The *communication and information sharing aspect* of the term network is emphasized more explicitly by Cambridge Online Dictionaries (2012). Network as a noun in an IT context is here defined as "a system of computers connected together so that they can share information...". 'Network' may also have social and business related aspects; in the sense of "a group of people or organizations in different places who work together and share information", as in 'He also has a network of contacts who give him help when he needs it'; 'A network of agents/dealers/suppliers' (Cambridge Dictionaries Online, 2012). Also used as a verb these aspects are underlined. *To network* thus can mean "to meet people who might be useful to know, especially in your job"; and one can also *network with* somebody; as in the example "Conferences offer the opportunity to network with other professionals in your field of business" (Cambridge Online Dictionaries, 2012).

In his discussion of social capital, Bourdieu (1986) describes a network as practically or socially instituted relationships of 'mutual acquaintance and recognition', whereby the

members of the group gain economic, cultural or symbolic advantages. “A network of connections is not a natural given (...) constituted once and for all”, Bourdieu (1986) says; but the result of enduring effort where ‘institution rites’ are necessary in order to “produce and reproduce lasting, useful relationships that can secure material or symbolic profit (...) In other words, the network of relationships is the product of investment strategies (which imply durable obligations subjectively felt (feelings of gratitude, respect, friendship etc.) or institutionally guaranteed (rights)”.

‘Networks’ in the regional development literature

It seems that the term ‘network’ is or could be used about relationships between actors across the full scale; from the micro level to the macro level: At the micro level within individual companies, one can find groups or ‘internal organizations’ to boost innovation (Adams, 2012). At the meso level (Tödtling & Trippel, 2005, with reference to Grabher 1993) mentions *inter-firm networks*, and Johnstad (2007) says that an important criterion for a cluster to develop is the presence of networks between the companies in an agglomeration. A cluster is established, he continues, when such networks engage in collaboration with other business networks in a *network of networks*. Karlsen (2008, p. 185) describes high-tech industry in Norway as particular as most of it is located in medium size town regions, as ‘local clusters in *national and global networks*’.

Networks can further be described as *horizontal* or *vertical* according to type of interaction and who are involved (Tödtling & Trippel, 2005, see also the section on clusters).

In the networks, ideas and impulses are communicated. What connect such networks are common interests and relations. Törnqvist (1997, pp. 102-103) showed that accumulation and development of knowledge in the networks happened through personal contact and communication. Healey (1997, 2007) claimed that to develop a community there is a need to create alliances across special interest groups to be able to face the challenge together. When arenas are established actors meet and discuss, they can learn from each other. The common platform which emerges through this collaboration can be a basis for the mobilisation process needed to meet future external challenges. A closely related term to ‘network’ in this sense is *(business) clusters*, which we will look at next.

2.2.6. Clusters - Related, but not the same

Cooke (2002, p. 119) states that clusters frequently are discussed as if they were the same thing as networks “which they are not, he presents a schematic overview of the differences between the two terms (see table below).

Table 3. Schematic overview of the differences between Clusters and Networks (Cooke, 2002)

Clusters	Networks
Large scale	Small scale, inter-firm
Open membership	Restricted membership
Competitive with cooperation	Competitive through cooperation
Informal interaction	Formal partnership

Input-output linkages	Interdependence
Mainly exchange relations	Agreed objectives

In order to better understand the similarities and differences between the two terms, it may be useful to look at etymology and definitions also concerning the cluster notion, inclusive the related term ‘agglomeration’.

Clusters: Etymology and definitions

The word ‘cluster’ is by Oxfords Advanced Learner’s Dictionary (2012c) defined as either “a number of things of the same kind grow or appear close together” such as flowers, or “a number of persons, animals, objects, etc in a small, close group”, such as a cluster of bees. (Memidex, 2012) gives similar definitions in that ‘cluster’ means ‘a grouping of a number of similar things’, ‘to come together’ or ‘to cause to gather’. According to (Etymonline, 2012a) the word probably has the same root as ‘clot’, and has been used as a verb since late 14th century.

The concept of *business clusters* was introduced by M. E. Porter (1990), and Wikipedia (2012a) presents the topic with clear reference to him (see his 1998 definition quoted in two passages further below):

“A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field. Clusters are considered to increase the productivity with which companies can compete, nationally and globally (...). Clusters are also very important aspects of strategic management”.

Later other terms have been added, such as *industry cluster*, *competitive cluster*, or *Porterian cluster*. In urban studies, the term *agglomeration* (Wikipedia, 2012h) is used. Agglomerations are according to (Johnstad, 2007) related businesses that are co-located in the same geographical area, and which give rise to regional specialization. They constitute a possible starting point for cluster development. Another condition is that networks develop (Johnstad, 2007). Following the definition of (Oxford_Learners_Dictionaries, 2012b) ‘agglomeration’ also has an earlier and more general meaning of “a group of things put together in no particular order or arrangement”. As a verb to ‘agglomerate’ means to “gather, collect, into a mass”, and as an adjective ‘agglomerate’ means “collected into, forming or growing into, a mass” (Oxford Dictionaries, 2012a).

Clusters in the regional development literature

According to Cooke (2002, p. 184), England was the first country where clusters emerged. Initially they were described by the use of other words: “Of course, Marshall (1916) wrote extensively about the cluster phenomenon, or the industrial districts, as he termed them in his accounts of the evolution of the dominant manufacturing industries of nineteenth-century Britain” (Cooke, 2002, p. 122). Similarly, B. Asheim, Cooke, and Martin (2006a) comment that since Marshall, ‘agglomerations of specialized economic activity’ have been described as ‘industrial districts’, ‘new industrial spaces’ and more recently, ‘clusters’.

B. Asheim et al. (2006a) state that although the cluster notion has been extensively used within regional theory and planning in the last decade, this does not guarantee for conceptual quality, and they criticize the cluster notion for being poorly defined. Many attempts have been made, though, and Cooke (2002, p. 120) refers five definitions dated 1998, of which we mention two here. Cooke (2002) considers M. Porter (1998) definition too static as it leaves out the central aspect of the concept, the 'propensity for fast growth':

A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities

Cooke (2002) prefers his own definition, that clusters are

geographically proximate firms in vertical and horizontal relationships involving a localized enterprise support infrastructure with a shared developmental vision for business growth, based on competition and cooperation in a specific market field

How does a cluster come into existence? Johnstad (2007) mentions *agglomerations* as a possible starting point; defining agglomerations as related businesses that are co-located in the same geographical area, and which give rise to regional specialization. This co-localization is often due to access to certain resources, and in a Norwegian context examples would be the wood industry in Solør or the light metal industry at Toten (Johnstad, 2007). In order to develop into a cluster, there must also exist networks between the businesses, which is not automatically the case. Johnstad (2007) defines a cluster as a

network of networks, which connect different businesses and actors in order to create collaboration advantages in developing competitiveness and productivity

Through his concept of clusters Porter (1998) has drawn the attention to the *systemic* character of business and trade; the companies develop and strengthen their competitive advantages through relationships with each other (Bukve & Gammelsæter, 2004a, p. 61).

According to Tödting and Tripl (2005, pp. 1205-1206) the companies within a cluster are ideally linked by networking in two ways; *horizontal networking* between companies (collaborators and competitors) and *vertical networking* between customers and contractors. Tödting and Tripl (2005, p. 1210, with reference to Isaksen 2001) points to the importance of the cluster to reach a *critical mass* as a condition to develop dynamically with high levels of R&D, patenting and product development. This can be difficult to achieve in regions which are mainly dominated by small and medium sized enterprises (SME's). At the other hand, too strong clustering may be a disadvantage when overspecializing in mature and declining industries.

The focus on networks and relationships between actors in order to enhance productivity and competitiveness is also underlined in the concept of regional innovation systems. Bukve and Gammelsæter (2004a, p. 61) state that the ideas of clusters and regional innovation systems are very similar, and that the reason why the cluster notion is treated as a separate concept and not as a version of regional innovation systems, may result from the popularity of the cluster concept and the Michael Porter 'brand'. Still, it seems that many authors (Tödting & Tripl, 2005, p. 1206) see regional innovation systems as a wider concept. Before we explore this more in detail, we need to look at some basic underlying concepts which are

central for a deeper understanding of what networks and regional innovation systems are, and how they work.

2.3. Networks and regional innovation systems: Some underlying concepts

We will here look at the role of knowledge and learning, as well as the concepts of social capital and institutional capacity.

2.3.1. The role of knowledge and learning

Despite being a common word in everyday use, the term 'knowledge' is diffuse, and already in 1949 Dewey & Bentley (referred in Isaksen, Karlsen, & Sæther, 2008, p. 81) warned against using it without discussion and clarifying.

In pedagogics Dewey is known for his principle of 'learning by doing', or 'learning by Dewey', which it later has sometimes been referred as. This focus on activity as a way of learning has also led to an interest in what happens when mistakes occur. In modern pedagogics it is seen as a fact that mistakes are not only an inevitable part of the learning process; they should also be interpreted positively as an *occasion* for learning. This principle is actively used in product development and innovation. (B. Asheim, Cooke, & Martin, 2006b, p. 18) mention the phenomenon of *swarming*: "The mere existence of an innovation attracts swarms of imitators seeking (...) 'second comer-advantage', that is learning from the mistakes committed by the innovator".

Learning through activity is also associated with what Michael Polanyi (1958) called *tacit knowledge*, and which he explained by the simple fact that "we can know more than we can tell". That is; not all forms of knowledge are easy to express or transmit verbally in the same way that one can do with *explicit* or *formal* knowledge (Wikipedia, 2012b). B. T. Asheim and Gertler (2005, p. 292) underline that to understand innovation it is important to appreciate the central role of *spatial proximity*. Tacit knowledge does not travel easy because it is "best shared through face-to-face interaction between partners who already share basic commonalities" (B. T. Asheim & Gertler, 2005, p. 293). Thus tacit knowledge is a key determinant of the geography of innovative activity because it is difficult to exchange over long distances, and because innovations are strongly based on the interaction and knowledge flow between companies, research organisations, and public agencies.

Karlsen (2008, p. 93) say that the awareness we have today concerning tacit knowledge and organizational learning has demonstrated that the kind of knowledge which is useful for an enterprise, is not always easily transferred. He therefore suggests that 'knowledge sharing' may be a better suited expression than 'knowledge transfer', and that in order to gain competitive advantages from the presence of knowledge institutions, the simple reading of their written documents will not suffice – enterprises will need to engage in personal interaction with the researchers. The parties will need to develop background knowledge about each other and about the profession of the other, as well as developing common norms and routines for interaction. Establishing relationships is a process which takes time Karlsen (2008, p. 93).

Amin and Cohendet (2004, referred by Isaksen & Asheim, 2008; p. 28) underline that innovation processes to a great extent depend on the knowledge flow and collaboration between individuals who belong to the same *epistemic communities*. 'Episteme' is used by Platon about 'true knowledge', in contrast to 'doxa' which he used about personal convictions (SNL, 2012a, our translation). R. A. Boschma (2005, referred by Isaksen & Asheim, 2008; p. 28) specify that individuals who participate in epistemic communities share the same type of knowledge, mainly transmitted as codified knowledge, while the informal rules that govern the group are mainly tacit. The collaboration in such groups is based on cognitive and institutional proximity between the participants, understood as sharing the same knowledge base and the same norms, habits and rules which regulate the activities (Boschma, 2005).

In a typology by Isaksen and Asheim (2008, p. 30), they distinguish between three innovation models; *STI* (science, technology, innovation), *DUI* (doing, using, interacting) and *PCI* (project, communication, infrastructure). These are related to three types of knowledge which develop from three different knowledge bases. The typology gives a schematic overview of knowledge content, important knowledge types, knowledge development, typical learning processes, typical innovation model and dominating form of knowledge flow. For example, according to Isaksen and Asheim (2008), the STI-model is associated with an *analytic / scientific* knowledge base; with *know-why* as an important type of knowledge. The DUI-model is associated with *synthetic / engineering* based knowledge; and *know-how* as an important type of knowledge. The third innovation model, PCI, is associated with a *symbolic* knowledge base and *know-who* as an important type of knowledge (Isaksen & Asheim, 2008). Isaksen (2008, p. 181) states that large portions of Norwegian business and industry ('næringsliv') are characterized by experience based knowledge, acquired through daily work operations and new projects in collaboration with demanding customers. In Norway knowledge intensive industry had strong growth in the period from 2000 – 2006; both in high-tech industry and in the consultancy business (Isaksen, 2008).

Lundvall & Johnson (referred in Isaksen et al., 2008, p. 81) claim that in the modern economy, knowledge is the most important resource and learning is the most important process in the development of innovations. Notions such as 'the knowledge economy' and the 'learning society' underpin this. *The knowledge economy* can be seen as an extension of the *information society*, and it constitutes an "interconnected, globalized economy where knowledge resources such as know-how and expertise are as critical as other economic resources" (Wikipedia, 2012c). A similar term is "the knowledge-based economy", which is mostly used with the reference to the application of computers and knowledge technologies. In the literature the distinction is not clear (Wikipedia, 2012c).

The learning society is a concept which Wikipedia (2012d) relates to Donald Schön's (1973) idea about modern society as being in a constant state of change. Subsequently there is a constant need for this society to learn in order to adapt and cope. Later the notion of being 'learning' has been combined into related concepts. According to Wikipedia (2012d) Peter Senge and his colleagues developed the notion of the *learning organization* in 1994. Mintzberger (1998, referred by Karlsen, 2008; p. 91) says that a learning organization does not consider learning as a result of coincidences, but rather sees learning processes as a central part of the activities in the organization. Important qualities which characterize a learning organization are that it is decentralized, and it encourages open communication and

team work. The organization will be able to take advantage of external changes by building on experiences from its interaction with customers, suppliers, knowledge institutions, as well as studying the strategies and products of competing businesses (Karlsen, 2008; p. 91 with reference to Mintzberger (1998)). In the continuum of this thinking, authors like B. T. Asheim (1996) and (B. Asheim, 2001) have brought this framework into the regional development literature by describing regions as 'learning' (referred by Karlsen, 2008, p. 81).

The necessity of focusing on the *regional level* to keep up in a global world, was by M. Porter (1998, referred by Isaksen & Asheim, 2008) related to the importance of local knowledge and interaction: "Paradoxically, the enduring competitive advantages in a global economy lies increasingly in local things – knowledge, relationships, and motivation that distant rivals cannot match". Isaksen and Asheim (2008) nuance what M. Porter (1998) says about the importance of the regional level; claiming that while transfer of tacit knowledge ensures optimal use of local knowledge, one should not exclusively rely on local partners. Research has shown that the regional business environments which display the highest levels of growth and capacity for change are the ones which have international connections with creative and well-informed businesses (Isaksen & Asheim, 2008).

In this section we have seen that the *social* aspect is inherent in learning and knowledge transfer, exemplified through terms like tacit knowledge and learning organizations or – regions. In the literature this topic is frequently explored through concepts related to social capital and institutional capacity.

2.3.2. Social capital

The concept of *social capital* originates from sociology and is strongly associated with Pierre Bourdieu, although he was not the first person to use it. According to Wikipedia (2012f) the term was in occasional use from about 1890. According to Wikipedia an early example is found in an article by L. J. Hanifan from 1916 on social cohesion and personal investment in local communities, in this case by supporting rural schools. In his definition of the concept, Hanifan sees social capital in contrast to material goods. The term only became widely used at the end of the twentieth century Wikipedia (2012f). Arent Greve (2000) says Hanifan used the social capital in 1920 as a concept to describe how poor people could overcome difficulties by mobilizing family and friends' resources, and the notion later was forgotten until Bourdieu (1986) and Coleman (1988) both became influential with their independent use of the term, each on his side of the Atlantic. While the differences between them are minimal, Bourdieu focused more on cultural aspects while Coleman centred on norms and reciprocity. The notion has later been used to study entrepreneurship, innovations, migrations, and productivity in organizations (Greve, 2000). The concept came to be grasped by economists as well – not only as a framework to understand economic processes, but also as an economic tool. Why is the concept of social capital so important and what exactly does it mean? We will here first look at some definitions, and then see how Bourdieu (1986), Coleman (1988) and later authors explain its importance and use.

Definitions of social capital

We have here chosen to present the both the authoritative definitions given by Bourdieu (1986) and Coleman (1988), and for comparison also the Wikipedia definition, as this is one of the sources that most people use in their everyday information search. (Key words set in italics by us).

Bourdieu (1986) defines social capital as

- the aggregate of the actual or potential *resources* which are *linked to* possession of *a durable network* of more or less institutionalized relationships of mutual acquaintance and recognition – or in other words, to *membership in a group* – which provides each of its members with the backing of the *collectivity-owned capital*, a ‘redential’ which entitles them to *credit*, in the various senses of the word.

Coleman (1988, p. 98) defines the concept as

- “a particular kind of *resource* available to an actor (...defined by its *function*...). It’s not a single entity but a variety of entities, with two elements in common: they all consist of some *aspect of social structures*, and they *facilitate certain actions of actors* – whether persons or corporate actors – *within the structure*. Like other forms of capital, social capital is *productive*, making possible the achievement of certain ends that in its absence would not be possible”.

(Wikipedia, 2012f) gives this definition:

- In sociology, social capital is the *expected collective or economic benefits derived from the preferential treatment and cooperation between individuals and groups*. Although different social sciences emphasize different aspects of social capital, they tend to share the core idea "that *social networks have value*". Just as a screwdriver (physical capital) or a university education (cultural capital or human capital) can increase productivity (both individual and collective), so do *social contacts affect the productivity of individuals and groups*.

Pierre Bourdieu (1986) on social capital

In order to understand the structures and the organization of the social world, (Bourdieu, 1986) says that we need to consider ‘capital in all its forms’. While economic theory only focuses on economic capital and thereby reduces the ‘universe of exchanges’ to business and profit maximization, this economical ‘*self-interestedness*’ of the bourgeois can only be understood in contrast to the ‘*desinterestedness*’ of the artist and the intellectual; with their ‘*gratuitous activities of art-for-art’s sake and pure theory*’ (Bourdieu, 1986). In addition to economic capital, which is directly convertible in money and can be institutionalized as property rights, Bourdieu (1986) mentions *cultural* and *social* capital. These forms of capital can also be converted into money on certain conditions, and they may be institutionalized as for example educational qualifications and a title of nobility, respectively. All forms of capital need time and effort to be acquired, and therefore represent ‘accumulated labour in its

materialized or incorporated, embodied form'. The different forms of capital offer the possibilities of profit; 'to reproduce itself in identical or expanded form'.

The definition of social capital which Bourdieu (1986) gives above, focuses on the resources and help that a person can get access to through his or her network of social relationships. Relationships between members in social groups may, according to Bourdieu (1986), exist in the *practical* state; as material or symbolic exchanges, or *socially instituted*, for example as family membership or membership in a class or a party. Institutionalized relationships are 'guaranteed for through a common name' (e.g., family name) and through instituting acts 'to form and inform' the people who practice them, and which maintain and reinforce the relationships. These material or symbolic acts and exchanges are based on *proximity* as a necessary, but not sufficient means for their establishment; whether this proximity concerns relations in physical/geographical, economic or social space (Bourdieu, 1986).

The *volume* of a person's social capital depends on the size of the person's network, and on the volume of economic, cultural or symbolic capital each of the members possesses (Bourdieu, 1986). Social capital has a *multiplier effect* on the capital of each member of the group, but also requires a minimum of similarity or *homogeneity* between the members, in order to consolidate ('institute') mutual recognition through the relational exchanges. Although the members of the group may not be aware of this, the *solidarity* between them is based on the profit they gain through the membership. This profit cannot be taken out and 'act instantaneously' unless relationships have existed and been maintained for a long time, 'as if for their own sake'. The time lag transforms the 'simple debt' into a more undefined indebtedness; gratitude. In comparison to the quick exchanges in monetary economy, social capital therefore constitutes a 'more subtle economy of time'. Although less cynical, social capital work in less transparent ways than in economic exchange where 'equivalents change hands in the same instant' (Bourdieu, 1986).

The maintenance of the network requires continuous effort and personal or collective investment (Bourdieu, 1986). The obligations between the members rely on subjective feelings (e.g., gratitude, respect and friendship) or institutional guarantees (rights). The exchange of gifts and words is a sign of mutual recognition, which reproduces and simultaneously indicates the limits of the group. In this context Bourdieu (1986) even mentions women as an example of 'signs of recognition'; in most societies marriage "should be the business of the whole group" as the "whole definition of the group... is at stake". In modern societies where families have lost the 'monopoly of the establishment of exchanges', Bourdieu (1986) says, they can still control these exchanges – by facilitating *occasions* (cruises, parties), *places* (smart neighbourhoods, select schools, clubs) and *practices* (smart sports, cultural ceremonies) to ensure that the members meet people who are similar to themselves.

Bourdieu (1986) underlines that the expenditure of time, energy and social capital to build and maintain social capital through exchanges, is without value if one does not invest what he calls a '*specific competence*'. This competence he defines as *knowledge* of relationships (with both family and connections), *skill* at using them, and an *acquired disposition* to continue developing that competence (key words set in italics by us). In addition to the acquired element, there is also a *heritage* aspect to social capital. Bourdieu (1986) mentions

how a 'great family name' gives good starting point, as many will know about this person, and it will be easier to establish long lasting connections from random meetings.

Social capital is further associated with opportunities of gaining and exercising power through *delegation* and *representation*. The group's total social capital is concentrated in the hands of, and personified in, a few or a single person; such as the head of the family, the eldest, or the leader of the party or the country. This allows large numbers of people in different places to act as one and thus dissolve the constraints of space and time. At the other hand, such representation entitles a person to exert power which exceeds the agent's own contribution, and Bourdieu (1986) comments that this inherently entails a risk of power abuse. However, he does not discuss potential problem of bribery. As social capital is so closely related to the use of gifts and words to maintain personal relationships, this should be an important topic to discuss and be aware of.

James S. Coleman (1988) on social capital

In a previous section we have presented Coleman's (1988) definition of social capital. Here we will look at his theoretical motivation and background for introducing the concept, see how he compares it with economic capital, and refer some of the examples he gives on social capital and its function in social structures and networks.

Some examples of social capital which Coleman mentions are norms, expectations and obligations, trustworthiness, and access to information through personal relationships. Coleman (1988) introduced the concept as a means to combine sociologic and economic perspectives in the endeavour of explaining human action. Sociologic perspectives acknowledge the influence of the social context on human action; with norms and expectations shaping and constraining action. What they lack, according to Coleman, is the recognition of an actors' 'inner engine' and own motivations. The economic perspectives pay attention to this element of independency in agency, but often on 'extreme individualistic premises' looking at actors as 'wholly self-interested'. These perspectives ignore the 'empirical facts of reality'; that the social context with trust, norms and social networks shape and redirect individuals' actions. The virtue of this intellectual stream, says Coleman, is that it has a principle of action; the maximization of utility. This thinking is typical in neoclassical economics, and has also led to an upsurge of political philosophies like utilitarianism, contractarianism, and natural rights (Coleman, 1988).

A theoretical combination which looks at action as rational and purposive, and which within specific social contexts can explain both individual action and the development of social organization, is what Coleman (1988) advocates. This combination can be obtained through the social capital concept, he argues. In this task Coleman (1988) builds on previous work by others, like Granovetter's (1985) criticism of the '*undersocialized concept of man*' and his focus on the importance of 'embeddedness'; that is, personal relations and networks of relations creating trust, expectations and norms. Coleman (1988) also mentions Ben-Porath's (1980) inclusion of anthropologic and sociologic perspectives through his idea of the '*F-connection*' in economic systems; showing that family, friends and firms influence economic exchange. Equally Coleman (1988) refers the work of Lin (1988) and de Graf and

Flap (1988), who found that social resources and social ties can be used instrumentally in the search of jobs.

Social capital may, as Coleman sees it, be directly compared with economic capital: Person A does something for person B, and A thus gets a 'credit slip' constituted by his own expectations and B's obligations of returning the favour. The more credit slips A has outstanding and the more people who are indebted to A, the larger is the credit that A can call in. The condition is that the trust was worthy and that the debts will be repaid. Coleman also notes that in some social structures people do things for each other all the time, and that both parties may have many slips outstanding by each other, as the credits constituted by different activities are not completely comparable. People who may hold extreme amounts of social capital or numbers of 'credit slips' may be the patriarch or 'godfather', the wealthy family, and the legislator.

An important form of social capital is according to Coleman the *potential resource for information* inherent in social relations. Information is a base for action, but it is acquired only at some cost – at the very least, it needs attention to be paid. One can reduce the costs of searching information by getting the main points from family members or colleges who are interested in and thus well informed in the actual field. Another important form of social capital that he mentions, are effective prescriptive *norms*, which are reinforced by rewards such as social support, status or similar. This kind of social capital encourages some kinds of behaviour, and discourages others: When norms reward one activity, energy is automatically led away from other activities. This can influence the level of innovativity in an area as effective norms may reduce not only harmful deviant activity, but also deviant activity that could have been useful for the community.

Norms regulate individuals' behaviour, and 'arise as attempts to limit negative external effects (on others) or encourage positive ones'. In order to come into existence and be efficient in directing action, norms may require what Coleman calls *closure of the social structure* or network. In open social structures, where agents have contact with some agents but not with others, they cannot stand together in their effort to influence the behaviour of certain members of the group. An example which Coleman mentions is the effort of parents to establish common standards and sanctions among their children in school. This situation requires *intergenerational closure*. In a school the children will normally have 'high degree of closure among peers' because they see each other every day and develop expectations and norms. Thus parents also need to establish (friendship) links with each other in order to support and reinforce each other in the effort of sanctioning both own children and the children of the others. Also *trustworthiness* depends on closure of the social network, as reputation cannot develop in an open structure, and in order to be effective sanctions should not depend only on the person who has been let down by another person concerning an obligation.

Available social capital may not only depend on the actual number of persons in a community, but also on how these persons organize themselves. Coleman demonstrates this point referring a situation during WW2, where the residents in an American city suffered from various problems due to low construction quality. They managed to solve the problems by creating a voluntary organization which went in dialog with the construction companies and

which also otherwise dealt with the problems. Also after the problems were solved, the life quality of residents continued on a higher level through more available social capital represented by this organization. One concrete example that Coleman mentions, was that although the number of teenagers was declining, the inhabitants were more satisfied with the availability of teenage babysitters.

Coleman (1988) gives four real life examples of what kind of trust, personal relationships and economic exchange social capital can be associated with: 1) *Jewish merchants trading with diamonds* in New York demonstrate extreme trust in fellow merchants when they give away bags of stones worth up to hundreds of thousands of dollars (1988 currency), so that the diamonds can be examined by the potential buyer 'in private at his leisure, with no formal insurance' (Coleman 1988, p 98). The insurance is there through the intimacy of the connections in these communities; with frequent interactions among people who have close ethnic and family ties. What they gain from this trust is a situation of smooth and simple transactions without complicating and expensive insurance measures. 2) *Political activists in South Korea* were able to share radical ideas in secret 'study circles' that had emerged from relationships within environments like high school, home town or church. In order not to be detected, the groups shared information through 'an appointed representative'. 3) *A Jewish family with six children moving from Detroit to Jerusalem* experienced higher levels of safety and freedom for their children in Jerusalem than in Detroit. This was due to cultural norms which ensured that any adult would look after unattended children, for example when they were playing or taking the bus alone. 4) In the Kahn El Khalili market of Cairo, any specialized shop owner will on request turn out to either sell the required product himself, or know someone who sells it. He can quickly also turn into a money exchanger by just contacting a college in the vicinity. Coleman (1988) comments that the market can be seen as 'an organization, no less than a department store' – or as 'a set of individual merchants, each having an extensive body of social capital on which to draw'.

Other authors on social capital

According to Arent Greve (2000), Hanifan used the social capital concept in 1920 to describe how poor people could overcome difficulties by mobilizing family and friends' resources. The notion later was forgotten until Bourdieu (1986) and Coleman (1988) both became influential with their independent use of the term, each on his side of the Atlantic. While the differences between them are minimal, Bourdieu focused more on cultural aspects while Coleman centred on norms and reciprocity. The notion has later been used to study entrepreneurship, innovations, migrations, and productivity in organizations (Greve, 2000).

Greve (2000) relates the development of the social capital notion to preceding work in two theoretical fields; one which focused on Gary Becker's concept of human capital from 1964, the other concerned with structural sociology. Becker (1964, referred in Greve, 2000) saw *human capital* as an individual resource resulting from both investments in education and (career) experiences. Realizing that (the combination of different persons') human capital also could be seen as a production factor in companies, organizational psychology soon included the notion in resource-based organizational theory (Greve, 2000, with reference to Conner & Prallahad, 1996).

Economists have later criticized this perspective for not considering questions of property rights related to human capital. As an example, Greve (2000) mentions a trial between the University of San Francisco and Genentech which it took ten years to conclude. The conflict originated in Genentech's use of knowledge and research findings produced by the USF, a situation which came about as people who had participated in the research had changed their work place and brought their knowledge with them. Such conflicts might not be very constructive. Discussing *innovativity and productivity in companies*, Greve (2000) gives examples which show that companies may gain from sharing knowledge rather than keeping it to themselves. In Silicon Valley social capital and informal networks are frequently used to achieve complementary knowledge (Greve, 2000, with reference to Rogers & Larsen, 1984). In Norway there is a great extent of openness between companies in the development of new technologies within the petroleum sector (Greve, 2000) and in the manufacturing of wood (Greve, 2000). Learning and problem solving is enhanced by sending delegates to other companies. Thus the period of first comer advantages is shortened, but to include more people may also reduce the risk of technology failure and the time it takes to develop the product (Greve, 2000).

Similarly, studies of entrepreneurship were early in finding that *entrepreneurs* could gain access to important resources by the means of their social connections; both for advice and to get in contact with people and firms that could be helpful (Greve, 2000). According to Greve (2000 with reference to Burt, 1992), the type of network an entrepreneur is involved in may have influence on the outcome. If the entrepreneur is in a network where most of the members have much contact with many other people, than the time available for contact with each is reduced to a minimum, this is called a *network constraint*. Other networks may have *structural holes* where some members are less busy than others; a situation which gives the entrepreneur an opportunity of 'combining and utilizing resources' (Greve 2000 with reference to Burt 1992).

Structural sociology considers individual behaviour and achievements to be influenced by social structures. Through norms, status and commitments these structures provide opportunities but also constraints (Greve, 2000). Developing in the 60ies and the 70ies, this thinking was used in discussions of social stratification and -mobility (Sørensen, 1983, referred in Greve, 2000). Studies on career mobility included vacancy chains rather than networks; Granovetter (1974, referred in Greve, 2000) was among the first researchers to look at people's use of personal contacts in their search for a job.

According to Cooke (2002, pp. 100-101) Jacobs (1961, 2000) early looked at social capital as an economic instrument, and Putnam (1993) foresaw that "social capital is coming to be seen as vital in economic development around the world". Also economic policy advisers like Henton, Melville, and Walesh (1997, referred in Cooke, 2002; pp. 100-101) have followed up on this theme.

Social capital refers to the social relations and duties that the individuals in a society have toward each other. It takes time to develop this kind of capital, but it can later be taken out as surplus to gain personal or collective goals in a change and innovation process. How individuals, companies, and organisations co-operate and compete will to a great extent influence their capacity to develop efficient responses to challenges (Diez, 2000; Healey, Magalhaes, & Madanipour, 1999; Putnam, 1993). This has become an important focus due

to the ever-changing conditions in the globalized economy. Co-operation requires a flexible dynamic based on mutual trust and a sufficient action space to find practical solutions together. Innes and Booher (2010) say "In collaborative practice (...) problems are treated as puzzles as participants work jointly to put pieces together to create a shared picture of the future and a strategy for getting there. This open ended approach is at odds with both bureaucratic norms and the ideal of finding the right policy". At the same time, challenges must be proactively countered through strategies and tasks that broadly involve the community and which are adapted to suit the actual situation and challenges of the community in question (Skogseid, 2007; Stöhr, 1990).

Social capital, concretized as *economic communities*, can play an important role in revitalizing 'distressed economic areas' and strengthen competitiveness in situations of cyclical shifts in the markets (Cooke, 2002, with reference to Henton et al. 1997). Economic communities can be defined as cooperative governance practices where privately led initiatives are supported by public authorities (Cooke, 2002). Also Ring, Peredo, and Chrisman (2010) point to social capital as central for the development of 'economically depressed rural regions', through its role in the establishment of entrepreneurial networks. They specify that the *nature* of social capital may either facilitate or constrain business networks among entrepreneurs. With reference to Flora and Flora (1993) and Flora (1998) they argue that the building of entrepreneurial networks is enhanced when the social capital of a community allows for constructive conflict, inclusion of actors with different perspectives and non-rigid boundaries.

2.3.3. Institutional capacity

Healey et al. (1999) used the expression *institutional capital* to refer to a combination of the knowledge resources, relational resources and mobilisation capability in a community. Access to knowledge and relational resources are a prerequisite for mobilisation to develop a sustainable institutional capital. The knowledge resources are broadly defined as both explicit and tacit knowledge and the ability to absorb new ideas. The relational resources refer not only to the fact that every individual takes part in different types of social networks, but also to the dynamics of the network. To achieve common social goals, these resources have to be deliberately mobilised through use of common arenas and networks, using mobilisation techniques and change agents (J. Amdam & Veggeland, 1998; R. Amdam, 2005; Healey et al., 1999). The relational resources include social and cultural networks that link individuals, social groups and different types of knowledge.

With reference to (Beck, 1992), Skogseid (2007, pp. xi, 75, 89-90) relates institutional capacity to *reflexivity*; an ability to reflect on and cope with external change forces which in turn are reflections of global changes; in order to model and utilize these change forces according to the needs of the community. Reflexivity and institutional capacity will thus be important in relation to innovation. Similarly, social capital can be strongly related to entrepreneurship: Minniti and Bygrave (1999) hold that people are more likely to alter their mind sets and engage in the risks of venture creation when they have access to learning through good role-models. The existing amount of entrepreneurship is important as it has a self-reinforcing effect on the entrepreneurship in the community Minniti and Bygrave (1999). Looking at innovation in a social and systemic perspective is at the very base of recent theoretical approaches which focus on *regional innovation systems*.

2.4. Regional Innovation Systems

As with the other terms we have defined concept of 'regional innovation systems' builds on other, similar ideas, and has developed over time.

2.4.1. Regional Innovation Systems: Origin

Concerning *regional innovation* in general, Johnstad (2012) says that this topic has received considerable attention in Norway over the two last decades, but the phenomenon has also been addressed before under other names like regional renewal or change-over, job-creation or growth. Before that words like modernizing or building the country were used. Today 'regional innovation' is particularly associated with *regional innovation systems*, *RIS*, which is understood as institutional support to business innovation (Johnstad, 2012).

The original focus of this concept was on '*national systems of innovation*'. Christopher Freeman (1995, referred in Edquist 1997) gives credit to Bengt-Åke Lundvall for inventing this expression, while Freeman (1987, referred in Edquist, 1997, p. 8) was the first person to use it in written form when analysing the Japanese 'economic wonder' after the Second World War. Freeman (1995, referred in Edquist, 1997; p. 8) defines a 'national system of innovation' as "*the network of institutions in public and private sectors whose activities and interactions initiate, import, modify, and diffuse new technologies*". In the 90'es related concepts were introduced, such as 'Technological Systems' analysed by Carlsson (1994)

and others, as well as sectorial approaches (Tödtling & Trippl, 2005). Later one has come to stress the importance of the regional level because of the role of geographical proximity, embeddedness in local and regional institutions and culture, and personal interaction in building and transmitting knowledge and behavioural patterns that promote creativity and innovations. Among others B. T. Asheim (1996, referred by Johnstad, 2007; p. 15) pointed at the concept of national systems of innovation as a useful framework for studying innovation systems at the regional level. Some authors (Uyarra, 2010) use the original word order '*regional systems of Innovation*' and use the abbreviation *RSI*, while others (Tödtling & Trippl, 2005) – maybe out of pronunciation reasons – have inverted the expression to '*regional innovation systems*' and *RIS*, respectively. In both versions the first letter of the words are by some authors written in capitals, by others in minuscules.

2.4.2. Regional Innovation Systems: Definitions and distinctions

"The term Innovation System and Regional Innovation System even more so, does not have a one commonly accepted definition". This is stated on the web pages of an EU-run regional development project, (TeRIS, 2012). Also Uyarra (2010) holds that the concept is too vaguely defined. Many attempts have been made, though, and according to (TeRIS, 2012) most of the definitions focus on the primary function of the innovation systems: creation and utilisation of innovations. On the project's web pages (TeRIS, 2012) explains that a "RIS consists of the regional networks and interactions (also non-sectoral) which enhance the regional R&D activities and creates new innovations to the region (also non-technology based)".

Similarly, Bukve and Gammelsæter (2004b) say that regional innovation systems are characterized by 'interaction between enterprises, authorities and knowledge institutions', and they (2004a, p. 61) underline that an innovation system is 'more than' a business network: The role of public *institutions* is important as accommodator (such as municipalities) and as collaborator (such as educational institutions and economic instruments). In order to be called a regional innovation system, the interaction between the various actors should also be planned and formalised (Bukve & Gammelsæter, 2004a, p. 61). The concept of institutions can be understood as both 'hard' (organisations and laws), and 'soft' (norms, routines and practices); both are seen as important in that they shape behavioural and interaction patterns between actors (Tödtling & Trippl 2005).

Pointing to the meaning of *system* as "(an entity) composed of components and relations between the components...", (TeRIS, 2012) say that in a Regional Innovation System the components are mostly actors at organisational level. On this background (TeRIS, 2012) defines a regional innovation system (RIS) as "the set of economic, political and institutional relationships occurring in a given geographical area which generates a collective learning process leading to the rapid diffusion of knowledge and best practice". This definition underlines the importance of the various *actors* involved, as well as the relationships or *interactions* between them – and the kinds of *learning* which occur within this system. Such elements have been referred to as *immaterial resources*: In the change and innovation processes within a regional innovation system, access to local immaterial resources is vital for the innovations taking place in a community. The most cited immaterial resources are;

intellectual, social, cultural and institutional capital (Bourdieu, 2001; Healey et al., 1999; Putnam, 1993).

Tödting & Tripl (2005) refer to Autio who in 1998 when suggestion to view the regional innovation systems as two sub systems: the *knowledge application system*; which are mainly businesses (along with clients, suppliers, partners and competitors), and the *knowledge generation and diffusion system* which is related to knowledge infrastructure such as universities and R&D institutions. Knowledge, and even more so learning, is also a central aspect in Asheim & Isaksen's (2002, referred in Isaksen et al. (2008)) distinction between three types of regional innovation systems: *regional innovation networks*, adapted or *developed regional innovation systems* and *regionally embedded national innovation systems* (our translations).

2.4.3. Regional Innovation Systems in the Regional development literature

As we saw in section 2.2.4, a *system* can be a set of connected things or phenomena which work together in an organized manner, often with a certain objective. A system may vary from the very simple to high levels of complexity. When it comes to recent perspectives on innovation and production, though, it seems that many authors (Edquist, 1997; Tödting & Tripl, 2005) tend to use the term 'innovation systems' about rather complex processes and relations in the 'real' world, and – correspondingly – 'innovation systems approaches' about recent (read updated) theory and policy which take this complexity into consideration. Isaksen (2008, pp. 184-185) mentions the fish farming industry as a good example of knowledge networks and innovation systems in Norway: While OECD in 2007 defines this industry as 'low-tech', in 2005 2200 fish farmers collaborated with 1200 suppliers of food, medicines, production equipment and –facilities and ICT, and 1600 researchers and scientific staff worked to develop and spread knowledge in this field. According to Isaksen (2008, pp. 184-185) the suppliers frequently function as knowledge mediators between the researchers and the fish farmers.

These new approaches which focus on complex patterns of interaction, stand in contrast to traditional, *linear* (read simplistic) perspectives on innovation (Edquist, 1997; Tödting & Tripl, 2005). It is not always clear in the literature whether the 'linearity-criticism' concerns traditional production-, learning- and innovation processes, traditional theorizing about those processes, traditional policy, or all. Karlsen (2008, p. 93) refer to Bush who in 1990 says that the base of the linear innovation model, lies the assumption that knowledge could be transferred in simple and direct ways to business and production ('næringslivet'). This model has been criticized for being unrealistic and not well suited, and a more interactive model was introduced (Karlsen 2008; p. 93); with the belief that there is close collaboration between knowledge institutions and business at all stages of the innovation process. According to Karlsen (2008; p. 93), the discussion on these models has not been aware of *how* learning may be transferred (see the section concerning (tacit) knowledge).

Johnstad (2007) relates the development of new terms and new theoretical perspectives to an actual change in production methods from simpler to more complex ones; from 'fordism' and assembly lines with a national scope, to specialization, outsourcing and subsequent

interdependency between a multitude of actors, and where the global and regional perspectives come into the foreground.

When it comes to how innovation systems are perceived and analysed in the regional development literature, Edquist (1997, pp. 15-29) has identified nine characteristics of what he calls the 'systems of innovation approaches': 1) They are putting *innovation and learning at the centre*, 2) They are *holistic and interdisciplinary* in the sense that they tempt to analyse a wide spectrum 'or all' (!) factors relevant to innovation, whether at sectorial, regional or national level. These approaches also bring focus on other factors influencing innovation than the purely economic ones; including social, organisational, institutional and political factors. In this sense, Edquist (1997, p. 17) says, the systems of innovation approach "is an interdisciplinary approach. Perhaps it might best be labelled a 'political-economic' approach". These approaches further tend to 3) *include historical and long term perspectives on innovation*, 4) stress the *differences between systems* as well as what Edquist (1997, pp. 15-29) calls *non-optimality*, that one cannot define one single optimal or ideal system of innovation, much because of the evolutionary character of learning processes which make innovation systems subject to constant change. Therefore one should compare different systems in order to find out what works better. The systems of innovation approaches also 5) put emphasis on *interdependence* between various actors and *non-linearity* of the innovation process, 6) their innovation concept *include product technologies and organisational innovations* (as opposed to mainstream economic perspectives which rather focus on process innovations), 7) '*institutions*' are seen as central, but are not well defined – and may include elements such as 'normative structures', 'policies' and 'organisations', 'routines', and 'technical standards'. The systems of innovation approaches themselves are 8) *conceptually diffuse* (including different definitions or uses of the same term, and vagueness of concepts). Finally, Edquist (1997) concludes that these approaches are to be seen as 9) *conceptual frameworks rather than formal theories*.

Edquist (1997) also underlines the *evolutionary perspective* which is prominent in these approaches. Similar to the evolution which goes on in nature, enterprises and technology development go through phases of 1) existence and reproduction of technology and organizational forms, 2) mechanisms which introduce diversity; 'mutations' or innovations and 3) 'natural' or market selection mechanisms which reduce diversity. Edquist might here also have added that this selection ensures the 'survival of the fittest', which mistakenly has been referred to as the survival of the strongest, but which Darwin specified as survival of the best adapted to ever changing conditions.

These Darwinian perspectives of what happens on the ground in the 'real (business) world', bring us over to the topic of how regional innovation theory is (or is not) applied in policy.

2.5. Regional conditions for innovation, and innovation policy

Regional conditions for innovation are influenced by geographical and other regional specificities. Tödting & Trippel (2005, p. 1211) tell that many studies in recent years have explored regional differences in innovation and R&D, and despite some exceptions, the findings generally point towards a core-periphery difference. Larger agglomerations are found to be more innovative and spend more resources on R&D than peripheral regions and

old industrial areas. Nuur and Laestadius (2010) relate the gap between urban and peripheral regions to new conditions of challenges and opportunities caused by technological improvements and the globalization of the economy. Similarly, Lorentzen (2012) describes core regions as successful in developing knowledge-based businesses, while many peripheral territories 'seem to be stuck between job losses in traditional industries on the one hand and weak potentials of embarking on knowledge-based activities on the other'. A key objective in the innovation policy is to enhance organisations capacity to change and strengthen their competitiveness and survivability, and thereby level out regional disparities. The literature show that regions associated with peripherality and rurality may turn challenges into assets (Gløersen & Dubois, 2010).

2.5.1. Typology of three types of 'problem regions' and their corresponding weaknesses

As a conceptual tool for better understanding the weaker innovation capabilities in less favoured regions, (Tödting & Tripl 2005, p. 1208) build on a typology developed by Isaksen (2001) and Nauwelaers and Wintjes (2003). In this typology three kinds of problem regions are identified: *Peripheral regions*, *old industrial regions* and *fragmented metropolitan regions*. According to the different conditions in these kinds of regions, different sets of deficiencies may occur in the regional innovation system. In the typology these deficiencies are called *organisational thinness*, *lock-in* and *fragmentation*, respectively. Tödting & Tripl (2005) underline that in many cases the problem picture may represent a mix of different deficiencies, but that some problem types may be more pronounced than others according to the predominant characteristics in a given region.

Peripheral regions: organisational thinness

According to Tödting & Tripl (2005, pp. 1209-1210, with reference to Isaksen 2001), a main problem in many peripheral regions is that the conditions for a RIS to develop are not favourable due to the absence of dynamic clusters and supportive organisations, which is an important factor in causing 'organisational thinness'. Often the critical mass for cluster development is not reached, as peripheral regions tend to be dominated by small and medium sized enterprises (SME's). R&D also tends to be below average, which not only constrains the innovation activity in the region, but also reduces the absorption capacity of firms (Tödting & Tripl 2005, with reference to Cohen and Levinthal 1990). Another aspect of organisational thinness is that when levels of clustering and agglomeration are low, this also often associated with a 'thin' and less specialised base of knowledge institutions. In addition, networking with such institutions may be poorly developed. Attempts to compensate for these problems by setting up technology transfer organisations have often failed, as they didn't reach the firms or the needs of the firms were not met (Tödting & Tripl 2005, with reference to Hassink 1996 among others).

Old industrial regions: lock-in

Old industrial regions face the opposite problem compared to the peripheral regions concerning clustering. Too strong clustering can lead to path dependency or *lock-in*: Although often having a highly specialised and well developed knowledge generation and diffusion system, this type of region tends to be stuck in old traditions, specializing in over-ripe industries which are already in decline. Their competitiveness is reduced due to low levels of learning and poor innovation capacity (Tödting & Trippel 2005, p. 1210). The industry also tends to focus on incremental process changes rather than product oriented and radical innovation (Tödting & Trippel 2005, p. 1210, with reference to Tödting 1990 among others). Also in old industrial regions technology transfer has had somewhat limited success. Larger firms have been reached to higher extents than smaller ones. The needs of SME's are often not well enough considered, and interactive learning seldom achieved (Tödting & Trippel 2005, p. 1210, with reference to Asheim et al. 2003).

Grabher (1993, referred in Tödting & Trippel 2005) has identified several types of lock-in: *Functional lock-ins* caused by lack of flexibility in company networks, *cognitive lock-ins* due to lack of diversity in world-views, and *political lock-ins* caused by too strong and interlocking relationships between central private and public actors, which restrains industrial restructuring.

Fragmented metropolitan regions

Statistically metropolitan regions are superior to peripheral regions concerning levels of R&D and innovation activity. They are often blessed with excellent universities and research institutions, business services and headquarters of international companies. Still, there is no automatic causation between the characteristic 'metropolitan' and being innovative. When firms do not engage in networking and interactive learning with other companies and with knowledge institutions, this may result in 'fragmented metropolitan regions' which suffer from lower levels of technology development and entrepreneurship than expected (Tödting & Trippel 2005, p. 1211). In such regions it seems that the two RIS sub-systems are not well integrated, as firms and knowledge institutions do not cooperate. Firms may also be too little involved in networking with other firms (Tödting & Trippel 2005, p. 1211 with reference to Fritsch, 2003). Also in urban areas the role of proximity is important. Industrial clusters and agglomerations have been found to produce knowledge spillovers; but the effect is confined within certain spatial distances from such industrial centres. According to Tödting & Trippel (2005, p. 1208) authors point in different directions concerning what is more favourable for innovation in agglomerations; specialisation or diversification. Tödting & Trippel (2005, p. 1208) conclude that Feldman and Audretsch (1999) give an accurate description when claiming that innovation is stimulated most efficiently when complementary industries share a common knowledge base.

2.5.2. Other descriptions of peripheral and rural regions - problems and potential

Other authors have identified similar or additional problems related to certain types of regions, or bring in research which gives nuance to the general picture.

The typology presented in the previous section seems to draw on the work of Stöhr (1982, referred in Lorentzen, 2012, p. 16-17). He distinguishes between three types of peripherality related to economic structural patterns: *Agriculture, mining, and old industrial areas*. In contrast to Tödtling and Trippel (2005), Nuur and Laestadius (2010) do not distinguish between peripheral and old industrial regions. They hold that traditional policy approaches in peripheral regions have had a macro-oriented, 'Keynesian flavour' in that they were measures from above, based on localization of industry. One unfortunate consequence of this policy was '*big employer dependency*' and lack of entrepreneurial spirit among workers (ibid). This is also associated with so-called *path-dependent development*, which Martin & Sunley (2006, p. 399) describe as "an inability to shake free of their history". This inability might lead to lock-ins. Based on Bukve and Gammelsæter (2004a, p. 61) one might define lock-ins as the negative version of 'continuity': When actors base their activity too much on their local and regional tradition, or "lock themselves in in their own regional excellence", innovativity tends to halt as new ideas from outside are not let in.

While many authors focus on the disadvantages and problems of regions associated with peripherality and rurality, other perspectives exist. Davies, Michie, and Vironen (2012) have documented that innovation can be performed in peripheral regions. R&D then tended to be small-scale and would cluster in locations equipped with good infrastructure and an existing concentration of firms. The relationships would be of both local and distant character.

2.5.3. Some common issues in 'geographically specific areas':

Here we will first look at some issues related to transport, accessibility, distance and proximity; the role of ICT as a challenge and facilitator; and finally how concepts like 'the good life' and 'the experience economy' may help framing territorial specificities as assets for rural and peripheral development.

Transport, accessibility, distance and proximity

Gløersen and Dubois (2010, p. 22) sum up the situation of various 'geographically specific areas' as similar concerning important consequences for economic activity: Mountainous, insular and wide, uninhabited areas in sparsely populated regions constrains the *functional neighbourhood* of the place. Transport costs increase with low volumes and need for specific infrastructure. However, according to Gløersen and Dubois (2010, p. 22), this does not automatically lead to economic handicaps. Studies have demonstrated difficulties in documenting a direct causation between peripherality and low economic performance. This may be related to the fact that transport costs generally are moderate relative to the total production costs, and the question of proximity to large markets is less relevant for industries which are able to develop in remote areas (Gløersen & Dubois, 2010).

Concerning the notion of *proximity* Bergum (2012) comments that it receives much attention in a wide range of scientific literature dealing with leadership, organization and inter-organizational collaboration, innovation, and regional development. He relates this to the strong focus on tacit knowledge; and accordingly 'proximity' has mainly been understood in geographical terms. This is now changing as alternative perspectives on distance and

proximity are being introduced, including notions such as *organisational*, *social*, and *cognitive proximity*. Bergum (2012) believes such concepts may help to explain research findings from Norwegian regions, which show that successful 'distributed innovation activities in remote areas' are possible both on individual, company unit, company, and network level. Hildrum (2008, referred by Bergum, 2012; p. 136) defines *distributed innovation* as 'innovation activities or processes in which participants or actors are located in different geographical places'. Here ICT is central as a facilitating medium (Bergum, 2012).

The role of information and communication technology (ICT)

On a broader base Skogseid (2007, pp. ix, 1) refers to information and communication technology (ICT) as becoming a factor in regional and rural development. New electronic concepts and services reflect how the use of ICT entails several organizational changes in modern society; such as e-learning, e-health, e-business and e-government (eEurope, 2002). The 'information society' requires knowledge resources and appropriate infrastructure, and disadvantaged areas run the risk of digital exclusion referred to as the *digital divide*, which may have economic, social or cultural consequences (Moran, 2005). Skogseid (2007, p. xi) argues that social aspects of the development processes, for example institutional capacity, may constitute bigger challenges than the technical ones, and that establishing networks may help to reduce the digital divide.

Regional specificities as attractivity assets: the 'good life' and the 'experience economy'

In a qualitative study Bergum (2012) has documented that small and medium-sized places may be attractive because they give opportunities for 'the good life' and 'work – life balance'. Lorentzen (2012, p. 17) discusses possibilities of regional development in the light of *the experience economy*, or regions competing to be attractive places for consumption. This potential has become an important topic in the literature. Lorentzen (2012) mentions several related perspectives: Similar to the concept of *leisure value* (see page 19). Anderson & Anderson (2006, referred by Lorentzen, 2012) mention *leisure economics*; they point to several factors leading to increased opportunities for leisure consumption: working hours in OECD countries have been reduced by almost 50% from 1870 to 1979, incomes are higher, and people live longer and have fewer children. *Experience economy* or *experience industry* (Toffler, 1970), *experience society* (Schulze, 2005), *the culture economy*, *the culture economy* (Meehan, 1996), *the creative economy* (Howkins 2002). Howkins relate the creative economy to 15 industries which he identifies as giving particularly good opportunities for income and profit: Advertising, architecture, art, crafts, design, fashion, film, music, performing arts, publishing, research and development, software, toys and games, television and radio, and video games.

Howkins (2002) does not list tourism, but according to Gløersen and Dubois (2010; p. 26) this has been identified as a strategy to diversify local and regional income sources, especially in agricultural rural areas. They hold that small, traditional farms can turn lack of modernization and mechanization into an asset, as they can offer good conditions for *agro-tourism*. Tourism related to small-scale, high-quality food production may also be combined

with activity in preserved natural environments, and areas with cultural heritage. Gløersen and Dubois (2010; pp. 26-27) mention *conference-tourism*, *sports-tourism* with activities such as fishing, hiking, bicycling, winter skiing, paragliding, rafting, nature studies, picnics, and spa. While not using the term *cultural tourism*, they also mention visiting 'cultural assets' such as monasteries and art listed on the UNESCO World Heritage List.

We have seen that peripheral and rural regions have several potential assets, but that close relationships and strong rooting in local traditions may lead to lock-ins. Some countries and regions have been able to break out to a new path, but history shows that it is impossible to plan these new paths (Ron A. Boschma & Sotarauta, 2007, pp. 157-158). Regional development understood as something one cannot fully control or foresee the outcomes of in an evolutionary perspective, is typical for a more recent approach in regional policy which Nuur and Laestadius (2010) call the 'Marshallian dynamic' or a 'growth' based development which is organic, evolutionary and rooted in a local entrepreneurial culture. Similarly, Skogseid (2007) emphasize that when the regional specificity is put in the centre, a different process comes into place; one that is not possible to plan in a top down manner, but which needs to be developed organically based on the local resources available. Following the literature analysis of Edquist (1997) these perspectives are typical for the innovation systems approaches.

Absence of full control does not imply that one should give up planning. On the contrary, it is of vital importance to get an overview of, use and refine the existing knowledge about the factors which are shown to be relevant for innovation and development processes, and in which way these factors tend to interact within different contexts. We will here sum up what we have found so far concerning factors which may influence regional innovation and development.

2.6. Factors influence regional innovation and development

Various factors at different levels may influence regional development and innovation. Positive and negative factors tend to be polar; if a factor is shown to be negative (e.g. lack of diversity); the opposite representation of this factor (e.g. diversity) frequently is found to have positive influence. This picture is nuanced by the possibility of contextual variations; the same factor may have different effects according to varying contexts and in combinations with other factors. Some factors may reinforce each other while others can counterbalance each other. Different factors can further be analysed with respect to how general or specific they are. Some factors may render a whole society, and thereby indirectly individual enterprises, more robust or vulnerable on a general basis. Such factors are here presented under the labels 'vulnerability' and 'robustness'.

2.6.1. Vulnerability

(Gløersen & Dubois, 2010, p. 21) mention *dependency on a limited range of exports*, as well as '*big employer dependency*' as important factors which may render a region vulnerable. Similarly, Nesse et al. (2009, p. 16) give examples that *dependency on corner-stone industry* is a problem for the whole society when this industry fails. This kind of vulnerability is by (Kobro, Vareide, & Hatling, 2012) termed the "*corner-stone factor*" (our translation).

The corner-stone-factor will frequently be part of the problem picture in old industrial areas. Such regions will also often suffer from *path-dependency* and *lock-in*; reduced levels of renewal and competitiveness associated with *too strong clustering in old traditional industries* that are in decline, and low innovation capacity (Tödttling & Tripl 2005, p. 1210). The industry in such regions also tends to focus on *incremental process changes*, rather than product oriented and radical innovation.

At the same time, *entrepreneurship* has been found to be a risky way of compensating for declining or lost industry. Nesse et al. (2009, p. 17) refer a meta-analysis performed by Starbuck & Nystrøm in 1981, in which they synthesized the findings in the available literature at the time. They found that less than 40% of all new organisations managed to stay in business for five years, and of those who made it to ten, 65% survived another five years. Survivability increased with age, though; among 50 year old organisations 83% stayed in another five years. A more recent review by (Aldrich, 1999) gave similar conclusions: New businesses were small and lived short, and less than 10% of new businesses grew to be larger than what they were when they started out. According to Nesse et al. (2009, p. 17) statistics from SSB show the same tendency; only one third of the companies created in 2001 made it to the five year anniversary. Joint-stock companies had a bit better prognosis with 50%.

2.6.2. Robustness

Danson and De Souza (2012c) report that the expression 'robust regions' generally is used about regions that have a relatively strong centre and large potentials when it comes to population and attracting international production, and which are connected with other 'strong growth and development contexts'.

With reference to Shane 2003, Fuduric (2012, p. 172)172) underlines that *industrial diversity*, with both smaller and larger firms, has positive effects on entrepreneurship through increased opportunities for employment and career experiences. At the other hand, as a means of ensuring development and employment *intrapreneurship* has been shown (Nesse, et al. 2009, p. 42), to be a safer strategy than entrepreneurship; building on existing businesses when developing new products or other innovations, is less risky than trying to create something completely new.

There is agreement among researchers that *networks of entrepreneurs* may be a means of lifting rural areas to their potential and overcoming limitations of scale and capability (Ring et al., 2010). Ring et al. (2010) underline that perspective is supported across disciplines like sociology (Flora 2008), public policy (Woolcock, 1998), and political science (Putnam 1993).

In this section we have summarised some of the existing knowledge concerning factors influencing vulnerability and robustness of a region. This is knowledge which can be used in order to analyse a given context. At a more specific and concrete level it will also be essential to develop good tools to identify and consider central aspects of this context. In the next section we will look at one such tool, called *descriptive clusters*.

2.6.3. From a problem oriented to a pro-active perspective

We have seen that various terms are used to indicate differences between regions. Such terms are not necessarily neutral descriptions, but may reflect value perspectives on these differences. According to Gløersen and Dubois (2010) the discussion on territorial diversity has traditionally focused on “structural constraints and obstacles to development”, which is a rather problem-oriented perspective. They give an implicit example of this in their discussion on mountainous areas, mentioning that in 1975 European mountainous regions were included in the *aid schemes* for farmers in *Less Favoured Areas (LFA)*. The expression ‘less favoured areas’ has been adopted in the academic language. For example, Tödtling & Trippel (2005) use this expression as well as other normative descriptions such as ‘well performing’ and ‘problem’ regions. With reference to Makarychev (2004) Herrschel (2012) comments that in the literature peripheries are ‘linked to disconnectedness and thus marginalisation from the main (“standard”) developments by their inconvenient position’, and that they are laggards ‘which need to be encouraged to “catch up” with the core areas’.

Other terms are more neutral, but the distinction is not always clear. A seemingly neutral term may bring certain connotations according to how it is used. For example, terms like ‘peripheral’ may reflect at least some elements of (negative) judgements. Crone (2012) asks: ‘Peripheral’ in relation to what, and for whom? Similarly, Danson & de Souza (2012) point to the characteristics that are commonly mentioned in relation to ‘robust regions’, like having a strong centre and large population potentials, and ask whether ‘peripherality’ denote the opposite set of characteristics and therefore is considered as an ‘extended antonym’ or opposite of robustness.

There is a growing awareness that it is not unimportant how different regions with their respective challenges and possibilities are described. How a given situation is framed may be determinant for how one copes with this situation. (Bygstad, 2012) says, with reference to Vygotsky (2001) and Clausewitz (1832), that terminology affects how one thinks about certain phenomena; it can even effect the direction in which the culture develops. Gløersen and Dubois (2010) underline that one can now see a shift towards a more pro-active and positive stance where territorial diversities such as regions being peripheral, mountainous, or insular are seen as ‘specificities rather than handicaps’. In the European Territorial Diversity project, TeDi, the importance of positive perceptions is underlined: the project focuses on ‘growth opportunities’, ‘potential resources’ and how ‘disparities’ can be overcome while maintaining ‘territorial diversity’ (Gløersen & Dubois, 2010). Similarly, Ring et al. (2009) underline that although many rural communities are small, isolated, and partly economically depressed, they have large potentials as they can be rich in social capital.

2.6.4. Policy Advice

Based on research and theory several authors give advice regarding regional development policy. Although not always easy to categorise, some recommendations are of more general character, others more specific.

General recommendations

- **Apply a holistic and interdisciplinary perspective on innovation and regional learning:** Among others, Lagendijk (2000, referred in Tödtling & Trippel 2005, p. 12) recommends to apply a broad view on innovation to ensure learning. Cooke et al. (2000, referred in Tödtling & Trippel 2005) say that in addition to the traditional focus on R&D and technology, one should also work on the organisational, financial, educational and commercial aspects of innovation processes. Neuwelaers (2001, referred in Tödtling & Trippel 2005) similarly underlines that in addition to physical capital such as R&D and infrastructure, one should also strengthen human capital by training workers, and social capital by promoting trust-based relations between regional actors. Social capital is among academics recognised as a vital element of a well-functioning RIS, and there is growing optimism that this can be enhanced through public policy initiatives (Morgan 1997, referred in Tödtling & Trippel 2005).
- **Apply a multi-level, multi-actor perspective on innovation:** As part of a holistic picture of innovation processes, one should think broad also concerning which kind of actors should be included, at which levels and in which ways. Among others, Mayntz (1997, referred in Tödtling & Trippel 2005) say that interaction based forms of state intervention and related governance types are better suited than traditional top-down intervention. Neuwelaers & Morgan (1999, referred in Tödtling & Trippel 2005) recommend building regional policy networks which include other regional actors in addition to the policy makers.

Policy collaboration and coordination is recommended to be conducted both *horizontally* by connecting different (regional) policy arenas (Mytelka 2000, referred in Tödtling & Trippel 2005) and *vertically* by including regional, national and European levels of policy making (Cooke et al. 2000, referred in Tödtling & Trippel 2005).
- **Support systems and networks of firms rather than individual companies, and provide good role-models:** Stöhr (1990) says that supporting individual firms often is of no help if the firm lack a supportive network. According to Tödtling & Trippel (2005) both peripheral and metropolitan business environments improve their innovation capacity when networks are established between businesses and knowledge institutions (the two RIS sub-systems related to knowledge application and generation, respectively). Similarly, Ring et al. (2009) underline that entrepreneurship is strongly related to social capital and model-learning. People are more likely to change their ways of thinking and get involved in the uncertainties of entrepreneurship when they have good role-models. The existing amount of entrepreneurship is important as it has a self-reinforcing effect on the entrepreneurship in the community (Minniti & Bygrave 1999, referred in Ring et al. 2009).
- **Involve local actors, build on existing foundations, go step by step and take the time it needs:** As a basic principle Gløersen and Dubois (2010) recommend *improving the coherence between three key factors; the natural resources, human capital and the institutional context* or governance structure. Nuur and Laestadius (2010) state that “policy makers seem to (overestimate) what can be done from above in a short time”. They recommend that policy should rather be long term, incremental and that it should target and reinforce emerging sectors which are “already there”. In order to create something completely new one will need more resources and still run the risk of not getting long-term impact from the investment (ibid). Similarly, Nesse et al. (2009, p. 17) point to statistics presented in the literature

on entrepreneurship, which agrees that new businesses tend to have low survivability. *Intrapreneurship* as a strategy has a stronger potential to succeed. Also Gløersen and Dubois (2010, p. 21) recommend *incremental innovation* seeking to increase the added-value in traditional sectors, as found in agriculture (see examples in the section of specific recommendations). Tödting & Trippel (2005:1210, with reference to Tödting 1990 among others), at the other hand, comment that the industry in old industrial areas should not only focus on incremental process changes, but also include product oriented and radical innovation.

- **Be positive and realistic:** [Nuur and Laestadius \(2010\)](#) recommend realism in the efforts to promote regional development. At the same time, (Gløersen & Dubois, 2010, p. 31) underline the importance of taking a *pro-active* and *positive* stance in policy planning when it comes to regions with specificities that traditionally have been termed rather negatively; such as mountainous, sparsely populated or island areas in peripheral regions. They (ibid) remind us that notions concerning landscape and regional characteristics only partly refer to physical realities; they are partly also culturally constituted realities.

Specific recommendations

- **Go for specialisation and cooperation:** In mountainous, sparsely populated and insular regions one should identify endogenous (local) potentials and development opportunities, focusing on 'niche' activities and comparative advantages. At the same time one should not consider territories in isolation, but rather think of possibilities of cooperation and functional integration (Gløersen & Dubois, 2010, p. 21).
- **Reduce mismatch in the labour market.** Not least related to a niche-based development, it will be important to reduce the gap between the demand of a special kind of labour force and the actual skills of the local population (Gløersen & Dubois, 2010, p. 21).
- **Use adequate notions and terms as a help to understand specific contexts:** Gløersen and Dubois (2010, p. 21) point to notions as 'small scale economies' and 'transitional labour markets' as a conceptual framing which can help to understand the 'specific dynamics' of relatively small and isolated communities. It is not an absence of resources which cause problems in such areas, but rather imbalances between economic, social and ecological aspects of development.
- **Use tools for context analysis and process planning:** As a help to analyse the local context with respect to identifying potentials, resources, and obstacles, and in order to plan the necessary steps of technological and other development processes, (Skogseid, 2007, 2008) provides a schematic framework based on the 'descriptive clusters' of Schön (1991). This is a set of thematically grouped ('clustered') questions that need to be asked and answered in order to secure a systematic and thorough process.
- **Apply positive territorial branding:** As a means of "creating an awareness of local assets and emphasizing the qualities of specific territories" Gløersen & Dubois (2010) recommend positive *territorial branding*, both internally and externally.

2.7. Some final considerations

Having studied relevant literature and research in the field of development one may feel tempted to jump at conclusions and say "this will work" and "this will not". As we have seen,

this has partly been tried out as a policy strategy, but case studies presented in the literature show that learning from the experiences of others is a complex process – it is not possible to make a blueprint copy from one location to another, because the context will vary (J. Amdam, 2010, 2011; Nuur & Laestadius, 2010; Skogseid, 2007). Policymakers must have better knowledge of their own region to build on the region's existing strengths and capabilities to stimulate innovation (Ron A. Boschma & Sotarauta, 2007, pp. 158-159). Politicians and other actors will thus need to consider to what extent described situations resemble their own context, and what elements may be useful for them to consider in their current development process.

We have seen that regional innovation and development processes in most cases will require both patience and time. A good process will require good preparation, and it is vital to analyse each local context with respect to obstacles and available resources. One should also be aware that an evaluation of a situation will always be just that; an evaluation – or a judgement. Observations will to some extent be subject to interpretations, which may include political, ethical or other facets. It will therefore be important to clarify own position and use arguments based on facts that can be controlled and discussed by others. While not easy to achieve, research has shown that qualitative regional innovation and development *is* possible when approaching the task with a realistic, positive attitude, good analytical tools and in collaboration with relevant actors. The field still needs elaboration but to base the processes on what theory and research over the last decades have taught us is a good start.

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