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# Regional innovation and economic policy for transformative change: the CORIS approach as a framework for orientation

Michaela Tripll, Maximilian Benner & Simon Baumgartinger-Seiringer

Department of Geography and Regional Research,  
University of Vienna,  
Vienna, Austria

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# Regional innovation and economic policy for transformative change: the CORIS approach as a framework for orientation

## Authors

Michaela Tripl  
[michaela.tripl@univie.ac.at](mailto:michaela.tripl@univie.ac.at)

Maximilian Benner\*  
[maximilian.benner@univie.ac.at](mailto:maximilian.benner@univie.ac.at)

Simon Baumgartinger-Seiringer  
[simon.baumgartinger-seiringer@univie.ac.at](mailto:simon.baumgartinger-seiringer@univie.ac.at)

Department of Geography and Regional Research, University of Vienna, Austria

\* corresponding author

## Abstract

The current era is characterised by multiple crises such as climate change, health crises, geopolitical uncertainties, and an increase in social and territorial inequalities. These and other grand societal challenges require transformative change, that is, significant adaptations in our production and consumption patterns. These altered contextual conditions have far-reaching implications for regional innovation and economic development policies. Conventional approaches such as cluster policies or Smart Specialisation primarily focus on promoting regional economic growth and competitiveness and are thus inadequate for addressing pressing societal challenges. This article argues in favour of a reorientation of regional innovation and economic development policies. It emphasises the increasing responsibility of such policies to actively support the initiation and acceleration of territorial transformation processes towards sustainability, promote societally desirable innovations, and shape alternative regional development agendas in collaboration with a broad set of stakeholders. The article explores how the challenge-oriented regional innovation systems approach can contribute to such a reorientation of regional innovation and economic development policies, and it outlines the implications for policy practice. Zooming in on a practical example, the article discusses activities related to the revitalisation of disused industrial sites under the project “RIS4Danu”.

## Introduction

After a period of relative political, social and economic stability in Western Europe following the World War II, our society is now experiencing an era characterised by upheaval and multiple crises. Grand societal challenges such as anthropogenic climate change, pandemics, geopolitical uncertainties and the increase in social and territorial inequalities require transformative change, which not only includes technological progress and changes in production systems, but also an adaptation of consumption patterns and lifestyles (see e.g. Schot and Steinmueller 2018).

The changing context requires a reorientation of regional innovation and economic policies to support the transition towards environmentally sustainable and socially inclusive economic practices. Traditional approaches such as cluster policies (Porter 1998) or Smart Specialisation (Foray et al. 2012) are insufficient to initiate or accelerate innovation-based regional transformations (Tödtling and Trippl 2018).

In recent years, a new innovation policy paradigm has emerged, focusing on tackling urgent societal challenges by fostering socio-technical change (Schot and Steinmueller 2018). Publications on mission-oriented (Mazzucato 2018) and transformative innovation policies (Diercks et al. 2019; Schot and Steinmueller 2018) exemplify this new paradigm. The question of how these contributions can be transferred to the subnational policy level is now the subject of intense academic debates, as shown by recent work on regional problem-, mission- and challenge-oriented policy approaches (Flanagan et al. 2023; Henderson et al. 2023; Tödtling et al. 2022). Furthermore, practice-oriented publications such as the so-called "Partnerships for Regional Innovation (PRI) Playbook", which was recently presented by the Joint Research Center of the European Commission (Pontikakis et al. 2022), should also be mentioned. This publication proposes to modify the Smart Specialisation approach and it presents guidelines for a regional transformative innovation policy that aims to reconcile economic, environmental and social objectives.

These new approaches all highlight the role of the regional level in addressing grand societal challenges. Various reasons are given for this (Uyarra et al. 2023). First of all, it should be noted that economic, social and environmental challenges are unevenly distributed across space. Even global crises manifest themselves differently in different geographical contexts. For instance, regions with emission-intensive economic structures face different implications of climate change and challenges resulting from combating it than an Alpine tourism region. In this regard, it is important to note that a region's specific confrontation with challenges can become a source of legitimacy for new approaches, knowledge and market creation (Uyarra et al. 2023). Accordingly, the search for solutions also varies significantly from one region to another. Thus, regions can become places of learning and experimentation, depending on how they are affected by challenges and how strong their specific innovation capacities are.

Therefore, regions play a vital role in solving global crises, especially if their solutions can be transferred beyond the area of origin and become recontextualised and implemented in other regions. In addition, the regional level also remains of outstanding importance in the implementation of policy measures, not only because important competencies are often located there (for example in fields such as transport, planning or housing), but also because the effects of top-down strategies (that are often characteristic of mission-oriented policy approaches) unfold (differently) in regions (Uyarra et al. 2023).

Not least for these reasons, a clear analytical concept that provides guidance is essential for a reorientation of regional innovation and economic policies. Hence, this article proposes the concept of challenge-oriented regional innovation systems (CORIS) as a framework for orientation. The CORIS approach leads to a number of practical implications, which will be detailed in this article.

### **The challenge-oriented regional innovation system approach**

The CORIS approach (Tödtling et al. 2022; Tripl 2023) critically evaluates and modifies the well-known regional innovation systems (RIS) approach (Cooke et al. 1997) (for a comparison see Tödtling et al. 2022, p. 6). The RIS concept has had a significant influence on the practice of regional innovation policy in recent years and has contributed to the development of systemic and so-called "place-based" (i.e. region-specific) strategies (Asheim et al. 2019; Barca et al. 2012). From the perspective of the RIS approach, innovation serves the purpose of enhancing regional economic growth and increasing the region's competitiveness. The focus lies mainly on the development of technological innovations through the networking of companies, research institutions, government agencies and intermediary organisations such as technology transfer institutions. In contrast, the CORIS approach puts territorial sustainability challenges, regional problems and needs centre stage and calls for socially desirable innovations and changes (directionality) to overcome them. A broad understanding of innovation is considered important for this: Not only technological innovations in the corporate sector are taken into account, but also social and institutional innovations in various areas of society as well as the application of innovative solutions. What is more, CORIS not only considers the positive effects of innovation, but also possible negative or unintended consequences, as innovation may not only solve social and environmental problems, but can also cause them (Coad et al. 2021; Soete 2013). Finally, the CORIS approach emphasises the involvement of "new" innovation actors such as users or civil society organisations (Tödtling et al. 2022; Tripl 2023), thereby moving beyond the focus on "traditional" innovation actors (firms, universities, government, intermediaries).

A remaining question is: At which administrative level (e.g. county, district or federal state level) can the CORIS approach be applied as a useful guide for regional innovation and economic policy?<sup>1</sup> There is no clear-cut answer to this a priori, as it depends not least on how capacities, power, and competencies are distributed between political levels, and thus on how respective political systems and their degree of (de)centralisation are configured. Moreover, answering this question also depends on the identification of the specific problem or solution strategies. Advocating the principle of subsidiarity, Wanzenböck and Frenken (2020) contend that challenges should (primarily) be addressed by the lowest administrative level capable of solving them or the level most likely to be affected by them. However, a strategy may also aim to transfer solutions beyond the (affected) region to other contexts or to contribute to achieving national or supranational goals. Therefore, there is not "the one" predefined administrative level for which the CORIS concept provides orientation. Ultimately, depending on the distribution of competencies, the specific problem framing, and the path taken in the search for solutions, different subnational administrative levels may be relevant.

### **CORIS as orientation framework: Implications for policy practice**

The CORIS approach identifies four core processes as fields of action for a transformative regional innovation and economic policy (Hölscher et al. 2019; Trippel 2023):

- *Identification of challenges and resources*: Conventional approaches such as cluster policy or Smart Specialisation strive to identify and promote new fields of innovation and diversification potentials for the (mostly incremental) further development of regional economic structures, based on historically grown economic and technological strengths. The CORIS approach, in contrast, takes territorial sustainability challenges as its starting point. Regional innovation and economic policy have the important task of identifying these challenges together with other stakeholders, delineating their root causes, and selecting the most significant regional needs or problems. Existing economic and technological strengths and other resources available in the region can be crucial for addressing them. However, to drive innovation-based territorial transformation, it will often be necessary not only to utilise existing resources but also to explore how the region's resource base (consisting of natural resources, infrastructure and material assets, technologies, competencies, qualifications, and institutions) needs to be modified.
- *Development, application and diffusion of innovation*: This core process encompasses the development, testing and application of innovative solutions for the identified

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<sup>1</sup> We thank an anonymous reviewer of a previous version of this article for inspiring and constructive comments in this regard.

challenges. Furthermore, it includes the scaling of solutions within the region and diffusion to other regions facing similar problems. In this context, “solutions” are broadly understood and encompass both technological and social or institutional innovations, or their combination, as system transformations often require a combination of different types of innovation.

- *Delocking and exnovation*: The CORIS approach advocates not only the search for and support of socially desirable innovations, but also exnovation, understood as the deliberate and planned exit from unsustainable industries (the coal industry can serve as a prime example here), technologies, institutions, networks and practices (Heyen et al. 2017). This should be the subject of targeted political efforts. In such processes, there is a risk that groups of established actors with an interest in maintaining the status quo will block transformation activities (Baumgartinger-Seiringer 2022). Current debates surrounding the handling of resistance to change, policy approaches to destabilise unsustainable structures (Kivimaa and Kern 2016), and the compensation of losers in transformations within the context of shaping a just transition (Newell and Mulvaney 2013) bear witness to this. On the other hand, phasing out emissions-intensive industries, technologies and practices in favour of environmentally friendly solutions and “green” economic activities can open up new opportunities (Tripl et al. 2020). Supporting the exploitation of such transformation potentials is becoming a central objective of regional innovation and economic policy.
- *Orchestration*: The three core processes mentioned above require the coordination of different stakeholder groups. These groups often have different motivations and capabilities to shape innovation-based regional transformations. Conflicts of interest and ideology may arise, especially with the involvement of “new” innovation actors such as citizens' initiatives, environmental organisations, and users. Thus, an open discussion process about the goals and trajectories of innovation may be lengthier and more cumbersome than decision-making in homogeneous circles. Yet, it also offers the opportunity to better anticipate possible negative consequences of innovations (Coad et al. 2021) and to use such conflicts for creative and constructive processes. Drawing on years of experience with networking (e.g. cluster initiatives) and participatory policy development processes (e.g. Smart Specialisation), the practice of regional innovation and economic policy can play a key role in developing shared visions, mobilising stakeholders, moderating conflicts of interest and reducing resistance (Benner 2020; Sotarauta 2018). However, orchestration also means handling complex policy coordination processes. This affects both coordination with other policy areas, i.e. the cooperation with departments that are responsible for labour market policy, environmental policy or spatial planning (horizontal policy coordination) as well as

coordination with the national and supranational policy level (vertical policy coordination). The latter in particular often proves difficult in practice (as, for example, experiences with the implementation of Smart Specialisation show), but is becoming increasingly important in light of the European Green Deal and ambitious mission-oriented policy programmes at the supranational and national levels (Pontikakis et al. 2022).

The shaping of these four core processes depends on the specific regional environmental, social and economic conditions. Regions differ greatly from one another in terms of their resource endowment, their problems and transformative potential. Transformative regional innovation policy must therefore be tailored to the specific needs and potentials of each region. Moreover, it is essential to pursue a reconfiguration of the historically evolved RIS to generate innovations that can address societal challenges (Isaksen et al. 2022). This requires not only a reorientation of regional innovation and economic policy, but also other actors in the innovation system, such as universities, must take on new tasks and contribute to solving territorial sustainability problems. In addition to providing an evidence base for regional transformations, this also includes transdisciplinary approaches in which university researchers along with regional innovation and economic policy actors and other stakeholders co-create and implement innovation and transformation strategies for regions (Tripl et al. 2023). The "RIS4Danu" project is an example of how such processes can appear in practice.

### **Transformative regional innovation and economic policy in practice: the "RIS4Danu" project**

The EU-funded "RIS4Danu" project (2022-2024) provides insights into how the basic conceptual ideas of the CORIS approach can be put into practice. The project revolves around the revitalisation of disused industrial sites in eleven regions within the Danube macro region and aims at initiating and/or accelerating sustainability transformations in these regions.<sup>2</sup>

At the heart of "RIS4Danu" is the search for a new purpose for abandoned industrial sites through a co-creative process involving various stakeholders. The project understands these revitalisation processes as challenge-oriented initiatives that are intended to have an impact on the region beyond the individual site. The new use of old industrial facilities (such as a former clock factory or a coal mine) is intended to create experimental spaces for transformative change and networking venues for different stakeholders. Based on the CORIS approach, the project is aligned with the following basic principles:

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<sup>2</sup> This paragraph has been slightly modified during translation.



- *Challenge orientation - directionality of change:* Strategies for repurposing industrial sites are designed to tackle regional sustainability problems. After identification, a targeted search is conducted to explore technological, social, and institutional innovation and transformation potentials that can be mobilised to drive desired changes towards sustainability and reconfigure the RIS.
- *Evidence-based and region-specific:* The reuse strategies are based on thorough scientific analyses of region-specific resources and challenges conducted by university researchers for all eleven involved regions.
- *Inclusive and co-creative:* The development of the specific revitalisation strategies is based on broad stakeholder involvement. This includes proactive engagement of both "traditional" and "new" innovation actors in the co-creation process (see Photo 1). This process is orchestrated by the project consortium with the support of regional partners (such as regional development agencies).



**Photo 1** Workshop with regional stakeholders of the RIS4Danu project (© Mariana Baďínská)

An example of how these principles have been translated into practice is provided by a disused ceramic factory in Lower Austria. The plan for its reuse, which was developed with broad participation, envisages the establishment of a 'Circular Ceramics Hub'. This hub will



include a research and training campus for complex materials and will also take advantage of the favourable conditions for renewable energy production on site. This idea not only builds on existing regional resources, expertise and principles of the circular economy as an emerging development paradigm, but also addresses the following regional challenges: the high energy intensity of the industry and dependence on fossil fuels, the outmigration of young people due to a lack of training and job opportunities, the shortage of skilled workers and the high material intensity and low recycling rate in the manufacturing industry.

While "RIS4Danu" initially focuses on the challenge-oriented initiatives at the individual site level (see Photo 2), the reuse is intended to have a broader regional impact in the medium term. The challenge-oriented activities not only establish points of contact for follow-up activities. Newly created networks, awareness-raising, demonstration and learning effects, new coupling effects between different projects or new attraction logics (i.e. how resources are distributed) can contribute to the accumulation and strengthening of regional capacity for transformative change (Termeer and Dewulf 2019) and thus lead to a reconfiguration of the RIS.



**Photo 2** Visit of a "RIS4Danu" project site in Banská Bystrica (© Oliver Ziegler)

All in all, the "RIS4Danu" project thus provides a vivid example of how the CORIS approach can serve as a guiding framework for practical initiatives within a transformative innovation and economic policy context. It demonstrates how regional change processes can be aligned with overarching goals and programmes (such as the European Green Deal).

## Outlook

This article discusses significant contributions of the CORIS approach to reorienting regional innovation and economic policy in times of major societal challenges. This leads to subsequent questions regarding implementation into the everyday processes and routines of regional innovation and economic policy practice, which cannot be elaborated upon in detail in this short article. Nonetheless, the CORIS approach provides a starting point to pragmatically address such implementation issues through dialogue between science and practice, as well as through experimentation processes. The project "RIS4Danu" exemplifies such a transdisciplinary and experimental approach and demonstrates the potential transformative opportunities resulting from it.

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## Declaration of conflict of interest

The authors declare no conflict of interest.

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