

The main risk factors for rural innovation in Europe: an analysis of 200 case studies

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Abstract

Purpose – European rural development programmes are driving multi-actor interactive innovation initiatives and alliances to create an environment in which innovation acts as a tool for accelerating rural development processes. In Europe where rural areas are facing many challenges, identifying which challenges, difficulties, obstacles, or risk factors that interactive innovation projects have had to face in rural areas while being planned and set up would be interesting. The objective of this research work was to, therefore, identify and analyse the risk factors of 200 rural projects and initiatives that were selected as case studies from the whole of Europe.

Design/methodology/approach – The employed methodology consisted in conducting interviews to subsequently perform statistical independence analyses of the qualitative variables characterising the found projects and risk factors.

Findings – The findings indicated that most of the risks that rural projects and initiatives faced were related to the social domain which was, in turn, the fundamental pillar of interactive innovation. Dependence was found between social risk factors appearing and the innovation type carried out; the risk factors corresponding to the political-legal risks category and the project or initiative coordinating country; the economic-technical risks category and the initiatives' geographic magnitude.

Keywords: rural development, interactive innovation, risk management, multi-actor approach.

Paper type: Research paper

1. Introduction

Europe faces different problems and challenges that directly affect development in its rural areas, particularly in recent years, which has led farmers and the rural community to voice their various concerns (Stathopoulou et al., 2004). The main problems affecting European rural areas include: land abandonment as a result of poor soil productivity, low profitability and fierce end product competition (Lasanta et al., 2017); social problems related to economic dependence, gender inequalities and

occupational vulnerability (García González, 2013); rapid social changes, environmental conflicts and the urgent need to restructure the economic base (Moseley, 2000).

Although some rural areas in Europe are affected by these challenges, innovation comes over as one of the possible solutions to contribute to their development by starting understanding that innovation processes are essential to promote development and to produce knowledge flows that allow problem solving (Bruckmeier and Tovey, 2008). Likewise, by analysing the elements and characteristics of the regional innovation systems approach, innovation is capable of promoting competitive advantages and reducing economic differences among various areas (Asheim et al., 2011).

Strategies created to encourage innovation in rural areas, such as the European LEADER programme, enable development and quality of life to improve in these areas (Dax and Oedl-wieser, 2016). This initiative facilitates the encouragement of social relations and new learning cultures in the rural innovation field (Dargan and Shucksmith, 2008). Another example is the European Association for Creativity and Innovation (EACI) “Agricultural Productivity and Sustainability” (EACI-AGRI), created by the European Commission in 2012. EACI-AGRI promotes innovation by taking a multi-actor approach to allow actors with different supplementary knowledge types in scientific, practical or other domains to work together in the innovation process from start to finish (European Commission, 2017). According to this approach, innovation is seen as a non-linear evolutionary and iterative learning process that requires actors collaboration and intense communication between diverse knowledge sources (Van Lancker et al., 2016; Tödtling and Trippel, 2005).

Despite the importance of innovation in rural areas development, this process involves a high degree of uncertainty which, technically speaking, spells potential risks. Although the word risk generally has the downside in mind (Hillson, 2002), it is a term associated with an uncertain event or condition that, if it occurs, has either a positive or negative effect on a project objective (Project Management Institute, 2000). Researchers have indicated that risk is the situation with a latent probability of possible outcomes and uncertainty occurring (Knight, 1921). According to PMI, unlike “issues” which are events that have already occurred, risks are a potential issue that may or may not occur (Project Management Institute, 2010). Risk is also defined as the expected result of an uncertain event or series of circumstances that, if they should take place, can affect project objectives being met or not.

Identifying and managing risks in innovation processes is one of the most challenging tasks, and also a necessary one to solve the different problems that innovation projects face in the rural domain (Batkovski et al., 2015). Due to a considerable degree of uncertainty regarding future results in projects, risk management tasks are the most demanding in project management in innovation projects with multi-actor interactions (Suárez et al., 2021). A basic understanding of the multi-actor, is the bottom-up method (Fieldsend, Cronin, et al., 2020). It is allowing things to emerge rather than pre-conceiving or dictating, and watch it play out in order to get the interaction going. However, this type of approach is not exempt from presenting drawbacks associated with biased results, inaccurate decisions, or lack of participation structures by the various actors involved (Koopmans et al., 2018; Navarro et al., 2016), generating different types of risks that may affect the development of the tasks carried out.

More globally, Bornhofen et al. (Bornhofen et al., 2019) point out that the world’s countries have different levels of vulnerability to risk because of certain factors like: degree of development, infrastructure, governance, among others. This means that factors exist and can possibly increase the probability of a risk occurring. For this reason, during the last few years, several researchers have focused their efforts on identifying and analyzing the risks in multi-actor innovation initiatives in

rural areas (Florian and Tudor, 2015; Ghadim *et al.*, 2005; Suárez *et al.*, 2021; Viganó and Bonomo, 2007).

Presently there is no overall classification of projects' risk factors for innovation because each project is unique. Thus individually determining risks and their risk factors are considered key given their negative potential for projects (Batkovskiy *et al.*, 2015). Williams *et al.* (1998) (Williams *et al.*, 1998) indicate that causes of risks can be classified depending on the area where they appear: physical, social, political, operational, economic, legal, and cognitive. Along these lines, risks can also be classified according to different aspects. However, each organisation defining categories according to its requirements is believed to be more appropriate (Royer, 2000).

The main activity of the population living in rural areas is agriculture, which is considered a high-risk activity (Anderson, 1979; Anderson and Dillon, 1992; Tinnermeier *et al.*, 1982). From it stem the impacts of risk on rural development, which are truly omnipresent, and the task of all the agents at all levels to face these impacts is enormous (Anderson, 2003).

In remote rural places, inhabitants' innovation capacity varies according to the specific characteristics of these regions, such as accessing education services, advice, or research (Läpple *et al.*, 2016), and this access is often limited. This makes the connections among a region's internal innovators, as well as external actors, the key to make the necessary knowledge flow to trigger innovation (interactive innovation). To facilitate local links among actors, a practical implication that bears in mind, among others, how to perceive and manage a risk is essential. Farmers must generally face an endless list of uncertainties and risks related to aspects like the interaction among financial sector instruments, local farming systems, climate, infrastructure, policies and institutional frameworks (Anderson, 2003). Guiding farmers and growers in risk management will help them to better adapt to changing environments, and to also fulfil their objectives (Kostov and Lingard, 2003), by generating a more resilient rural society to face adversities. By properly identifying risks in interactive innovation projects, it is possible to centre on improving the way the actors inside and outside the project interact by creating farmers' resiliencies and strong points, especially if we bear in mind that this rural group faces a wide range of production, financial, legal and market risks (Huet *et al.*, 2020) that are often related to institutional, economic, social and climate factors (Swami and Parthasarathy, 2020).

This study aims to identify the main risk factors and how they impact innovation processes using the geographic and technical characteristics of each initiative and analysing the data of 200 rural innovation case studies from all over Europe. This study is based on a European initiative called LIAISON in which, by means of a series of interviews held in relation to interactive innovation initiatives in the whole of Europe, it is possible to identify the main challenges and bottlenecks that emerge while they are underway. The results obtained from the interviews reveal that social risks more frequently affect the evaluated initiatives, and are followed by technical, economic, and political risks. The main encountered risks for each case were respectively associated with strong political opposition, technical problems, and lack of partner commitment. Statistical independence analysis was also performed between the project's descriptive variables and the associated risk factors, which gave three main findings: (1) the relation between political risk factors and the region coordinating the project; (2) the relation between economic-technical risk factors and the initiative's geographic magnitude; (3) the relation between social factors and the innovation type being carried out.

2. Methodology

Based on the results obtained from the interviews conducted within the framework of the LIAISON Project, literature was searched for issues of innovation projects that followed the same line in order to relate them. According to the issues found and interviews, a classification was made

of the main risks that could affect the projects studied, to finally perform a statistical analysis between the main risks and the descriptive variables of the project (coordinating region, domain, type of innovation, gender balance, geographic magnitude) by means of an analysis of independence.

2.1 Research Context

The study framework lies in the activities and results obtained by the LIAISON Project. LIAISON is an international project financed by the European Union that aims to optimise the interactive innovation processes and networks in agriculture, forestry and rural areas (European Commission, 2021). LIAISON brings together multidisciplinary professionals and researchers from 15 countries all over Europe and examines “interactive innovation” and the “multi-actor approach” concepts. Researchers, political advisers, promoters of projects and interactive innovation networks, agricultural and forest counsellors, and heads and managers of decision making, jointly investigate the design and set up of interactive approaches. This research work falls in line with the methodology and analytical framework proposed by Fieldman et al. and Cronin et al. (Fieldsend et al., 2021; Fieldsend, Cronin, et al., 2020).

2.2 Sample Selection

The case study worked with 200 innovation initiatives, which were selected according to previously established criteria, which allowed the sample to be as representative as possible (Fieldsend et al., 2021; Fieldsend, Cronin, et al., 2020). The initiatives have been associated with forestry, rural, agricultural and rural development sectors. Samples were obtained mainly from two sources. One was based on EU databases by searching for keywords, which gave 1,375 possible candidates. The second source, whose intention was to identify less formal innovation initiatives, involved an EU Rural Innovation Call called EURIC organised by the LIAISON project. For participation in EURIC to be high, diffusion activities were performed by farming, political and rural advertising means within EU States, which gave 200 possible candidates from 26 countries. The selected projects had to pass five “key tests” to be selected for the study: a) direct relevance of the co-innovation activity theme for agriculture, forestry or similar sectors; (b) being able to demonstrate an association among many actors; (c) professionals’ substantial participation in the innovation process “throughout the project”, preferably as part of the consortium or association; (d) having a clear intention to innovate; (e) the quality of the activity’s description.

The selection and review process were performed by the LIAISON project team, which is made up of 17 partners from 15 countries, by means of stratified sampling to ensure the diversity of co-innovation activities. In all these countries, the procedure followed to acquire information from projects was an interview called “Light touch review” (Fieldsend, Rønningen, et al., 2020). This allowed the information from project’s interactive innovation practices to be identified, collected, and reviewed by the widespread methodology developed by Fieldman et al. (2021). During these semi structured interviews, representatives from all the projects were interviewed to acquire information by identifying challenges, perceived failures and success stories. Each of the representatives interviewed were or continue to be direct participants in the projects. According to the analytical framework proposed by Fieldman et al. (2021), the present research is based on two questions asked during the interview process: (a) “What is/was the most significant bottleneck or challenge during the project? (b) How is/was it addressed? All 17 partners held about 12 interviews while the project was underway during the May-July 2019 period. Each interviewed lasted approximately 1 hour.

Interviews also allowed to obtain further information to characterise the sample (Table I), such as: coordinating region, domain, innovation type, gender balance and geographic magnitude.

Table I. Characterisation of the study samples.

2.3 Literature Review

For this paper, we analyzed the risks that could affect the projects and initiatives covered in this study based on issues identified in similar projects. According to the results obtained from the survey, and with the help of the state-of-the-art research from platforms like Elsevier, ScienceDirect and Scopus, and with keywords related to the management and identification of issues in rural areas, different factors associated with the answers provided during interviews were found, and allowed the information obtained with the questionnaires to be related to previous research findings. The criterion set for this was to match interviewees' answers with the issues that came closest to their description.

To facilitate the identification of the information, a classification was chosen for both the analysis of the state of the art and the results, according to the most important aspects that affect the development of an innovation project in the rural environment, as other authors have done in previous researches (Bing *et al.*, 2005; Boateng *et al.*, 2015; Ongkowitzo and Doloi, 2018; Santalova *et al.*, 2015; Suárez *et al.*, 2021; Zou *et al.*, 2008): social, economic, environmental, political, technical, legal and innovation factors. A need to create and include other factors to better reflect the conflicts identified in projects (RF11, RF12, RF23, RF30) was also encountered (See Table II).

The social category includes those consequences that centre on social performance and behaviour, and they go beyond the traditional project management view, which focuses mostly on aspects like time, cost and quality (Yu *et al.*, 2017). The factors in this category are closely related to the management performed by interested parties because conflicts come about and are normally associated with them (Shi *et al.*, 2015). Economic factors are related to high costs and available funds (Lukale, 2018; Mei-ni and Xue-ping, 2014). Environmental factors also play a key role and are related to unfavourable climate conditions, force majeure events and adverse environmental effects like pollution (Boateng *et al.*, 2015). Political threats include all government changes, such as laws, regulations and policies, and administration systems' improper management (Zavadskas *et al.*, 2010). The technical category covers those factors related to modifications and planning mistakes (Neumeier, 2017). The legal aspect is related to a rising taxes and rights, changes in exchange rates, inflation or changes in legislative and normative-legal actions in the beneficiary country's investment (Malakhovskyi *et al.*, 2019). Finally, the innovation category includes all conflicts to do with R&D in rural areas (Gaukhar *et al.*, 2019).

Table II. Categories and issue factors identified with the state-of-the-art analysis

2.4 Independence Analysis

In order to identify the dependence of the different initiatives' parameters with the risk categories of the projects analysed in this investigation, the independence between the projects' descriptive variables (region, domain, innovation type, gender balance, geographic magnitude) and the risk categories related to these variables was analysed. The intention of a Chi-squared test for independence (χ^2) is to determine if a pair of qualitative variables are independent or not (Mchugh, 2013). This allows the identification of those dependence cases that allow any relation among the evaluated parameters. The higher the χ^2 value is, the less likely the null hypothesis is correct. Likewise, the closer it comes to zero, the better the fit of both distributions.

3. Results and Discussion

3.1 Descriptive Analysis of the Risk Factors

The most recurrent risk factor (34 initiatives) found during interviews (see Figure 1) was RF7 (17%): “Lack of partner commitment”. It is interesting to note that it is the most frequent risk factor to appear because it represents a fundamental aspect of the multi-actor approach in interactive innovation. This can be taken as a warning about lack of effectively implementing this approach, particularly in relation to actors being committed to initiatives. The next most frequent risk factor was RF9 (13%): “Social or cultural problems” with 25 related initiatives. In third place came RF24 (9%), related to the technical risk category and to “Technical problems”, with 17 projects.

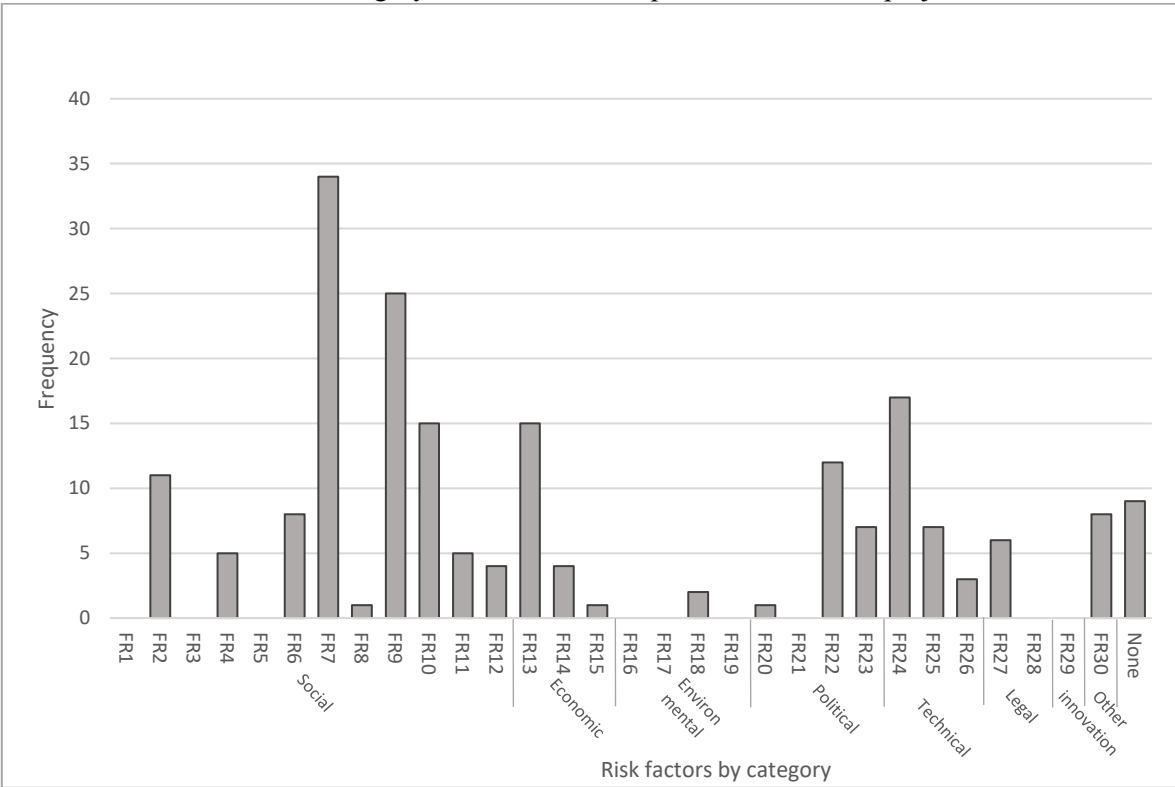


Figure 1 Frequencies of the found risk factors.

From the results in Table III, the risk category with the most related risk factors is the social one with 108, followed by the technical risk factors category (27), economic (20) and political (20). We can also see how, despite being initiatives with a high innovation component, no innovation risk factors were related to this category. The environmental risk factors also obtained a low-risk incidence in the evaluated initiatives with only two identified risk factors.

Table III. Frequency of risk factors per category.

If we consider that interactive innovation takes a multi-actor approach, it is interesting to find that, despite the social aspect being a fundamental pillar for relationships among actors (European Commission, 2017), it is, in turn, one of the challenges that our sample study is avoiding the most. Thus, attention must be paid to the initiatives that the EU puts into practice with multi-actor approaches because, in practice, applying such an approach may incur in social problems. According to these data, associated strategies must be adopted to involve actors in decision making and to

establish a relationship with them so they play a more committed role in rural development in the future (Kasemir et al., 1999). This vision falls in line with the need to improve different actors' participation, coordination and commitment beyond their own interests in fulfilling objectives (University of Cape Town and United Nations Institute for Training and Research., 2006). It also backs the importance of focusing on and paying attention to the risk factors related to the project's social domain because the risks in the social category normally come about through conflicts with actors or interested parties (Shi et al., 2015).

3.2 Independence Analysis Between the Risk Categories and Descriptive Variables of Innovation Cases

The results of the statistical independence analysis between the risk categories and the project's descriptive variables, identified that independency should be rejected for a confidence level of 0.05 between the following variables: (1) political-legal risks with the coordinating region; (2) social risks with innovation type; (3) economic-technical risks with geographical magnitude. For the first case, the greatest dependence appears for all the performed statistical tests with a P-value of 0.002. This evidence a close relation in the evaluated rural initiatives between the coordinating region and the related political-legal risks. Moreover, the statistical analysis indicates important relations, with P-values of 0.025 and 0.046, between the project's innovation type to social risks, and geographical magnitude to technical-economic risks, respectively. For the three obtained dependence results, the incidence of the risks for the descriptive variable is quantified.

a) Relation between the social risk factors and innovation types

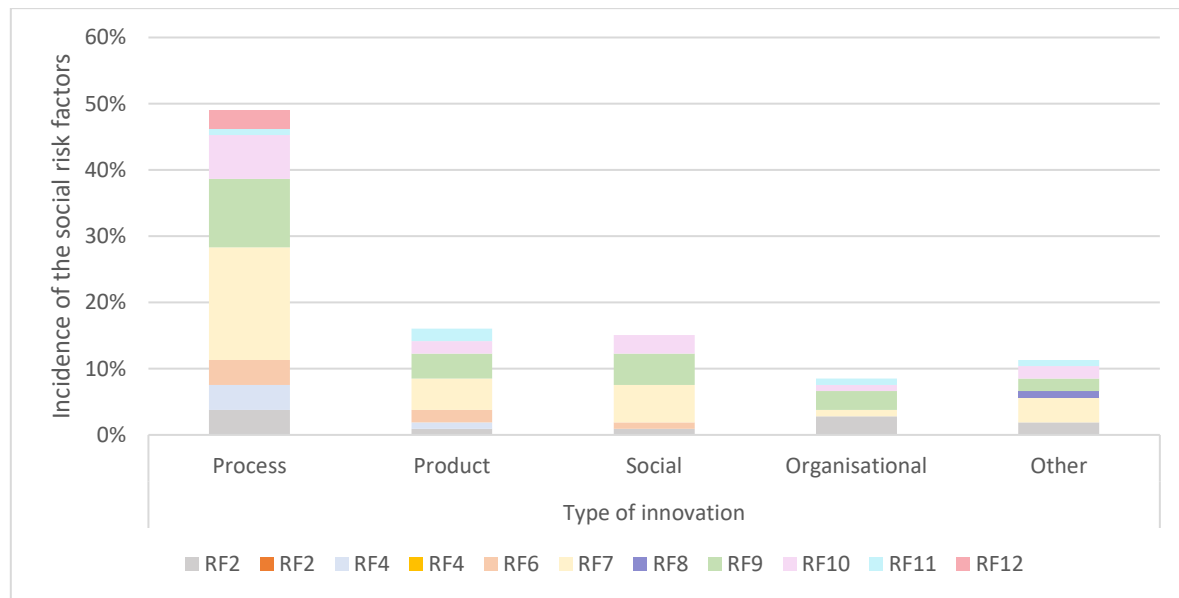


Figure 2. Distribution of the social risk factors according to innovation type.

The first case evidence how the Processes innovation type has more related social risk factors, with 49%. For this descriptive variable, “Lack of partner commitment” (RF7) is the most frequent risk factor with 17%, followed by Social or cultural problems” (RF9) with a 10% incidence. The following innovation types related to social risks obtain lower incidence percentages: product (16%) and social (15%).

The Process innovation type aims to adapt to the initiative's operational, maintenance or operations management processes to make technology use more efficient. Although optimising agricultural and forestry processes could generate considerable benefits for the rural population, as previously mentioned, the risks related to its implementation are really very high, mainly because of lack of partner support and any socio-cultural drawbacks that this can result in. Based on these findings, quite understandably rural communities often prefer to continue with their traditional processes and avoid setting up new implementation techniques.

On product innovation, there is evidence for the production and commercialisation of new products in rural areas still involving related risks. In this case, and as with processes, lack of partner commitment and socio-cultural problems are the main risk factors that affect the innovation process of new products in the rural setting.

Despite initiatives marked social component and the different interactions between initiatives' various actors, it is striking to note from the obtained results that the innovation type with the most related risk factors is processes and not the social type. Social innovation aims to help communities to respond to local problems, make sustainable changes and react to environmental, economic and social challenges (Kirwan et al., 2013). According to this definition and the results offered in Figure 2, we can see why innovators are exposed to a higher risk in the processes generating logistic and technological changes to those approaches that focus occasionally on social development.

Finally, and given its less than 10% incidence, associated risks with organisational innovation come over, which implies creating or changing business practices, organising the workplace or external relations (Shohreh Soltani, 2012). In this case, "Lack of organisation and coordination risk" (RF2) is the main risk to prevail in this innovation type.

b) Relation between the political-legal risk factors and the coordinating region

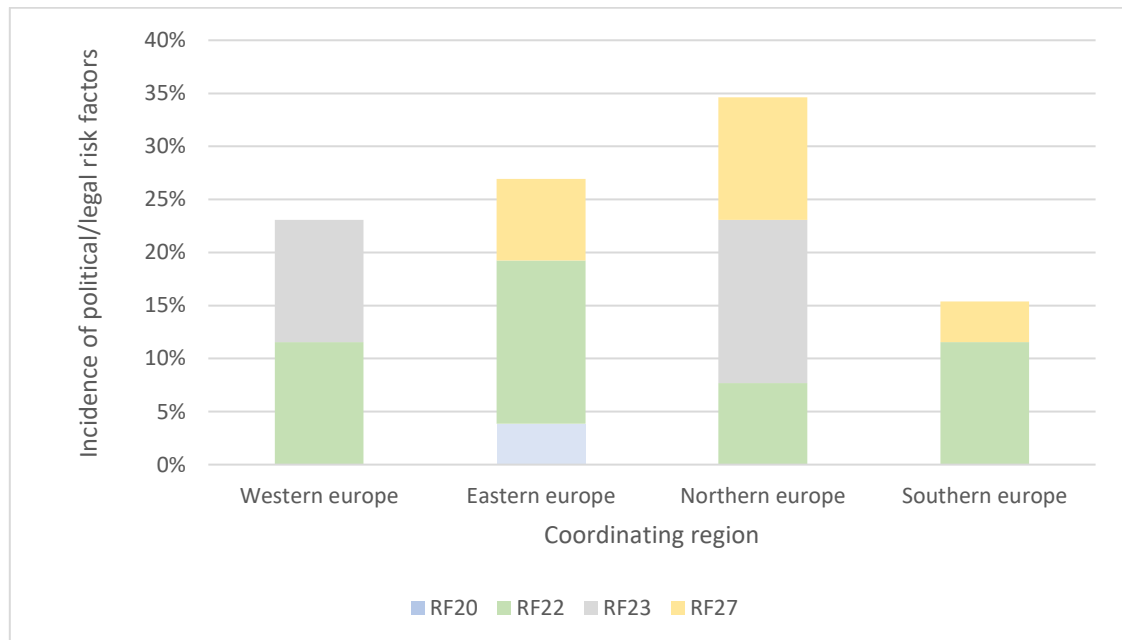


Figure 3. Distribution of the risk factors according to the coordinating region.

The performed independence analysis shows that the political-legal risk factors are closely related to the region that the initiative belongs to, each region generally has its own legislation that does not have to coincide with the countries forming part of the innovation process. Binswanger

(Binswanger, 1980) demonstrated that, as public policies can affect low-income farmers, it is important to stress how appropriate a political-legal factor is for each region in interactive innovation initiatives. So, it would be worthwhile reviewing the legislation of coordinating region before starting to undertake new rural projects as the obtained results indicate that neither incidence nor risk factors coincide in the different evaluated EU countries.

The risk factors with the highest incidence are “Political opposition/hostility” (RF22) with 46%, “Excessive administrative regulations/management” (RF23) with 27% and “Change in legislation” (RF27) with 23%, present in eight, seven and five countries, respectively. The “Unstable government” risk factor (RF20) is occasionally linked with only one of the countries included in this study: Bulgaria.

With the results obtained for the second case (see Figure 3), Northern Europe, conformed by Sweden, Estonia, Ireland, Lithuania, Norway, United Kingdom, and Ireland. is identified as the region with the most related political-legal risk factors with 35% of all the results. This is a somewhat unusual result because of the advanced development of their political systems and measures, which encourage rural development. However in countries like Norway, where huge efforts are made to set up rural measures, innovation and entrepreneurship have not developed so much, mostly because many Norwegians prefer to live in urban areas (Nastase and Lucaci, 2011). Todtling and Trippol (2005) agree that the peripheral regions of Northern Europe have limitations associated with geographical distance, sparse population and a weak development of innovation support institutions that focus on providing advice and monitoring the legal procedures faced by the rural population in this region (Tödtling and Trippol, 2005).

In second place, with 27%, is the Eastern European region, where countries such as Hungary and Bulgaria stand out. Here the results indicate strong opposition and political hostility towards rural innovation initiatives. After analysing the Hungarian system, and despite improvements in the rural environment’s situation in recent years, the controlling institutions are still named by those in power and the State. Hence those actors excluded from politics and state mechanisms are excluded from rural development (Bell et al., 2010).

In the third tier, with 23% of the associated risk factors, is the Western European region, consisting of Austria, Belgium, Switzerland and the Netherlands. In the case of the Netherlands and Austria, where space and land is extremely scarce, governmental organizations and the rural population are constantly confronted by the interest generated by land use (Aarts and Woerkum, 1999), mainly due to excessive administrative regulations applied by public administrations.

Lastly, with 23%, is the Southern European region, comprising Spain, Italy and Portugal. In Portugal, for example, risks in rural areas stem from the unemployment and depopulation witnessed in these areas. That’s why political programmes based on new development opportunities to attract investments, create jobs and allow innovation with local resources is important (Almeida, 2017). According to Maroto-Maroto et al. (2020), for south European countries, changes in legislation and political opposition risks might be related to rural development management being understood to supplement the traditional agricultural policies deriving from economic, social and territorial cohesion for society (Maroto-Martos et al., 2020).

c) Relation between the economic-technical risk factors and the geographic magnitude type

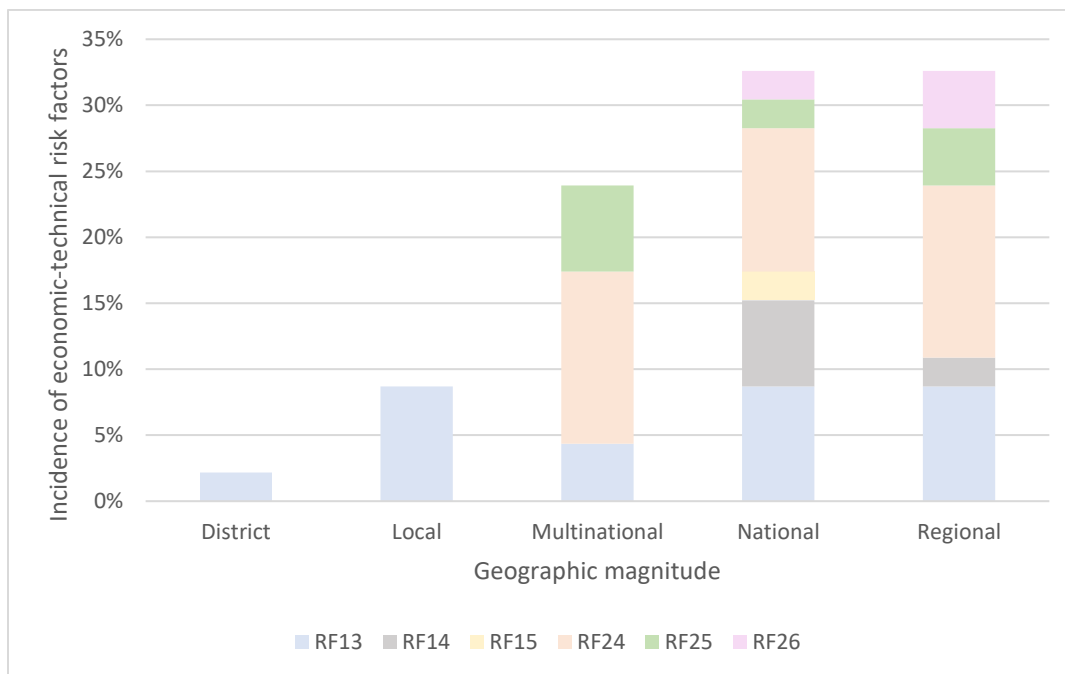


Figure 4. Distribution of the risk factors according to the geographic magnitude type.

Figure 4 evidence how the economic-technical risk factors mostly fall in national and regional areas, and the risk factor “Technical problems” (RF24) is the main cause of conflict in both cases, followed by “No available economic funds” (RF13). Next come multinational initiatives, on which “Technical problems” have a strong influence. “No available economic funds” is the only risk factor present in all the evaluated geographic magnitudes.

In district and local terms, the incidence of the risk factors is quite low with 2% and 9%, respectively. This might make sense because local magnitude initiatives generally have low budgets and simpler management processes than those developed on a larger scale. With multinational initiatives like Horizon 2020, projects tend to have stricter financing mechanisms, mainly because resources are intended for foreign countries for which both control and follow-up are more difficult to monitor. This means that initiatives’ budgets and technical specifications may sometimes need to undergo complex controls, which become risk factors for projects.

Although for this research we have emphasized and analyzed risks on the downside as mentioned above, risks can also have a positive effect on projects, so that they are not always seen as threats, but also as opportunities.

4. Conclusions

Interactive innovation acts as a way towards European rural development through much effort and has allowed this innovation approach to be set up and applied to different projects and initiatives in several rural areas. Nevertheless, several risks have been identified that can negatively affect innovation type. This study allowed to confirm the hypothesis that most of the risks faced by rural initiatives that take an interactive innovation approach are related to the social domain, specifically “Lack of organisation and coordination”, “Lack of partner commitment”, “Social or cultural problems” and “Lack of communication”. This social aspect is extremely important for undertaking innovation initiatives because social interaction allows new information flows among the various involved actors to generate new knowledge. So, it is worthwhile recommending the adoption of strategic social work plans for the different programmes supporting rural development in Europe

when calls are announced to subsidise such initiatives with this approach because, when promoting interactive innovation initiatives, the involved actors can come from distinct cultural and social settings. Bearing in mind that the four previously indicated risk factors (RF2, RF7, RF9 and RF10) cover 79% of the social category, having strategies to form cooperation links among actors and to improve management could be a solution to counteract the identified risk factors, especially those related to the process innovation type.

This work also notes that, despite not having the same incidence as social risks (54%), technical (14%), economic (10%) and political (10%) risk factors also come into play. Here we find that the projects and initiatives undertaken at a lower geographic magnitude (i.e. local or district-based) tend to present fewer technical-economical risk factors, unlike projects undertaken on a multinational or national scale, which generally involve more complex budget/technical controls that makes their control and follow-up more difficult. In the technical-economical risk categories, the risk factors related to the problem of not covering the project's scope owing to "Technical problems" (RF24) and "No available economic funds" (RF13) are the most predominant ones in the 200 evaluated case studies.

Additionally, the findings indicate that political-legal risk factors depend on the region to which the project belongs to a great extent. For Northern Europe we found that the risk factor related to excessive administrative regulations/management (RF23) are the main causes that affect the development of rural innovation projects. The regions of Eastern and Western Europe also have a high level of risk factors, but in this case mainly associated with political opposition/hostility (RF22).

Finally, it would be interesting to set up a "help table" to bring together the problems and solutions set out in the 200 initiatives that formed part of this study. This would contribute to the create a database for whoever wishes to investigate how similar problems have been solved in other projects and initiatives. Nevertheless, the results of the present research indicate that there is still a long way to identify the risks faced by rural initiatives that adopt a collective innovation approach, focusing not only on those that generate threats but also on those that can provide opportunities for the projects.

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