Smart Specialisation for Sustainability Transitions?

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Short description of the report / guide to the reader

Smart specialisation (S3) is a key delivery mechanism for the European Commission to realize its new growth strategy – the European Green Deal - cutting emissions while also creating jobs and improving our quality of life. It can combine top-down directionality towards sustainable development goals with bottom-up search and co-creation processes in all regions. In its initial design and development S3 was primarily geared towards building competitive advantage through place-based innovation, collaboration and entrepreneurship. The reorientation towards sustainable development raises both challenges and opportunities for S3. These challenges and opportunities are discussed in a forthcoming EU JRC Science for Policy report 'Addressing sustainability challenges and Sustainable Development Goals via Smart Specialisation: Towards a theoretical and conceptual framework' (Miedzinski et al., 2021). This short note summarizes the key insights from this report and seeks to start a discussion about the role of smart specialisation for sustainability transitions in Norway.

What is Smart Specialisation (S3)?

Smart Specialisation is a place-based approach to regional development that was conceptualised in the 2000s and since then has primarily found large-scale practical application in European regional policymaking. The initial rationale for Smart Specialisation was twofold: (i) to reduce duplicative regional investments in science and technology and (ii) to encourage regions, especially regional governments, to "particularise themselves by generating and stimulating the growth of new exploration and research activities, which are related to existing productive structures and show the potential to transform those structures (Foray, 2015:11).

Over 160 regions in Europe, and beyond, have prepared Smart Specialisation strategies giving rise to the development of a global circuit of policy knowledge and practice. One of the interesting, and partly paradoxical features of Smart Specialisation is that is offers a general framework for place-based development.

The six key stages of S3 (Foray, 2015) are shown in Figure 1 and are described here.

Analysis of the innovation potential in the region, involving investigation of the industrial structure and innovation system to assess both existing assets and prospects for new industrial path development and competitive advantage, is the initial stage. Its inclusion emphasizes S3 as an evidence-based framework. The second stage covers the establishment of inclusive, collaborative governance arrangements, encompassing stakeholders across the 'quadruple helix' of industry, academia and public sector as well as citizen groups and NGOs. Such a quadruple helix forms the basis for the subsequent development of a shared vision and scenarios about where the region would like to be in the future, what the main goals to achieve are and why they are important. The entrepreneurial discovery process is central for the next step to collectively identify desirable areas for innovation and investment. The entrepreneurial discovery process emphasises the principle of prioritisation in a non-neutral manner - to favour and support certain technologies, fields, populations of firms - and defines

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a method to identify desirable areas for policy interventions. The inclusivity of the process reflects not only its importance for knowledge creation and use in terms of 'making choices' but also the value of identifying innovative potentials across technological, practice-based and social innovation (Barca, McCann, & Rodríguez-Pose, 2012). This, in turn, sets up a roadmap that defines an action plan with a coherent policy mix, detailing and organizing all of the measures and tools a region needs to support its innovation system towards the prioritized goals and direction. The main goal of a smart specialisation policy is to concentrate resources on the development of those activities that are likely to effectively transform the existing economic structures through R&D and innovation. Finally, embedding mechanisms for monitoring and evaluation from the outset, is another vital element, allowing for ongoing adaptation, deliberation, collaborative policy learning and refinement of the strategy. See also KMD (2018) for an extended guide in Norwegian.

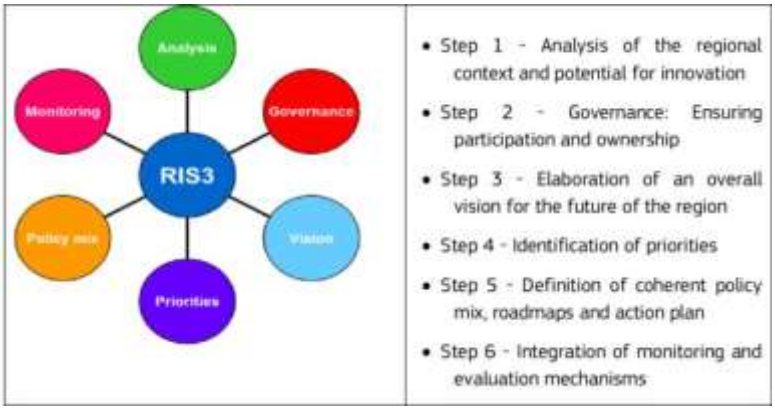

Figure 1: Six stages of S3 (Uyarra et al., 2014)

The evolution of S3

It is important to emphasize that smart specialisation is not a finished concept or approach but subject to continuous debate, criticism and evaluation, both in academic and policy circles. Various challenges to its implementation in Norway have already been discussed by Mariussen (2020). Key critiques that have been raised in the academic literature are the following. There is a lack of conceptual clarity, notably the relationship between specialisation and diversification. As also noted by Fitjar (2018), the concept entails a discovery process towards new areas of specialisation, often based on diversification of existing capabilities in the region. This also applies for smart specialisation towards greener, more sustainable industries (see below).

Another important criticism concerns a dominant focus on innovation based on science and technology, at the expense of other types of innovation. Science and technology are necessary to understand and solve sustainability problems, not the least climate change, but not sufficient. Social innovation and grassroot innovation, often driven by social entrepreneurs, not-for-profit organisations or even the public sector itself, have critical parts to play as well. Examples from sharing mobility, community energy initiatives and green finance illustrate this. The concept of responsible innovation asks for greater attention to citizen inclusion and participation in the innovation process both as a source of creativity and to achieve social acceptance for novelty and transformation (Fitjar et al., 2019). For a more comprehensive discussion, see Hassink and Gong (2019) and Benner (2020).

Finally, it needs to be noted that the implementation of smart specialisation across a great variety of different regions has provided helpful reflections and improvements of the approach from practice, shaping its further evolution. Here, Marques and Morgan (2018) have identified a number of hidden assumptions that underpinned the first wave of smart specialisation strategies. They have called these

assumption ‘heroic’ as they are challenging, particularly for public authorities in less developed regions. The assumptions are: regional representatives from governments, business and potentially academia are universally committed to innovation; the State has sufficient public sector competence to meet the challenge of implementing and learning from S3; the linear model of innovation – scientific inputs will automatically generate innovation output - is dead and buried; regions are assumed to have a quadruple or triple helix coalition in place; multi-scalar co-ordination is at the heart of S3 design and delivery. These assumptions are central to the S3 framework yet its practical implementation may prove they are often missing, notably in less-favoured regions.

Transformative innovation policy for sustainability transitions

Initial development of smart specialisation was primarily geared to industrial transformation and enhanced regional competitiveness. Directing regional development towards sustainable transition broadens the scope and scale of change & innovation substantially. Embedding the Sustainable Development Goals into smart specialisation strategies requires an explicit focus on ‘transformative change’ and so-called third generation innovation policy (Schot and Steinmueller, 2018). Innovation policy 3.0 involves the explicit mobilization of science, technology and innovation for meeting grand societal challenges. It emphasizes environmental sustainability and social inclusion, in addition to economic competitiveness, at a more fundamental level than previous framings of innovation, such as the linear science-push or innovation system approach which Schot and Steinmueller (2018) associate with first and second generation innovation policy paradigms respectively .

Drawing on socio-technical transition theory transformative change explicitly calls attention to two novel aspects: 1) directionality of innovation, 2) transforming socio-technical systems which lead to more sustainable, long-term alterations in both production and consumption that radically modify provision of societal functions such as energy, mobility or housing. Directionality emphasizes that innovation not only has a rate but also a direction and is closely aligned with the concept of missions (Mazzucato, 2021). Such missions are defined by the OECD (2020) as a coordinated package of policy and regulatory measures tailored specifically to mobilise innovation in order to address well-defined objectives related to a societal challenge, in a defined timeframe. Transformations of socio-technical systems are considered vital to avoid unambitious incrementalism and to address system linkages and rebound effects. This can be illustrated by the role of electric mobility in the energy transition – while ever-better performing electric vehicles lead to lower emissions and cleaner air, they do not solve problems related to congestion and lead to problems related to scarce materials and toxic waste.

The example of electric vehicles also shows the wickedness of many sustainability-related societal challenges. Firstly, they are complex, multi-sided and uncertain. Multiple causes and consequences co-exist, often covering several societal domains. One partial solution at one point of time may generate new, additional problems at a different point of time or elsewhere. Secondly, they are difficult to manage. Many different actors are involved that represent different interests, have different problem perceptions and advocate different solutions. Wicked problems defy easy solutions but require reflexive and responsible innovation processes that, in addition to economic goals, also meet social, ethical and environmental goals and, consequently, face dilemmas and trade-offs (Jakobsen et al., 2019).

To address wicked, societal challenges through innovation, Weber and Rohracher (2012) suggest policy should focus on four ‘transformational failures’:

■ Directionality failure: Lack of a shared vision regarding the goal and direction of transformation; the inability of collective coordination of agents involved in shaping systemic change; insufficient

regulation or standards to guide and consolidate the direction of change; a lack of targeted funding for R&D, demonstration projects and infrastructures

■ Demand articulation failure: Insufficient spaces for anticipating and learning about user needs to enable the uptake of innovations by users; the absence of orienting and stimulating signals from public demand; a lack of demand-articulating competencies.

■ Policy coordination failure: A lack of multi-level policy coordination across different systemic levels (e.g. regional–national– European or between technological and sectoral systems); a lack of horizontal coordination between research, technology and innovation policies and sectoral policies (e.g. transport, energy, agriculture); a lack of vertical coordination between ministries and implementing agencies leads to a deviation between strategic intentions and the implementation of policies.

■ Reflexivity failure: Insufficient ability of the system to monitor, anticipate and involve actors in processes of self-governance; no adaptive policy portfolios to keep options open and deal with uncertainty.

(Transformative) S3 for sustainability transitions

Attention for transformational failure comes in addition to the more conventional rationales for policy intervention to support and incentivize innovation, such as market and capability failure. Smart specialisation, covering aforementioned 6 stages of strategy development and implementation, offers a suitable starting point for transformative innovation policy that address sustainability transitions. Moreover, it helps to adapt transformative innovation policies that address global societal challenges to local circumstances and conditions. This is an important adaptation in view of the wickedness of many sustainability challenges, such as climate change, loss of biodiversity or obesity and considering the multi-dimensional nature of the SDGs.

To become purposeful for sustainability transitions, the S3 framework and methodology needs to be revisited and extended if S3 is to facilitate reflexive, responsible innovation and systemic change in line with the SDGs. Notably, the entrepreneurial discovery process should emphasize bottom-up & inclusive experimentation processes that explore place-based pathways to sustainable regional development. Here, experimentation refers to 'iterative action that generates small wins, promotes evolutionary learning and increased engagement, while allowing unsuccessful efforts to be abandoned' (Fastenrath and Coenen, 2020, p. 141). Such iterative action encompasses a broad notion of innovation, including entrepreneurial, technological grassroot, social and public sector innovation.

To shift S3 from discovery to experimentation the following adjustments to the 6 stages of the framework are suggested.

Step 1: analysis of the regional context and potential for innovation. The diagnosis should be complimented by a comprehensive analysis of regional and local drivers and impacts of global environmental and societal challenges underpinning the SDGs. It reflects scientific knowledge as well as diverse local expertise and stakeholder perspectives, including views held by groups directly at risk. However, this step also involves identification of local capabilities in science, technology and innovation for addressing such challenges. Interestingly, recent systematic research across all EU regions found that regional diversification into more environmentally sustainable industries is driven by related capabilities, sometimes even with origins in 'dirty' and/or carbon-intensive industries (Santoalha and Boschma, 2021).

Step 2: governance: ensuring participation and ownership. With its inclusive quadruple helix approach, the existing model of S3 is generally well-suited to addressing sustainability challenges. Particular focus

should be on the participation of those actors and organisations who can translate SDGs into concrete local challenges and those who are directly impacted by the consequences of unsustainable development, including users, interests groups, civil society, or the public sector. Greater attention may be warranted for asymmetric power relations in governance arrangements and the risk of capture by vested interests.

Step 3: Elaboration of an overall vision for the future of the region. The 'directionality' or ambition for change when a shared (sustainability) problem arises drives experimentation with practical 'local' solutions. At the same time, the problem framing can be contested across different interests while new solutions can meet political or societal resistance if they go against social norms, vested interests, or established routines. It can even be argued that if a change effort does not create tensions, it will not contribute to systemic transformation (Bours et al., 2021).

Step 4: Identification of priorities. Where in S3 the rationale for priority-setting was fairly straightforward (derived from a competitive advantage logic), the logic for setting priorities becomes more heterogeneous and will be more informed by political processes and stakeholder interests weighing different sustainability goals. This presupposes greater acknowledgement of trade-offs and dilemmas, e.g. between speed and inclusivity in transitions (Skjølsvold and Coenen, 2021). Here, regions can act as living laboratories for transformative initiatives where 'lived' experiences gained can be used to scale up and diffuse the initiative to other places.

Step 5: Definition of coherent policy-mix, roadmaps and action plan. Rather than fostering novelty creation per se or bringing innovation rapidly to market, S3 for sustainability transitions would likely require policy and regulation to actually create demand and shape markets for environmentally sustainable and socially responsible innovations, e.g. through public procurement. It would also include policy action to legitimize or institutionalize new norms and behaviour. Finally, it entails the mainstreaming of policy experiments or regulatory sandboxes into more formal, programmatic and large-scale arrangements.

Step 6: Integration of monitoring and evaluation mechanisms. Traditionally S3 has been geared to ex-post evaluation. S3 for sustainability transitions would require greater emphasis on process evaluations that focus on how outcomes are produced. During an ongoing process they are often organised as 'formative evaluations' where they may provide feedback on opportunities for reflection and help to change direction or adjust the ongoing project.

To conclude, it is worthwhile to point out that a defining feature of smart specialisation lies in avoiding one-size-fits-all policies and mistaking innovative solutions for off-the-shelf, silver bullets. As a policy approach to sustainability transitions, its strength lies in bringing together sustainability challenges and capabilities in a way that is sensitive to the characteristics, conditions and constraints in place. As such smart specialisation offers an important local tool in the face of 'big' global problems that require urgent solutions.

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