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ARTICLES / TANULMÁNYOK

Smart development for peripheral areas. A never-ending story?

Okos fejlődés vidéki területeken. Végtelen történet?

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KEYWORDS: smart development; peripheral areas; innovations

ABSTRACT: Many European countries have implemented development policies for regions and territories in order to contribute to their growth and reduce inequalities. The EU has developed policies for cohesion and smart development which aim to promote the growth of all territories and reduce the gaps between them. The implementation of those policies raises questions about the place of and role of peripheral areas in terms of development. Will they remain under-developed regions, lagging behind? Or are they able to participate in overall development processes? The topic of our paper is an exploration of smart development for peripheral areas, and more especially, rural areas, in Europe. The question arises as to whether these areas are, despite their handicaps, capable of meeting the challenges of development, and most of all of satisfying the conditions for a smart development process. In order to address the question of the development potential of peripheral areas, we start by presenting the European policies of cohesion and smart development, before highlighting the limits of their acceptance by local people. We then show that there are other types of territorial innovations than those identified in the most well-known policies, and finally we propose development strategies for a particular type of peripheral area: rural territories.

We found that even while the development policies devoted to these territories have multiplied over the last thirty years, the inhabitants of peripheral areas very often feel dissatisfied with their situation and express their opposition through extreme votes or public demonstration. One of the major reasons for this growing gap between the proliferation of EU policies and the dissatisfaction of the population is that innovations and novelties coming from these areas are rarely considered and encouraged by the current policies. The latter attach too great an importance to technological dimensions and are mainly directed towards industrialized and densely populated areas, whereas innovations stemming from peripheral territories, which are very real, are concentrated primarily in the social, institutional, and organizational fields. In the end, many policies are disconnected from the needs, the will, and the skills of local populations in peripheral areas.

In order to avoid these problems and to reduce the obstacles on the development paths of peripheral areas we advocate policies that are better adapted to these territories and which seriously consider their innovative character. The case of rural areas in Europe provides interesting insights because it shows that a mix of 'traditional'



and more social and institutional policies is possible, and that various mixes can be adapted to the peculiarities of these regions; from peri-urban areas to remote agricultural or forested lands. In any case, it is important to stress that the measures that are applied must be adapted to the respective characteristics of the different categories of territory and not be based on a catalogue adaptable to any type of peripheral areas. It is at this price that we may avoid the disjunction between the different territories of the EU and the appearance of zones of separatism, or even the dislocation of the European community.

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KULCSSZAVAK : okos fejlődés; periférikus térségek; innovációk

ABSZTRAKT : A növekedés és az egyenlőtlenségek csökkentése érdekében számos európai ország vezetett be regionális és területi fejlesztési politikákat, s az Európai Unió is elindította a kohézió és az okos fejlődés politikáit, amelyek a területi növekedést és a területi különbségek mérséklését célozzák. E politikák megvalósítása felveti azt a kérdést, hogy a periférikus területeknek hol a helye és mi a szerepe a fejlesztésben. Vajon fejletlen, elmaradott régiók maradnak? Vagy képesek arra, hogy bekapcsolódjanak az általános fejlődési folyamatokba? Tanulmányunk az okos fejlődés lehetőségeit tárgyalja Európa periférikus vidéki térségeiben. Az a kérdés, hogy ezek a térségek, minden hátrányuk ellenére, képesek-e válaszolni a fejlődés kihívásaira, s leginkább, hogy képesek-e megfelelni az okos fejlődés feltételeinek. A periférikus térségek fejlődési potenciáljára vonatkozó kérdések megválaszolását a kohézió és az okos fejlődést célzó európai politikák bemutatásával kezdjük, majd rámutatunk e politikák lokális elfogadottságának korlátaira. Ezt követően bemutatjuk, hogy a területi innovációnak más típusai is léteznek, mint azok, amelyeket a leginkább ismert politikák azonosítanak, s végezetül javaslatot teszünk a periférikus térségek egy sajátos típusa, a vidéki területek fejlesztési stratégiáira.

Azt tapasztalhattuk, hogy miközben az e területek fejlesztésének szentelt politikák az elmúlt harminc év alatt megsokasodtak, a periférikus térségek lakói gyakran elégedetlenek a helyzetükkel, és szembenállásukat a szélsőséges pártokra leadott szavazatokkal vagy tüntetésekkel fejezik ki. A burjánzó uniós politikák és az elégedetlenség közötti növekvő távolság egyik legfontosabb oka az, hogy az ilyen térségekből érkező innovációkat és újdonságokat a mindenkori politikák ritkán veszik tekintetbe és ösztönzik. E politikák túl nagy jelentőséget tulajdonítanak a technológiai dimenzióknak, és leginkább az iparosodott és alacsony népsűrűségű térségekre irányulnak, miközben a periférikus területeken elinduló, ténylegesen létező innovációk elsősorban a szociális, intézményi és szervezeti szférákban jelentkeznek. A végeredmény, hogy számos politika nem találkozik a periférikus vidékek lakóinak igényeivel, szándékaival, tudásával és képességeivel.

Annak érdekében, hogy ezeket a problémákat elkerüljük és mérsékeljük a periférikus vidékek fejlődési útjában álló akadályokat, olyan politikákra teszünk javaslatot, amelyek jobban alkalmazhatók e területeken, és komolyan figyelembe veszik innovatív természetüket. Az európai vidéki térségek példája érdekes belátásokat kínál, mert rámutat arra, hogy lehetséges a „hagyományos”, valamint a szociális és intézményi politikák ötvözése, és hogy ezek különböző egyvelege a városkörnyékektől a távoli mezőgazdasági és erdőszült területekig könnyen igazítható e régiók sajátosságaihoz. Fontos továbbá hangsúlyozunk, hogy az alkalmazott mérési eszközöknek alkalmazkodniuk kell a különböző területek mindenkori sajátosságaihoz, és nem alapulhatnak egy olyan katalóguson, amely a periférikus vidékek összes típusára ráhúzható. Ezen az áron kerülhetjük el az Európai Unió különböző területei közötti megosztottságot és a szeparatizmus zónáinak megjelenését, vagy akár az európai közösség működéséptelenségét.

Introduction

The issue of regional or territorial development has become an important topic of debate in a context of uncertain growth, significant inequalities, and environmental and biodiversity concerns. It is part of a historic movement of decentralization policies at the global level and might also be considered a response to a demand for participatory democracy and participation stemming from local populations. Many countries, especially at the European level, have implemented development policies for regions and territories in order to contribute to their growth and reduce inequalities. The EU has been moving in this direction and has developed policies for cohesion and smart development which aim to promote the growth of all territories and reduce the gaps between them (European Commission 2022; Foray 2018).

The implementation of those policies and the constant concern about social and spatial inequalities between various types of areas and territories raise questions about the place and role of peripheral areas in terms of development. Will they remain under-developed regions, lagging behind? Or are they able to participate in the overall development processes? The topic of our paper concerns the exploration of potentially smart development for peripheral areas, and more especially, rural areas in Europe.

To provide an answer to this question, one must first provide a definition of peripheral territories and their possible difference from more central areas which are suffering less from developmental delays. A rapid survey of the factors used to define the peripheral regions reveals that there is little research on the relations of center and periphery, and that the theorization of the notions of central and peripheral regions is largely absent in the literature. Some works mention geographical factors; most typically transport costs due to lower accessibility. Other factors are demographic dimensions like low population density and population aging and decline (Eder 2019). A third explanation is linked with economic factors: the lack of support infrastructure, weakness of human capital or R&D expenditure, and the dominance of traditional industries or agriculture (Pinto, Esquinas, Uyarra 2015; Trippel, Asheim, Miorner 2016). However, only few publications consider peripheral areas from the geographical point of view, and researchers prefer to base their analyses on a combination of economic, geographic, and more rarely, demographic factors (Soursa 2007; Melancon, Doloreux 2013; Dubois 2015; Torre, Wallet 2020).

In this paper, we will consider that peripheral regions are characterized by low technological innovation capacity because of the absence of conventional innovation drivers in these areas, and that they are deficient in at least one of the following domains, generally considered highly conducive to innovation activity:

- High-level skills in research and development linked to the weakness of public and private laboratories and R&D departments of large companies;

- The concentration of talent and presence of a creative class – which generate many inventions and innovations, and are sources of increased knowledge – specially compared to in big cities;
- Transport and communication networks: these areas seem isolated and difficult to access;
- Size and characteristics of market demand: The small size of local communities does not allow for the creation of adequate market demand;
- Presence of a network of skills and potential partners: this other effect of small population size leads to the low density of enterprises and related activities;
- Access to finance for innovative projects and to land for economic development: here again, this is related to population density, transaction volumes, and availability of resources.

The question then arises as to whether these areas are, despite their handicaps, capable of meeting the challenges of development, and most of all, of satisfying the conditions for a smart development process. In order to address the question of the development potential of peripheral areas, we will proceed in four steps. We begin by presenting the European policies of cohesion and smart development, before highlighting the limits of their acceptance by local people. We then show that there are other types of territorial innovations than those identified in the most well-known policies, and finally we propose development strategies for a particular type of peripheral area: rural territories.

The EU's Cohesion and Smart Development policies

The EU's Cohesion Policy started in the late 1980s based on the idea that the market forces are not necessarily sufficient to significantly reduce regional disparities. The fund's development programs are designed for EU regions that are backward or facing structural difficulties, to use the official terms (OECD 2012; European Commission 2014, 2022). The EU created this instrument of financial solidarity between Member States with the aim of improving the competitiveness of growth-lagging regions and correcting regional imbalance. The goal has always been to reduce regional disparities, restructure regional economies, create jobs, and stimulate private investment in these areas. Given the very sensible addressing of the issue of the unequal distribution of wealth, the general objective is to stimulate the levelling up of the least developed countries/regions. The question whether these cohesion policies really help to reduce (or rather accentuate) disparities is a key issue in the literature, with arguments in favor of one or the other, whereas the spatial heterogeneity of regional growth questions the design of the territorial development policies.

A good part of European policies, including cohesion policy, have taken a territorial turn since the 2010s, starting in the programming period 2014–20 after criticisms addressed at the Lisbon Strategy – which aimed to make Europe the world’s leading technological power – and in particular following the Barca report (2009). The diagnosis of this policy revealed several limitations (Giannitsis 2009) and led to a movement towards the territorialization of EU cohesion policy (Bourdin 2019). In particular, the new approach points to the fact of the smaller share of European regional economies composed of high-tech and R&D-intensive sectors, and also the fragmentation of R&D efforts which have prevented the emergence of critical mass effects and of localized learning processes. They also put the stress on the lack of attention to the differences between the various regions and territories of the EU, and to the failure of a ‘one-size-fits-all’ technology development policy. In addition, many of the policies implemented by EU public authorities to promote convergence between the economies of European states (such as ERDF programs) have been unable to prevent processes of marginalization and are now sharply criticized, and funding for these programs has been significantly reduced (Camagni, Capello 2013; Berkowitz et al. 2015).

The modern approaches to territorial development have taken into account the key role of geography in policies targeting economic growth after the failure of the Lisbon Strategy (Varga 2017). European regional policy has been reoriented (Barca, McCann, Rodríguez-Pose 2012; Bachtler et al. 2017) around the idea that competitive advantage is created and sustained through a highly localized process. The result has been huge reflection about the specific factors that lie at the origin of competitive advantage, such as the quality of human capital, the presence of infrastructure related to knowledge, and the existence of networks and clusters (Capello, Nijkamp 2019; Crescenzi, Rodríguez-Pose 2012). All these factors have reinforced the idea that territorial and local policies should be conceived and applied at the regional level (Lagendijk 2011).

The principles for a new development policy have been defined, distinguishing between ‘core’ regions with the capacity to create generic R&D activities thanks to the presence of research laboratories, and ‘periphery’ regions, which are more oriented towards specialized knowledge domains related to external partners. Thanks to the research in regional science and regional development (Capello 2019), the core vs. periphery distinction gradually gave way to place-based considerations and to the adoption of an approach to development that looks beyond activities related to technological domains and R&D processes (Carayannis, Rakhmatullin 2014). So-called Smart Specialization Strategy (S3) or policy differs from previous ones in that it takes greater account of knowledge networks and spatial dimensions, as well as regionally specific modes of governance. As McCann and Ortega Argilés (2013) stated, there has been a shift from a “narrow sectoral and science-based R&D way of thinking about innovation”

to a policy “developed into a more multi-dimensional policy approach involving matters of institutions, geography and linkage development.”

According to the European Commission, S3 thus leads to a more comprehensive set of development objectives and encourages regions to build their innovation strategies both on the basis of existing structure and according to the potential for diversification. This approach, which now tends to characterize European policies (McCann, van Oort 2016; Radosevic et al. 2017), emerged from the work of a group of researchers of the economics of innovation conducted for the European Commission as part of the ‘Knowledge for Growth’ expert group (Foray, David, Hall 2009; Foray 2014). The basic principles have gradually been defined and refined. From an analytical point of view, they are essentially linked to selection criteria based on the following three concepts: embeddedness, connectedness, and related variety, or relatedness.

The concepts of embeddedness and connectedness underlie the idea that activities selected to benefit from specific development programs should not be selected solely on the basis of their level of excellence. They must be linked to other activities located upstream and downstream of value chains with strong ties to the local environment. This type of linkage can generate network externalities, which promote growth by means of external effects, and are likely to boost the regional network and stimulate a virtuous growth cycle thanks to activities that have critical mass in sectors in which the region has competitive advantages. It is also important that connections with the external environment (in terms of product or technology exchanges) are maintained, so as to benefit from external innovation and/or the sale of locally produced goods.

The funding decisions made by public authorities must take into account the characteristics of local productive systems and architectures, and not merely the pure comparative advantages of a region in various production sectors. The concept of related variety, which is often used in relation to embeddedness and connectedness, was introduced by Frenken, van Oort and Verburg in 2007 in an attempt to show that a region benefits more from engaging in broad ‘activity domains’ – in which related activities are characterized by technologies or forms of production that are closely and consistently interrelated – than from specializing in a single activity. These recommendations have been translated into practical growth and development strategies. The EU invited each region to choose a few key domains or activities or technologies, based on three criteria: the overall context (the chosen activity should fit into a value chain and not be isolated at the local level), specialization in specific fields of activity, and coherent diversification through related variety (the selected sectors must be closely related to or belong to interconnected and complementary fields of activity).

Thus, to qualify for development funds, EU regions have had to set up programs and projects aimed at promoting entrepreneurship and innovation,

guided by a strategy explicitly drawn up on the basis of an inventory of the strengths of the territory. In principle, the logic of the policy prioritization process is neither exclusive nor exhaustive but based on thematic choices and is conceived to promote competition in resource allocation proposals (McCann 2015). Finally, it should be noted that governance issues have been considered to a certain extent (Morgan 2017), since it is recognized that each region must interact with and take into account its own entrepreneurial environment and make its choices according to the latter's characteristics and to its relationships with it, and therefore consider the wishes of local actors.

The limits of these policies: protest by vote and in the street

Traditional electoral sociology approaches put the stress on the preponderance of the role of social class and economic and psychological approaches to explain electoral behavior (Stavrakakis et al. 2017). But the rise of populism and populist parties in many contemporary Western democracies throughout Europe and beyond to the American continent (Müller 2017) during the last two decades have brought new issues to the table and forced researchers to find new explanations. Obviously, beyond the traditional explanations mobilized by sociology and political science, other determinants have been put forward, notably by geographers via what is known as ecological analysis (Forest 2018). Approaches in electoral geography have made it possible to enlarge the initial vision and to consider that an individual's vote may also depend on their characteristics and factors at the level of the territories in which they live (Johnston, Shelley, Taylor 2014; Köppen et al. 2020).

In different countries like the United Kingdom, France, Italy, and the United States, one can observe a rise in extreme or protest voting. This is the case of pro-Trump voting, or of voting for the extreme right in various EU countries (like for the Front National in France or Liga del Norte in Italy), or for Brexit, for example (the position of UKIP and part of the Tories). The study of recent events such as Brexit (Los et al. 2017; Abreu, Öner 2020), the American elections (Gusterson 2017; Rodríguez-Pose, Lee, Lipp 2021), and the European elections (Di Matteo, Mariotti 2020) highlight the fact that this rise in extreme voting is not even, and is particularly restricted to several areas with peculiar characteristics. Various countries find themselves in the grip of problems related to the so-called 'geography of discontent' (Dijkstra, Poelman, Rodríguez-Pose 2020), and many scholars identify that the rise of populism is particularly significant in areas on the periphery or far from major cities (Van Gent, Jansen, Smits 2014; Gordon 2018; McCann 2020). They have identified these areas as 'places that don't matter' (Rodríguez-Pose 2018; McCann 2020); namely, rural territories, peripheral areas, urban districts in difficulty, etc., and they highlight the difficult local

situations in places that have fueled people's dissatisfaction with the socioeconomic environment in which they live. For example, Rodríguez-Pose, Lee and Lipp (2021) and Beecham, Williams and Comber (2020) show that in the American context local socioeconomic characteristics – particularly those that characterize areas in decline – may explain part of the vote for Trump.

This analysis of election results in various countries has brought an essential spatial component into the debate. It has opened room for the idea of the paradoxical importance of these places that 'don't matter,' where people's behaviors are at the basis of the vote of discontent. And it has given birth to the idea of an opposition between the 'globalized elites of the large metropolises' and the 'real people of the forgotten places' (Ferrante, Pontarollo 2020). According to Rodríguez-Pose (2018), a geography of electoral behavior can be drawn according to three main types of local areas and their territorial characteristics: (i) productive and dynamic areas that concentrate economic activity, (ii) non-productive but dynamic territories that benefit from the wealth produced by the productive areas, (iii) former industrial regions, now in decline, in which one can make a distinction between (a) areas where a market sector subsists, and (b) areas that depend essentially on social income, which are the most fragile in the face of reduced public spending.

Some authors also refer to the crisis in the small towns of rural areas, regardless of the decline of the shops in the centers of these towns. More generally, a lot of scholars agree on the idea that the withdrawal of public services (closure of railway stations, post offices, etc.) and the weakening of public investment have also increased the sense of abandonment and marginalization felt by people living in peripheral areas, and most of all in rural territories (Broz, Frieden, Weymouth 2019). But it is fair to note that to this protest vote – which expresses the rejection and the voice of voters living in these peripheral areas – is associated with an additional characteristic: major protestations on the streets. Opposition does not only take place through legal channels; it also takes more frontal and violent forms, and in a way can be compared to the movement of revolutions and reforms that can be seen all over the world.

The case of France is particularly interesting from this point of view (Torre, Bourdin 2021). In 2018, the country was shaken by a large-scale protest movement well known as the 'yellow vests' movement (related to the name of the garment the protestors were wearing). The movement started with motorists angry at rising fuel prices and against the decision of the government to reduce authorized speeds on secondary roads. But it rapidly turned into a general protest against government policy in all its dimensions and especially regarding the lack of consideration for peripheral areas. Participants blocked traffic as close as possible to their homes and launched local demonstrations on roundabouts. They also made big protests in the major French cities where they were not

leaving, in order to render visible to the public authorities and to urban dwellers their living conditions and the problems they face in their day to day lives.

Protest about the increase in the tax on petroleum products was rapidly accompanied by other ideas and attempts at reclamation. The demonstrators complained of a feeling of abandonment by public authorities. In particular, they highlighted their abandonment in terms of public services. The absence and disappearance of post offices, of tax-collection offices, schools and lyceums, hospitals, maternity wards, doctors, etc., but also the gradual disappearance and abolition of connecting railway lines and their remoteness, which obliges them to make long and expensive journeys, both to get to work and to acquire the goods and services they need to live. Step by step, fundamental questions were raised about public policies related to peripheral areas in a context of falling public spending and growing inequality, with significant territorial repercussions (Bourdin, Torre 2020; Torre, Bourdin 2021). This movement can be seen as the behavior of disenchantment; the participants had no confidence in politics or were no longer part of the 'political offer' (Kostelka 2017). They expressed their voice in a different way, using conflictual behavior instead of expressing their agreement or their disagreement by voting.

Some examples of (non-technological) territorial innovations

We have just noted a significant discrepancy between the policies supposed to address peripheral areas and take into account their specificities and the very mixed perceptions of the local populations: The latter have a sense of abandonment and the impression that the measures implemented by the policies are inadequate. One of the ways in which this gap can be analyzed is that these development policies fail to take advantage of much of the creativity and innovation at the heart of many of the activities carried out in the territories because they are primarily based on a conception of technological or even organizational innovation and forget about other forms of innovation. If we want to help these territories and encourage their development, it is important to consider all categories of innovation in order to be able to base future development policies on their recognition and their promotion. This dimension is mostly crucial in peripheral (or rural) areas which generally present, as already mentioned, a significant technology and innovation deficit.

Scholars have pointed out that innovations might occur in more traditional sectors than the ones frequently studied (Alderman 1998) or be of a more incremental nature. It helps to understand that there exist different types of innovations: organizational, social, and institutional (Shearmur 2012; Torre, Wallet 2016). Territorial innovation models (Moulaert, Sekia 2003), which have met with some success in the economic geography literature and in policymaking,

are based on the idea that geographical proximity and urbanization economies are beneficial or even mandatory for innovation. But several scholars agree that local systems of innovation are not always based on high technology. Peripheral systems analyzed in various places like Canada (Doloreux, Dionne 2008), and in EU countries (Zitek, Klimova 2016) seem to fulfil both the criteria of institutional thickness and organizational thinness identified in Trippel, Asheim and Miorner (2016).

More and more examples attest to the very wide capacity for innovation and creativity of local actors, including in low-technological-intensity territories or so-called peripheral territories. These territorial innovations refer to the inventiveness of local populations, without necessarily being linked to a high level of industrialization or productive specialization. They reveal the vitality of the territories, demonstrating their dynamism and their capacity for renewal by mobilizing local forces. They are based on less formal models of organization than the most well-known forms of local systems (like clusters, districts, or technopoles). Examples include the development of 'third places' (Oldenburg 1989), in which collaborations can occur between professional experts and knowledgeable amateurs around profane knowledge, for example, and which emerge and multiply in the territories, including in peripheral areas. Their massive development, even if this often involves very different forms and is not completely mastered, is a signal of the vitality that emanates from the territories, and permits the mobilization of energies, the creation of chains of values and skills, and the development of new ideas. This is also the case with fab labs (Gershenfeld 2005) or living labs (Lehmann, Frangioni, Dubé 2015) as places for exchange and interaction in which complex collaborations are formed the precise content of which is not always easy to describe. However, even if their virtues in economic terms (i.e., added value) are often difficult to quantify, the societal dimension appears to be proven.

Other examples can be found in short local-value-added chains or peasant agriculture, which consist of bringing together producers, often agricultural, and consumers, involving the possibility to identify the origin of the products to be consumed and avoid industrial intermediates that are considered too expensive or dangerous to health. In addition to controlling the origin of food, there is a social dimension through familiarity with the producer, or collaborative relations between producers and/or sellers, as well as the integration and re-creation of the social link through cooperative production, the creation of solidary grocery stores or places of distribution, and the sale of products, for example. Further initiatives include the introduction of local currencies, joint financing initiatives (crowdfunding) for raising small amounts of local funds, collective support for projects, loans between individuals, and local savings. Additionally, crowdsourcing, which brings together groups of local actors to develop and implement common projects that allow inhabitants to create products and develop concrete solutions

but also to identify opportunities and innovate together in service of their territory.

This component is also found in the analysis or movement of commons, which highlights the shared use and management conducted in whole or in part of a good or space by a collective or a community of users. The interest in this case and in what interests us lies in the public or mixed nature of these goods, but above all in the fact that these commons are often approached from a relational perspective (Polko, Czornik, Ochojski 2022). A forest, an irrigation system, a pasture, a parking lot, a cycling route, or a local currency can be defined not only as a shared resource but also as a set of actions and decisions of a group of people, cooperating in their management and use. Here, there are also non-localized commons (certain computer-based networks such as Wikipedia or communities of practice or music, for example), which cannot be defined in a territorialized way, that appear from the moment when geographical proximity is absent.

Shared or collaborative enterprises (SCOPs), activity and employment cooperatives, community transport organizations, the pooling of care and parental nurseries contribute to the resilience of territories by their ability to recreate proximities and maintain local solidarity, in addition to or substituting technological innovation. Finally, the social and solidarity economy contributes to social or societal innovation (Moulaert, MacCallum 2019). The development of networks of cooperation between local actors is a factor of assistance and support to people, but also of resistance to the effects of the crisis. These initiatives are particularly valuable in territories where traditional economic and social structures are being eroded, with the disappearance of local services such as stores and grocery stores, post offices or hospital branches, contributing to the desertification of places and the isolation of people.

The last example is in the area of sustainable development. It is the circular economy or industrial ecosystems which integrate the recycling of outputs and propose to replace the succession of processing operations, ranging from the use of raw materials to the sale of products, with a more resource-efficient model which involves reintegrating waste into the production cycle (Jacobsen 2006). For example, anaerobic digestion is one of the solutions adopted by most European countries (Jacobsen, Laugesen, Dubgaard 2014; van Foreest 2012) in peripheral and rural areas. This refers to the production of biogas and digestate through a process of transforming plant biomass, such as crop residues, livestock manure, household waste, or bio-waste, that can be reused as fuel, transformed into electricity and heat, or used as agricultural fertilizer.

Development strategies for rural areas

All these elements open up avenues for the implementation of development strategies that are alternatives to those generally presented, particularly in the most industrialized and urbanized territories. As a matter of fact, if we take into account the various dimensions of innovation, it is possible to design smart development policies for peripheral areas, taking into account both their specificities and the peculiarities of the types of innovation found in these territories. Obviously, we are moving away from 'one-size-fits-all' policies and have to adapt to the various cases that are studied, and to the various expressions of innovation at stake.

Let us consider now the case of rural areas which we have described in a recent book (Torre et al. 2020). Being smart in terms of policies is associated with specific challenges for rural areas, which represent a large part of peripheral areas, at least in terms of land occupation. We will show that the usual 'smart' approach – which is based primarily on the exploitation of technological innovation – must be modified to address the specificities of this type of area.

Given our previous studies and the experiences generated from several EU rural areas, we can assess that five key factors must be considered to build an efficient smart development strategy in rural areas. These key factors do not exclude technological innovation, but they enlarge and enrich the paths to development for these areas.

a) **Support variety and diversity:** It is not diversity per se that creates growth, but diversity in related business sectors with a common knowledge base. Related variety plays an even bigger role in innovation and growth in rural areas than in larger urban centers, where the diffusion of knowledge is facilitated by the presence of many related sectors. Regional stakeholders (politicians, development agencies, business owners, unions, and the interested public) should strive to identify and understand the competitive advantages of their region. The strengths of a region must be developed further, capitalized on, and made visible to external regions as well as to local actors. One possibility is to create regional brand(s) which could represent an industry, a group of businesses, or specific products or services of a region. Collective approaches implemented through the formation of networks of producers interacting with other stakeholders are also channels through which rural economic systems can be adapted to the local environment, as evidenced, for example, by Agricultural Knowledge and Innovation Systems (AKIS).

b) **'Borrow size'** Rural and peri-urban areas often lack the regional R&D centers or educational facilities needed to intensify research and development through which they can technically enhance their products or services. The need for extra-regional knowledge and expertise becomes a deciding factor – regional businesses must cooperate with external R&D centers or universities to

compensate for this lack. To increase the willingness to cooperate with external knowledge centers, the implicit and explicit costs incurred by local entrepreneurs to engage in such efforts must be reduced. Local entrepreneurs in rural areas can be encouraged to 'borrow size' – and with it, knowledge – in several ways, among which the most standard are direct subsidies or tax incentives for R&D, or temporary geographical proximity. The latter can be achieved through short visits and through the organization of or participation in congresses or conferences on topics related to the core activities of the region concerned that are relevant to regional businesses. Besides presenting the latest research results, such events can serve as starting points for cooperation and network-building.

c) Implement education measures: Once the competitive advantages of a rural region have been identified, the adoption of measures for supporting education could help regional businesses to secure their position in the global economy by giving them easier access to a well-trained and educated workforce. This could be achieved either in the form of internal courses within firms, or through platforms of cooperation between local firms. Firms should be encouraged, through tax incentives, to actively promote employee training. Furthermore, regional secondary schools as well as specialized commercial and agricultural schools (often present in rural areas as a way of compensating for the lack of tertiary institutions) can respond to regional demand by providing training and education programs tailored to the needs of learners and local firms. These complementary educational instruments can also contribute to increasing the related variety. This is a specialized form of support for knowledge creation and exchange between the firms that form the core of a region's strength.

d) Make use of amenities: These can range from natural amenities (land and water resources, mountains and lakes) to built amenities (thanks to which natural resources can be utilized for recreational activities) to social and cultural amenities (special sites and buildings, local culture and tradition, including food, crafts, festivals, and lifestyles). Firms can use them to generate new business activities such as tourism and recreation, which then generate other activities upstream and downstream. Amenities can also attract a creative class: because outdoor amenities are often considered as quality of life factors, they can play a key role in attracting specialized workers and encouraging them to stay in the area. The amenities and resources provided by rural areas should be considered in initiatives aimed at promoting more sustainable development models. Given the biodiversity and ecosystem services they provide and the opportunities for agricultural and energy production they represent, rural areas have a vital function. This calls for the implementation of public policies that promote both smart and sustainable development.

e) Improving the multidimensionality of infrastructure: The main characteristics of rural areas are the geographical distance separating individuals and villages from one another, on the one hand, and their lower density on the

other. Common solutions for compensating for this distance – besides those already mentioned concerning smart development – are better transport facilities and an improved ICT infrastructure, such as high-speed internet. This reduces the importance of distance and also enhances the possibility to work from home. However, digital connectivity is a necessary but insufficient condition for rural growth. Indeed, the availability of connectivity and IT on the one hand, and of digital skills on the other, are necessary as factors of growth in rural areas. Measures for supporting and strengthening the technological and digital competences both of entrepreneurs and employees become vital.

Consequently, long-term strategies for smart development in rural areas must aim at helping the latter to reinforce their core by promoting the development of various economic and social activities and cultural services. Instead of encouraging uncontrolled development and trying to reach an impossibly level of high-tech development, what must be promoted is rural growth through the reinforcement of the core activities and assets of these areas. Thus, a challenge for spatial planning is developing rules and incentives that promote a concentration of economic and social activities and facilities in these rural centers that are vital for rural development.

Conclusion

The objective of this article was to examine the opportunities for the smart development of peripheral areas, with particular attention to rural territories. We have found that the development policies devoted to these territories have multiplied over the last thirty years, mostly by means of cohesion or smart specialization strategies. However, the inhabitants of peripheral areas very often feel dissatisfied with their situation and express their opposition through voting for extreme parties or public demonstration. One of the major reasons for this growing gap between the proliferation of EU policies and the dissatisfaction of the population is that the innovations and novelties of these areas are rarely considered and encouraged by the current policies. The latter attach too great an importance to technological dimensions and are mainly directed towards industrialized and densely populated areas, whereas the innovations stemming from peripheral territories, which are very real, are concentrated primarily in the social, institutional, and organizational fields. In the end, a large part of such policies are disconnected from the needs, the will, and the skills of the local populations in peripheral areas.

In order to avoid these problems and to reduce the obstacles on the development path of peripheral areas, we advocate policies that are better adapted to these territories and which seriously consider their innovative character. The case of rural areas in Europe provides interesting insights because

it shows that a mix of 'traditional' and more social and institutional policies is possible, and that various mixes can be adapted to the peculiarities of these regions; from peri-urban areas to remote agricultural or forested lands. In any cases, is important to stress that the measures that are applied must be adapted to the respective characteristics of the different categories of territory, and not be based on a catalogue adaptable to any type of peripheral areas. It is at this price that we may avoid the disjunction between the different territories of the EU and the appearance of zones of separatism or even the dislocation of the European community.

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