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Highlighting smart development patterns in rural areas Some proposals

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Abstract: This paper provides an assessment about the relevance of smart development policies in rural areas. Based on different applied researches and several European case studies we claim that these policies are well suited to the developed or intermediate regions but must be adapted to the specific characteristics of rural regions. In particular, it makes sense 1) to exploit their natural and cultural amenities, 2) to develop the multifunctional nature of agriculture, 3) to highlight territorial innovation in all its forms, 4) to promote synergies between the different uses of space and soils, 5) and to develop knowledge on ecological, socio-economic processes, as well as territorial governance mechanisms.

1. Introduction

The EU growth strategy for 2020 builds on the ambition to become “a smart, sustainable and inclusive economy” (European Commission, 2010). This forms the fundamental priority for the overall EU policy with five main objectives including employment, innovation, education, social inclusion and climate/energy. In addition, four targets of growth policy are identified, with respect to smart, sustainable and inclusive growth as well as economic governance. This objective relies on the identification, in a context of global competition, of comparative advantages of the regions and their consistent inclusion in global value chains and innovation processes, but also to prior sectors, allowing peculiar local development spirits. Smart development strategies are based on the exploitation of the related variety of EU areas and their ability to initiate new activities and/or technological fields.

Rural development is an integral component of EU policies and one of the pillars of the Common Agricultural Policy (CAP). A substantial part of the rural policy for development of nations and regions can be found in the CAP, which does not only include measures for agriculture, but also targets at a wider institutional and economic setting. But, in recent years emerged an agreement on the idea that the rural sector approaches have not achieved the expected results (Barca et al., 2009), and a growing demand for policies involving territorial dimensions (place-based policies) to better reflect the new challenges and differentiated growth potential of EU rural spaces. The recognition of the multi-facet character of rural areas puts the stress on the necessity to assess not only the agricultural development and its impact in terms of externalities or agroecology, but also the other dimensions of rural areas, be there business, services, tourism or nature (Brouwer and Sas-Past, 2011). All this also fits in a context of increased territorial competition, pressure on public funding for agriculture, and claims for administrative and fiscal decentralization, putting a greater emphasis on the ability of local actors to renew their proximity relations and connect to external networks.

In recent years, the EU adopted the notion of “smart” for its 10 year growth strategy (Horizon 2020 strategy), with the development of the smart development and smart specialization policies. The main objective is to make Europe a smart, sustainable and inclusive economy, on the basis of cohesion policies aiming at reducing the gap with trade partners on

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productivity, R&D spending, and innovation, to meet regional disparities within Europe and to reduce the lack of convergence between core and peripheral regions. This policy oriented concept (Foray, 2014; Foray et al., 2009 & 2012) is mainly based on two notions. Related variety first (Frenken et al., 2007), which involves cognitive proximity or relatedness between firms, as well as relations between sectors closely related or belonging to interconnected and complementary fields of activity and/or technology. And firms embeddedness (e.g. strong regional or local connections to certain industries, in terms of input-output linkages and labor force), relatedness (knowledge spillovers), and connectivity (in terms of networks, face-to-face contacts and mobility of human capital) (McCann and Ortega-Argilés, 2013).

At the policy level, each European region should specialize in activities with a competitive advantage based on differentiation, on the whole value chain. In practical terms, each region had to choose a few key activities or technologies out of a limited number of sectors or technologies which are supposed to have a competitive advantage over other territories. These intervention priorities are based on three criteria: the specialization in specific field of activity, the overall context (the activity should fit into a value chain), and the coherent diversification through related variety. The main idea is to ensure coherence and to reason in terms of regional production system, of knowledge absorption and diffusion, and of spillover effects (Boschma, 2014; Capello and Kroll, 2016; Morgan, 2016).

Given these peculiarities, the question of an application of smart development policies to rural areas is at stake. Are they adapted, or does the peculiar character of rural areas impede the implementation of these policies and create barriers to the success of the EU strategy in these remote or less developed areas? The aim of the article is to shed light on the role played by rural areas in the regional dynamics of Europe, with regards to the orientations assigned by the Horizon 2020 strategy and the smart development policies launched by EU. More precisely, it asks questions and provides clear answers about two major topics:

- Is there a possible smart development for European rural areas?
- Which type of smart development (agriculture, business/industry, peri-urbanisation, tourism/leisure...) can be privileged with regards to regional peculiarities?

In a nutshell: what is a smart future for rural areas in Europe? What is a smart governance of rural areas?

The paper identifies issues and forms of smart development of rural and peri-urban areas, and their relationships with urban dynamics, given the diversity of local configurations. It also examines the contribution of public policy and governance patterns as a consistent and innovative means of intervention to support smart development of rural areas. The first part of the paper is devoted to a brief survey on the patterns of rural development and their various evolutions, and the second to the description of the analytical rationale of the smart development policies. The last part of the paper brings our main results regarding the uneasy application of smart development principles to rural areas, with regards to topics like entrepreneurship, land use, smart agriculture and innovation processes.

2. Patterns of rural development

One of the greatest challenges currently facing rural analyses lies in the necessity to bring analytical depth to the contemporary approach to development, by enriching it with a conceptual apparatus able to take account of the main characteristics and original features of rural development in relation to development in other types of geographical areas, while respecting the diversity that now characterizes rural areas, their inhabitants and the activities they engage in.

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A look back at the approaches discussed above reveals that a broad consensus exists around the need to focus attention on the social, human and environmental dimensions of bottom-up development, and the need to take greater consideration of rural issues in regional and territorial development theories. But although there is sometimes talk of an emerging new paradigm of rural development, it is also quite clear that the different approaches appear more as a patchwork of influences and recommendations than as a consensus on the key components underlying rural development in its diversity.

Rather than attempting the impossible task of synthesizing approaches based on often different and sometimes opposing views and methodological presuppositions, it is more interesting to build an analytical grid of these approaches (Torre and Wallet, 2016). This is useful for drawing up an assessment of the conception of development advocated by each of these approaches, for examining their articulations and limitations, and even for potentially developing a harmonized model for approaching rural development processes. The work presented here is based on three elements that underlie these analyses and which structure discourses on development and, in some cases, recommendations. These elements are: the favoured conception of development; the basic principle of development; and, finally, the key development variable(s) in question (see Table 1).

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Table 1: Patterns of rural development

	Technicist paradigm	Local networks approach	Empowerment approach	Capabilities approach	Civil society approach	Environmentalist approach
Conception of development	Farming	Local network	Cognitive community	Individual	Territorial project	Agroecology/Bio-economy
Structural principle of development	Increase of agricultural productivity and technology transfer	Development and exploitation of specific human resources	Social capital and learning dynamics	Individual choices and exploitation of competencies	Governance and involvement of stakeholders in projects	Sustainable development
Key development variable(s)	Technical mastery of agricultural production	Quality and development of local resources	Knowledge	Implementation of choices and social justice	Power relations and coordination mechanisms	Multilevel and multi-actor environmental systems

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The works underlying the technicist paradigm are based on a vision of development centred on agricultural production and a transformation of agriculture through technical progress (higher yields and increased acreage, mechanization and use of crop-protection products). Thus, in this approach, the key variable of rural development remains technical farming expertise based on technology transfers, leading to increased productivity. Regarding the learning and knowledge acquisition processes, they are thought to be based on complete or incomplete networks, the formation of which must be encouraged. Thus, the aim is primarily to develop and use local resources and facilitate the dissemination and implementation of new techniques by tapping local human resources and promoting collective action.

In the case of the capability and empowerment patterns, the aim is more to develop the capabilities or competencies of the population and to raise its levels of education and know-how. The empowerment pattern advocates improving the level of knowledge and inference skills of the population by promoting collective learning processes within local communities, in the hope of enabling them to "take control of their destiny". The capability pattern has a more individualistic approach in that it embraces the notion that it is right that each individual should achieve a level of development that corresponds to his or her expectations and capabilities. As for approaches centred on governance and participatory democracy, they tend to envisage development as a happy by-product of governance processes based on popular participation, overcoming opposition and defining common projects.

Finally, environmentalist/agroecology approaches place the sustainability and resilience of agroecological systems at the heart of the challenges of territorial development. They place emphasis on the ability of the different stakeholders to steer agricultural, energy and dietary models towards the socio-technical transition necessary for them to adapt to the constraints of global change (climate change, demographic change, etc.).

This brief overview of the successive patterns of rural development highlights several major changes. Over time, the notion of territorial diversity and the specificities of the challenges, stakeholder configurations and resources have gained ground, making obsolete any attempt to define a standardized and canonical model of rural development that would be valid at all times and in all locations. The waning influence of agriculture, concomitant with the economic socio-demographic diversification of rural areas, has required that the multifunctionality of farming systems and their interaction with other activities and interests be taken into account (Knickel and Renting, 2000). The search for new solutions to emerging development challenges and territorial competition has made innovation in practices a constant imperative and called into question the linear models based on the definition of standards. It has led to recognition of the advantages of dispersed expertise, collective learning approaches, negotiated agreements and a shift in focus from agricultural production to multi-sectoral, territorial and multilevel governance. Finally, broadening the focus from purely economic aspects to the social and environmental dimensions has highlighted the need to determine and implement the principles of sustainability at local level, together with mechanisms that take account of the diversity of stakeholders and of development challenges.

3. Smart development and smart innovation policies

The concept of "smart specialization" first surfaced in the mid-2000s in the context of debates on EU competitiveness and in the wake of doubts over the success of the previous European policy, namely the Lisbon Strategy for a knowledge-based economy. The Barca Report (2009) shows that the Lisbon Strategy has not yielded the expected effect: there has been a reduction in competitiveness, innovation has been slow compared to the USA or Asia, and some enterprises have been tempted to relocate production to non-EU countries. These weaknesses

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are usually attributed to excessive uniformity at EU level, which results in insufficient specialization, as well as in a lack of interest in the spatial dimension and territories. Indeed, the basic idea was to develop high-tech sectors at European level, without any special recognition of regional differences, resources or the status of the development process.

In an attempt to make gains in competitiveness and counter the decline in the EU's influence, it was decided to implement and operationalize the concepts of smart development and smart specialization, developed by a group of European experts known as "Knowledge for Growth" (K4G), and more particularly the recommendations of economists such as Foray et al. (2012). For these authors, the S3 (Smart Specialization Strategy, or Europe 2020 strategy) provides an answer to the difficulty involved in choosing specializations in an ever more competitive world, with limited resources. The geographic level selected is that of the region. The idea is that each region should specialize in activities in which it has a competitive advantage based on differentiation (as described by Porter) – or, to put it another way, in which it can outperform its competitors, based not only on a product's attributes but on the whole value chain. In each region, S3 determines intervention priorities selected from a limited number of sectors or technologies that are potentially in competition with one another on international markets, and in which the region in question has a competitive advantage over other territories (Barca et al., 2012; McCann and Ortega-Argilés, 2013).

The EU policy proposes to operationalize these principles through practical recommendations in terms of policy and action. Each region is invited to choose a few key 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 sectors selected must be closely related or belong to interconnected and complementary fields of activity). The region does not necessarily have to be competitive in high-tech sectors – all types of innovation are concerned, whether technological, social or organizational – rather, it is important to ensure coherence and to reason in terms of regional production systems and in terms of knowledge absorption and diffusion (Foray, 2014).

Using a self-assessment process, each region is required to focus on a few specific areas. The role of public policy is then to ensure the implementation of the new strategy by supporting regions in the choices they have made (Kyriakou et al., 2016). The public authorities may create incentives for entrepreneurs, support investments in the sectors they specialize in, ensure that the different areas of innovation or innovation diffusion are connected, or redirect existing investments towards smart specializations (McCann and van Oort, 2016). It should also be noted that the allocation of EFRD funding to member states and regions is now conditional upon them having defined and implemented a smart specialization strategy that sets investment priorities. With this in mind, each region in the EU has undertaken to identify its priority sectors (Radosevic et al., 2017)

One key question is that of the place of rural areas in this mechanism, which requires regions comprising both urban and rural areas to establish priorities. Is it still possible to focus on rural territories and promote their development? More specifically, is it feasible to shift from a support-based approach focused mostly on mass agriculture to an approach that seeks to promote other forms of agricultural organization and practices and social innovation in these territories? How to consider productive and technological combinations that link agricultural activities with those of other sectors (tourism, energy, etc.)?

This, in turn, raises the question of how to move away from general policies and to place emphasis, in the growth process, on interventions and activities aimed at very specific areas. The future of rural areas and their growth patterns is at stake, and one major concern is that the

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transition to region-based policies might result in less attention being paid to rural and peri-urban areas, considered to be of secondary importance compared with large industries and urban areas. Does this approach not run the risk of reopening the center–periphery divides between those rural areas that will successfully specialize in dynamic sectors related to urban and global economic development on the one hand; and, on the other, those exposed to international competition that risk of falling behind at the slightest loss of competitiveness, or between those in a position to promote a residential economy and those which lack residential attractiveness.

The rural development strategy sets out for the period 2014–2020 provides some answers on this subject. As mentioned above, it is structured along three main lines (European Commission, 2013): smart growth, by supporting innovation, skills and green technologies and by improving uptake of research, but also by providing incentives for social innovation; sustainable growth, by increasing resource efficiency, maintaining the food, feed and renewables production base, providing environmental public goods, reducing emissions, enhancing carbon sequestration and developing bio-energy, ensuring sustainable land management, and addressing biodiversity loss; and inclusive growth, by unlocking local potential, diversifying rural economies, developing local markets and jobs, and opening up alternative opportunities to accompany agricultural restructuring.

But beyond these broad directions, the challenge lies in the ability to operationalize the mechanism and its potential adaptation to different regions according to their specific context and choices of rural development policies. In order to meet this challenge, the European Union has structured the rural development policy around six priorities (European Commission, 2013) on the basis of which the regions can define their action plan for rural areas:

- a. fostering knowledge transfer and innovation in farming, forestry, and rural areas;
- b. enhancing farm viability and boosting the competitiveness of all types of agriculture in all regions, and promoting innovative farm technologies and the sustainable management of forests;
- c. promoting food-chain organization, including the processing and marketing of agricultural products, animal welfare and risk management in agriculture;
- d. restoring, preserving and enhancing ecosystems related to farming and forestry;
- e. promoting resource efficiency and supporting the shift towards a low-carbon and climate-resilient economy in the farming, food and forestry sectors;
- f. promoting social inclusion, poverty reduction and economic development in rural areas.

As we can see, this form of the concept of smart growth in the context of a renewal of European rural development policy remains very much geared towards agricultural priorities, in conjunction with environmental goals, whereas the constituent aspects of rural diversity have been somewhat forgotten. Vacillating between urban tropism and agricultural bias, the way in which the principles of smart-growth policies will be adapted to take account of the diversity of rural regions remains rather vague (da Rosa Pires et al., 2014). The operational implementation of smart-specialization policies pleads in favor of a rigorous definition of the notion of smart growth and, above all, of the associated economic mechanisms, in such a way as to facilitate the efficient coordination of development policies and the measurement of their effects (Naldi et al., 2015).

4. Diverse illustrations of smart development issues in rural areas

It is therefore necessary to make progress on understanding the dynamics at work in rural areas before determining their potential to be part of the smart specialization strategy, the relevance of these policies for rural areas, and the need for possible to bend them to avoid more acute problems of cohesion between European regions. It's the aim of the TASTE project (ERANET

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RURAGRI, 2014-2017) that helped to improve the understanding on how to implement the smart specialization strategy for rural and peri-urban areas, through three main issues: industrial activities and innovation processes that value local resources; competitive dynamics of land uses in the long term; smart agriculture. The production of original analysis grids, typologies and measurement indicators, and the analysis of concrete cases constitute advances for knowledge and tools that can be mobilized for the scientific community and public decision-makers.

IV.1 Smart specialization: a more relevant strategy for urban than rural areas

One of the major challenges in implementing the smart specialization strategy in Europe lies in its ability to adapt to the diversity of regional profiles, and since it is based on the rejection of framework of the TASTE project made it possible to highlight a typology of European regions according to the characteristics of smartness (Naldi et al., 2016a). They conclude that the determinants of smart development policies and smart specialization concepts have a different regional impact depending on the characteristics of the regions. In particular, the logic of smart specialization can be difficult to implement in the most rural regions, because of their remoteness and also their small demographic size, which hampers the possibilities of internal networks. The related variety, at the core of these policies, particularly at the industrial level, can only be applied and benefit to businesses in urban areas or diversified rural areas (often close to or in close contact with urban areas), but not for the most agricultural or remote areas. Therefore, support strategies for growth in the most rural areas need to rely on other factors, such as the promotion of amenities (Rappaport, 2009; McGranahan et al., 2011) to give rise to alternative policies.

These results contribute to a better understanding of the concepts of smart development and smart specialization. They first show that smart development strategies apply, but with more difficulty, to rural and intermediate regions; but also that the determinants of smart development are related above all to the technological links between industries and the connections in terms of knowledge. They also point out that the determinants of smart specialization have a different impact depending on the size of the region (better when the region is large). Finally, they call to bear interest on certain externalities (in terms of amenities, tourist benefits or local products), which are not directly related to the logic of smart development, but which can play an important role in terms of growth in rural areas.

It can be said that overall rural areas as a whole have a low capacity for technological innovation, because of the shortcomings affecting several points, usually considered as levers for innovation. There are, however, many innovations that are not limited to technology, but rather social, institutional and organizational dimensions, so that we can then talk about territorial innovation (which can be applied to all types of territories).

Rural areas are also characterized by the absence or weakness of a number of favorable factors for smart development policies, such as embeddedness; the ability to easily connect the actors (relatedness); connectivity; entrepreneurship; critical mass and density; the presence of intermediary organizations (brokers). More specifically, some principles can be stated relating to the main economic dimensions of rural areas.

IV.2 Differentiated regional trajectories in terms of consumption and land preservation

The characterization of the main evolutions and changes in land use trajectories in rural and peri-urban areas is an important issue in planning and development strategies. Indeed, issues of

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land use and management of spatial uses must play a role in regional development and planning policies, particularly in order to identify potential obstacles to their implementation and success. Land uses and their evolution thus appear to play a crucial role in the development capacities and policies of European regions, because they determine the possibilities of development, as well as the installation of new activities or their replacement by new activities. They aim to reach the definition of land use management principles in a smart development perspective.

Europe experienced a strong artificialisation of its rural and peri-urban areas, over the period 1990-2012, especially marked between 1990 and 2000, accompanied by a general development of the protection zones, especially in the forest areas. The work carried out in the TASTE project has led to the identification of a typology of land uses and their evolutions based on six major types of European regions, characterized by various processes and rates of artificialization for agricultural and forest areas (Ollivier et al., 2016). These results reveal a specific pressure on agriculture. On the one hand, agriculture is under pressure from urban development, generally consuming the most suitable land for agricultural activities. This induces an intensification of practices, which increases the pressure on extensive agricultural activities. On the other hand, the abandonment of agricultural land is severe when this activity is not economically viable, which leads to the extensification and sometimes reforestation of agricultural land.

Several principles (or good practices) of smart development of land uses can thus be highlighted, modeled on those of the related variety for industrial activities. First, it is fair to avoid a too monolithic use of soils, with an insufficient variety, which can cause a vulnerability in the event of important changes (climate change or economic crisis for example). But also to avoid excessive fragmentation of competing land uses, which can lead to unbridled competition, land use conflicts and hampered development processes. European regions thus describe differentiated potentials, and current developments show marked geographical differences, such as the existence of an East-West gradient, for example (Ollivier et al., 2016).

IV.3 Smart agriculture: a variety of possible paths regarding the territories

The analysis of the functioning modes of urban and peri-urban agriculture and its impact on the development of territories makes it possible to give a reading of the contribution of this activity to smart specialization strategies. It also allows to identify the main characteristics of what could be a smart agriculture. The work carried out in the TASTE project underlines a diversity of conception of this concept, which cannot be reduced to the technological dimension. From the combination of these approaches, it is possible to establish the basis of what could be a smart agriculture in connection with development strategies and territorial development. This emerging paradigm incorporates the particularities of urban and peri-urban areas. Rather far from the definition of a technology-intensive agriculture, it is based above all on a holistic and multifunctional approach of agricultural potentials, with a strong emphasis on collective practices and strategies of concerted actors at the territorial level (Corsi et al., 2016a). The results of the quantitative studies carried out in France and Italy, based on this approach, show that, in France, it is mainly the most remote regions which are the smartest, whereas on the contrary, in Italy, it is first and foremost the rural areas closest to urban areas or the peri-urban areas that are awarded in that perspective (Corsi et al., 2016b).

The case studies carried out in the framework of the TASTE project (4 in France, 2 in northern Italy) make it possible to clarify the concepts and practices of smart agriculture at territorial level. They highlight the emergence of projects marked by a strong organizational and social innovation involving a local dimension: bringing together producers / consumers, collective initiatives of producers, social integration, blurring the boundaries between leisure

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activities, agricultural production, development of the space bearing on areas that are not at the heart of agricultural activity or initiating alternative organizations and practices (shared gardens, short circuits ...). Moreover, they demonstrate the willingness of local authorities to include these initiatives in the production of local public policies that are more sustainable and more inclusive of food (and not just agricultural). The result is an empirical verification of the new definition of smart agriculture, based primarily on the resources of the territories (and related knowledge) rather than on a multiplication of technical and technological dimensions (Corsi et al., 2016b).

IV.4 The need to broaden the concept of smart specialization to reflect the peculiarities of innovation drivers in rural areas

Deploying the smart specialization strategy across all territories requires highlighting the determinants of innovation in rural and peri-urban areas, and thus contributing to business survival and competitiveness strategies in these regions.

Works in the TASTE project (field surveys and statistical processing) in France, Sweden and Austria reveal different characteristics of innovation activities and strategies of firms in rural and peri-urban areas (Naldi et al., 2016b). They show, in fact, 1) that the different modes and drivers of innovation and entrepreneurship differ in rural and urban areas, 2) that collaborations and the contribution of outside knowledge, and especially the interactions with the outside the region, play a very important role for innovation in rural areas, 3) that they are also characterized by a lack of collaboration, very detrimental, between universities and businesses, 4) that the related variety between the fields of education is an important source of knowledge in rural areas, rather than the related variety of fields of industry, 5) that the creation of new enterprises in these regions is realized both in the presence and in the absence of related variety in the traditional sense of the term, 6) that the presence of cultural and natural amenities plays an important role in determinants of setting up new firms in rural areas.

It is also crucial to stress the importance of policies that promote different types of collaboration, in particular exchanges between regions and interactions between universities and businesses. Likewise, smart development policies depend on the level of human capital in a region; and local amenities must be exploited by firms in their development strategies in rural areas, while industrial specialization ultimately plays a relatively modest role in the growth of these activities at the local level (Naldi et al., 2016b).

The experimental approaches carried out in different territories within the framework of the TASTE project make it possible to conclude that the coherence of local projects is built around spatial objects that make sense for the actors; but also that the quality of the projects is based on the hybridization of knowledge between researchers and actors (Lardon and Soulard, 2017); and that their 'effectiveness' is linked to their activation by intermediate actors. The quality and success of the projects thus depend largely on the hybridization of knowledge between researchers and local actors (Barreteau et al., 2010; Wittmayer and Schöpke, 2014). Finally, their effectiveness relies heavily on the actions of intermediary actors working for territorial dynamics.

5. Conclusion

In this paper we tried to make an assessment about the relevance of smart development policies in rural areas, based on different applied researches and several case studies in rural and peri-urban European areas. The main result is that the smart development policies are well adapted to the developed or intermediate regions containing at the same time rural and urban areas when

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their population is important enough, but do not really function for the more rural or more peripheral regions. For these reasons, it is necessary to go beyond smart development policies for predominantly rural areas and regions, because they rely primarily on the mobilization of technological innovation rather inadequate to rural specificities. The development policies of rural areas and regions must be adapted to their particular characteristics, to the structure of their economies (agriculture, small firms, etc.), as well as to their diversity (remote regions, intermediate regions, rural areas close to urban areas). In particular, it is interesting 1) to exploit natural and cultural amenities, 2) to develop the multifunctional nature of agriculture, 3) to highlight territorial innovation in all its forms, 4) to promote synergies between the different uses of space and soils, 5) to develop knowledge on ecological, socio-economic processes, as well as territorial governance mechanisms.

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