

A1.4: Report on the factors that influence rural economy SMEs to adopt innovation, enabling partners to realize the policy obstacles concerned



**CoC - Molise**

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## 1 INTRODUCTION

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 regarding the integration of new production technologies and business models that lead to innovative products. The project will promote 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.

This document is an output of the INNOGROW project and constitutes the final part of the Activity 1.4 entitled "Investigating the factors that influence rural economy SMEs to adopt innovation". The analysis report presents the barriers and enablers that affect rural SMEs' investments in innovative technologies and involvement in innovative collaborative networks and models.

The purpose is to offer an overview that will enable policy makers to understand the inhibitors and the policy obstacles related to innovation adoption by rural SMEs in INNOGROW regions, and improve the management and implementation processes of own policy instruments.

The representatives of rural economy SMEs (which participated in the survey) provided valuable insights into the current state of the SMEs' innovation performance, weaknesses and strengths, enabling the INNOGROW partnership to identify the main factors (including motivations, barriers, enablers and expected organisational impact) affecting SMEs' decision to invest in innovation either through the adoption of innovative technologies and production processes or by participating in collaborative networks/clusters focused on stimulating firm-level innovation.

The main findings/conclusions drawn from the survey will be used by regional authorities (as the main source of knowledge) for developing territorial action plans that will promote the diffusion of innovative solutions and new business models among rural economy SMEs.

Overall, the report is outlined as follows: section 2 provides information about the context of the project and the interdependencies of the particular activity with other INNOGROW activities; section 3 describes the methodological framework upon which the survey was developed; sections 4-5 present the results of the survey on the factors influencing the adoption of innovation, including business demographics and section 6 summarises the key findings.

## 2 CONTEXT OF THE INNOGROW PROJECT

### 2.1 Background of the INTERREG Europe Programme

The INTERREG EUROPE programme ([www.interregeurope.eu](http://www.interregeurope.eu)) promotes the exchange of experience on thematic objectives among partners throughout the European Union (EU) on the identification and dissemination of good practices, to be transferred principally to operational programmes under the Investment for Growth and Jobs goal, but also, where relevant, to programmes under the European Territorial Cooperation (ETC) goal. This will be done via the support and facilitation of policy learning, sharing of knowledge, and transfer of good practices between regional and local authorities and other actors of regional relevance.

INTERREG EUROPE is one of the instruments for the implementation of the EU's cohesion policy. 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 economic and social development and environmental sustainability, taking into account their specific territorial features and opportunities. 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

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. Research results 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 practices of regions, with the aim to influence

policies both at regional and national level for improving the competitiveness of rural economy SMEs.

The "Regional policies for innovation driven competitiveness and growth of rural SMEs – INNOGROW" project aims to improve partners' policies on rural economy SMEs competitiveness regarding the integration of new production technologies and business models that lead to innovative products. The project will promote 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.

Rural economy SMEs need to remain globally competitive by adopting innovative solutions, new business models and modernisation approaches that will lead to increases in productivity and access to new markets. 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 can play an important role in the modernisation of existing SMEs and the proliferation of innovative start-ups, providing 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.

### **2.3 INNOGROW Activity A1.4**

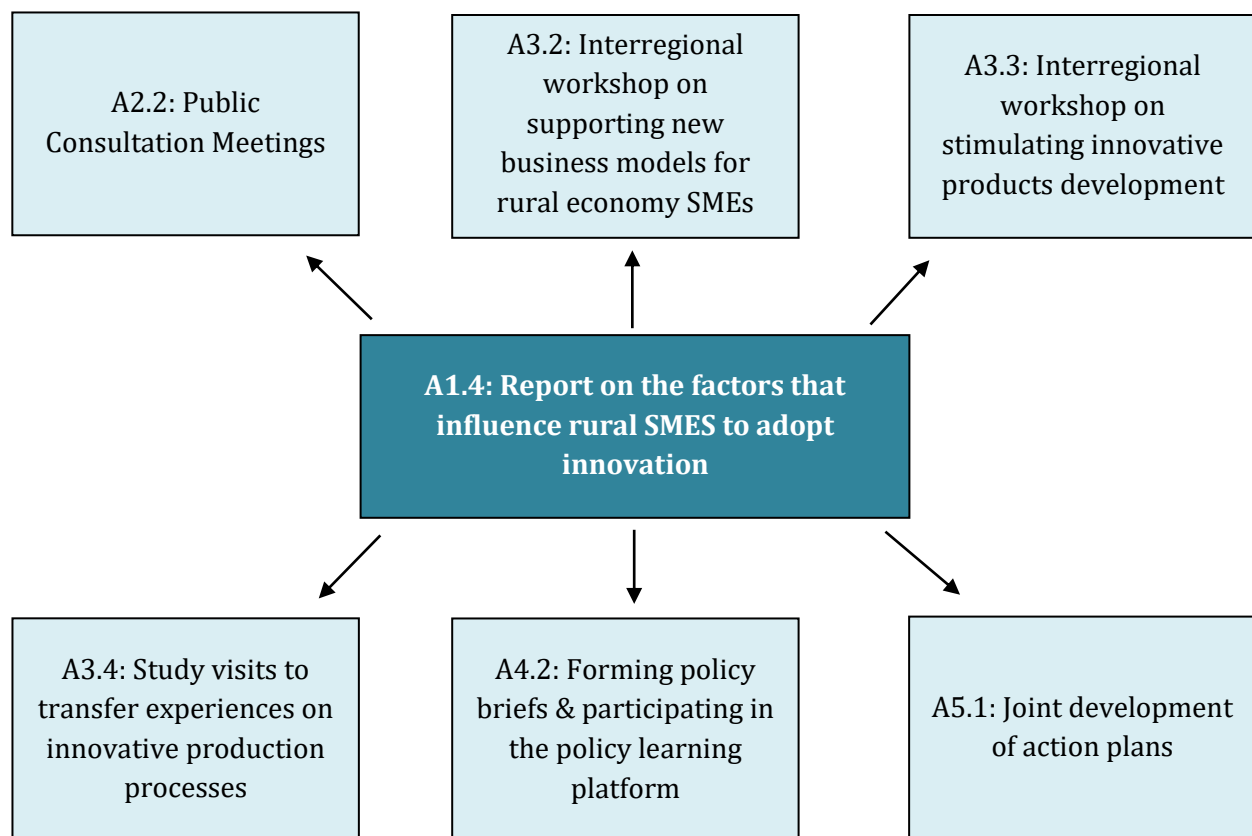
The INNOGROW Activity A1.4 "Investigating the factors that influence rural economy SMEs to adopt innovation" is based on the implementation of a survey with stakeholders in INNOGROW regions to analyse the barriers and enablers that affect rural SMEs' investments in innovative technologies and involvement in collaborative innovation networks and models.

Based on a survey methodology, the project partners were able to gather, prepare, synthesise and provide input on the factors that influence rural economy SMEs to adopt innovation. All partners (excluding UNEW) will promote the survey in their region to gather data and evidence.

The analysis of the evidence collected will result in an analysis report, presenting the barriers and enablers that affect rural economy SMEs' investments in innovative technologies and involvement in innovative collaborative networks and models. The report will offer an overview that will enable policy makers to understand the inhibitors and the policy obstacles related to innovation adoption by SMEs, and improve the management and implementation processes of own policy instruments.

## 2.4 Dependencies to other INNOGROW activities

The results of activity A1.4 will provide input and support the implementation of the forthcoming workshop on new business models for rural economy SMEs (Activity A3.2), the public consultation meetings (Activity A2.2), the workshop on stimulating innovative products development (Activity A3.3), the study visits to transfer experiences on innovative production processes (Activity A3.4), the policy briefs to be developed in the second semester (A4.2) and the partners' action plans (A5.1), where/whenever thematically relevant.



## 3 SURVEY PURPOSE AND METHODOLOGY

### 3.1 Purpose and research questions

The **strategic purpose** of the survey is to offer an overview that will enable policy makers a) to understand the inhibitors and the policy obstacles related to innovation adoption by rural economy SMEs, and b) to improve the management and implementation processes of own policy instruments by providing incentives to SMEs to invest in innovative technologies and participate in innovation collaborative networks.

The empirical evidence gathered aims to provide insights on: a) the current level of innovation capacity of SMEs in rural areas, b) the barriers and enablers that affect rural economy SMEs to invest in new technologies and get involved in collaborative schemes, c) the existing and potential benefits of innovation adoption for rural economy SMEs, and d) the impact of innovation on business operations and SMEs performance.

This study will therefore address the following **research questions**:

1. To what extent, do rural SMEs invest in innovative technology and get involved in innovative collaborative networks and models?
2. What are the main needs / objectives addressed by adopting innovation at business level?
3. What are the tangible and perceptual barriers affecting SMEs' investment in innovation?
4. How can SMEs overcome the barriers hindering the adoption and implementation of innovation?
5. What are the benefits of the adoption of innovation in rural economy SMEs performance?

The **scope** of the survey is defined in the INNOGROW Application Form in terms of geographical location, target population and themes covered, as follows:

- **Geographical scope:** Countries of the consortium (Greece, Italy, Hungary, Slovenia, Bulgaria, Czech Republic and Latvia) and secondarily the rest of EU member states
- **Target population:** Representatives of rural economy SMEs
- **Thematic scope:** Factors that influence the adoption of innovation among rural SMEs

## 3.2 Survey population and sampling

According to the objectives of the survey, the target respondents should include owners/managers/staff of rural economy SMEs, who influence the process of decision making within their organisations, concerning the management, administration, and/or leadership as well as strategic orientation. Thus, the main groups comprising the target population of the survey are administrators, managers and executives of SMEs in rural areas; each respondent should represent a different organisation. An indicative, not exhaustive, list of survey respondents could involve the following:

- **High-level executives:**
  - Owner / Director of
  - CEO, CMO, CFO, CTO, COO
  
- **Medium-level executives:**
  - Administrative managers
  - Marketing managers
  - Sales managers
  - Operations managers
  
- **Low-level executives:**
  - Staff of SMEs with knowledge and experience in the implementation and management of innovation

In addition to representatives of SMEs, field experts with knowledge, exposure and experience in technological innovations for rural economy SMEs have been contacted to provide insights on the main determinants of innovation adoption.

The INNOGROW Application Form dictates that the sample is to be drawn primarily from the countries represented in the project consortium (Greece, Italy, Hungary, Slovenia, Bulgaria, Czech Republic and Latvia) and secondarily from neighbouring EU countries, aspiring to cover as broad a geographical area as the resources and means of partners allow.



### 3.3 Data collection instruments and tools

A structured questionnaire (Annex A) was the main instrument for gathering the survey data. The questionnaire collected opinion-based evidence and personal views on certain cases of innovation adoption. A web-based approach was employed for reasons of practicality, and to facilitate the data collection, coding, and analysis process.

The questionnaire has been structured in a clear and simple manner to leverage the participation of the defined target groups. Direct communication (by e-mail or phone) with survey respondents did also take place for establishing an initial contact, whilst allowing potential participants to ask for additional evidence or clarifications on certain aspects regarding the factors that influence the adoption of innovation among rural economy SMEs.



The survey questionnaire comprised mostly closed-ended questions as they are easier and quicker for respondents to answer; offer better coding, analysis and comparison possibilities; and can further clarify the meaning of each question through response choices. Open questions were not included, as they pose the risk of obtaining different degrees of detail in answers; responses may be irrelevant; comparisons and analysis become difficult. To ensure consistency and facilitate data analysis, the questionnaire was developed, communicated and completed in English. However, two project partners (CoC-Molise, FLA) decided to translate the questionnaire in their own national language, seeking to facilitate the participation of local SMEs.

The questionnaire is made up of 4 sections (a. Company profile, b. Needs, barriers, enablers, c. Benefits and impact, d. Personal information), which are designed to address the research questions and purposes of the survey and determining the respondent's identity. The questionnaire

items and their mapping to the survey’s research questions are presented in the following table (questions not included cover demographic data).

**Table 1: Mapping of questionnaire items**

Nr.	Research Questions	Questionnaire item	Variable	Units of measurement
1.	To what extent, do rural SMEs invest in innovative technology and get involved in innovative collaborative networks and models?	- Question 7 - Question 8	- Current state of innovation	- Percentage
2.	What are the main needs / objectives addressed by adopting innovation at business level?	- Question 9	- Motivations behind adoption of innovation	- Percentage
3.	What are the tangible and perceptual barriers affecting SMEs’ investment in innovation?	- Question 10 - Question 11	- Constraints and barriers to innovation	- Percentage - Scale
4.	How can SMEs overcome the barriers hindering the adoption/implementation of innovation?	- Question 12 - Question 13	- Perceived enablers of innovation	- Percentage - Scale
5.	What are the benefits of the adoption of innovation in rural economy SMEs performance?	- Question 14 - Question 15	- Expected organisational benefits	- Percentage - Scale

As mentioned above, the questionnaire was provided as an on-line survey, which was directly completed by the respondents themselves, using their personal computing devices (e.g. desktops, smart-phones, tablets, laptops).

The questionnaire remained open for more than four months, from the end of November 2017 until the 5th of April 2017, in order to gather sufficient responses from the target stakeholder groups.

CoC-Molise was the partner responsible for coordinating the survey, monitoring data collection and encouraging partners to collect as many responses as possible.

### 3.4 Data processing and analysis

The survey questionnaire was distributed by CoC-Molise to INNOGROW consortium partners during the 2<sup>nd</sup> project meeting held in Zelgava, Latvia. Each partner was responsible to compose a list of relevant stakeholders in order to further promote the questionnaire towards the final recipients (i.e. SMEs' representatives and field experts).

All partners promoted the questionnaire to relevant potential respondents, but no information exists regarding the number of invitees given that project partners (apart from email campaigns) communicated the survey through their social pages, websites and mouth to mouth. The survey was conducted through an online questionnaire version (powered by Google Forms), gathering a total of 97 responses.

Data analysis was facilitated initially by a preparation stage of data validation and then by a three-step process. These processing steps were defined based on the structure of the survey questionnaire, as well as the type and volume of data produced. The data processing steps are described in more detail below.

#### **Preparation stage: Data validation and consolidation**

Upon the completion of the survey, the collected data was validated and consolidated, based on the criteria defined in methodology. Data validation refers to the process of determining whether information gathered during the process of data collection is complete and accurate. Actually, there were not responses that did not meet the criteria/requirements.

To consolidate data, all the information was merged by combining the large amount of data into a single, persistent data source (e.g. one large worksheet) that reflects all collected input from survey respondents. To this end, Pivot Tables (in MS Excel) were used to facilitate the process of grouping data in a concise, tabular format, which allows for easier reporting and analysis.

#### **First stage: Identifying variables and scales**

Statistical computations and analyses assume that the variables have a specific level of measurement and are properly defined. For the purposes of this survey and following the questionnaire structure, survey variables were defined as nominal, ordinal and interval to avoid nonsensical results.

Table 2: Type of variables

Type of variable	Description	Questionnaire items
Nominal variables	Nominal variables are based on mutually exclusive but not ranked or ordered categories. Yes / no, multiple choice or demographic questions (e.g. country, job profile etc.) are common examples of nominal variables.	Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q12, Q14, Q18
Ordinal variables	Ordinal variables have two or more categories, which can be ordered or ranked; however these categories are not equally spaced. Ordinal variables are more flexible than nominal variables and allow for the evaluation of priority issues, opinions or levels of agreement.	Q15
Interval variables	An interval variable has two or more categories, which can be ordered or ranked from high to low. In contrast to ordinal variables, the intervals between the values of the interval variable are equal. For example a question with rating scales from 1 to 5.	Q11, Q13

**Second stage: Mapping and coding of responses**

Prior to data processing, valid responses were reviewed and coded into specific variables based on the type of the question to enable the process of quantitative analysis. The coding process included three essential steps: a) defining the coding categories; b) classifying relevant information and c) testing the reliability of coding. Questionnaire sections that did not allow quantitative processing (e.g. open text fields, “other” choices) were not included in the analysis process, unless they could be categorised into specific variables. In case of “select all that apply” questions, the coding of answers was executed using a “Countif” function in Excel so that answers can be categorized as yes or no variables facilitating quantitative processing. In order to investigate possible relations between variables, more than one field were combined.

**Third stage: Statistical data processing**

The Microsoft Excel program was used to process collected data for survey analysis. More particularly, a pivot table data summarization tool was used to automatically sort and combine data and return descriptive statistics and frequencies of the predefined data fields.

**Final stage: Data analysis**

Basic tools of descriptive statistics like counts, means, and percentages were employed (where appropriate) to extract information and conclusions from the replies of SMEs’ representatives (such as the most pronounced barriers and motivations behind innovation). The use of inferential statistical analysis was deemed not necessary due to the type and amount of data collected.

For scale/rank order questions, tables of descriptive statistics were used to present the basic features of the data gathered on the variables under examination, whilst providing simple summaries about the sample (e.g. frequency, total responses) and measures of central tendency and variability (arithmetic mean, mode, median, standard deviation).

**Table 3: Explanation of measures of central tendency**

Measures of central tendency	Description
Mean	The mean is the average of all numbers and is sometimes called the arithmetic mean. It is used as a metric for measuring the central tendency; or else for determining the overall trend of our data set. To calculate mean, add together all of the numbers in a set and then divide the sum by the total count of numbers.
Mode	The mode is a common measure of central tendency, which refers to the most frequently occurring value. To put it differently, it is the number that occurs most often within a set of numbers. The mode is most often useful in describing ordinal or categorical data.

Measures of central tendency	Description
Median	The statistical median is the middle number in a sequence of numbers ranked in ascending or descending order. It is considered a better measure of central tendency than the mean for a data set that is asymmetrical or contains outliers. To calculate the median, organise each number in order by size; the number in the middle is the median.
Standard deviation	Standard deviation is a measure for quantifying the amount of variation or dispersion of a set of data values. A low standard deviation indicates that the data points tend to be close to the mean of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values.

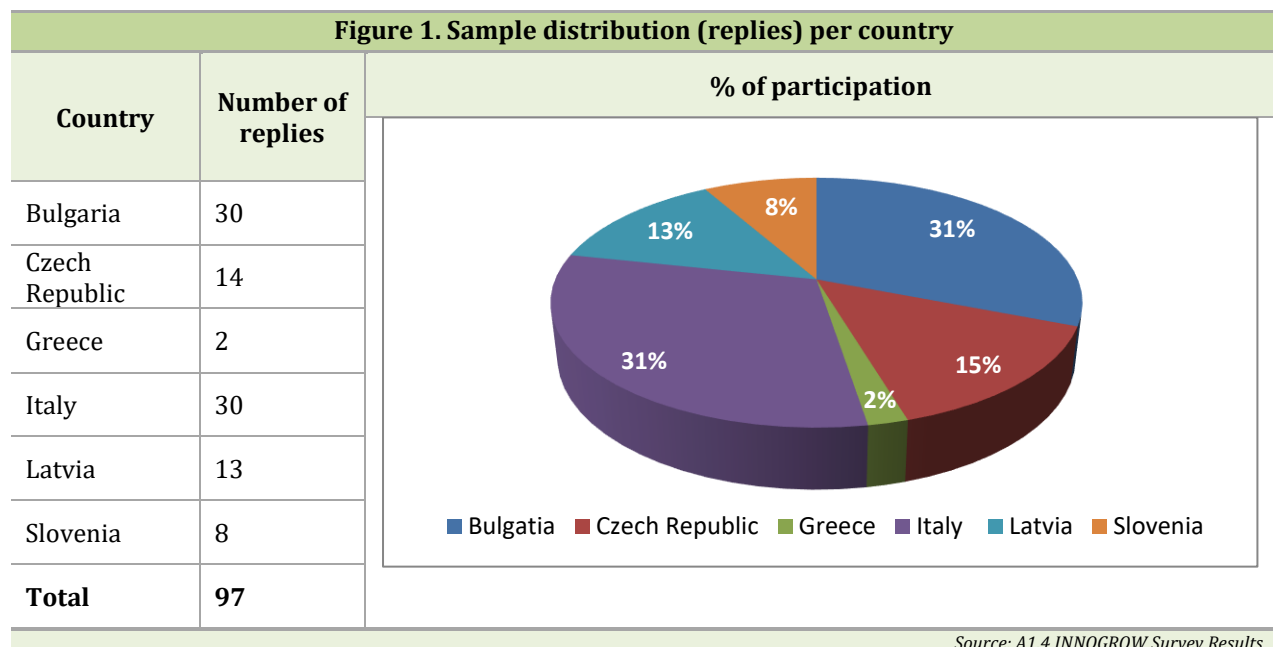
Data were exported and further processed in separate spreadsheets, summing up and visualising results. Visualised results included pie charts, bar graphs and column charts. Exported results were compared to imported data for any inconsistencies and data processing was repeated if required. Finally, exported results were listed in tables, visualised in graphs and included in the analysis report.

## 4 BUSINESS DEMOGRAPHICS AND PARTICIPANTS' PROFILE

The population of the survey included stakeholders (i.e. SMEs' representatives and field experts) from 6 EU countries (Bulgaria, Czech Republic, Greece, Italy, Latvia and Slovenia). In total, 97 answers were collected either through the online form or a printed copy of the questionnaire. The results are representative in terms of geographical distribution, industry breakdown and target groups.

### 4.1 Location

Stakeholders from 6 countries of the INNOGROW consortium participated and responded to the survey (Bulgaria, Czech Republic, Greece, Italy, Latvia and Slovenia). Regarding the sample distribution per country, Bulgaria and Italy are found to participate with the highest rate, accounting to 31% (i.e. 30 answers each). Czech Republic and Latvia follow with 15% and 13% rate of participation respectively (9 and 8 answers), whereas Slovenia and Greece have contributed with 2 and 8 responses respectively. The rest consortium partners did not contribute to the research with responses from SMEs representatives located in own territory; demonstrating a low level of commitment, which hampered the successful implementation of the survey.

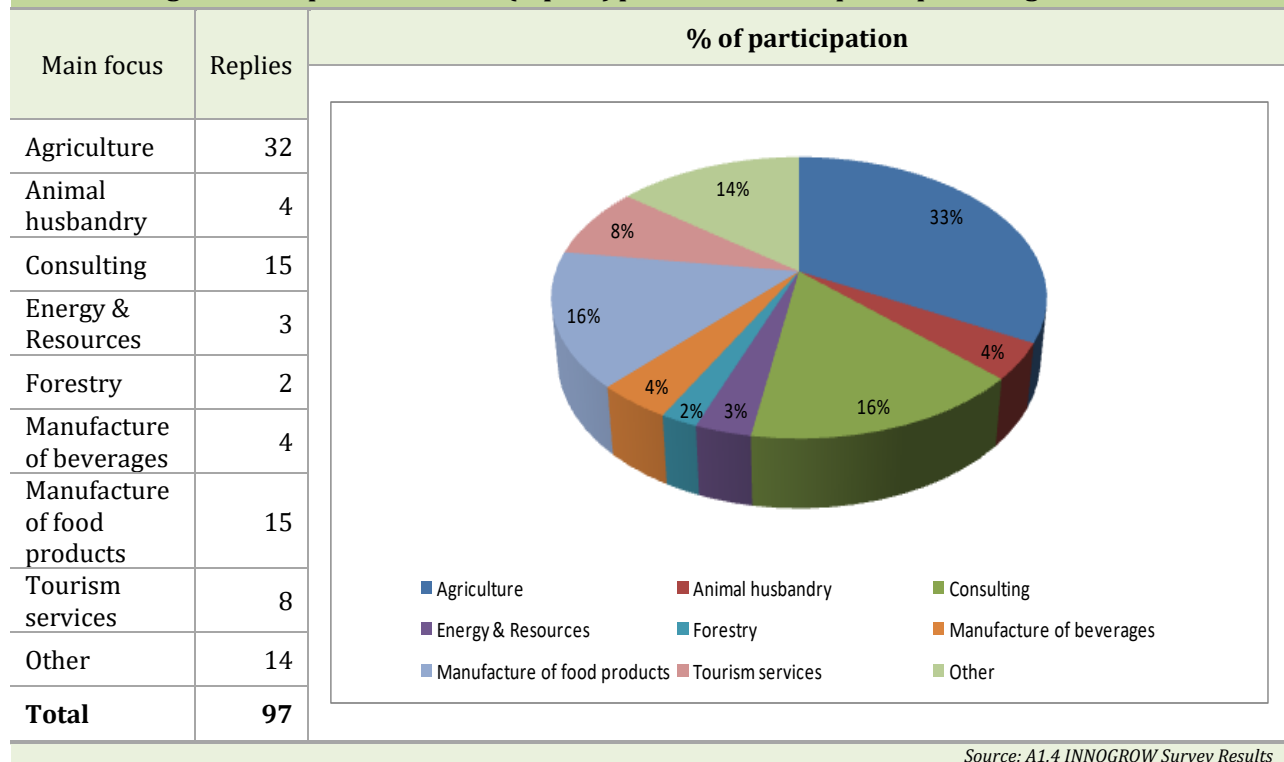


## 4.2 Industry breakdown

This section aims to examine the main focus/core industry of the enterprises participating in the survey. Each respondent represents a different organisation (i.e. SME), located outside the urban limit and driven by or based on natural capital / rural environment, whilst contributing to the GDP of rural area.

Regarding the sample distribution per type of activity / industry, the majority of responses (33%) came SMEs operating in the agri-business sector such as small farmers, producer organisations/cooperatives and agricultural service providers. This can be explained by the fact that the primary factor holds an important share to the composition of the regional economy of the INNOGROW participating territories (i.e. Thessaly, Lombardy, Zemgale, Stara Zagora, Pardubice, Gorenjska and West-Transdanubian).

**Figure 2. Sample distribution (replies) per main focus of participants' organisation**





A significant 20% of the responses came from manufacturers of food products and beverages (i.e. 19 responses in aggregate), followed by consultancy companies with 16% participation rate. The latter comprise business centres, incubators, innovation support centres and consultants, engaged with the provision of advisory services for strengthening SMEs' innovation capacity.

Tourism enterprises are adequately represented in the collected sample, accounting to 8% of total responses (i.e. 8). All these tourism enterprises share a common characteristic; their primary focus is on the promotion of alternative forms of tourism based on natural and cultural resources/heritage, contributing thus to sustainable development and smart specialisation.

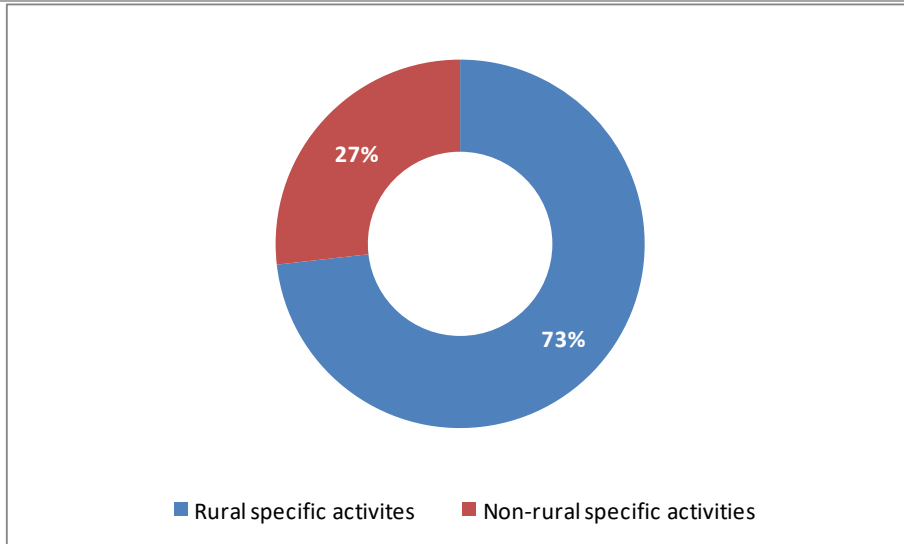
The remaining categories of activities (incl. animal husbandry, energy and resources and forestry) are represented with lower rates, which range from 2% to 4%. The remaining 14 participants come from other type of organisations such as universities, research centres, business associations, clusters and public administrations, and belong to the category of field experts.

Figure 3 depicts the sample distribution per type of activity, making the distinction between the companies that are connected to specific rural activities and can be considered rural economy SMEs, and those activities that have a broader scope, not exclusively addressing rural specific activities and needs (e.g. universities). In particular, 71 responses came from 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. 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 located in rural areas for quality of life.

The remaining responses represent companies that, although are located in rural territories, their activities are not connected to the rural environment, delivering services that can be found in any geographical and industry context (e.g. ICT, communication, research, and education).

**Figure 3. Sample distribution (replies) per type of activity**

**% of total replies**



Type of activity	Number of answers
Rural specific activities	71
Non-rural specific activities	26
<b>Total</b>	<b>97</b>

*Source: A1.4 INNOGROW Survey Results*

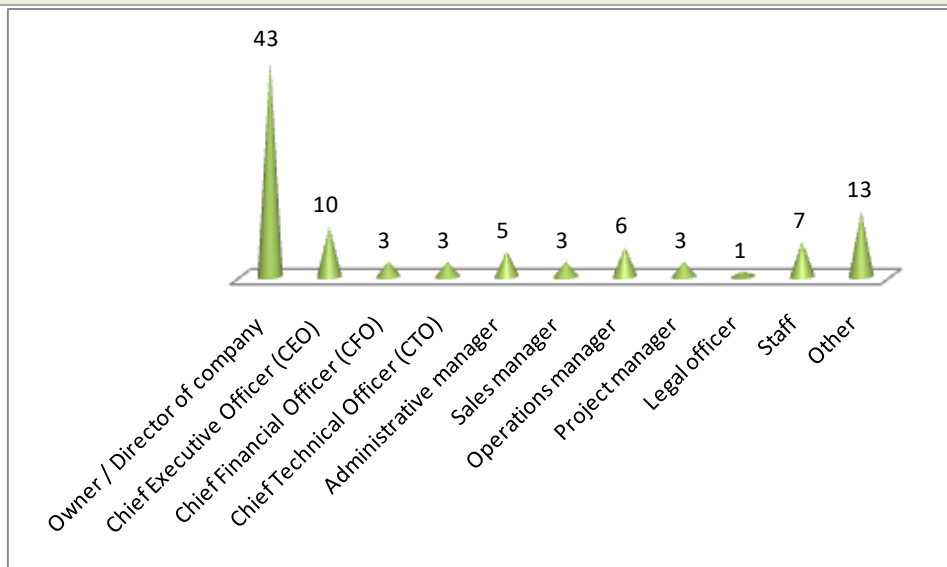
### 4.3 Job positions

The sample distribution per job position illustrates that the majority of respondents belong to the target groups originally outlined in the methodology report (84 out of 97 or 86.6%). The remaining 13 individuals could not be uniformly distributed into the predefined categories as they come from different types of organisations (e.g. university, research centre, network, business association) other than rural economy SME. All these participants have significant knowledge and experience in the implementation of innovation activities, and are considered individuals who can significantly contribute to the survey with useful information and insights on the main determinants of innovation adoption.

As far as the main target groups are concerned, the majority of responses came from SMEs' owners or directors (46 out of a total of 97 replies, i.e. 45%); while Chief Executive Officers (CEO) are also well represented in the collected sample (10.5%). Overall, high level executives (incl. Directors, CEOs, CFOs and CTOs) represent 61.5% of the total sample, which is a fact that assures survey's validity in terms of participants' knowledge and experience on the matter under investigation (i.e. technological innovation).

**Figure 4. Sample distribution (replies) per job position**

% of total replies



Type of activity	Number of answers	Percentage
Owner / Director of company	43	45%
Chief Executive Officer (CEO)	10	10,5%
Chief Financial Officer (CFO)	3	3%
Chief Technical Officer (CTO)	3	3%
Administrative manager	5	5%
Sales manager	3	3%
Operations manager	6	6%
Project Manager	3	3%
Legal officer	1	1%
Staff	7	7%
Other	13	13,5%
<b>Total</b>	<b>97</b>	<b>100%</b>

Source: A1.4 INNOGROW Survey Results

The questionnaire was also completed by 18 individuals (i.e. 18%) holding medium-level job positions within their business organisation. Among them, operations and administrations managers represent 6% and 5% of the total sample respectively (i.e. 6 and 5 replies each). Finally, low level executives participate with a lower percentage (7%). This target group includes the administrative personnel or/and staff of rural SMEs, which have been actively involved in the implementation/management of innovation related activities.

The heterogeneity of the sample prevents the comparative analysis of the survey's key results against demographic variables. The low number of observations that each variable concentrates by type of possible answer, does not permit any type of cross tabulation analysis on categorical data. While all the demographic variables were examined against the survey's key results (i.e. barriers, enablers, benefits, etc.), no interrelation was found between them. This finding excludes the use of demographics from any bivariate analysis.

## 5 SURVEY DATA AND RESULTS

In this section, a detailed presentation of the responses gathered using the structured questionnaire and a detailed analysis of the results is provided. The categories analysed include:

- a) Current state of innovation among rural economy SMEs
- b) Motivations (needs) behind adoption of innovation
- c) Constraints and barriers to innovation
- d) Perceived enablers of innovation
- e) Expected organisational benefits

The results of each survey question are presented with a table indicating a pie chart and a tabular visualisation of the percentage of each answer to each questions. For all cases, the exact number of responses is mentioned. The structure of the analysis that follows is mostly based on the structure of the questionnaire (Annex A) and the sequence of questions included.

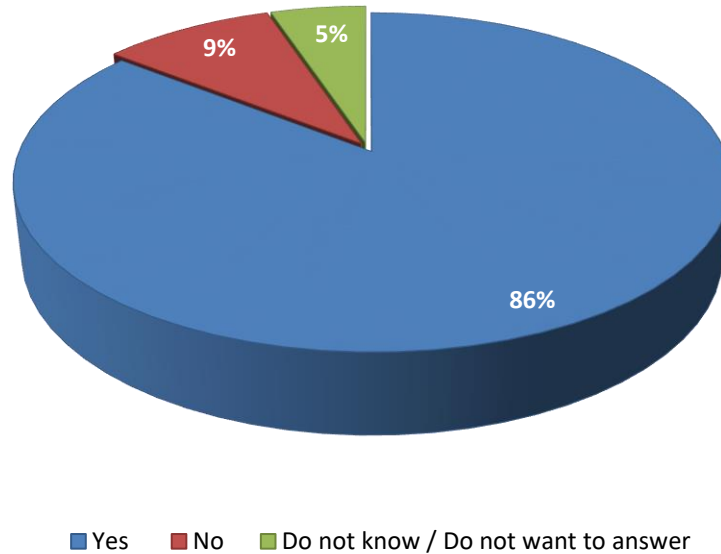
### 5.1 Current state of innovation among rural economy SMEs

The first section of the survey questionnaire seeks to gather information about the identity of each SME (industry, number of employees, annual turnover/balance sheet, country and region of business operations), including a preliminary investigation of SME's involvement in innovation-related activities. The importance of these findings is twofold, as (a) they help identify the extent that rural economy SMEs invest in innovative technologies and get involved in innovative collaborative networks and models and (b) they act as screening questions for the more sophisticated innovation-related issues that are examined in the next sections of questionnaire.

According to the survey results, the majority of the respondents (86%, corresponding to 83 answers) replied that they have adopted innovation within their business organisation; 9 individuals (9% of the total sample) replied that their organisation has never adopted any type of innovation or participated in innovative collaborative networks; while 5 individuals preferred to not answer the question.

**Figure 5. Have you ever adopted any type of innovation within your organisation?**

% of total replies



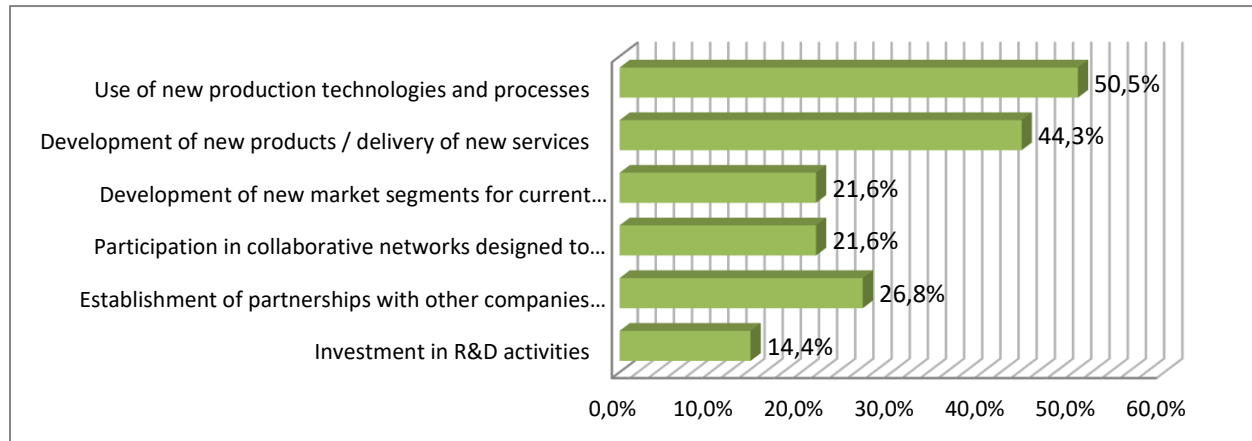
Adoption of innovation	Number of answers
Yes	83
No	9
Do not know / Do not want to answer	5
<b>Total</b>	<b>97</b>

Source: A1.4 INNOGROW Survey Results

The respondents were asked to select all types of innovation that their organisation has adopted as part of its overall business strategy, among a predefined set of possible options. The percentage of positive answers (“Yes”) for each statement is analytically presented in figure 6. “Use of new production technologies and processes” arises as the most common type of innovation adopted by rural economy SMEs (with a “success rate” of 50.5%), followed by “Development of new products / delivery of new services” (44.3%) and “Establishment of partnerships with other companies across the supply chain” (26.8%). “Participation in collaborative networks designed to stimulate innovation activity”, “Development of new market segments for current products” and “Investment in R&D activities” are the types of innovation with the lowest ranking.

**Figure 6. Type of innovation adopted by participants' organisation**

**Positive answers ("Yes") as % of total answers ("Yes" + "No") in each component**



Type of innovation	Number of positive answers ("Yes")
Use of new production technologies and processes	49
Development of new products / delivery of new services	43
Development of new market segments for current products	21
Participation in collaborative networks designed to stimulate innovation activity	21
Establishment of partnerships with other companies across the supply chain	26
Investment in R&D activities	14

*Source: A1.4 INNOGROW Survey Results*

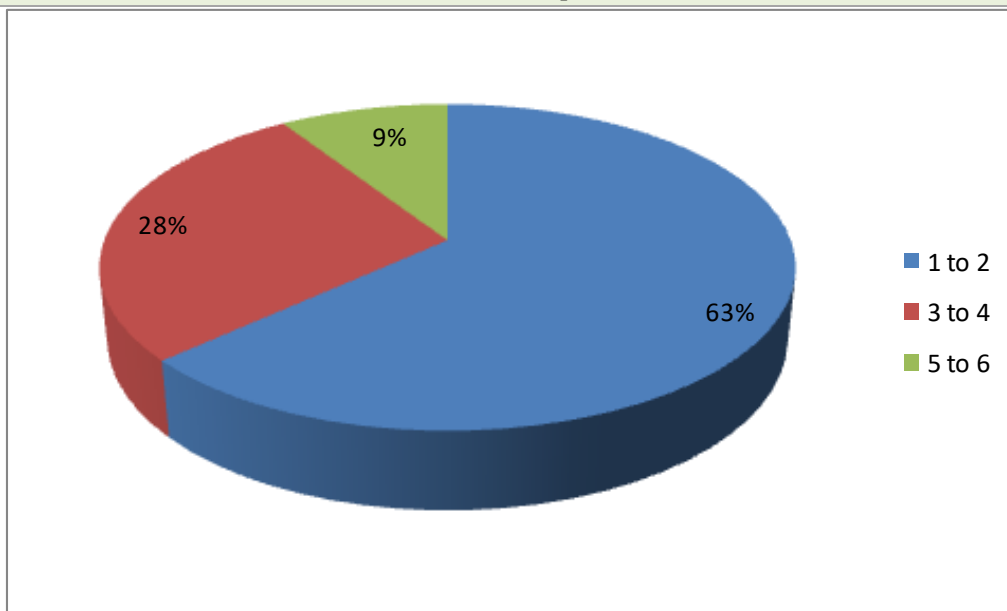
During the analysis, the number of positive responses was grouped to provide an estimation of the extent that rural economy SMEs have invested in technological innovations or/and have participated in dedicated networks promoting innovation (Research Question 1). For the purpose of the analysis, three groups were created, based on the number of types of innovation adopted. One to two positive responses imply a "low intensity of innovation", three to four responses a "moderate intensity of innovation", and five to six responses a "high intensity of innovation".

The vast majority of rural economy SMEs (that participated in the survey) demonstrate a low intensity of innovation (around 63%), which results from the fact that only 55 respondents reported that their company has adopted one or two types of innovation for increasing their competitiveness and productivity. 28% of rural SMEs had a moderate degree/level of innovation adoption, while approximately 1 out of 10 rural SMEs can be characterised as innovation intense, having adopted more than 4 types of innovation. Overall, 91% of the respondents declared that they have been involved in the decision making process within their organisations, concerning the

management, administration, and/or leadership as well as strategic orientation for innovation related issues, indicating a good level of understanding on the determinants of innovation adoption.

**Figure 7. Intensity of innovation**

**% of total replies**



Degree of familiarity	Number of answers
1: Low intensity of innovation (adoption of 1 to 2 types of innovation)	55
2: Medium intensity of innovation (adoption of 3 to 4 types of innovation)	24
3: High intensity of innovation (adoption of 5 to 6 types of innovation)	8
<b>Total</b>	<b>87</b>

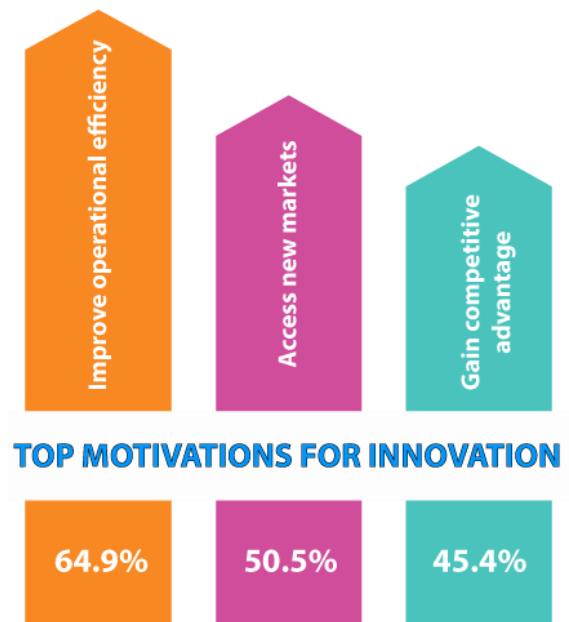
Source: A1.4 INNOGROW Survey Results



## 5.2 Motivations behind adoption of innovation

This subsection aims to examine SMEs’ innovativeness and to explore the motivations behind the adoption of innovation. Rural SMEs may have different motivations associated with the utilisation of any type of innovation such as the use of new production technologies or the participation collaborative networks designed to stimulate innovation activity. Literature suggests that SMEs invest in innovation to cover their functional needs; the motivations to get functional benefits, arisen from the production of new products, access to new markets and reduced production costs. This section explores in detail the various motivational drivers for participating in adoption of innovation process.

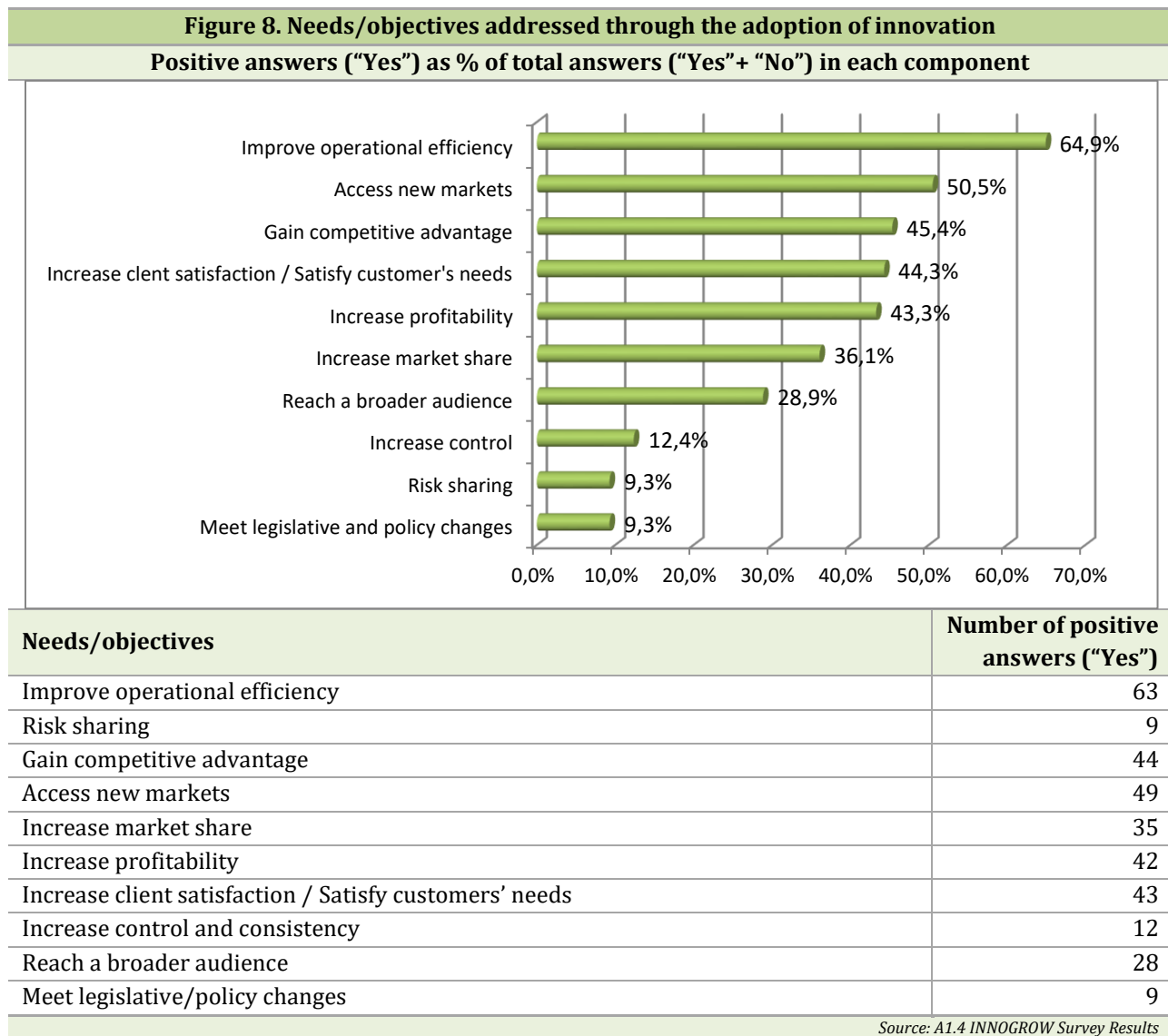
The respondents were asked to select among a predefined set all the possible needs/objectives addressed through the adoption of innovation, according to their expectations and perspectives. The main findings indicate that five types of motivations underlie SMEs’ innovativeness and adoption of innovation; namely the need to a) improve operational efficiency, b) access new markets, c) gain competitive advantage, d) increase client satisfaction / satisfy customer’s needs and e) increase profitability. The percentage of each statement, i.e. the percentage of the positive answers (“Yes”) that each statement gathered is analytically presented in Figure 8.



“Improve operational efficiency” arises as the most popular need/objective addressed though the adoption of innovation (with a percentage of 64.9%), followed by “Access new markets” (50.5%). These 2 statements (out of the 10 available) apart from being the most preferred, where those chosen by more than half of the respondents. “Gain competitive advantage” is found in the third place (45.4%), followed by “Increase client satisfaction / satisfy customer’s needs” and “Increase profitability” with a percentage of 44.3% and 43.3% respectively. “Increase market share”, “Reach a

broader audience”, “Increase control”, “Risk sharing” and “Meet legislative and policy changes” are the 5 statements that rank lower in preference, with percentages ranging from 9.3% to 36.3%.

It is noticeable that the distribution of preference reasons/drivers falls within the category of function needs, seeking to address needs associated with financial benefits, productivity and competitiveness, as suggested by the literature.



### 5.3 Constraints and barriers to innovation

To improve the innovation capacity/performance of rural economy SMEs, it is critical to understand the key barriers surrounding the innovation ecosystem. This issue has been extensively investigated by researchers in the quest of answers as far as the determinants of the innovation adoption (at the firm level) are concerned.

Comparing the findings from different studies/surveys, we came into the reasonable conclusion/assumption that most SMEs (no matter their country of origin or type of activity) face similar barriers to innovation, which fall in three main categories a) technological, b) organisational, and c) environmental factors.

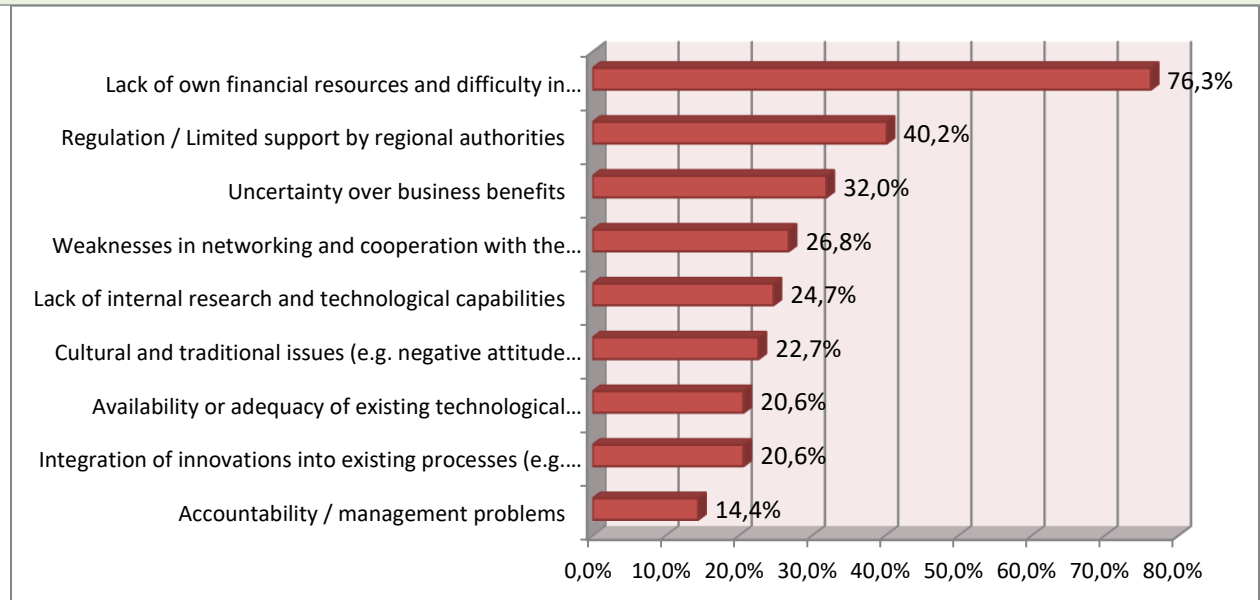
The technological dimension includes a number of technological related factors (such as technology readiness, compatibility, and availability of existing technology and tools) that affect an organisation's decision to develop new technologies or participate in a collaborative model. The organisational dimension describes the features of an organisation that might have a significant impact on the process of decision-making (towards an open innovation model) and relates directly to the availability and use of internal resources (such as financial capacity, human resources, and research capabilities); the environmental factors relate to the market structure, regulatory framework and competition pressures, determining the environmental and background elements that might affect an organisation's intent to invest in innovation. Nonetheless, the analysis of these determinants suggests that further research needs to be carried out to better understand the process of innovation and the related obstacles hindering the diffusion of new technologies.

To identify the barriers to innovation for rural economy SMEs, the respondents were asked to select all the factors that may prohibit the adoption and diffusion of innovation within an organisation, among a predefined set of possible choices (i.e. factors), based on their actual experience (if available) or personal perceptions.

Evidence shows that rural economy SMEs experience certain limitations to engage in innovation, having for instance difficulty in accessing funding, lacking sufficiently qualified personnel in-house, and/or receiving limited support from regional authorities that could enable them to market new products or processes. The percentage of each statement/factor, i.e. the percentage of the positive answers ("Yes"), is analytically presented in Figure 9.

**Figure 9. Barriers to innovation**

**Positive answers (“Yes”) as % of total answers (“Yes”+ “No”) in each component**



Barriers	Number of positive answers (“Yes”)
Integration of innovations into existing processes (e.g. new production technologies)	20
Availability or adequacy of existing technological infrastructures	20
Uncertainty over business benefits	31
Lack of own financial resources and difficulty in accessing funding from external sources	74
Cultural and traditional issues (e.g. negative attitude towards technology)	22
Regulation / Limited support by regional authorities	39
Accountability / management problems	14
Weaknesses in networking and cooperation with the innovation stakeholders (e.g. technology vendors)	26
Lack of internal research and technological capabilities	24

Source: A1.4 INNOGROW Survey Results

The factors that can be referred as “the most pronounced barriers to innovation” are those related to funding, regulation and uncertainty over business benefits. More than 75% of rural SMEs see limited availability of finance from both within the enterprise and external sources as a barrier to innovation. This clearly indicates that financial constraints remain one of the biggest barriers to SME innovation; the cost of innovation itself is high. Secondly, SMEs lack the financial resources to implement innovation and, lastly, access to finance from external financial institutions seems to be limited, creating further bottlenecks. Therefore, there is an urgent need to address this significant

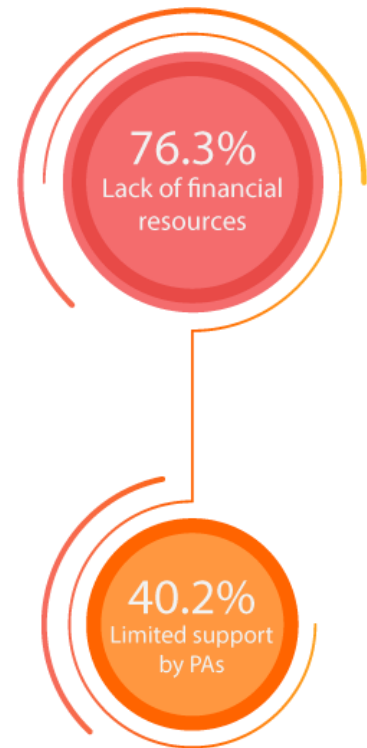
challenge by bringing down the cost of innovation and increasing the availability of innovation capital through funding programmes and support mechanisms.

“Regulation / limited support by regional authorities” appears to be the second most pronounced factor hindering the adoption among rural economy SMEs (40.2%). This is particularly true considering that policy making can affect the different dimensions/aspects underlying innovation adoption, including access to finance and technological equipment, capacity building and human resources, market linkages, availability of research facilities, and access to key information, among others, through regulations, interventions, and schemes.

“Uncertainty over business benefits” placed third with percentage 32% (i.e. 31 responses), followed by “Weaknesses in networking and cooperation with the innovation stakeholders” (26.8%), “Lack of internal research and technological capabilities” (24.7%), “Cultural and traditional issues”, “Availability or adequacy of existing technological infrastructures” (20.6%), “Integration of innovations into existing processes” (20.6%) and “Accountability / management problems” (14.4%).

Development and implementation of any type of innovation requires staff (human resources) with high quality research and technological skills that will support the adoption of innovative procedures/technologies within business operations. The need for highly skilful personnel with an innovative culture (e.g. scientists, technicians, or engineers) is necessary for both R&D and non R&D based SMEs. More than 24% of rural SMEs faced difficulties arising from the unavailability of internal research capabilities.

Availability of up-to-date technological infrastructures is also crucial for R&D-based innovations. Rural SMEs need to have access to laboratories and research facilities (inside and outside their own premises) to be able to create/deliver new products that brings added value into the market; enhancing their competitiveness and market position. The limited access to technological infrastructures and research facilities is seen as a barrier to innovation by 20% of the total sample.



At a next stage, respondents were asked to determine the degree by which the aforementioned factors constitute problems for an organisation wishing to invest in technologies or/and participate in innovative collaborative networks. A five-point Likert scale was employed to facilitate SMEs' representatives to express their views on the perceived barriers to innovation. Table 4 presents the descriptive statistics (mean, median, mode, standard deviation) for all variables included in this question.

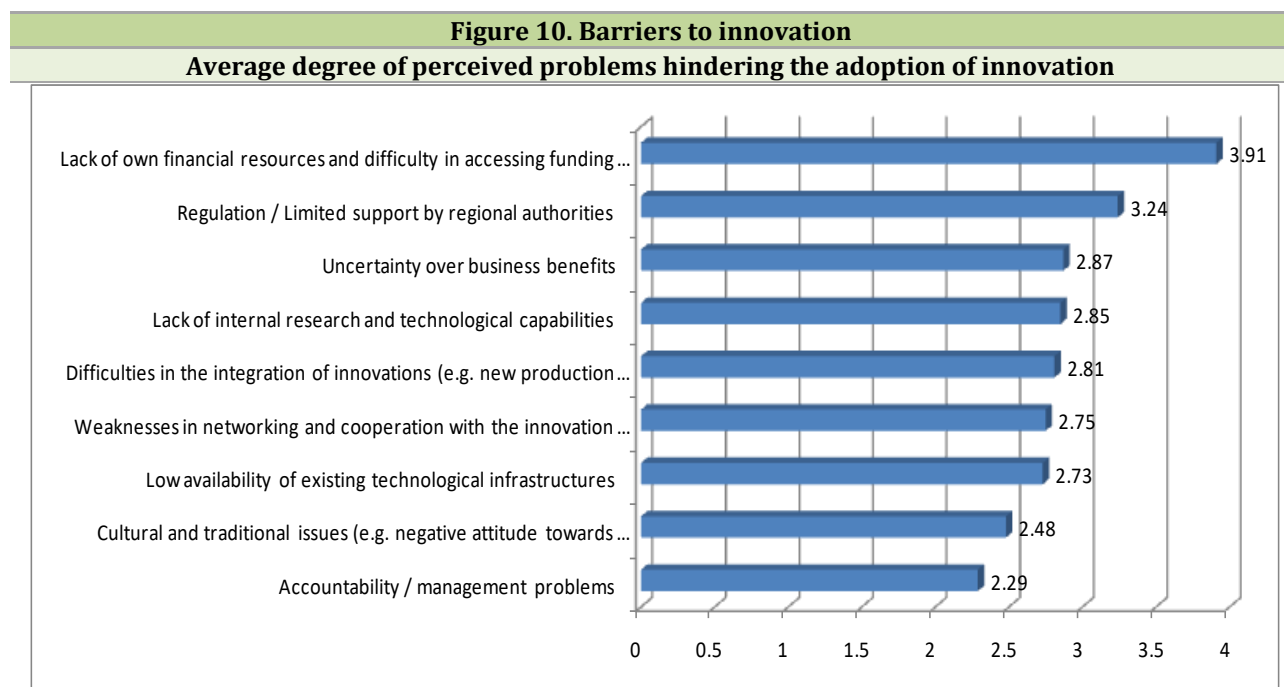
**Table 4: Descriptive statistics for the variables on barriers**

Barriers	Mean	Median	Mode	Standard deviation
Difficulties in the integration of innovations (e.g. new production technologies) into existing processes	2.81	3	3	1.24
Low availability of existing technological infrastructures	2.73	3	2	1.33
Uncertainty over business benefits	2.87	3	3	1.23
Lack of own financial resources and difficulty in accessing funding from external sources	3.91	4	5	1.22
Cultural and traditional issues (e.g. negative attitude towards technology)	2.48	2	2	1.25
Regulation / Limited support by regional authorities	3.24	3	3	1.37
Accountability / management problems	2.29	2	2	1.11
Weaknesses in networking and cooperation with the innovation stakeholders	2.75	3	3	1.25
Lack of internal research and technological capabilities	2.85	3	3	1.30

The arithmetic mean, more commonly known as “the average,” is the sum of the degree that each factor (e.g. uncertainty over business benefits) received from every participant divided by the total number of responses. The mean is useful in determining the overall trend of our data set. This

metric will enable us to determine the most constraining factors that limit the innovation performance of rural economy SMEs.

“Lack of own financial resources and difficulty in accessing funding from external sources” and “Regulation / Limited support by regional authorities” received the highest mean score (3.91 and 3.24 respectively), arising as the most pronounced barriers to innovation, according to participants’ replies. On the other side, the factors that received the lowest mean score were “Cultural and traditional issues” (2.48) and “Accountability/management problems” (2.29). The remaining factors shared arithmetic means, ranging from 2.73 to 2.87. Figure 10 displays a visualisation of the calculated arithmetic means in descending order, which provides a useful insight into the prioritisation (in terms of importance) of barriers by SMEs’ representatives.



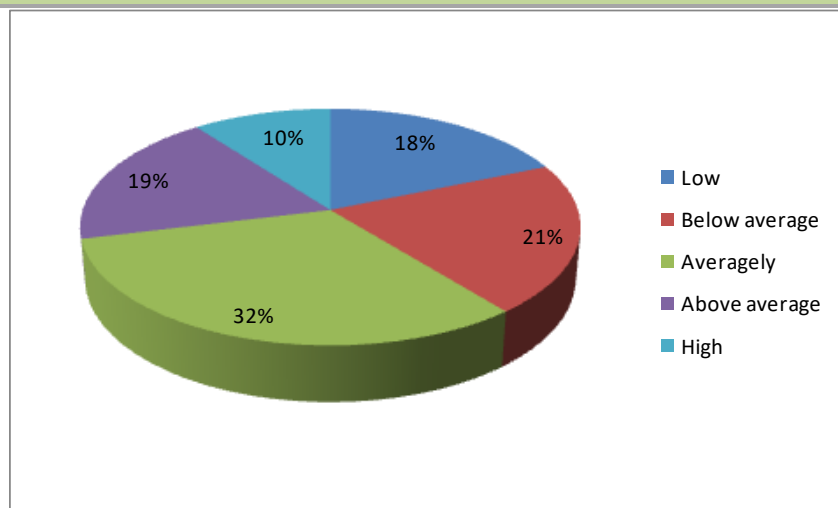
Based on the frequency distributions (i.e. percentages of observations) for each statement, similar conclusions can be drawn. If options “Above average” and “High” are considered as positive answers, option “Averagely” as neutral, and the option of “Below average” and “Low” as negative answers, then the factors “Lack of own financial resources and difficulty in accessing funding from external sources” and “Regulation / Limited support by regional authorities” appear to be the most significant factors preventing rural SMEs from investing in innovation or/and participating in

collaborative networks. More particularly, the positive answers (by aggregating “Important benefit” and “Very important benefit” replies) represent the following percentages in each examined factor:

- “Difficulties in the integration of innovations (e.g. new production technologies) into existing processes”, 29%
- “Low availability of existing technological infrastructures”, 34%
- “Uncertainty over business benefits”, 24%
- “Lack of own financial resources and difficulty in accessing funding from external sources”, 68%
- “Cultural and traditional issues (e.g. negative attitude towards technology)”, 23%
- “Regulation / Limited support by regional authorities”, 39%
- “Accountability / management problems”, 15%
- “Weaknesses in networking and cooperation with the innovation stakeholders” 26%
- “Lack of internal research and technological capabilities” 30%

**Figure 11. Degree of problems:**

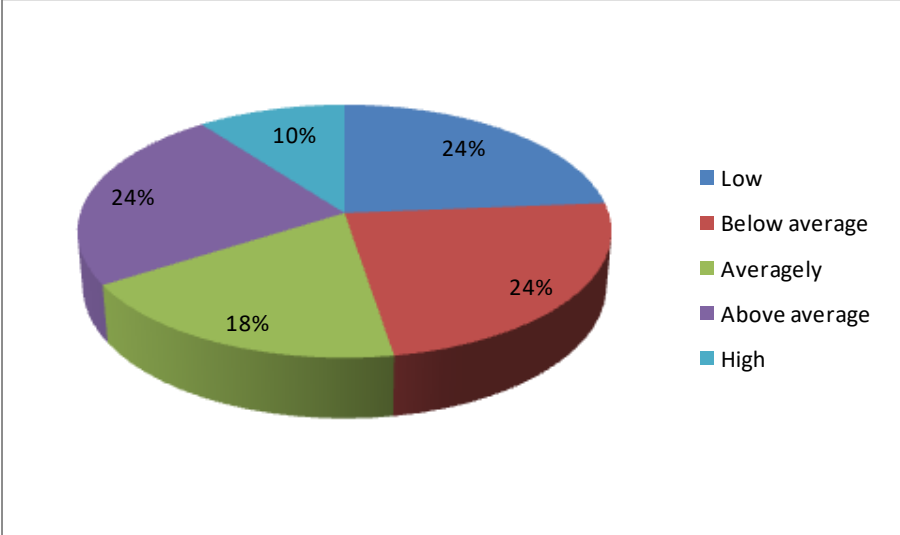
**Difficulties in the integration of innovations into existing processes**



Source: A1.4 INNOGROW Survey Results

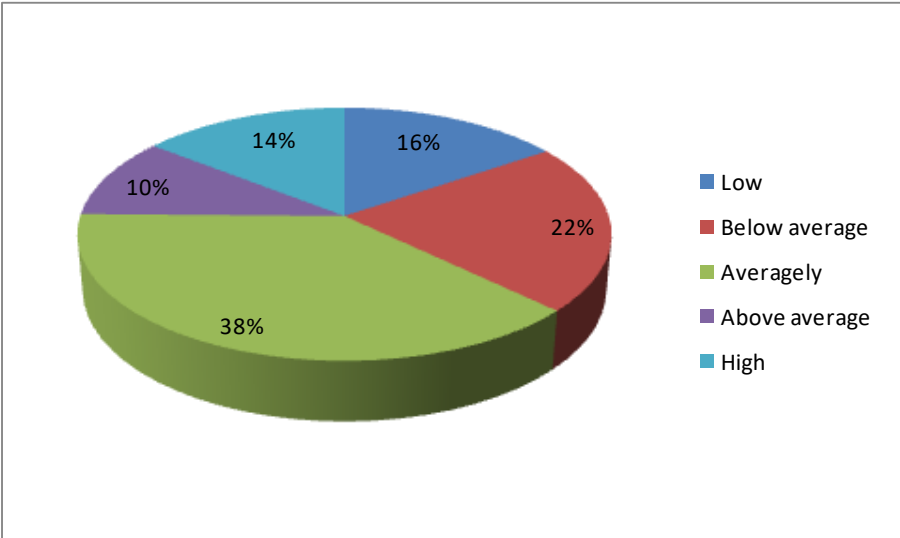


**Figure 12. Degree of problems:**  
**Low availability of existing technological infrastructures**



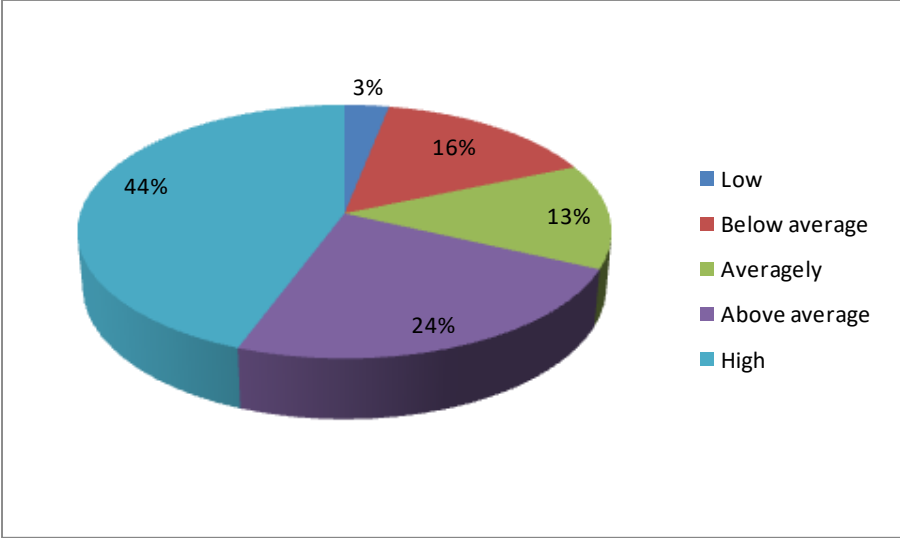
Source: A1.4 INNOGROW Survey Results

**Figure 13. Degree of problems:**  
**Uncertainty over business benefits**



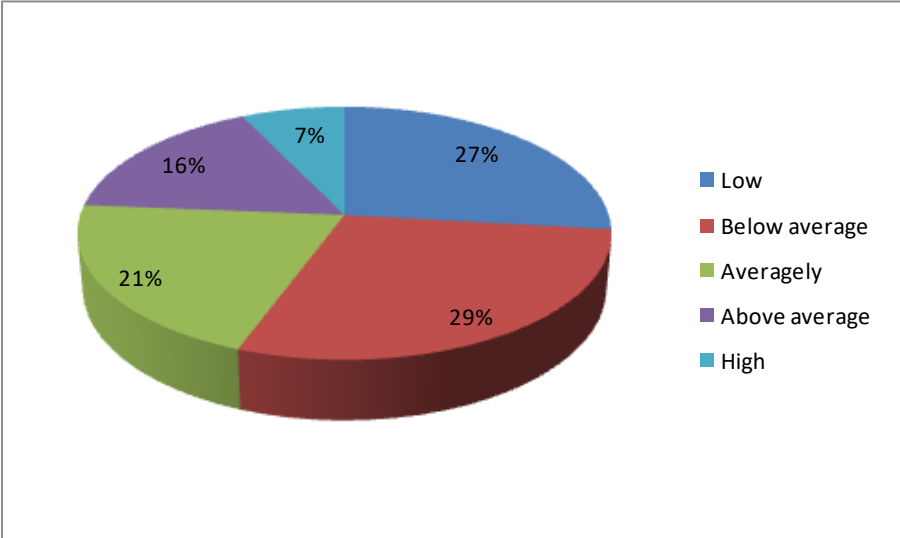
Source: A1.4 INNOGROW Survey Results

**Figure 14. Degree of problems:**  
**Lack of own financial resources and difficulty in accessing funding from external sources**



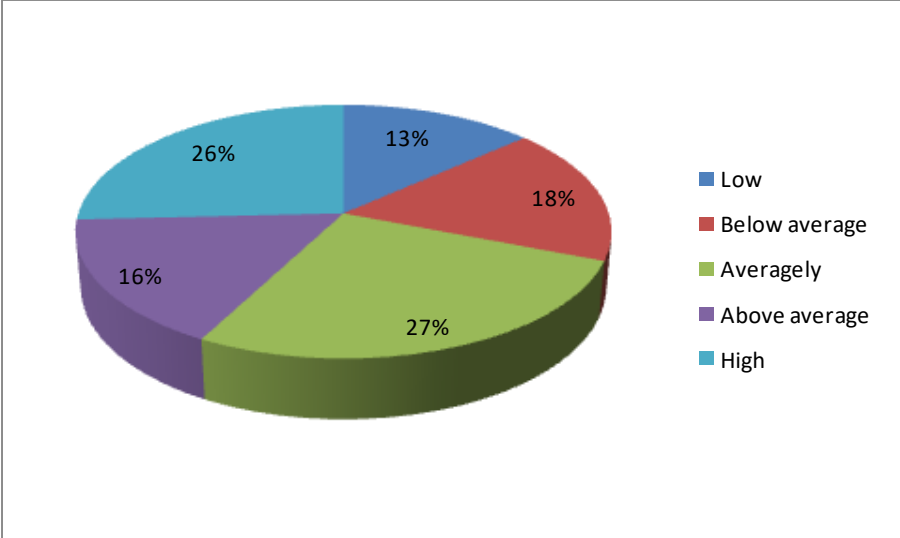
Source: A1.4 INNOGROW Survey Results

**Figure 15. Degree of problems:**  
**Cultural and traditional issues (e.g. negative attitude towards technology)**



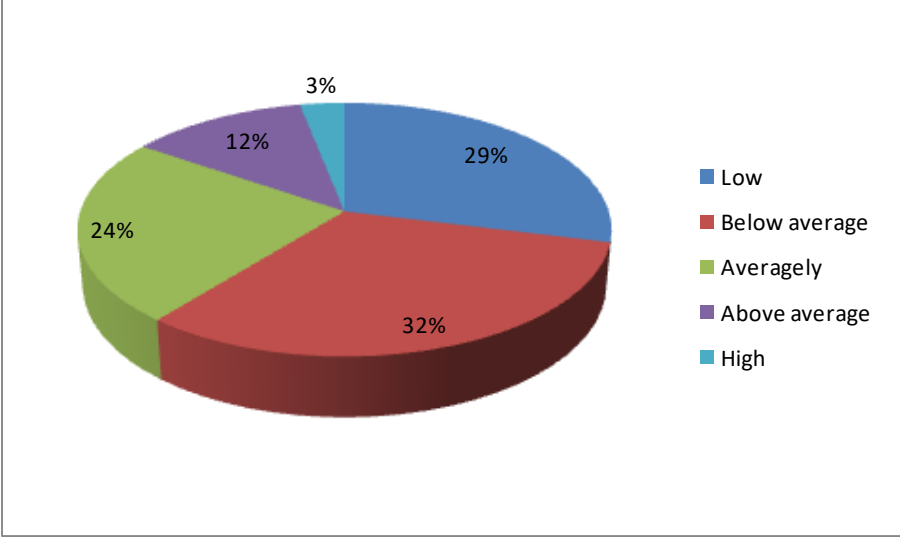
Source: A1.4 INNOGROW Survey Results

**Figure 16. Degree of problems:  
Regulation / Limited support by regional authorities**



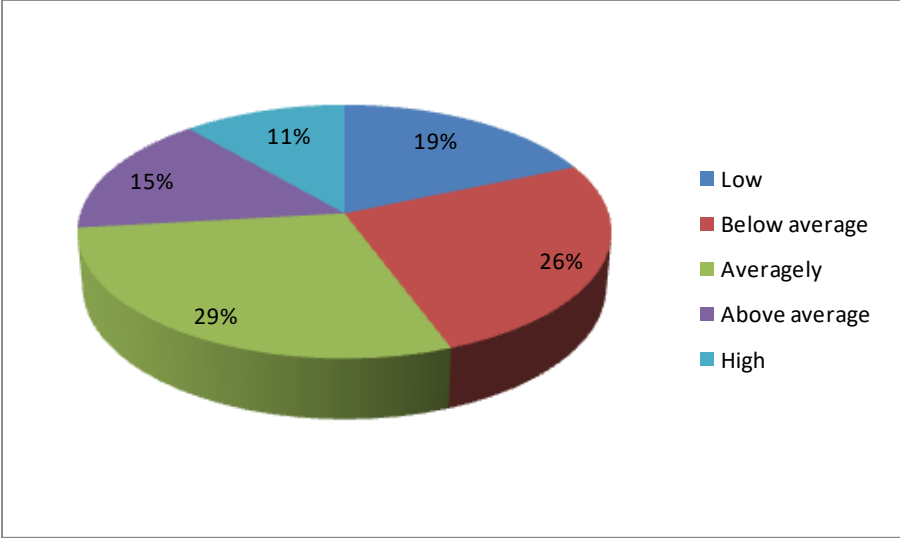
Source: A1.4 INNOGROW Survey Results

**Figure 17. Degree of problems:  
Accountability / management problems**



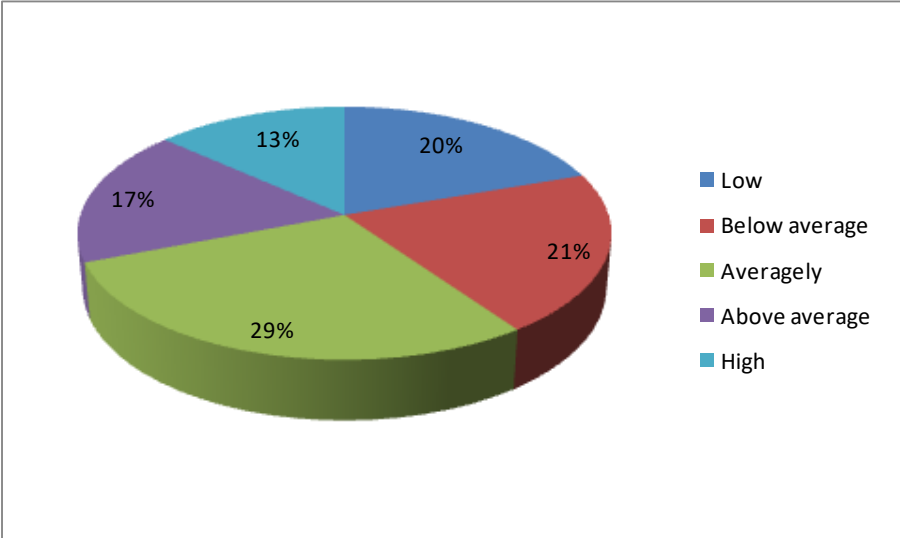
Source: A1.4 INNOGROW Survey Results

**Figure 18. Degree of problems:**  
**Weaknesses in networking and cooperation with the innovation stakeholders**



Source: A1.4 INNOGROW Survey Results

**Figure 19. Degree of problems:**  
**Lack of internal research and technological capabilities**



Source: A1.4 INNOGROW Survey Results

## 5.4 Perceived enablers of innovation

The innovation capacity of SMEs is critical to the competitiveness and growth of rural economies across the EU. Evidence suggests that SMEs in rural areas are innovating less than their urban counterparts. The reluctance to explore new products and processes can hinder the diffusion of innovation, which is necessary to improve SMEs' competitiveness and foster sustainable development and growth.

The literature indicates that a great range of factors influence SMEs' incentives and ability to innovate, ranging from the prevalence of corruption to the availability of an adequately skilled workforce and access to finance. Some of these factors are internal, reflecting either characteristics of the firm (its size or age, for instance) or decisions made by the firm (such as the decision to compete in international markets or the decision to hire highly skilled personnel). Other factors are external and shape the general business environment in which firms operate (such as customs and trade regulations).

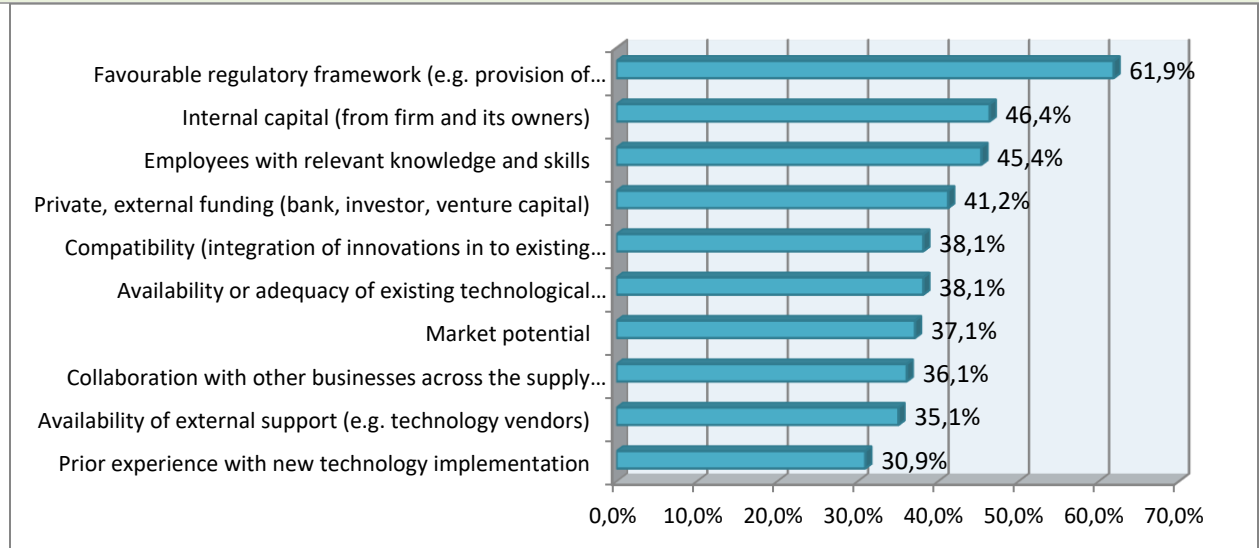
This chapter examines the internal and external drivers/enablers of innovation, looking first at firm-level characteristics (e.g. internal capital, employees with relevant skills, prior experience with new technology innovation) before turning to external factors such as the regulatory framework, market potential and availability of business support.

To identify the key enablers for innovation, the respondents were asked to select all factors that may support the adoption and diffusion of innovation in rural economy SMEs among a predefined set of possible choices, based on their actual experience (if available) or personal perceptions.

Evidence shows that the key enablers of business innovation can be grouped into three clusters: a) internal capacity and capability (e.g. availability of existing technological infrastructures, internal capital, employees with relevant skills), b) market structure (e.g. market potential, collaboration with other business actors across the supply chain, availability of business support) and c) the external environment (e.g. favourable regulatory framework, external funding). The percentage of each statement/factor, i.e. the percentage of the positive answers ("Yes"), is analytically presented in Figure 20.

**Figure 20. Enablers for innovation**

**Positive answers (“Yes”) as % of total answers (“Yes”+ “No”) in each component**



Enablers	Number of positive answers (“Yes”)
Compatibility (integration of innovations in to existing processes)	37
Availability or adequacy of existing technological infrastructures	34
Favourable regulatory framework (e.g. provision of incentives for innovation by regional authorities)	60
Internal capital (from firm and its owners)	45
Market potential	36
Employees with relevant knowledge and skills	44
Private, external funding (bank, investor, venture capital)	40
Collaboration with other businesses across the supply chain	35
Availability of external support (e.g. technology vendors)	37

Source: A1.4 INNOGROW Survey Results

The most pronounced driver for innovation is related to the establishment of a favourable regulatory framework, which can provide rural SMEs with a number of incentives for investing in innovative technologies or/and participating in innovative collaborative networks. The regulatory framework is crucial to generate and speed the diffusion of new technologies. Good regulatory conditions stimulate SMEs to engage in innovation and R&D activities, accelerating the reallocation of resources to innovation-driven firms and industries. In contrast, a poor institutional environment (widespread corruption, weak rule of law, lack of funding programmes and burdensome red tape) can substantially increase the cost of introducing new products and make

returns to investment in new products and technologies more uncertain. More than 60% of rural SMEs consider the regulatory environment as a key determinant for innovation adoption.

“Internal capital” is found to be the second most pronounced factor supporting the diffusion of innovation within rural economy SMEs (46.4%). This was expected, since respondents assume that financial constraints constitute a major problem that prevents SMEs from investing in innovative technologies. Taking into account that private enterprises find it difficult to attract external financing, the availability of internal capital allows covering the funding requirements of experimental-innovation projects and R&D activities.

Similarly, “Private, external funding” is found to be particularly important for accelerating the diffusion of innovation among SMEs in rural areas. More than 40% of the respondents assume that the availability of external funding in the form of bank loans, venture capital and national funding programmes can accelerate the deployment of innovative technologies, fostering sustainable development and growth for rural areas.



The results indicate that a suitably skilled workforce (including strong management skills) is one of the key prerequisites for successful innovation – both innovation at the technological frontier and the adoption of existing technology – as workers are required to develop and learn new production techniques. Employees with relevant knowledge, skills and capacities affect the probability of investing in R&D and thus constitute a significant driver for introducing new production technologies and getting involved in innovative collaborative networks. The availability of a high skilled workforce is seen as a key enabler of innovation for rural SMEs by 45.4% of the sample.

“Compatibility” came fifth (45.4%), followed by “Availability or adequacy of existing technological infrastructures”, “Market potential”, “Collaboration with other businesses across the supply chain and innovation stakeholders”, and “Availability of external support” with lower percentages, ranging from 35.1% to 38.1%. “Prior experience with new technology implementation” is found to be the least important factor in favour of the innovation adoption, having been selected by 3 out of 10 respondents.

At a next stage, respondents were asked to determine the degree that the aforementioned statements are facilitators/enabling factors for an organisation wishing to invest in technologies and/or participate in innovative collaborative networks. A five-point likert scale was employed to facilitate SMEs’ representatives to express their views/perceptions on the perceived enablers of innovation. Table 5 presents the descriptive statistics (mean, median, mode, standard deviation) for all the variables included in this question.

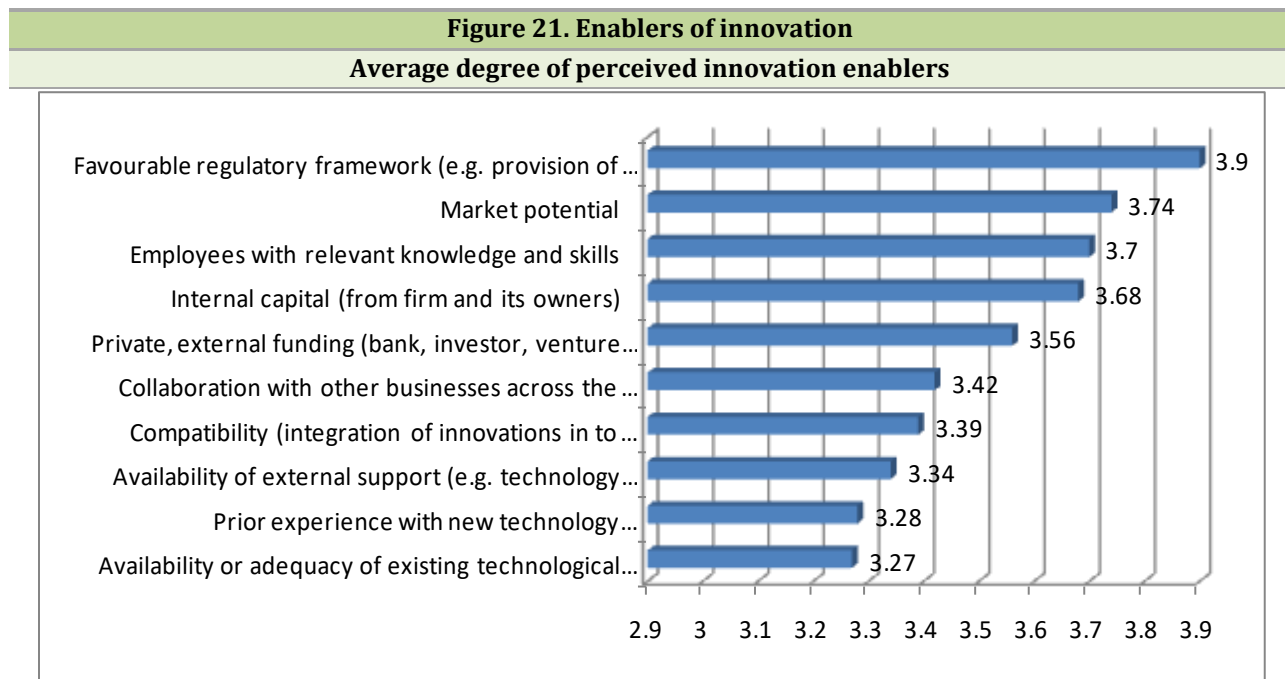
**Table 5: Descriptive statistics for the variables on enabling factors**

<b>Drivers / Enablers</b>	<b>Mean</b>	<b>Median</b>	<b>Mode</b>	<b>Standard deviation</b>
Compatibility (integration of innovations in to existing processes)	3.39	3	3	1.28
Availability or adequacy of existing technological infrastructures	3.27	3	4	1.20
Favourable regulatory framework (e.g. provision of incentives for innovation by regional authorities)	3.90	4	5	1.14
Internal capital (from firm and its owners)	3.68	4	4	1.20
Market potential	3.74	4	5	1.17
Employees with relevant knowledge and skills	3.70	4	4	1.23
Private, external funding (bank, investor, venture capital)	3.56	4	4	1.11
Collaboration with other businesses across the supply chain and innovation stakeholders	3.42	3	3	1.03
Prior experience with new technology implementation	3.28	3	3	1.21
Availability of external support (e.g. technology vendors)	3.34	3	3	1.01

All factors examined were found to be important for participants, having a mean score above 3.0. This implies that respondents assume that the degree by which the factors examined constitute facilitators/enabling factors for innovation adoption is above average. “Favourable regulatory framework”, “Market potential”, “Employees with relevant knowledge and skills” and “Internal capital” have the highest mean scores (3.90, 3.74, 3.70 and 3.68 respectively), arising as the most



pronounced enablers of innovation. On the other hand, the factors with the lowest mean scores were “Availability or adequacy of existing technological infrastructures” (3.27) and “Prior experience with new technology implementation” (3.28); however both of them received positive feedback from participants. The remaining factors had arithmetic means ranging from 3.34 to 3.56. Figure 21 displays a visualisation of the calculated arithmetic means in descending order.



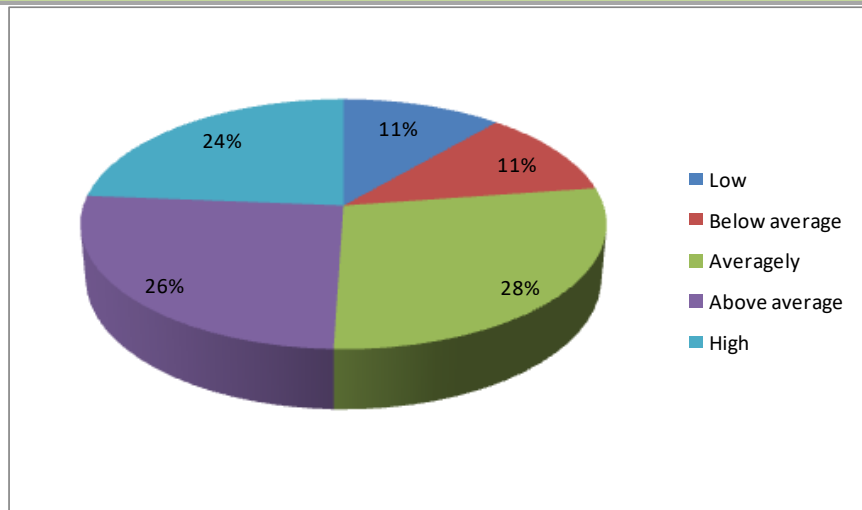
The above results are further confirmed when based on simple frequency distributions (i.e. percentages of observations). Again, If we consider the options of “Above average” and “High” as positive answers, the option “Averagely” as neutral and the option of “Below average” and “Low” as negative answers, then the majority of the replies for 6 out of 10 statements is positive. In particular, the positive answers for “Availability or adequacy of existing technological infrastructures”, “Collaboration with other businesses across the supply chain”, “Prior experience with new technology implementation” and “Availability of external support” did not manage to be a majority; a conclusion in accordance with the above findings. In particular, the percentages of positive answers (sum of “Above average” and “High” replies) in each examined factor are the following:

- “Compatibility (integration of innovations in to existing processes)”, 50%

- "Availability or adequacy of existing technological infrastructures", 45%
- "Favourable regulatory framework", 65%
- "Internal capital", 61%
- "Market potential", 60%
- "Employees with relevant knowledge and skills", 65%
- "Private, external funding", 54%
- "Collaboration with other businesses across the supply chain", 44%
- "Prior experience with new technology implementation", 42%
- "Availability of external support", 42%

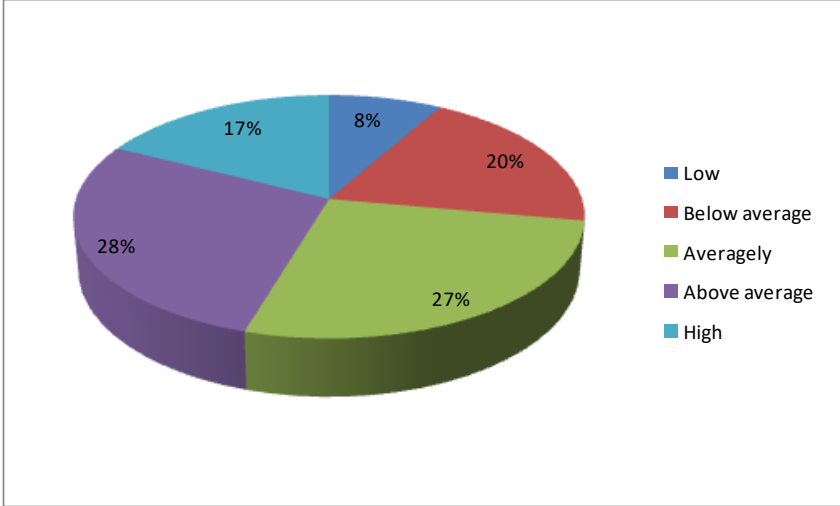
**Figure 22. Degree of enablers:**

**Compatibility (integration of innovations in to existing processes)**



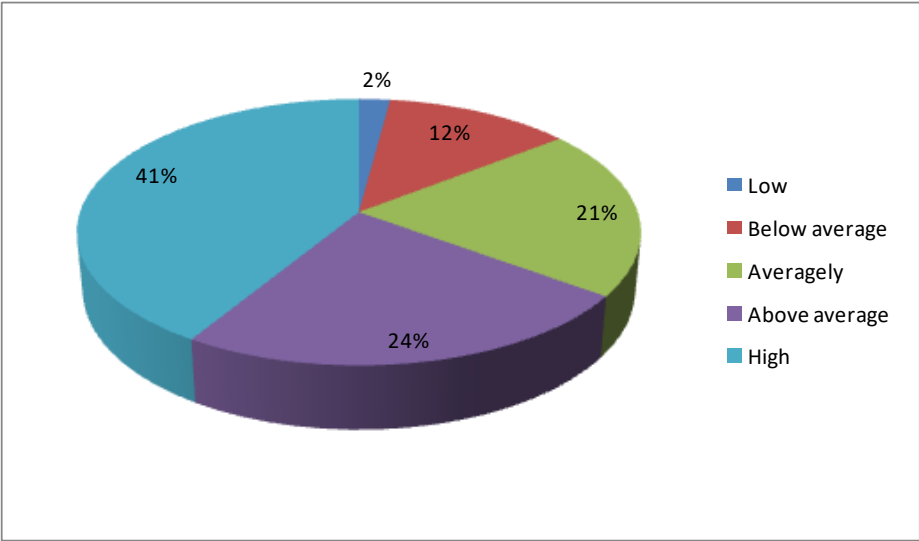
Source: A1.4 INNOGROW Survey Results

**Figure 23. Degree of enablers:**  
**Availability or adequacy of existing technological infrastructures**



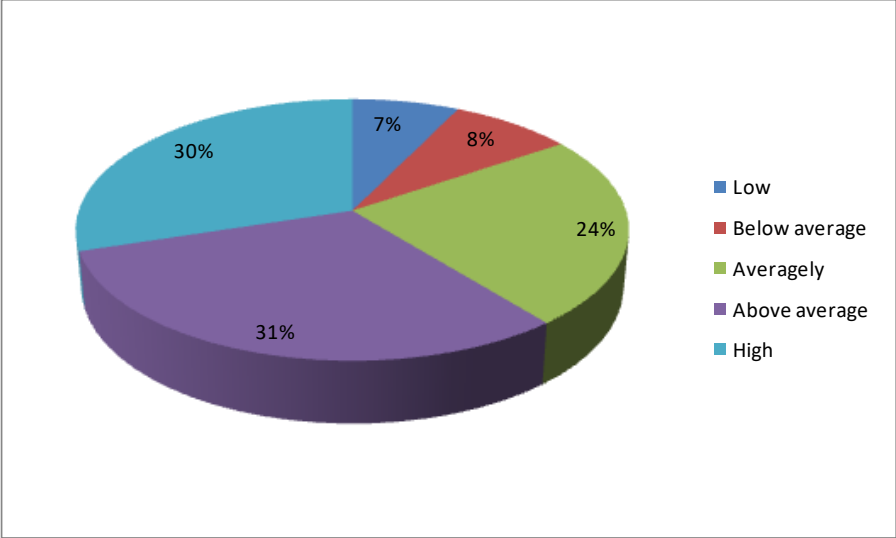
Source: A1.4 INNOGROW Survey Results

**Figure 24. Degree of enablers:**  
**Favourable regulatory framework (e.g. provision of incentives for innovation by regional authorities)**



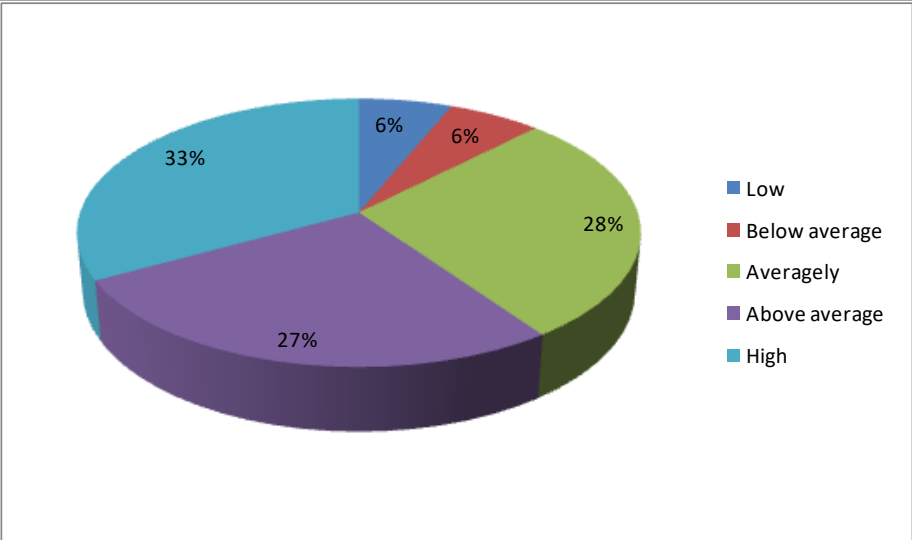
Source: A1.4 INNOGROW Survey Results

**Figure 25. Degree of enablers:  
Internal capital (from firm and its owners)**



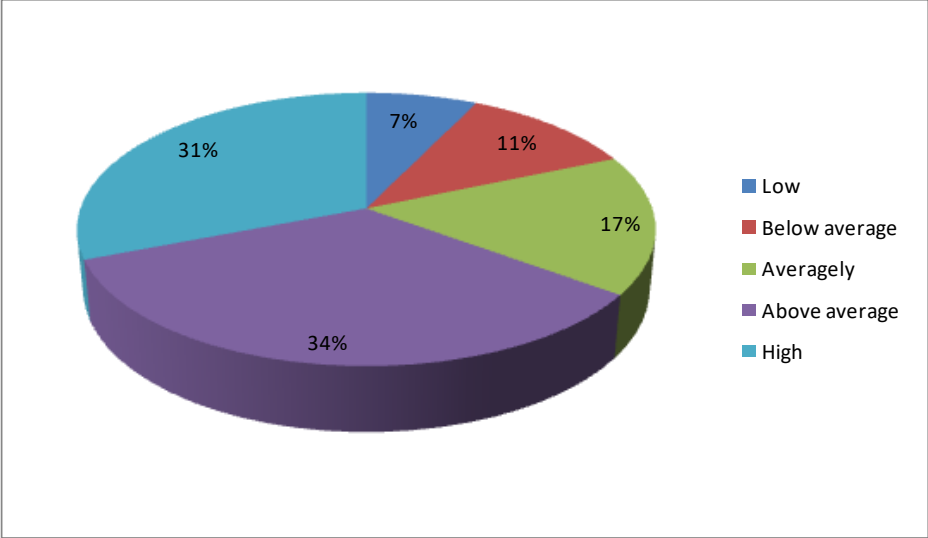
Source: A1.4 INNOGROW Survey Results

**Figure 26. Degree of enablers:  
Market potential**



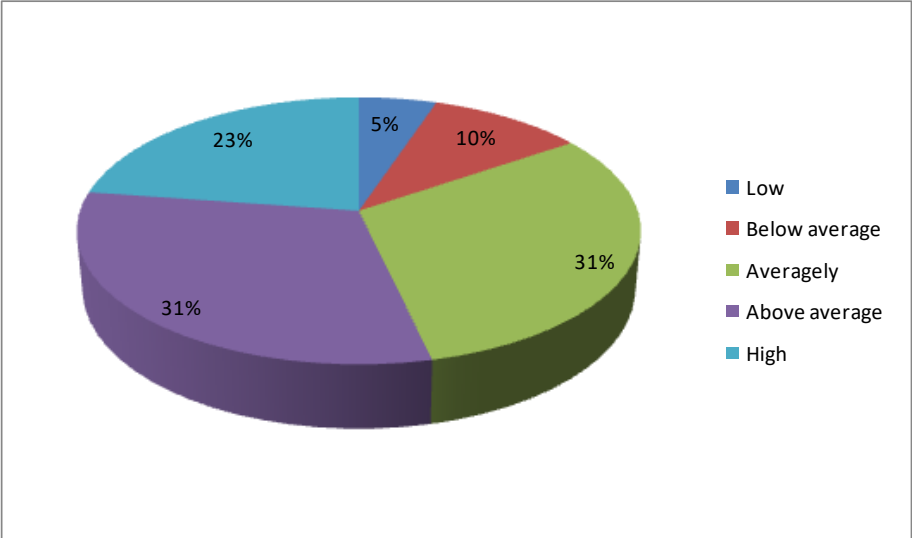
Source: A1.4 INNOGROW Survey Results

**Figure 27. Degree of enablers:  
Employees with relevant knowledge and skills**



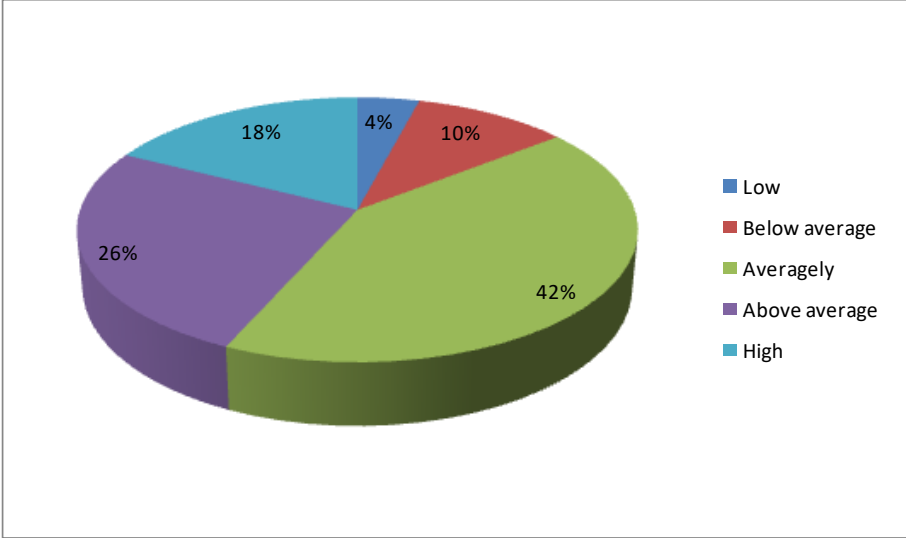
Source: A1.4 INNOGROW Survey Results

**Figure 28. Degree of enablers:  
Private, external funding (bank, investor, venture capital)**



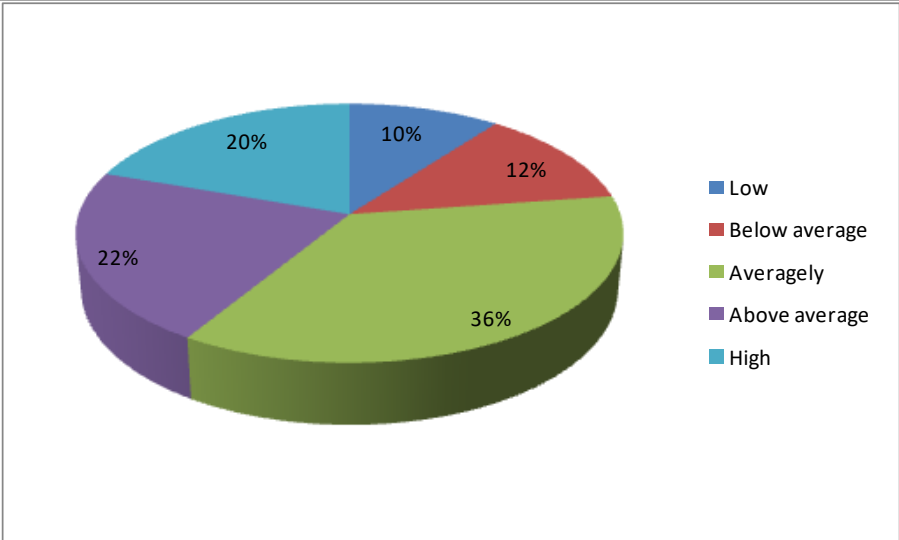
Source: A1.4 INNOGROW Survey Results

**Figure 29. Degree of enablers:**  
**Collaboration with other businesses across the supply chain and innovation stakeholders**



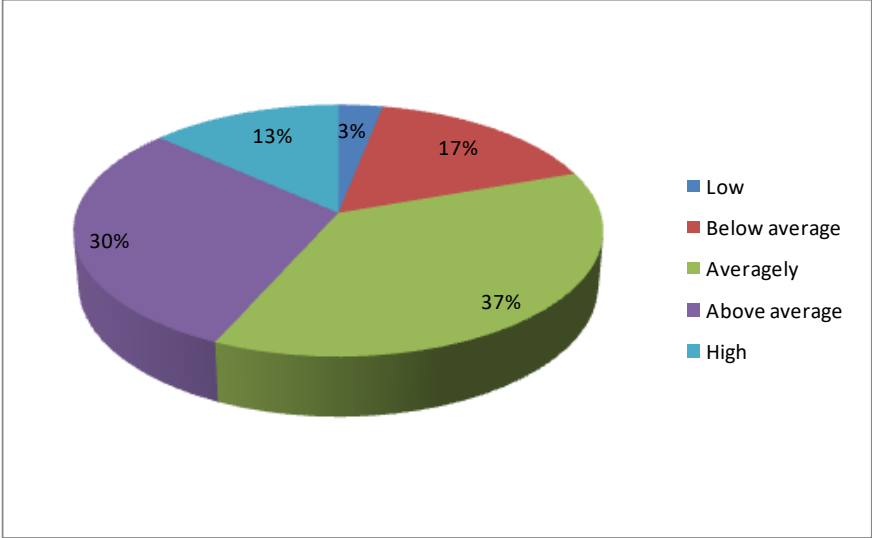
Source: A1.4 INNOGROW Survey Results

**Figure 30. Degree of enablers:**  
**Prior experience with new technology implementation**



Source: A1.4 INNOGROW Survey Results

**Figure 31. Degree of enablers:**  
**Availability of external support (e.g. technology vendors)**

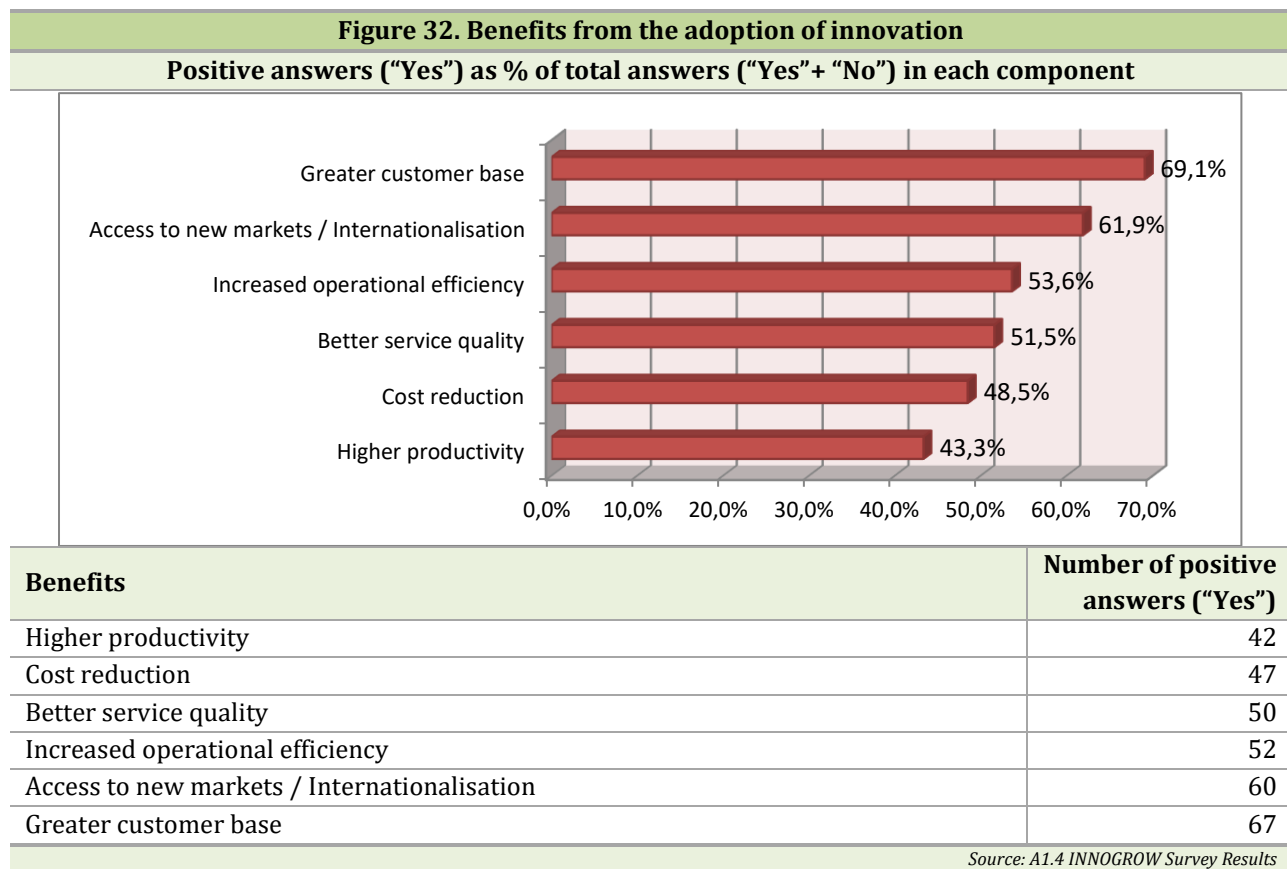


Source: A1.4 INNOGROW Survey Results

## 5.5 Expected organisational impact

The last section of the survey examines the perceptions of respondents towards the adoption and use of innovative technologies by rural economy SMEs, focusing on the benefits derived and the anticipated impact on business operations.

The respondents were asked to select among a predefined set all the possible statements that described benefits, according to their perceptions/expectations from investing in innovative technologies or/and participating in innovative collaboration networks. The percentage of each statement; the percentage of the positive answers (“Yes”) that each statement gathered is analytically presented in Figure 32.



“Greater customer base” is found to be the most popular expected benefit (with a percentage of 69.1%), followed by “Access to new markets / internationalisation” (61.9%), “Increased operational efficiency” (53.6%) and “Better service quality” (57%). These 4 statements (out of the 6



available) apart from being the most preferred, where those chosen by more than half of the respondents. "Cost reduction" and "Higher productivity" are the 2 statements that rank lower in preference, receiving 48.5% and 43.3% respectively.

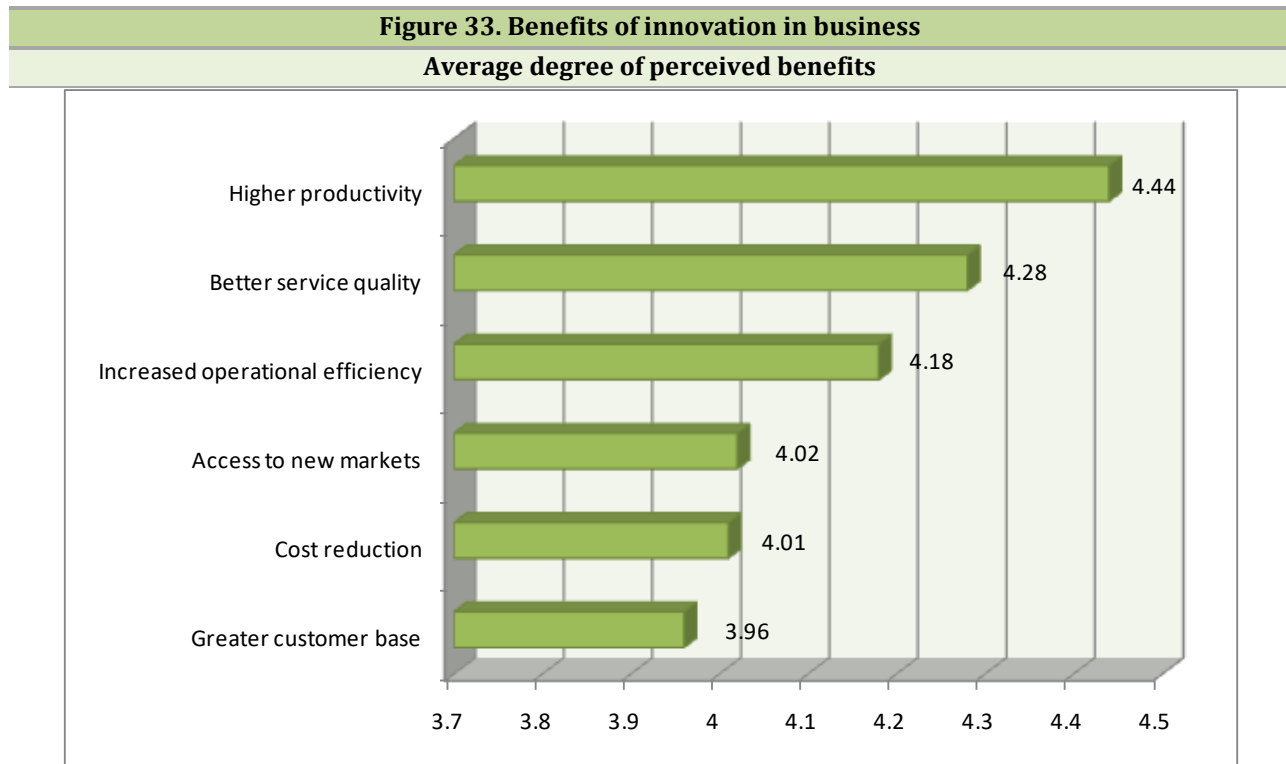
At a next stage, respondents were asked to rate their level of agreement with a series of potential benefits to be drawn from the adoption of innovation within business operations. A five point likert scale from "Strongly disagree" (=1) to "Strongly Agree" (=5) was employed to facilitate SMEs' representatives to express their views/perceptions on the perceived benefits of innovation. Table 6 presents the descriptive statistics (mean, median, mode, standard deviation) for all the variables included in this question.

**Table 6: Descriptive statistics for the variables on expected organisational impact**

Expected benefits	Mean	Median	Mode	Standard deviation
Higher productivity	4.44	5	5	0.63
Cost reduction	4.01	4	5	0.97
Better service quality	4.28	4	4	0.72
Increased operational efficiency	4.18	4	4	0.79
Access to new markets	4.02	4	4	0.76
Greater customer base	3.96	4	4	0.91

All the examined statements were found to be particularly important among participants (in terms of being considered expected organisation impact following the adoption of innovative technologies), receiving a mean score nearly or above 4.00. This means that respondents assume that the aforementioned statements constitute actual organisational benefits for a rural enterprise actively investing in innovative technologies or/and participating in innovative collaboration networks. The most pronounced (by respondents) expected benefits of innovation adoption are those related to productivity, service quality and operational efficiency. In particular, the statements that received the highest mean score (i.e. the statements with the higher level of agreement) were "Higher Productivity" (4.44), "Better service quality" (4.28) and "Increased

operational efficiency” (4.18). On the other side, the statements that had the lowest mean scores were “Greater customer base” (3.96), “Access to new markets” (4.02) and “Cost reduction” (4.01). Figure 33 displays a visualisation of the calculated arithmetic means in descending order.



Interestingly, these findings contradict previous question’s results and assumptions, which suggests that “Access to new markets / internationalisation”, “Increased operational efficiency” and “Better service quality” are the most pronounced anticipated organisational benefits to be derived from the adoption of innovation. Nevertheless, survey rating questions are more reliable in determining which statements are best prioritised after measuring respondents’ level of agreement using metrics of central tendency (e.g. mean, mode).

The evidence drawn from the questionnaire are further analysed in terms of positive, negative and neutral replies given by the participants. Three alternative types of options were available in each sub-question (i.e. statement) referring to potential benefits: a) positive referring to “Strongly agree” and “Agree”, b) negative referring to “Strongly disagree” and “Disagree” and c) neutral referring to “Neither agree nor disagree” choice. Figure 41 displays the survey results in details.

Evidence shows that the great majority of respondents agreed that the adoption and diffusion of innovation among rural economy SMEs results in a series of benefits that reflect all the statements under examination; namely higher productivity, cost reduction, better service quality, increased operational efficiency, access to new markets, and greater customer base. Among the statements that received the most positive replies were “Higher productivity”, “Better service quality” and “Increased operational efficiency” with 92, 84 and 78 replies respectively. The statements that received the less positive answers were “Access to new markets” (74 answers), “Cost reduction” (71 answers) and “Greater customer base” (71 answers).

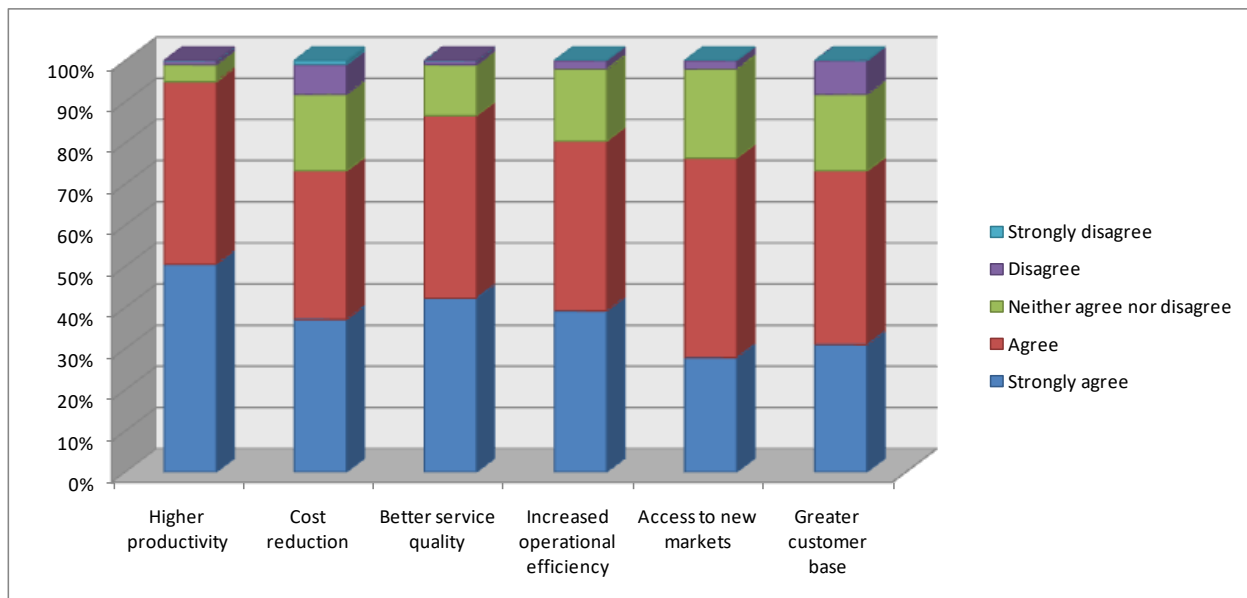


Accordingly, the statements with perceived benefits that received the most negative answers (i.e. “Strongly disagree” and “Disagree”) were “Cost reduction” and “Greater customer base” with 8 answers each. On the other side, the statements with the less negative answers were “Higher productivity” and “Better service quality” with only one reply each. The rest statements gathered 4 negative answers in total.

Neutral answers as demonstrated with the choice “Neither agree nor disagree” have a significant share in the distribution of answers. Among the statements that received the most neutral answers was “Access to new markets” with 21 answers and “Cost reduction” and “Greater customer base” with 18 answers each; while the statements with the less neutral choices were “Higher productivity” and “Better service quality” with 4 and 12 answers respectively. Overall, neutral answers represent 15.5% of the total sample.

Last, figure 34 presents visually the percentage of positive, neutral and negative answers for each statement of perceived benefits of innovation.

**Figure 34. Percentage of positive, neutral and negative answers (% of respondents)**



	% of Respondents					Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	
Higher productivity	50.5%	44.3%	4.1%	1%	0%	100%
Cost reduction	37.1%	36.1%	18.6%	7.2%	1%	100%
Better service quality	42.3%	44.3%	12.4%	1%	0%	100%
Increased operational efficiency	39.2%	41.2%	17.5%	2.1%	0%	100%
Access to new markets	27.8%	48.5%	21.6%	2.1%	0%	100%
Greater customer base	30.9%	42.3%	18.6%	8.2%	0%	100%

*Source: A1.4 INNOGROW Survey Results*

## 6 KEY FINDINGS

This section presents the main findings and conclusions drawn from the survey conducted with SMEs representatives regarding the factors that influence the factors that influence SMEs in rural areas to invest in new technologies and get involved in new collaborative models.

### **Current state of innovation**

When examining the current state of innovation among rural economy SMEs, 90% of respondents stated that their organisation has previously engaged with R&D activities or have participated in collaborative networks focused on stimulating innovation adoption at the business level. Overall, the majority of rural economy SMEs (64%) show a low level of innovation, having adopted only one or two types of innovation as part of their business strategy; the “Use of new production technologies and processes” seems to be the most common form of innovation among rural SMES, followed by “Development of new products / delivery of new services”.

### **Motivations behind the adoption of innovation**

Evidence shows that rural economy SMEs tend to invest in innovation for fulfilling their functional needs; the motivations to get functional benefits drawn from the production of new products, reduced production costs and internationalisation. In particular, the most important motivation behind the adoption of innovation for rural SMEs is the need to improve their operational efficiency. Altogether, five types of motivations underlie SMEs’ innovativeness: a) improve operational efficiency, b) access new markets, c) gain competitive advantage, d) increase client satisfaction / satisfy customer’s needs and e) increase profitability.

### **Constraints and barriers to innovation**

Rural economy SMEs experience certain limitations to engage in innovation. Evidence show that they face difficulties in accessing funding, lack sufficiently qualified personnel in-house or receive limited support from regional authorities. The factors that can be referred as “the most pronounced barriers to innovation” are those related to funding, regulation and uncertainty over business benefits. This clearly indicates that financial constraints remain one of the biggest barriers, hampering SMEs’ potential to create innovative products that will deliver added value in the

market. “Cultural and traditional issues” and “Accountability/management problems” resulted as the least important factors hindering the adoption of innovation among rural SMEs.

### **Perceived enablers of innovation**

The key enablers of business innovation can be grouped into three clusters: a) internal capacity and capability (e.g. availability of existing technological infrastructures, internal capital, employees with relevant skills), b) market structure (e.g. market potential, collaboration with other business actors across the supply chain, availability of business support) and c) the external environment (e.g. favourable regulatory framework, external funding). Overall, the regulatory framework was found the most pronounced driver of innovation, followed by market potential and employees with relevant skills. In any case, all examined factors were found to be perceived enablers of innovation.

### **Expected organizational impact**

SMEs’ representatives assume that all examined factors/statements can be potential benefits for a rural enterprise actively investing in innovative technologies or/and participating in innovative collaboration networks. In particular, improvements related to productivity, service quality and operational efficiency appear to be the most expected benefits associated with the adoption of innovation.

## 7 ANNEX A: QUESTIONNAIRE

### **What is the purpose of this survey?**

To identify the factors that influence rural economy SMEs to invest in new technologies and get involved in new collaborative models

### **Who should participate?**

Owner / Director of company, Administrative managers, Marketing managers, Sales managers, Operations managers, Staff of rural economy SMEs with important knowledge and experience in implementing innovation.

### **How long does it take?**

The estimated total time for completing this questionnaire is about 10 minutes

Thank you very much in advance for your participation and valuable contribution!

## Section A. Company profile

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1. Name of organisation/company

2. Please indicate the country of your organisation

3. Please indicate the region of your organisation

4. Please select the main focus/core industry of your organisation

- Accommodation
- Agriculture
- Animal husbandry
- Aquaculture / Fishing
- Energy and Resources
- Food and beverage service activities
- Forestry
- Manufacture of beverages
- Manufacture of food products
- Manufacture of tobacco products
- Tourism oriented transportation
- Other (please specify).....

5. Please indicate the total number of employees within your organisation/company

- Less than 10 persons employed
- 10-49 persons employed
- 50-249 persons employed
- 250 or more persons employed



6. Please indicate the annual turnover of your organisation/company
- Less than 2 million EUR
  - From 2 to 10 million EUR
  - From 10 to 50 million EUR
  - More than 50 million EUR
7. Have you ever adopted any type of innovation within your organisation?
- Yes
  - No
  - Do not know / Do not want to answer
8. Please select the types of innovation that your organisation has adopted as part of its overall business strategy (Please select all that apply)
- Use of new production technologies and processes
  - Development of new products / delivery of new services
  - Development of new market segments for current products
  - Participation in collaborative networks designed to stimulate innovation activity
  - Establishment of partnerships with other companies across the supply chain
  - Investment in R&D activities
  - Other (please specify).....

## Section B. Needs, barriers and enablers

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9. What are the main needs / objectives to support the adoption and diffusion of innovation in your organisation? (Please select all that apply)

- Improve operational efficiency
- Risk sharing
- Gain competitive advantage
- Access new markets
- Increase market share
- Increase profitability
- Increase client satisfaction / Satisfy customers' needs
- Increase control and consistency
- Reach a broader audience
- Meet legislative/policy changes
- Other (please specify).....

10. To your knowledge, what are the barriers that may prohibit the adoption and diffusion of innovation in rural economy SMEs? (Please select all that apply)

- Integration of innovations into existing processes (e.g. new production technologies)
- Availability or adequacy of existing technological infrastructures
- Uncertainty over business benefits
- Lack of own financial resources and difficulty in accessing funding from external sources
- Cultural and traditional issues (e.g. negative attitude towards technology)
- Regulation / Limited support by regional authorities
- Accountability / management problems
- Weaknesses in networking and cooperation with the innovation stakeholders (e.g. technology vendors)
- Lack of internal research and technological capabilities
- Other (please specify).....

11. To what degree would the following constitute **problems** for an organisation to invest in new technologies or/and participate in innovative collaborative networks? (where 1 means “low” and 5 “high”)

	1	2	3	4	5
Difficulties in the integration of innovations (e.g. new production technologies) into existing processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low availability of existing technological infrastructures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uncertainty over business benefits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of own financial resources and difficulty in accessing funding from external sources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural and traditional issues (e.g. negative attitude towards technology)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regulation / Limited support by regional authorities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accountability / management problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weaknesses in networking and cooperation with the innovation stakeholders (e.g. technology vendors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of internal research and technological capabilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. To your knowledge, what are the enablers that may support the adoption and diffusion of innovation in rural economy SMEs? (Please select all that apply)

- Compatibility (integration of innovations in to existing processes)
- Availability or adequacy of existing technological infrastructures
- Favourable regulatory framework (e.g. provision of incentives for innovation by regional authorities)
- Internal capital (from firm and its owners)
- Market potential
- Employees with relevant knowledge and skills
- Private, external funding (bank, investor, venture capital)
- Collaboration with other businesses across the supply chain
- Prior experience with new technology implementation
- Availability of external support (e.g. technology vendors)
- Other (please specify).....

13. To what degree would the following constitute **facilitators/enabling factors** for an organisation to invest in new technologies or/and participate in innovative collaborative networks? (where 1 means “low” and 5 “high”)

	1	2	3	4	5
Compatibility (integration of innovations in to existing processes)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability or adequacy of existing technological infrastructures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Favourable regulatory framework (e.g. provision of incentives for innovation by regional authorities)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internal capital (from firm and its owners)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market potential	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Employees with relevant knowledge and skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private, external funding (bank, investor, venture capital)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaboration with other businesses across the supply chain and innovation stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prior experience with new technology implementation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of external support (e.g. technology vendors)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section C. Benefits and impact

14. What are the main benefits to be created by the adoption and diffusion of innovation on the operations of the organisation/company? (Please select all that apply)

- Higher productivity
- Cost reduction
- Better service quality
- Increased operational efficiency
- Access to new markets / Internationalisation
- Greater customer base
- Other (please specify).....

15. Please rate your level of agreement with the following statements. The adoption and diffusion of innovation will result in....

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Higher productivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Better service quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased operational efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to new markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greater customer base	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section D. Personal information

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16. First and last name

17. Email

18. Position in organisation / company

- Owner / Director of company
- Chief Executive Officer (CEO)
- Chief Marketing Officer (CMO)
- Chief Financial Officer (CFO)
- Chief Technical Officer (CTO)
- Chief Operating Officer (COO)
- Administrative manager
- Marketing manager
- Sales manager
- Operations manager
- Other (please specify).....