Methodology for the comparative analysis of measures promoting innovation adoption by rural economy SMEs

Project Activity: A1.3

May 2017

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1   Introduction

INNOGROW is a project of the INTERREG Europe programme which aims to encourage the adoption of innovation by rural economy SMEs in order to increase competitiveness and productivity, mainly through the exchange of experiences and the examination of good practices. INNOGROW is found under the second Priority Axis of INTERREG Europe "SME Competitiveness".

This particular activity namely A1.3 aims to develop the methodology for a comparative analysis of measures promoting innovation adoption by rural economy SMEs and is primarily based on activities A1.1 and A1.2, which set out the project base and objectives.

The structure of this document starts by presenting the INTERREG Europe programme, as well as the INNOGROW project, its principle objectives and expected results. The next section proceeds with key concepts and definitions required for the aims of the overall project and this particular activity.

The third section defines and analyses the suitability of a comparative policy analysis, for achieving the activity's main objectives and finally gives a short description of existing policies and measures which encourage the adoption of innovation in rural economy SMEs and which have recently been implemented in the EU rural regions. The research questions are then developed and briefly described, setting the basis for the methodology, followed by the examination of data collection and analysis methods (the latter will be carried out using the Open Coding Method). The research will be mostly based on external and internal desk research, otherwise known as secondary research. The partners will also find potential data sources and an outline of how each research method can be useful. Additionally, the report makes reference to Key Performance Indicators (KPIs) a type of quality specifications that have to be respected in both the quantitative and qualitative categories of research carried out.

At the end of the document, there are three annexes which include the document (input paper) for the INNOGROW partners to use in order to conduct the research. Annex A is a template of the input paper whereas Annex B presents a completed example which indicates how it should be completed, for the purpose of pre-testing. Annex C presents the timeplan for carrying out the activity.

2 Context of the INNOGROW Project

2.1 The INTERREG Europe Programme

The INNOGROW project is carried out under the scope of this programme. The INTERREG Europe Programme (www.interregeurope.eu), financed by the European regional development fund (ERDF) aims to provide solutions that ensure that the European regions, their regional and local authorities, have the opportunity to share experiences on thematic objectives with partners. The programme financially supports actions within the following four categories, research and innovation, SME competitiveness, low-carbon economy and environment and resource efficiency.

INTERREG EUROPE is one of the instruments for the implementation of the EU's cohesion policy and aims to identify and disseminate good practices, to be transferred principally to operational programmes under the Investment for Growth and Jobs goal. With this policy, the EU pursues harmonious development across the Union by strengthening its economic, social and territorial cohesion to stimulate growth in the EU regions and Member States. The policy aims to reduce existing disparities between EU regions in terms of their social development and environmental sustainability.

For the 2014-2020 funding period, cohesion policy concentrates on supporting the goals of the Europe 2020 strategy, which targets to turn the EU into a smart, sustainable and inclusive economy delivering high levels of employment, productivity and social cohesion.

2.2 The INNOGROW Project

2.2.1 Overview

The "Regional policies for innovation driven competitiveness and growth of rural SMEs – INNOGROW" is an INTERREG Europe project aiming to improve partners' policies on rural economy SMEs competitiveness as regards the integration of new production technologies and business models that lead to innovative products. The project promotes the adoption of innovation by rural economy SMEs, through sharing practices/ experiences between regions and actors relevant to rural economy SMEs' competitiveness, and integrating lessons learnt into regional policies and action plans.

European regions have an essential role to play in shaping and implementing policies for economic development. The economic and environmental challenges faced by rural economy SMEs are the ones INNOGROW partners focus on, and address with improved policies. Existing literature and the European Commission agree on the necessity to foster innovation adoption by rural economy SMEs, with the purpose to increase their productivity, competitiveness and internationalisation. The INNOGROW project idea has thus been developed to address these challenges through interregional cooperation, exchange and valorisation of good regional practices, with the aim to influence policies both at regional and national level for improving the competitiveness of rural economy SMEs.

Territorial capacity building and policy innovation involving all regional actors are critical factors for promoting the diffusion of innovations, to maintain and strengthen SMEs' competitiveness and consequently regions' growth. Regions in rural areas have to provide incentives to promote the adoption of technological innovations, such as organic farming, functional food, crop resistance systems, selective breeding and feeding processes to boost livestock resistance to local conditions. At the management level, incentives need to be provided for mixed production of crops and livestock products, and new business models and coalitions that lead to innovative business ideas.

2.2.2 INNOGROW activity

The INNOGROW project involves 9 partners (including Regional Agencies, Chambers of Commerce, Universities) from 8 different EU countries, and respectively aims to improve 8 different policy instruments. The project main objective is to improve the implementation of regional development policies and programmes, in order to support rural economy SMEs in all stages of their life cycle to develop and encourage growth as well as to adopt of innovation through the exchange of policies.

INNOGROW's main activities are briefly described below:

1. Exchange of experiences through interregional thematic seminars/workshops and study visits.
2. Public dialogue and consultation with regional stakeholders and the public on key issues
3. Development of stakeholder groups and meetings with stakeholders.
4. Identification of good practices and building up knowledge capital through thematic studies/surveys/analyses.
5. Organization of policy learning events.
6. Development of regional action plans to improve the relevant policy instruments.
7. Definition of policy performance indicators.
8. Dissemination activities, such as the development of online transferable tools and resources to promote benchmarking and policy learning.

2.2.3 INNOGROW expected results

Making reference to the project's objectives, as defined in the project proposal and application form, the following operational results are expected which will secure the effectiveness of the project:

1. Increased capacity of the regional administrations to effectively implement SMEs' competitiveness policies.

2. Increased stimulation of rural economy SMEs to adopt new technologies and innovative techniques and procedures.

3. Development and realization of innovation support services to rural SMEs in order to facilitate the adoption of innovation.

4. Increased awareness among policy makers regarding the influence of regional policy measures.

5. Improved implementation processes for SMEs competitiveness and innovation policies, as well as the promotion of vertical and horizontal cooperation between rural economy SMEs, with regards to the production and commercialization of products.

2.2.4 INNOGROW Activity A1.3

Activity A1.3 aims to develop the methodology for a comparative analysis of measures promoting innovation adoption by rural economy SMEs, primarily based on activities A1.1 and A1.2.

The methodology will guide partners on how to carry out desk based research and analysis, in order to collect sufficient information and good practice cases regarding policies which encourage the adoption of innovation in rural economy SMEs.

3 Key concepts and definitions

3.1 Basic definitions

In order to gain an in-depth understanding of the project's objectives and to ensure the suitability of the comparative policy analysis, it is necessary to define certain key words which are essential to the development of the activity's objectives and present a few policies which have been used to support the adoption of innovative technologies in rural economy SMEs.

➢ **Rural economy SMEs**

Rural economy SMEs are best described as small and medium businesses (fewer than 250 persons, annual turnover less than EUR 50 million) which operate in rural areas, contribute to the GDP of rural areas, and are connected with rural-specific activities.

Small and medium-sized enterprises (SMEs) are considered the backbone of Europe's economy as they represent 99% of all businesses across the EU. In the past five years, SMEs have created around 85% of new jobs and provided two-thirds of the total private sector employment in the Union. The European Commission considers SMEs and entrepreneurship as key to ensuring economic growth, innovation, job creation, and social integration in the EU.

Small and medium-sized enterprises (SMEs) are defined in the EU recommendation 2003/361. The main factors determining whether an enterprise is an SME are a) the staff headcount and b) either the turnover or balance sheet total. According to the European Commission, the category of small and medium-sized enterprises (SMEs) is made up of enterprises, which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million. Within the SME division, a small enterprise is defined as an enterprise, which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million.

Company category	Staff headcount	Turnover	or	Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

The term "**rural economy SMEs**" refers to small and medium businesses, which operate in rural areas and contribute to the GDP of rural areas, connected with rural-specific activities and make use of natural capital / rural environment. According to EU Urban-Rural Typology[1], a NUT3 region is classified as "Predominantly rural", if the share of population living in rural areas is higher than 50% and the region does not contain an urban centre of more than 200.000 inhabitants representing at least 25% of the regional population. For the purposes of the INNOGROW project, the definition of "rural economy SMEs" will remain as broad as possible so that the project consortium can have more opportunities to discover and exchange best practices that will facilitate regional authorities to implement policies for promoting the adoption of technology and business model innovations by SMEs in rural areas. Therefore, rural economy SMEs may comprise businesses driven by or based on natural capital or environment. This includes farming and forestry but also tourism, leisure, food (where linked to particular forms of natural capital or the environment, e.g. farm tourism, walking holidays) and/or activities of entrepreneurs locate in rural areas for quality of life.

➢ **Business competitiveness**

Business competitiveness is best defined as the ability and performance of a company to sell and supply goods and services in a given market, in relation to the ability and performance of other companies or sub-sectors in the same market nationally or in relation to other countries internationally. A **competitive business environment** is the dynamic external system in which a

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[1] http://ec.europa.eu/eurostat/statistics-explained/index.php/Urban-rural_typology

business competes and functions. Generally speaking, as the number of sellers of a particular product or service increases, so does the market's competitiveness.

A competitive business strategy allows for a company to be more effective in the production process, through which they aim to maintain a competitive advantage. Competitive business strategies, are usually focused on one of the following strategies: Cost leadership, differentiation or price strategy.

> **Business productivity**

Productivity is an economic measure of output per unit of input. Business productivity is the average measure of the efficiency of a firm in converting inputs into useful outputs. Inputs include labour and capital, while output is typically measured in revenues and other gross domestic product (GDP) components such as business inventories. Apart from aggregately, another way of measuring productivity is by industry and by examining specific trends in labour growth and technological improvements. This type of economic productivity is particularly relevant to the INNOGROW because an extremely import strategy which improves business productivity includes the more efficient use of technology to improve operational procedures. Increasing productivity can contribute significantly towards cost reduction and increase efficiency, while ensure that the latest innovations are implemented to improve productivity.
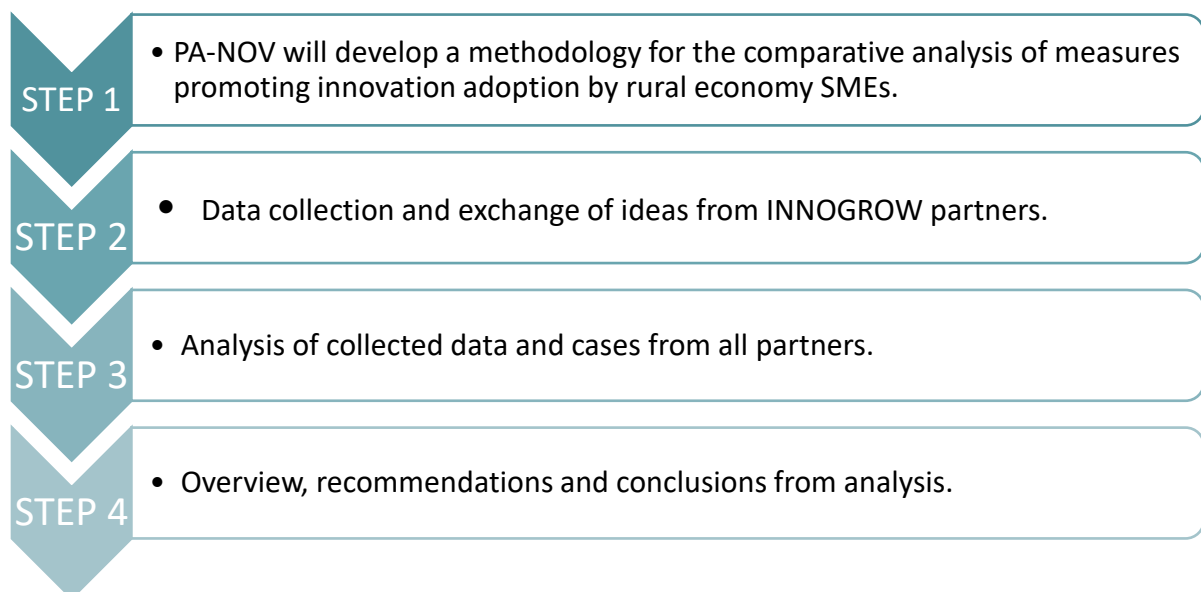
3.2 INNOGROW Activity A1.3: Comparative analysis of regional and national policies on the measures promoting innovation adoption by rural economy SMEs

The methodology for comparative analysis will set the framework for partners to be able to gather information and good practice cases, enabling them to exchange ideas, policy measures, skills and good practices and acting as a benchmark for the adoption of innovation in rural economy SMEs. All partners will conduct desk research on a regional/national level and will also make use of an input paper.

The analysis of the evidence collected will present a good practice guide and benchmarking guidelines on policy measures which encourage the adoption of innovation in rural SMEs, and allow them to determine the most efficient and suitable best practices on a local, regional or national level, thus encouraging growth and jobs.

The exact objective of activity A1.3 is the development of a comparative analysis of measures promoting innovation adoption by rural economy SMEs. An outline of the steps of the activity is presented below.

Comparative analysis procedure for the INNOGROW Activity A1.3

STEP 1
- PA-NOV will develop a methodology for the comparative analysis of measures promoting innovation adoption by rural economy SMEs.

STEP 2
- Data collection and exchange of ideas from INNOGROW partners.

STEP 3
- Analysis of collected data and cases from all partners.

STEP 4
- Overview, recommendations and conclusions from analysis.

3.3 The context for comparative policy analysis

A **policy** can be defined as the declared set of objectives that a government or public organization seeks, in order to achieve or preserve and to help solve problems in the interest of the community. In the EU a regional policy is an investment policy which supports job creation, competitiveness, economic growth, encouraging an improved quality of life and sustainable development[2]. Often regional policies are related to broad regional goals and raise the issue of trade-offs between environmental, social and economic goals. It is important to note that policy actions do not only impact the intended objectives but also have an indirect effect on other social or economic factors. It is therefore important that a policy is evaluated as a whole and that all the aspects of its implementation and the relevant trade-offs are examined when determining the policymaking process.

This process is known as **public policy analysis** and is a rational systematic approach used to make policy choices by evaluating the costs, benefits and consequences of relevant trade-offs of a specific measure or policy.

The implementation of public policy analysis helps the policymaker to come to an informed decision, because it aims to provide a better basis for the exercise of that judgment by helping to clarify the problem, evaluating existing conditions, presenting the alternatives and comparing their consequences in terms of the relevant costs and benefits. It is firmly founded upon the following scientific methods:

1. Open and explicit research.

2. Objective and empirically founded analysis.

3. The epistemological and methodological assumptions are consistent with existing knowledge.

4. Analysis results are verifiable and reproducible.

The policy being examined is often complex, meaning that it includes, social structures, portions of nature, equipment and organizations; the system being studied contains so many variables, feedback loops and interactions that it is difficult to project all the consequences of a particular policy change. This suggests that the possibilities that have to be evaluated and the variables that have to be considered before making an informed decision are numerous.

Another important word, when describing public policy analysis is "uncertainty". In a real business environment decisions have to be made based on incomplete information in regards to the future technological opportunities and other advances which cannot be taken into consideration prior to their development. These two characteristics make the analysis more difficult since it is not evident how the strengths and weaknesses of each policy should be analysed at all levels of public authority. It is therefore more effective to compare the specific policies in relation to their particular geographical location, using a **comparative policy analysis.**

Comparative analysis is used in various modifications and is defined as the comparison of two or more alternatives or processes which have identical or similar objectives or targets, or otherwise helps to identify logical conclusions from a combination of different variables[3]. Comparative analysis has two typical features, which explain why this approach is ideal for our research:

> 1. An interest in the explanatory question of why the observed similarities and differences between cases exist.

> 2. Reliance on the collection of data on two or more cases, ideally according to a common framework.

Comparative analysis allows for the better understanding of the causal processes and possible outcomes involved in a relationship. Particularly for the case of public policy, it enables the precise examination of the explanatory variables. However, when examining externalities which

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[3] qualitative comparative analysis - History Of qualitative comparative analysis | Encyclopedia.com: Dictionary Of Sociology

are either difficult to measure or which may be commensurable of concepts across different cases, such as the environmental impact, the evaluation process may be not be easily conclusive.

The two conventional types of comparative analysis focus on the explanation of differences, and the explanation of similarities. This is important to note because what is considered to be a similarity or a difference in policy analysis, depends on both the observed values but also on the subjective opinion of each analyst, making this distinction more complex than it might seem.

3.4 Description of existing policies

There already exist certain attempts both within the EU and internationally, which aim to implement specific policies to encourage the adoption of innovative practices and techniques and are relevant to the objectives of the INNOGROW project.

Tables 1, 2 and 3 below summarize a) key elements of successful policies EU policies that are currently used to encourage and facilitate the innovation process for SMEs, b) short descriptions of specific policy instruments, which can be useful to the INNOGROW partners and c) examples of innovation projects in regional EU economies.

Table 1: Elements of successful EU policies which support rural SME Growth and Innovation	
Element	**Description**
Facilitating access to finance	Attempting to improve the financing environment, by facilitating access to loans, grants, venture capital, investors and other forms of financial support, because financing is the most pressing issue for the majority of SMEs.
Creating a business friendly environment	The Small Business Act for Europe (SBA) provides a comprehensive SME policy for the EU and promotes the "Think Small First" principle and the entrepreneurial spirit among EU citizens.
Promoting innovation/ entrepreneurship	The Entrepreneurship Action Plan supports entrepreneurship education and provides support tools.
Improving access to new markets & internationalisation	Attempts to ensure that enterprises can rely on a business friendly environment and make the most out of cross border activities both within and outside the EU.

Encouraging and supporting Competitiveness	On an annual basis, the Commission analyses the economic performance of EU member states through the European Semester and Country Specific Recommendations (CSRs) and helps each country to address their structural problems.
Encouraging and supporting Innovation opportunities	Fostering broad commercialisation of innovation in the EU through Public Procurement for Innovation, Design, Demand-Side Policies, Public sector and social innovation. Encouraging the implementation of new processes/ business models and Technological breakthroughs, as well as non-technological innovation and innovation in the services sector. In priority areas SMEs are supported by the Horizon 2020.
Providing key support networks and information	Practical guides to doing business in Europe such as, Your Europe Business Portal, Enterprise Europe Network (particularly for SMEs and entrepreneurs access to market information).
	Source: Europa.eu

Table 2: European rural SME innovation policy instruments descriptions	
EU Policy/Instrument	**Description**
SME instrument	Designed specifically for single or groups of highly innovative SMEs with international ambitions, determined to turn strong, innovative business ideas into winners on the market. Full-cycle business support from the stage of business idea conception and planning over business execution and demonstration to commercialisation.

Collaborative Projects (SMEs and partners)	The ability to work with 2 international partners from different EU countries and request EU project support.
Access to Debt and Equity Financing	Loans for SMEs driven by R & I from the European Investment Bank.
	Source: Europa.eu

Table 3: European rural economy SMEs adoption of innovation policy descriptions

Finland 2004: InnoEnvi – Environmental mini clusters

- **Objective:** to create an environmental cluster in Southern Finland through which SMEs would gain new business opportunities and increase their export potential. 5 mini clusters were created and web-based information and training tools supported the work of the clusters.
- **Cost:** Total cost €1,400,000, of which €700,000 European Regional Development Fund contribution
- **Duration:** 2 years

Spain, Castilla y Leon, 2004: A Network of Rgional Innovation Agents creates links between Technology Providers and remote businesses

- **Objective:** to establish a network of regional innovation agents and train them to deliver a portfolio of services, visit companies and identify the technological services they could benefit from. Six Technology Centres of the region were involved in the project which was run in partnership between the Regional Council of Chambers of Commerce and the Economic Development Agency
- **Cost:** €1,234,968 of which €742,500 European Regional Development Fund
- **Duration:** 2 years

Spain, Aragon, 2004: COOPERA- Cooperation Porjects between companies and R&D Organisations and Strategic Research Structures

- **Objective**: to set up mechanisms to increase the technological and innovative development of Aragón's SMEs through cooperation projects between SMEs and scientific technological actors of the region and the creation of strategic research structures
- **Cost:** Total cost: €1,300,000, of which €650,000 European Regional Development Fund contribution (Aragon Region contribution: €400,000 and private sector contribution €250,000)
- **Duration:** 2 years

Austria, Tirol, 2005: Technology Innovation & Co-operation Networks encouraging SMEs and Universitites to work together

- **Objective:** promoting innovation in SMEs and to stimulate new partnerships between SMEs and Universities and Technological Institutes. Innovation projects in SMEs were funded to develop a new product or service in co -operation with other SMEs and a University or Technological Institute. Financing, in the form of a grant, was €50,000 to €100,000
- **Cost:** €3,185,000, of which €1,524,000 European Regional Development Fund, €908,000 public and €753,000 private
- **Duration:** 2 years

Source: European Union Regional Policy, Example of Regional Innovation Projects, 2007

4 Development of research questions

In order to carry out the required research for the collection of the necessary data, before describing the methods of data collection and analysis, partners have to know what kind of information should be gathered. Therefore the research questions of this investigation, which are derived from the aims of activity A1.4, are of vital importance. The following aims can be identified according to the INNOGROW application form and this activity's main objectives:

a) Understand the dynamics, potential for growth and jobs, as well as the enablers and obstacles to policy implementation related to encouraging the adoption of innovation for rural economy SMEs.

b) Integrate effective practices for the improvement of policy measures which encourage the adoption of innovative technologies in rural economy SMEs.

The research questions will be constructed based on the above aims which constitute a framework for the research and the identification of the information researchers need to obtain. The formation of the research questions is the stage of the research during which a topic becomes targeted. INNOGROW research questions should be of the following nature:

- **Relevant:** the question has to be of interest to the INNOGROW partners and useful to accomplish the objectives of the project. It should provide a direction for the research.

- **Manageable in terms of research and abilities:** the question asked must be answerable by partners given their capabilities.

- **Substantial:** the question should not simply copy questions asked in the past, and should give sufficient scope to develop into a research.

- **Consistent with the requirements of the research:** the question must be compatible with the sources of data used in the research and ultimately support the objectives of the latter.

- **Clear and simple:** the question should not hide concepts that are contradictory or not relevant to the research.

- **Interesting:** the question needs to maintain the interest of researchers throughout the research period.

Consequently to the requirements listed above and the aims of activity A1.3, the research questions have been developed and are presented in the table below:

Table 5: INNOGROW A1.3 Comparative policy analysis - Research questions	
1	What are the main characteristics of the innovative technology policies that are adopted to support rural economy SMEs (e.g. regional/ public/ EU funding, research, targeted training)
2	What were the main needs and objectives that the implemented policies aiming to encourage the adoption of innovative techniques have to address (e.g. reduction of production costs, respond to competition, access new markets/ identified market opportunity, Increase profitability/ revenues, satisfy consumers' needs, meet legislative/ policy changes).
3	Briefly describe the existing policy measures (which encourage the adoption of innovative techniques in the primary sector of production) in your region/country and any implementation difficulties.
4	What are the enablers and barriers for the successful adoption of innovations to support rural economy and how do you believe the public authorities can contribute to establish favourable conditions and offer incentives to SMEs for integrating these innovations?
5	What was the impact of the implemented policies on the competitiveness and productivity of the particular SMEs in the partners' countries?

5 Data collection methods

After developing the research questions, it is important to specifically describe the ways in which the data will be collected and to ensure that it is relevant and sufficient to the activity's objectives.

Desk research[4] will be the primary method for gathering the required information, on the measures which encourage the adoption of innovation in rural economy SMEs. Using both external and internal desk research, evidence and cases of good practices which foster the adoption of innovation and therefore increase competitiveness will be gathered to fulfil the activity's objectives.

5.1 External desk research methods

This type of data will be gathered from relevant secondary sources of information such as journals and academic documents, web portals on innovation and adoption of innovative technologies, industry research reports and corporate expert websites. Other possible sources of information are the outcomes of similar research conducted in the context of other EU projects, as well as case studies & surveys carried out for other organisations or businesses. These sources of information are described below:

5.1.1 Making efficient use of search engines

Search engines are a useful tool in order to begin a particular enquiry. Some of the most popular and commonly used are www.google.com, www.yahoo.com, www.infoseek.go.com and www.altavista.com. There also exist more specific search engines such as www.majestic.com which is a business search engine that maps the links between web pages.

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[4] Desk research (also known as secondary research) involves the summary, collation and/or synthesis of information retrieved from existing research and publicly available (e.g. reports, books), in juxtaposition with primary research, which entails the gathering of original data, using questionnaires or interviews with individuals.

For all types of search engines, the most important aspect for the researcher who aims to obtain targeted and relevant results is its effective use is the searching technique. This can be achieved using the appropriate key words and phrases. For the specific requirements of the INNOGROW project, indicative key words are presented in the table below.

Table 6: Useful key words and phrases	
Rural policy	Integration of innovative production methods
Public policy	Renewable energy
Rural economy SMEs	Innovative technology
New products Development	Encouraging innovation
Technological advances	Organic farming
Innovative Production	Precision farming
Reduction of production costs	Functional foods
Enablers to innovation	Novel crops
Innovative policies	Agricultural productivity
Barriers to innovation	Efficiency

5.1.2   Journals and other academic sources

Data can be collected by researching specialized academic journals which treat the issue of innovation and technological advancements in rural economies are essential data sources. The table below presents a non-exclusive list of potential data sources:

Table 7: Academic Journals and Papers
The Public Sector Innovation Sector
Journal of Innovation and Entrepreneurship
Journal of Technology Management & Innovation
Journal of Rural and Industrial Development
Journal of Innovation economics & Management (I-JIEM)
The Journal of Agricultural Education and Extension
Innovation: The European Journal for Social Science and Research
Barriers to Innovation in Rural Enterprises: the Strategy of "Doing Nothing"
European Journal of Innovative Business Management-EJIM
International Journal of Innovation
Journal of Rural Studies
Journal of Agribusiness and Rural Development
Journal of European Public Policy
International Journal of Rural management
RURAL 21 -The International Journal of Rural Development

5.1.3 Business and industry research reports

The third source of data consists of business and industry reports. Some examples of this type of reports for the given subject area are presented below:

- Smart Specialisation and Innovation in Rural Areas

- Business models For Small Farmers and SMEs

-Rural Development Report

- Innovation in European food SMEs: determinants and links between types

- EU Rural Review – Creativity and Innovation in EU rural Development

- The Inclusive Growth and Development Report

- World Economic Forum – The Inclusive Growth and Development Report

-The World Bank - Agricultural Innovative Systems

-Coherence of Agriculture and Rural Development Policies

- Encouraging Diversification of the rural economy

- Innovation and New Technology in Rural Small and Medium-Sized Enterprises: Some Policy Issues

- Small and Medium Enterprises in Agriculture Value Chain

- Diffusion of Technological Innovations in Rural Areas

-Benefits of agricultural technology innovation capacity to peasant farmers in rural poor areas: the case of DBN-Group, China

- Innovation and modernizing the rural economy (OECD)

5.1.4   International Organisations:

International organisations which are dedicated to or have specific departments related to research in the field of agricultural and rural development are listed below.

- EU Commission- Directorate General for Research and Innovation
- International Fund for Agricultural Development (IFAD)
- The World Bank- Agriculture Finance
- OECD - Committee on Industry, Innovation and Entrepreneurship
- United Nations Capital Development Fund (UNCDF)
- United Nations Development Programme (UNDP)
- World Business Council for Sustainable Development
- Smart Growth Network

5.1.5   Relevant EU projects:

The EU has already carried out certain projects which aim to encourage entrepreneurship and innovation in rural economy SMEs. This indicates that this type of policy intervention is of significant concern and priority for the innovative development and growth of jobs in the EUs rural economy.

- BUSINESS TO NATURE - Interregional Approach to SMEs and Entrepreneurship in Natural Areas
- Design 4 Innovation
- ENVISION - Empowering (European) SME business model innovation
- IEER – Boosting innovative Entrepreneurial Ecosystem in Regions for young entrepreneurs
- Inside Out EU – New approaches to improve SME internalisation support policies
- Rural Growth – increasing competitiveness of SMEs in the rural visitor economy sector
- RURAL SMEs – Policies to develop entrepreneurship and innovative SMEs in rural areas
- RURALAND - Rural Development Players

- SME ORGANICS – Enhancing SME competitiveness and sustainability in the organic sector
- UpGrade SME – Improving Policy instruments supporting innovative SME performance
- SKILLS+ - Supporting knowledge capacity in ICT among SME to engage in growth and innovation

5.2 Internal desk research methods

The second source of data is internal desk research, i.e. the internal documents of the INNOGROW partners and will be utilised in case they are available. Internal desk research refers to the collection of data by members of one organisation within their organisation. These data are easily accessible and this is the reason why researchers conducting desk research should consider finding data within their own organisations as one of the starting points of their research. This is particular the case, if the INNOGROW partners have previously been involved in similar types of projects. It is highly probable that some of the partners are institutions who are involved in policy making, already have produced data found in documents, capable of shedding light to the research questions on the adoption of innovation in rural economy SMEs.

The reason behind the need to focus on internal documents as a source of data is due to the individual value of each case study, consisting of research which is essential for the qualitative analysis and the examination of good practice cases. Often, these examples provide detailed descriptions of the implementation of relevant policies, measures or other factors of interest to the research objectives. During internal desk research, INNOGROW partners should focus on deriving data from the following categories of documents:

Table 8: Types of documents for Internal desk research

Type	Description	Contribution
E-mails and Memoranda	Employees use emails to communicate and exchange information with each other. Before email became prevalent, memorandums were used for communication between offices. Memos are still used in situations where a message is meant to accompany a specific file and in cases that require more privacy than an email. Both a memo and an email identify the sender and recipient and contain a subject line. The text is formatted in one or more paragraphs.	E-mails and memos provide information about how the INNOGROW partners' personnel are affected by the policy measures designed to encourage the adoption of innovative production techniques.
Letters	Business letters are used to communicate with individuals with external partners. Recipients may include customers, colleagues in other businesses, service providers, professionals who advise the business, government officials and job applicants. A business letter is usually formatted in block style, in which all of the elements of the letter, except the letterhead, are aligned with the left margin. It can be emailed or delivered by mail. If a letter is sent in the text of an email, the sender includes his name, job title and contact information at the bottom of the email.	Letters can be used to see how partners try to overcome obstacles of existing policies during their interactions with other collaborators in the adoption of innovative projects of rural economy SMEs.
Reports	Business reports convey information in a format that is more formal and explanatory. Reports cover a variety of topics, such as safety compliance, sales figures, financial data, feasibility studies and	Business reports can provide data about the official position of the partners with regards to specific policies, as well as provide

	marketing plans. They may include statistics, charts, graphs, images, case studies and survey results. Some reports are published for the benefit of investors. If a report is periodic, such as a monthly sales report, a template is used for convenience and to enable comparison with previous reports.	information about the overall strategy of partners in relation to the adoption of innovation.
Transactional Documents	An organisation uses documents to transact business with others. To save time, these documents may be formatted as a form, such as an order form, transmittal page, invoice or receipt. The types of transactional documents used vary somewhat by the nature of a business. An insurance agent, for example, generates insurance applications and policies, while a lender uses loan applications and mortgage documents. In some fields, businesses enter into agreements and contracts with others; these documents might be drafted by the company's lawyer.	Transactional documents can provide data about the business methodology of an organisation.

INNOGROW
Interreg Europe

Pannon Novum
Nonprofit Kft.

European Union
European Regional
Development Fund

Financial Documents	A business uses financial documents to stay within its budget, prepare budget proposals and file tax returns. These documents include receipt records, payroll reports, paid bills, bank statements, income statements, balance sheets and tax reporting forms. These documents may be prepared by the company's accountant. A business owner uses these documents to determine the financial success of the company and to identify areas that are unproductive. A department head might use financial documents to prepare a budget proposal.	Financial documents are especially important for gathering data about the impact of existing policies.

5.3 Internal research ethics principles

Internal research ethics principles are required to ensure that the data collected by the INNOGROW partners is specific and responds to the research key objectives and research questions.

Principle 1: Compliance with protocol.

- Research conducted by INNOGROW partners' employees should be aware of the range of research ethics on the subject of how valid consent to participate is sought, gained and recorded, how data are collected, stored and accessed, and how participants are informed of their rights within the study. The only exception to this requirement shall be where any reasonable judgement would suggest that no harm could possibly arise to any person, living or dead, in connection with the proposed research.

Principle 2: Valid consent

- Owners of documents used in the research should always be informed in advance and in understandable terms of any potential benefits, risks, inconvenience or obligations associated with the research that might reasonably be expected to influence their willingness to participate. Consent should always be gained in a consistent manner. This should normally involve the use of an information sheet about the research and what participation will involve, and a signed consent form.

Principle 3: Openness and integrity.

- Researchers should be open and honest about the purpose and content of their research and behave in a professionnal manner at all times.

Principle 4: Maximising benefit and protection from harm

- Researchers should make every effort to maximise the benefits of research while minimising the risks of any harm, either physical or psychological, arising for any participant, researcher, institution, funding body or other person or community.

Principle 5: Confidentiality

- Except where explicit written consent is given to reveal identities, researchers should respect and preserve the confidentiality of the identities and data of the owners of documents.

Principle 6: Professional codes of practice and ethics.

- Where the subject of a research project falls within the domain of a professional body with a published code of practice and ethical guidelines, researchers should explicitly state their intention to comply with this code and guidelines.

6 Data analysis method

Open coding will be used in order to carry out the data analysis, because it is a type of analysis that is commonly used in qualitative data analysis since it allows for the defining and developing of categories based on the data's properties and dimensions. The main objective of the comparative analysis is to evaluate a large amount of data in order to develop an overview of the negative and positive impacts of policy measures that aim to encourage the adoption of innovative behaviour in rural economy SMEs in the INNOGROW partner regions, and therefore it seems that this method is appropriate.

Open coding is not guided by researchers' theoretical assumptions, but by the data, meaning that researchers' do not chose to pick and code the patterns that fit their own theoretical assumptions, but on the contrary they have to identify, note and code all patterns that emerge from the data. In order to achieve this, they will do the following:

  a)   Read through and understand the data
  b)   Create tentative labels for chunks of data that summarize the phenomena described in the practical cases (based on the meaning that emerges from the data)
  c)   Development of a simple system of codification for the patterns that they found.

After collecting data up to the point where more research does not provide data with significantly different additional information (otherwise known as the point of saturation), partners will organise all the data so that it is in the same format, and therefore can be easily analysed. Since written text is one of the easiest forms of data to analyse, all data in video or audio form found online (if there are any) should be summarised in the form of written documents. After gathering the data, partners will categorize the policies, in order to facilitate the analysis and summarize the findings. INNOGROW partners will have to find and provide examples of that best represent

the characteristics of various policies to support the adoption of policies and measures which encourage innovation in rural economy SMEs.

Finally, all categories emerging from the data should be codified for easier reference at later stages of the research. Since this research relies on open coding, codes will emerge from reading and analysing the data.

7 Case documentation sheet (Input paper)

The case documentation (input) paper aims to identify, examine and evaluate the policy measures which have been implemented in order to encourage the adoption of innovation for rural economy SMEs in INNOGROW partners' regions and their effectiveness. The participants are regional public authorities who have the implemented this type of policy instruments in the EU member states. The time required to complete the input paper is approximated to be 30 - 35 minutes.

The following criteria in this section, will guide partners to identify policy measures which encourage the adoption of innovation in rural economy SMEs. The criteria have been developed to provide project partners with a uniform and consistent orientation framework. All collected cases should comply with the criteria mentioned below in order to be included in the report.

- Geographical level of implementation (e.g. national, regional, local)
- Country, region or territory of business/ industry
- Type of innovative technology or activity implemented in rural economy SMEs (e.g. precision farming, novel crops etc.)
- Type of actors involved (e.g. small and medium sized enterprises, regional authorities, etc.)
- Descriptive information of type of innovative technology and implemented policy measure
- Main objectives and expectations from the implementation of policy measures aiming to encourage the adoption of innovation
- Barriers and major issues encountered during the implementation process
- Success factors and evaluation of the implemented policy instrument
- Impact and results of the practice (e.g. reduction of production costs, increased profits)
- Transferability

- Other useful comments and information

In order for the scope of the analysis to be more precise and the evidence/data collected up-dated, focused and targeted to the activity's objectives, the cases described in the input paper should also have the following **characteristics:**

- **Data Collection:** should be focused on gathering the relative data and good practice cases for the development of a comparative analysis of measures/policies promoting innovation adoption by rural economy SMEs and should focus particularly on the outcomes and barriers of their implementation.

- Cases of policies encouraging the adoption of innovation in different industries of the rural economy should be retrieved from the **countries represented in the project consortium** (Bulgaria, Italy, Greece, Hungary, Czech Republic, Latvia, Slovenia and the United Kingdom,), and **where relevant / available the rest EU member states**.

- Evidence gathering may include measures promoting the adoption of innovative technologies, covering the **full spectrum of the rural industrial sectors** such as agriculture, agro-tourism or accommodation, food and beverage services, energy and renewable resources, forestry and others.

- Data collection should focus on recent cases of related measures, implemented at national, regional and local level across the EU, preferably within the timeframe of the last **10-15 years**, which are still in the process of being implemented or have been completed.

- **The collection of targeted good practice cases** are vital and should clearly correspond to the objectives of the input paper. The examples of good practice cases should include the cases where a particular policy measure was implemented in order to encourage the adoption of innovative technologies and techniques in rural economy SMEs across the EU, within the context of a particular projects or initiative.

8   Quality specifications

It is vital that specific quality criteria are followed in order to ensure that the collected information is reliable and can therefore be used to draw the necessary conclusions in the context of the comparative analysis. If the following criteria are not followed, then it is possible that the conclusions drawn can be misleading.

To a large extent, for this type or research the quality criteria for activity A1.3 is of qualitative nature rather than quantitative, since the information collected from the input paper is of a descriptive nature. However, the internal and external desk research consists of both quantitative and qualitative criteria. The key performance indicators are indicated in the table below.

Table 10: Key performance indicators (KPIs)

Qualitative Performance KPIs

- Information/data are relevant to the research questions of the enquiry
- Information/data are provided in a form that can be compared
- Information is provided in a clear form that can be synthesised for the final deliverable of the enquiry
- Conclusions derived from the question form a rigorous and coherent narrative to avoid significant contradictions

Quantitative Performance KPIs

- Number of referenced data sources from academic journals or other academic references: 3
- Number of referenced data sources from other websites: 5

9 Annex A: Input Paper

INNOGROW - Regional policies for innovation driven competitiveness and growth of rural SMEs –	
Activity 1.3: Comparative analysis of measures promoting innovation adoption by rural SMEs	
Collection of good practices on the implementation of policy measures promoting innovation adoption by rural SMEs	

A. CASE IDENTITY		
LOCATION	**Country:**	
	Region:	
	City/Town: *(if applicable)*	
INDUSTRY/TYPE OF ACTIVITY	**Geographical activity**	☐ National ☐ Regional ☐ Local
	Industry/Type of activity involved	☐ Agriculture ☐ Manufacture of food and beverage products ☐ Energy and resources ☐ Forestry ☐ Food and beverage service activities ☐ Agro-tourism/ accommodation ☐ Tourism ☐ Handicraft local products ☐ Other
Time Period	**Year of adoption/introduction**	

B. CASE DESCRIPTION – ADOPTION OF INNOVATION

Type of innovation adopted	☐ Precision agriculture
	☐ Renewable energy
	☐ Internal products' traceability systems
	☐ Selective breeding and feeding processes
	☐ Organic farming
	☐ Novel crops
	☐ Agro-farming
	☐ New Product Development
	☐ Other (please specify) ……………………………….
Please briefly describe the innovation	
Please briefly describe the process of adopting innovation	

C. NEEDS. ENABLERS AND BARRIERS FOR ADOPTION OF THE INNOVATION

What were the main needs and objectives for the adoption of innovative techniques?	☐ Reduction of production costs
	☐ Respond to competition
	☐ Access new markets/ identified market opportunity
	☐ Increase profitability/ revenues
	☐ Satisfy consumers' needs
	☐ Meet legislative/ policy changes
	☐ Other (please specify) ……………………………….
What were the main difficulties encountered during the integration of new technologies/methods of production?	☐ Lack of funding/financial resources
	☐ Lack of expertise/ skills of existing employees
	☐ Inability to hire new employees with relevant skills
	☐ Lack of consumer demand
	☐ Lack of appropriate external advise

	☐ Competition ☐ Other (please specify) ……………………………….
What impact did the introduction of these new techniques have on the production process?	*Please comment on the impact of introducing innovative technologies:* …………………………………….

D. DESCRIPTION OF THE POLICY MEASURE THAT ADDRESSED THE INNOVATION ABOVE

Please briefly describe the policy measure	
Main reason to choose the particular policy measure	
Main targeted impact of the policy measure	
Please briefly describe the implementation process of the policy measure	

E. RESULTS & PROSPECTS OF THE IMPLEMENTATION OF THE POLICY MEASURE

How would you describe the implementation of the policy measure?	☐ Very successful ☐ Quite successful ☐ Somewhat successful ☐ A little successful ☐ Not at all successful ☐ Do not know / Do not wish to answer

What are the most significant outcomes/ benefits created by the deployment/operation of the specific measure?	☐ Cost reduction / Annual savings ☐ Increased productivity for the participating companies ☐ Increase in job opportunities (employment) ☐ Enhanced research and innovation capacity ☐ Reduce in greenhouse gas emissions ☐ Improved resource efficiency ☐ Other (please specify):
Were there any unexpected/negative or positive outcomes as a result of the implementation of the measure	*If so, please briefly describe*
Other comments (URL, sources)	

10 Annex B: Input Paper Pre-testing (Example)

INNOGROW - Regional policies for innovation driven competitiveness and growth of rural SMEs		
Activity 1.3: Comparative analysis of measures promoting innovation adoption by rural SMEs		
Collection of good practices on the implementation of policy measures promoting innovation adoption by rural SMEs **Title: AGEvoluzione – Smart meters and Internet of Things**		
A. CASE IDENTITY		
LOCATION	**Country:**	**Italy**
	Region:	**Lombardy**
	City/Town: *(if applicable)*	**Pavia**
INDUSTRY/TYPE OF ACTIVITY	**Geographical activity**	☐ National ☐ Regional ☐ **Local**
	Industry/Type of activity involved	☐ **Agriculture** ☐ Manufacture of food and beverage products ☐ Energy and resources ☐ Forestry ☐ Food and beverage service activities ☐ Agro-tourism/ accommodation ☐ Tourism ☐ Handicraft local products ☐ Other (Research and development for the development of smart meters and mechanisms useful in agriculture and agri-business industries)

Time Period	Year of adoption/introduction	2010
B. CASE DESCRIPTION – ADOPTION OF INNOVATION		
Type of innovation adopted	☐ Precision agriculture ☐ Renewable energy ☐ Internal products' traceability systems ☐ Selective breeding and feeding processes ☐ Organic farming ☐ Novel crops ☐ Agro-farming ☐ New Product Development ☐ **Other (please specify)incubator of external ICT ideas which are developed and transferred into the market**	
Please briefly describe the innovation	**Due to the company's expertise and production facilities, the development and realization of new ideas is facilitated and are then transferred into the market. This project aims to promote sustainable business growth by developing mechanisms that monitor environmental impact and resource efficiency.**	
Please briefly describe the process of adopting innovation	**AGEvoluzione developed smart meters and IoT mechanisms which are useful in both the agriculture and agri-business industries. More specifically the company developed a microprocessor-based IoT device (namely Wi-Node) which enables to monitor operation parameters of hydraulic pumps and electro pumps suitable for watering systems in farming activities and manufacture of food and beverages, and to communicate the data detected by the company's control system or the pump manufacturer's or dealer's remote assistance service.** **Among other characteristics, information stored on removable media and data storage devices can be later transferred to a computer, smart phone or tablet and sent to the help desk or used in-house for troubleshooting or operational statistics useful to optimize production processes.**	

C. NEEDS. ENABLERS AND BARRIERS FOR ADOPTION OF THE INNOVATION

What were the main needs and objectives for the adoption of innovative techniques?	☐ Reduction of production costs ☐ **Respond to competition** ☐ **Access new markets/ identified market opportunity** ☐ Increase profitability/ revenues ☐ Satisfy consumers' needs ☐ Meet legislative/ policy changes ☐ Other (please specify) ………………………………….
What were the main difficulties encountered during the integration of new technologies/methods of production?	☐ **Lack of funding/financial resources (for technology's integration costs, making project initialization difficult)** ☐ **Lack of expertise/ skills of existing employees** ☐ Inability to hire new employees with relevant skills ☐ **Lack of consumer demand** ☐ Lack of appropriate external advise ☐ Competition ☐ Other (please specify) ………………………………….
What impact did the introduction of these new techniques have on the production process?	*Please comment on the impact of introducing innovative technologies:* **Improved quality of products, and thus the ability to respond to market needs and to increase competitiveness and profitability by reducing production costs, by making farming procedures more efficient and innovative.**

D. DESCRIPTION OF THE POLICY MEASURE THAT ADDRESSED THE INNOVATION ABOVE

Please briefly describe the policy measure	**Regional funding from the Lombardia Region in order to facilitate access to capital and therefore invest in R&D activities and the development of the Wi-Node.**
Main reason to choose the particular policy measure	**High costs involved in R&D and the development of new ICT products which will increase efficiency and reduce production costs in the agricultural production processes and the food and beverage industries.**

Main targeted impact of the policy measure	Facilitate access to capital through funding from the Lombardia Region as well as internal capital, and private, external funding including loans and venture capital, in order to encourage R&D activities and develop the Wi-Node system.
Please briefly describe the implementation process of the policy measure	Region of Lombardy is currently funding companies that work on the Open Innovation paradigm, where AGEvoluzione specialises. Furthermore, the Region has chosen to invest in companies formalizing an intellectual property protection policy aimed at securing their heritage, but with the precise will to pursue a plan of legality in the comparison and collaboration with other companies in order to promote the respectful use of their own and others intellectual property. More precisely, the policy measure provided support to the following steps of the development and initialization of the new technology: • Find adequate funding opportunities (private and public) which will cover the cost for the development and the integration of the innovative product and the marketing process for its launch in the local/regional/European markets. • Development of the new technology. • Testing of the product before its launch in the market. • Integration of the new product in the farming • Launch of Wi-Node in the local, national and European markets
E. RESULTS & PROSPECTS OF THE IMPLEMENTATION OF THE POLICY MEASURE	
How would you describe the implementation of the policy measure?	☐ Very successful ☐ **Quite successful** ☐ Somewhat successful ☐ A little successful ☐ Not at all successful ☐ Do not know / Do not wish to answer

What are the most significant outcomes/ benefits created by the deployment/operation of the specific measure?	☐ **Cost reduction / Annual savings** ☐ **Increased productivity for the participating companies** ☐ Increase in job opportunities (employment) ☐ **Enhanced research and innovation capacity** ☐ Reduce in greenhouse gas emissions ☐ **Improved resource efficiency** ☐ Other (please specify):
Were there any unexpected/negative or positive outcomes as a result of the implementation of the measure	*If so, please briefly describe* The company significantly improved the product quality in terms of profitability and competition. The implementation of the measure was overall successfull, however limited skills of existing employees in Internet of things, especially for agricultural purposes was a difficulty that to an extent was unexpected and had to be faced during the implementation procedure. Additionally, there was limited interest from stakeholders, supply chain partners, SMEs owners and farmers in sustainable and environmentally friendly technologies, which greatly influenced the financing opportunities for the initial implementation of the project. Finally, this potentially also meant that the process of launching the final product in the local and national market became more difficult.
Other comments (URL, sources)	http://www.agevoluzione.com/winode-iot-device/

11 Annex C: Time Plan

The Gantt chart below allows us to organise the required steps of the procedure for activity A1.3.

Months	1-15th May	16th-31st May	1st - 15th June	16th – 30th June	1st - 15th July	16th – 31st July	1st- 15th August	16th – 31 August	1st – 15th September	16th- 30th September
Development of Methodology for Input paper A1.3	▓	▓								
Desk enquiry and data Collection			▓	▓	▓					
Analysis of data and review						▓				
Drafting Input paper 1.3 – final deliverable/Input paper							▓	▓	▓	▓