



An expert view: framing S3 evaluation.

Tolias, Yannis

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Contact information

Name: Elisabetta Marinelli
Address: JRC Seville – Calle Inca Garcilaso 3
Email: Elisabetta.MARINELLI@ec.europa.eu

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Foreword

This report has been produced as part of the ongoing Lagging Regions project of the European Commission's Joint Research Centre. Currently in its second phase, Lagging Regions aims to support selected slow growth and low-income territories in nine EU Member States in the implementation of their smart specialisation strategies. In addition to the provision of targeted support to each of these partner territories, Lagging Regions brings them together to share experiences and to develop cross-regional, horizontal perspectives on the key challenges they and many regions across Europe are facing. These include: Governance, Monitoring and Evaluation; Managing industrial transitions and Transregional and transnational collaboration.

Monitoring and evaluation are important concerns for regions involved in RIS3. Under the first phase of Lagging Regions, horizontal working group activities led to the production of a Massive Open Online course on monitoring.¹ This work also led to the identification of the key next steps in furthering regions' capacities to monitor and evaluate the outcomes of their RIS3 efforts. This report is an intermediate outcome of the current Lagging Regions working group on monitoring and evaluation and provides a robust basis for further exploration of the topic and the development of tools and processes by the regions involved as well as the generation of wider lessons for all regions.

Dr Mark Boden
Project Leader
"S3 Targeted Support in Lagging Regions"

¹ Available for free at: <https://iversity.org/en/courses/monitoring-smart-Specialisation-strategies>

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Authors

Yannis Tolia, Innovatia Systems

Email: tolias@innovatiasystems.eu

Abstract

This paper aims to bridge the information asymmetry between the communities of S3 practitioners and evaluators by presenting relevant information to both sides on various aspects of evaluation design and the concept of smart specialisation, respectively. The document starts with a summary (largely addressed to the evaluators community) of the concept of smart specialisation and the reasons that pushed it in the policy agenda. It then considers the evaluation of smart specialisation in the context of the ESIF regulations for the current and the next programming period. Following that, the report introduces the key choices that have to be made upon formulating an evaluation strategy. It builds heavily on Guy (1996). The audience for this is primarily the community of S3 practitioners and specifically the technical bodies in charge of, among others, monitoring and evaluation activities. These observations are complemented by some very specific, S3-relevant, remarks on the tactics of running an evaluation and followed by some conclusions.

1 Introduction

This paper aims to bridge the information asymmetry between the communities of S3 practitioners and evaluators by presenting relevant information to both sides on various aspects of evaluation design and the concept of smart specialisation, respectively. Section 2 starts by providing a distilled summary of the concept of smart specialisation and the reasons that pushed it in the policy agenda and then considers the evaluation of smart specialisation in the context of the ESIF regulations for the current and the next programming period. This section is mainly addressed to the evaluation community.

Section 3 aims to introduce the key choices that have to be made upon formulating an evaluation strategy. It builds heavily on the material (Guy, 1996). that was shared within module 5 of the JRC-developed massive online course on monitoring smart specialisation strategies (Marinelli, Gianelle, Guzzo, & Guy, 2018). The audience for this is primarily the community of S3 practitioners and specifically the technical bodies in charge of, among others, monitoring and evaluation activities.

Section 4 provides some very specific, S3-relevant, remarks on the tactics of running an evaluation. These are mainly addressed to the evaluation community. It is followed by the conclusions.

2 Understanding Objectives and Drivers for S3 Evaluation

2.1 The Context of Smart Specialisation Strategies

Smart Specialisation is an innovation policy concept that aims to boost regional and national innovation, contributing to growth and prosperity by helping and enabling territories (i.e. regions or nations) to focus on their strengths or rectify weaknesses. The concept is attributed to the European Commission's High-Level Expert Group "Knowledge for Growth" (Foray, David, & Hall, 2009)

Smart Specialisation is based on partnerships between businesses, public entities and knowledge institutions. These partnerships identify strengths in their territory and prioritise support based on where local potential and market opportunities lie by engaging into the so-called "Entrepreneurial Discovery Process" (EDP). Moreover, by design, Smart Specialisation also imposes governance, critical mass and innovation diffusion requirements (European Commission, 2017, p. 11).

Formally², a "Smart Specialisation Strategy" (S³) means *a national or regional innovation strategy which set priorities in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts. A S³ may take the form of, or be included in, a national or regional research and innovation (R&I) strategic policy framework.*

The rationale behind the initial concept of S3 was to address main inefficiencies, namely the fragmentation of public research systems in Europe that render them uncompetitive on a global scale and the duplication of research that scatters resources. The European Commission's guide on designing S3 mentioned five more issues (European Commission, 2012, p. 11):

The lack of an international and trans-regional perspective, i.e. the territorial innovation and economic system was usually considered in isolation;

The lack of coherence between territorial innovation strategies and their industrial and economic fabric characterised by public involvement in R&D that was not sufficiently business driven;

The lack of a sound analysis of the territory's assets;

A "picking winners syndrome"; and

The imitation of best performing regions without consideration of the local context.

The main novelties introduced by the concept of S3 to improve the design and implementation of innovation policy can be summarised by the so-called "four Cs" (European Commission, 2012, p. 17):

(Tough) Choices and Critical mass: limited number of priorities based on own strengths and international specialisation – avoid duplication and fragmentation in the European Research Area – concentrate funding sources ensuring more effective budgetary management.

Competitive Advantage: mobilise talent by matching RTD + I capacities and business needs through an entrepreneurial discovery process.

Connectivity and Clusters: develop world class clusters and provide arenas for related variety/cross-sector links internally in the region and externally, which drive specialised technological diversification – match what you have with what the rest of the world has.

² Definition of Smart Specialisation Strategy established by the Regulation (EU) N° 1303/2013 of the European Parliament and of the Council of 17 December 2013.

Collaborative Leadership: efficient innovation systems as a collective endeavour based on public-private partnership (quadruple helix) – experimental platform to give voice to unusual suspects.

In October 2010, European Commission asked national and regional governments to develop smart specialisation strategies to maximise the impact of Regional Policy in combination with other Union policies and pledged to facilitate the process by developing platforms for mutual learning and by providing relevant data and policy analysis³. Three years later, smart specialisation strategies were introduced by Regulation EU/1303/2013 as a thematic ex ante conditionality⁴ for all investment priorities under Thematic Objective 1 (EAC1.1). To fulfil this ex ante conditionality, a national or a regional S3 should be in place having the following attributes:

- a SWOT or similar analysis should be used to concentrate resources on a limited set of research and innovation priorities;
- measures to stimulate private RTD investment should be outlined;
- a monitoring mechanism should be in place; and
- a framework outlining available budgetary resources for research and innovation should be adopted.

The EAC1.1 applied to 169 out of 205 national or regional operational programmes (OPs) and in all 28 Partnership Agreements, being the most frequently applied ex-ante conditionality at regional level. At the time the programmes were adopted, only 20% of the programmes were considered as fulfilling it. For the rest of the programmes and the partnership agreements of twenty member states, the adoption of regulation 1303/2013 led to a race towards fulfilment that began by understanding the root causes of underperforming research and innovation systems and concluded in June 2017 with significant reforms—especially in the 13 Member States that joined EU after 2004 and also Greece and Italy (European Commission, 2017, pp. pp. 14-30). Moreover, there are several regions across the EU that voluntarily engaged in developing their own smart specialisation strategy as early as 2014 (e.g. North-East Romania) without having an ex ante conditionality to fulfil and many counties outside the EU have also done so. From this perspective, smart specialisation can also be considered as an *organisational innovation* and the factors that drive or inhibit adoption must be assessed.

Under the broad theme of research and innovation the ERDF and the EAFRD have earmarked more than €44bn of EU funds in the programming period 2014-2020 to be invested in a range of relevant investment priorities. Although it is still early to assess the impact of S3 in terms of increased innovation, jobs and productivity, early evidence suggests that new practices in public administrations have emerged at national, regional and local level regarding innovation policy-making, the degree of interaction among stakeholder groups has improved, and strategic interregional co-operation has emerged. However, heterogeneity in economic and institutional realities and path dependence in policy making across Europe can directly affect the way in which S3s are embedded in territorial policy-making agendas (Kroll, 2015; McCann & Ortega-Argilés, 2016).

Smart specialisation strategies were supposed, regulation-wise, to guide the efficient and effective use of EU support for research and innovation and thus were initially named Research and Innovation Strategies for Smart Specialisation, or RIS³. However, in many Regions/Member States, their scope was extended to cover other themes. Enterprise support, human resources for science, technology and innovation and digitisation

³ European Commission, Regional Policy contributing to smart growth in Europe 2020, COM (2010) 553 final of 6.10.2010.

⁴ An ex ante conditionality, as well as a concise and exhaustive set of objective criteria for its assessment, aims to ensure that the necessary prerequisites for the effective and efficient use of Union support are in place. In cases where there is a failure to fulfil an applicable ex ante conditionality, the Commission has the power to suspend interim payments to the relevant priorities of the Programme.

constituted the most common extensions, while a few cases of S3 being the core territorial development strategy are also present.

Finally, by design, S3s leverage funding from all available sources including European Structural and Investment Funds, Horizon2020, regional, national and private funds under considerably variable regulatory regimes. From this perspective, S3s can be considered as *meta-programmes* facing very complex governance challenges. A stakeholder survey carried out in April 2018 has highlighted that setting up a functioning governance scheme is the second most problematic step in developing and implementing S3s, behind monitoring and evaluation (Guzzo, Gianelle, & Marinelli, 2018, pp. 7-8). Moreover, two role-playing exercises organised by the JRC in 2018 showed that the current ESIF regulatory framework cannot easily accommodate the S3 governance needs, due to the somewhat conflicting institutional objectives of the different bodies involved. This is especially the case for less developed regions, which rely significantly on ESIF operational programmes that operate under logics different than S3 (Marinelli, Toliás, Bertamino, Metaxas, & Grisório, 2018).

2.2 The context of the S3 Evaluations

2.2.1 S3 Evaluations in the Programming Period 2014-2020

Smart specialisation strategies were introduced by Regulation. EU/1303/2013 as a thematic ex ante conditionality for all investment priorities under Thematic Objective 1. Evaluation, in contrast with monitoring, is not explicitly listed in the fulfilment criteria. However, the term “compliance with the features of well-performing national or regional R&I systems” in the description of the EAC1.1 in conjunction with the Commission’s initial guidelines (European Commission, 2012, pp. 25-26 and 59-60) put S3 evaluation in the agenda, albeit in an implicit rather than explicit manner. The initial methodological guidance has a single reference to “...assess whether and how strategic objectives are met” (p. 24) by planning “an impact evaluation [...] to assess the actual contribution of the supported action to the change in the statistics or the indicator value” (p. 60).

Article 114 of regulation EU/1303/2013 asks Managing Authorities (MAs) to draw up evaluation plans for their Operational Programmes and submit to the EC the findings of all evaluations carried out by 31 December 2022. Article 56 of the same regulation indicates that evaluations can cover OPs or priorities or themes, reflecting the needs of the programmes. Therefore, MAs could include S3 evaluations in their evaluation plans, but they were not obliged to do so. Currently, there is no evidence available to indicate the share of OPs for which EAC1.1 is applied that have included S3 evaluations in their evaluation plans.

So far, apart from the Commission’s guidelines mentioned above, no further guidance has been provided to Regions or Member States about S3 evaluation. The guidance document on monitoring and evaluation for the current programming period (European Commission, 2018) is OP-oriented and does not make a single reference to S3s. The more recent JRC S3 Implementation Handbook discusses evaluation only in the context of the relationship between monitoring activities and evaluation (Gianelle, Kyriakou, Cohen, & Przeor, 2016, pp. 107-108).

From the above, it is clear that, for the programming period 2014-2020, in the absence of any need for regulatory compliance, regions or Member States will have to consider the utility of complementing their S3 monitoring activities with evaluation activities and act accordingly. This suggests that S3 evaluations can be either commissioned by the regional / national authorities independently of the OP evaluations, or by Managing Authorities in the context of OP evaluations.

A survey carried out by the JRC Lagging Regions 2 project in March 2019 indicated that from 20 cases of national or regional programmes, 8 (40%) have planned a S3 evaluation outside of the OP evaluation. Of them, three were Romanian regions that have developed their own S3s without having a dedicated regional OP. In 6 out of 20 cases

(30%) S3 evaluations will be carried out within OP evaluations. Finally, in 4 out of 20 cases (20%), all of them being Romanian Regional Development Agencies that started their S3s rather late, no evaluation has been planned yet. In terms of timing, out of 12 cases that reported their S3 evaluation plans, in 3 (25%) only a mid-term evaluation has been planned, in other 6 (50%) only an ex post evaluation has been planned while the remaining 3 (25%) have planned both types.

2.2.2 S3 Evaluations in the Programming Period 2021-2027

In the European Commission's proposal for a Common Provisions Regulation (CPR) for the programming period 2021-2027, good governance of national or regional smart specialisation strategy is included as an enabling condition for the policy objective of Smarter Europe and "monitoring and evaluation tools to measure performance towards the objectives of the strategy" are listed as item 3 in the fulfilment criteria. This provision seems to put S3 evaluations explicitly on the agenda as a self-contained activity, disentangled from OP evaluations, which, according to Art. 39 of the same regulation, are carried out at the programme level (the options of being priority- or theme-oriented in line with programme needs have been dropped). Art. 39 also states that MAs "shall carry out evaluations of the programme. Each evaluation shall assess the programme's effectiveness, efficiency, relevance, coherence and EU added value with the aim to improve the quality of the design and implementation of programmes" and that the MAs "shall carry out an evaluation for each programme to assess its impact by 30 June 2029". Naldini (2018) provides a critical discussion of the evaluation-related changes in the proposed CPR. His recommendation for methodological guidance (p. 502) might also be applicable to S3 evaluations.

From the above it is implied that the responsibility for S3 evaluations beyond 2021 lies with either the regions or Member States or with the "competent regional / national institution or body, responsible for the management of the smart specialisation strategy" (fulfilment criterion 2 for the S3-related enabling condition).

2.2.3 The key differences between OP and S3 evaluations

To understand the differences between OP and S3 evaluations we need to consider the degrees of freedom that are available to both, which is a good proxy for estimating the complexity of each endeavour.

OPs are highly regulated in almost every aspect of their design and implementation. They operate within a framework that has evolved over many decades of practice and observe very specific, EU-wide, thematic, funding, eligibility, monitoring, timing and governance constraints. The level of ambition of an OP's outputs and outcomes is usually constrained by the available financial resources. This implies that an OP can be characterised as being successful even if it has a very modest impact in a territorial economy because its financial resources were too little to make an impact.

On the other hand, an S3 is an untested policy innovation that operates in a legislative vacuum under a self-organised governance structure, aiming to leverage funds from every available source (i.e. private, regional, national and international) in the territory and to introduce reforms so that an agenda of economic transformation is met. The level of a S3's outputs and outcomes will be constrained by the stakeholders' performance in leveraging funding and in introducing reforms. Not meeting the agenda of economic transformation promised by a S3 might lead to blame-games between stakeholder groups or to heavily political arguments. This might make S3 evaluations unattractive and unwanted, but it could also lead to enlightenment and suggestions concerning the way forward.

3 Developing an evaluation strategy for S3

The first step in undertaking an evaluation is planning for it. This involves deciding why the evaluation is needed, specifying the aims, the evaluation questions and the most appropriate type of evaluation to answer them, the timeframes, the resource requirements, the governance settings and the terms of reference. Planning should also consider how evaluation findings will be used and by whom.

The output of this planning process is either a project specification if the evaluation is to be carried out inhouse, or a terms of reference document in the case of commissioning the evaluation to third parties. Typically, the output will have to be structured like this (HM Treasury, 2011, p. 50):

- the background, rationale and objectives of the policy to be evaluated, its target recipients, delivery method and intended outcomes;
- the extent of the existing evidence base related to the policy;
- the evaluation objectives and research questions;
- the audience and intended use of the evaluation;
- the available information, for example monitoring data collection processes already set up;
- the possible evaluation approach, research design and methods;
- the required capabilities, skills and experience of the proposed evaluation and team;
- the required evaluation outputs (including datasets) and the milestones to be met;
- data archiving requirements;
- the indicative budget; and
- the evaluation timetable.

The sections that follow provide guidance on how to address these issues. This guidance is relevant both to the bodies planning the evaluation and to the evaluation team since the latter will have to plan the evaluation accordingly and verify that the key design specifications are valid.

3.1 Which are the drivers?

Evaluations can serve many purposes including setting territorial priorities and objectives, providing defensible evidence on their degree of delivery, demonstrating accountability, enhancing decision-making, contributing valuable knowledge to the policy evidence base, feeding into future policy development and promoting incremental improvements. In sections 2.2.1 and 2.2.2 above, we identified which bodies would probably commission a S3 evaluation in the current and in the next programming period by reviewing the respective regulatory frameworks. Understanding how they might want to use the evaluation is the critical piece of information that is needed to elaborate a purposeful evaluation design. Since we are still in the middle of the first iteration of S3s across Europe not having a solid base of evidence, we can only hypothesise drivers for evaluation, assuming that S3 evaluations will be carried out not only because they were planned for, but to serve specific purposes.

Territorial governments and/or their agencies in charge of designing and implementing S3s will most probably use S3 evaluations to validate their selection of the priority sectors, to identify problems and suggest solutions. For them, evaluations are both problem-solving and legitimising mechanisms.

Managing Authorities of OPs that observe EAC1.1 might be interested in understanding the direction of change imposed by S3 in the preparation and the delivery of their programmes. For them, S3 evaluations might be seen as a process assessment and improvement mechanism that will provide input to their OP evaluations.

The European Commission has not taken any official position in relation to S3 evaluation. Nevertheless, the EC Joint Research Centre, has recently organised several activities addressing the topic. The improvements brought by S3-induced reforms in the national or regional innovation systems, the factors inhibiting the adoption of S3 and any evidence of barriers in reforms might constitute adequate drivers for the EC. Moreover, any bottlenecks identified in the operation of the Common Strategic Framework, another policy innovation introduced by the EC in the programming period 2014-2020 that aimed to support better co-ordination between ESI funds and between ESI funds and other relevant EU-wide programmes such as Horizon2020 could also be secondary drivers from the EC's perspective.

Establishing drivers for a S3 evaluation might push the limits of the evaluator's knowledge acquisition techniques since multiple stakeholders are involved in the process, especially in hybrid S3 settings with complex multi-level governance structures. The territorial bodies commissioning the evaluation can help by establishing a list of evaluation drivers after consulting with the stakeholders. This requires either a stakeholder base or a S3 Steering Committee that has a good understanding of what an evaluation is and how it can help, which is not always the case. If everything else fails, the evaluator should start by using formal techniques to map stakeholders, collect and analyse their drivers and agree by consensus-building a final set of drivers.

3.2 Which S3 aims should be evaluated?

Establishing the aims of a S3 is expected to be much easier than establishing the drivers. The guidance provided by the European Commission (European Commission, 2012; Gianelle, Kyriakou, Cohen, & Przeor, 2016) has put considerable emphasis on documenting the logic of intervention of the strategy and mapping it into a monitoring system. Most territories have followed this guidance. Moreover, the history of the development of the strategy is usually documented either in the S3 itself or in presentations during peer reviews and similar events.

The evaluator will have to review the relevant documentation and use his/her knowledge of innovation policy to reconstruct the intervention logic, verify its completeness and check for implied aims before agreeing a set of aims that will be the basis of the evaluation design.

3.3 Choosing the evaluation issues

The choice of evaluation approach will depend on a number of factors including drivers (see section 3.1), aims (see section 3.2), the complexity of the intervention logic and the importance of constraining factors, the availability and the reliability of existing evidence, the existing data sources and measurability of outcomes, the timing of the evaluation and resource availability. Depending on the case, the exact approach will be either developed by the body commissioning the evaluation or recommended by the evaluator. Having a clear idea about the issues that need to be addressed at an early stage will help inform the design of the evaluation and specifically the general approaches that can be used to explore them.

Table 1 presents a checklist of typical evaluation issues and the indicative questions which help define them. It can be presented to the different stakeholders at the start of an evaluation to identify the relevance of each issue to the different stakeholders that are expected to use the evaluation results. As already mentioned earlier (see section 2.2.2), effectiveness, efficiency, appropriateness and additionality are the common evaluation issues that must be addressed by OP evaluations according to Art. 39 of the proposed

CPR for 2021-2027, and impact is the only issue mentioned in the methodological guidance for S3s.

Table 1 Evaluation Issues Checklist

<i>Issue</i>	<i>Indicative Question</i>	
Appropriateness	<input type="checkbox"/>	Was it the right thing to do?
Economy	<input type="checkbox"/>	How much did it cost?
Effectiveness	<input type="checkbox"/>	Has it lived up to expectations?
Efficiency	<input type="checkbox"/>	What's the return on investment?
Efficacy	<input type="checkbox"/>	What's the ROI vs the expectations?
Process efficiency	<input type="checkbox"/>	Is it working well?
Quality	<input type="checkbox"/>	How good are the outputs?
Impact	<input type="checkbox"/>	What has happened as a result of it?
Additionality	<input type="checkbox"/>	What has happened over and above what would have happened anyway?
Displacement	<input type="checkbox"/>	What hasn't happened which would have happened in its absence?
Process Improvement	<input type="checkbox"/>	How can we do it better?
Strategy	<input type="checkbox"/>	What should we do next?

Source: Guy, 1996, p. 14

However, having understood the context and the aims of a S3, the drivers of the stakeholders and their perspective on issues of relevance is not enough to define the issues to be addressed.

There are some more factors that have to be considered and below we summarise how these impose constraints to the design of evaluations.

Timing

The timing of an evaluation has a profound role on the evaluation issues that can be explored. Ex ante evaluations are carried out before the start of the intervention to inform strategy making and thus their primary aim is appropriateness, strategy and process improvement. Ex post evaluations are carried out after the end of the intervention and aim at collecting and analysing measurements to assess issues such as effectiveness, efficiency, economy and impact. They also generate knowledge to be exploited in the future. Mid-term evaluations will usually aim to measure process efficiency and provide informed estimates on the effectiveness of the intervention.

Drivers

Depending on the drivers, an evaluation can have either a strategic or a tactical focus and also a formative or a summative nature. Depending on the timing and therefore their reliance on quantitative or qualitative evidence, evaluations with a strategic focus try to answer "what to do next" by considering appropriateness and process improvement. When timing permits, appropriateness may be examined in conjunction with economy, efficiency, effectiveness and impact. Evaluations with a tactical focus will be concerned with process efficiency and process improvement using summative and formative approaches, respectively.

Complexity of the Intervention Logic

Detailed evaluation of changes where the logic of intervention is particularly complex, such as a S3, might only be possible through only a limited number of approaches that depend on data and resource availability (see below). The option of restricting the scope of the evaluation to shorter causal paths may be considered as a partial solution.

Availability of Evidence

The availability of a strong evidence base (i.e. evaluations of similar interventions in the past) can focus the evaluation on the specific issues that have been left unanswered and rely on review-based evaluations and simulations to address the remaining issues.

Availability of Data

Existing datasets can provide good results in relatively short time, but they can also restrict the issues they can attempt to answer for obvious reasons. Knowing what data is available and accessible can help the evaluator shape the correct approach and decide on the need of pilot data acquisition exercises during the evaluation.

Resources

Evaluations, especially those focused on measurements that aim to explore issues such as process efficiency and impact will require considerable time and resource commitments. If these commitments are constrained either by time or by budgets, then the evaluation design shall have to be constrained to less formal methods.

3.4 Framing evaluation approaches

Evaluations can be designed to answer a broad range of questions on topics such as how the strategy was delivered, what difference it made, whether it could be improved and whether the benefits justified the costs. Broadly, these questions can be answered by three main types of evaluation.

- Process evaluations assess whether a strategy is being implemented as intended and what, in practice, is perceived to be working well, and why. Typically, process evaluations are components of interim evaluations and often occur when strategies are demanding in terms of communication, timeliness, control and engagement.
- Impact evaluations attempt to provide an objective test of what changes have occurred, and the extent to which these can be attributed to the strategy. Typically, impact evaluations are components of ex post evaluations assessing the extent to which strategic objectives have been attained, identifying and quantifying, as far as possible, all the effects brought about by the strategy, directly or indirectly, intentionally or not.
- Economic evaluations compare the benefits of the implementation of the strategy with its costs. Typically, economic evaluations are components of ex post evaluations in the form of cost-benefit, cost-effectiveness or cost-utility analyses.

Understanding why a strategy operated in a certain way and had the effect that was measured generally involves balancing the information and analytical approaches of all three types of evaluation.

The question of how the strategy was delivered is concerned with the processes associated with it, the activities involved in its implementation and the pathways by which the policy was delivered. In a typical S3 setting these might include the governance system, the entrepreneurial discovery process, the engagement of stakeholders, aspects of the management system (i.e. call quality, proposal assessment,

contract management, problem identification and resolution, monitoring) and the delivery instruments (i.e. grants, vouchers, clusters, and others). In general, process-related questions are intentionally descriptive, and as a result, process evaluations can employ a wide range of qualitative and quantitative data collection and analysis techniques, covering multiple topics and participants. Questions under this heading might ask:

- Is the governance structure set up in an effective and efficient way that allows the S3 objectives and results to be reached?
- Is the entrepreneurial discovery process effective and efficient in identifying domains with potential for innovation and spillovers?
- Is the strategy effective and efficient in minimising the bottlenecks for innovation diffusion?
- Is the entire project cycle (application, selection, contracting, implementing, reporting and monitoring as well as reimbursement of costs) organised in an effective and efficient way?

Answering the question of what difference the strategy has made involves a focus on the results of the strategy. Results are those measurable changes in a socio-economic dimension that we want to improve, which are themselves the objectives of the strategy and the benefits they generate. In the context of a S3, these results are usually documented in the discussion of priorities and are also included in the monitoring system. Questions under this heading might ask:

- What were the results of the strategy, were there any observed changes and, if so, how much of the change has been caused by the strategy as opposed to other factors?
- Did the strategy achieve its stated objectives?
- How did any changes vary across different stakeholders and how did they compare with what was anticipated?
- Did any results occur which were not originally intended, and if so, what and how significant were they?

Impact evaluations recognise that most results are affected by many factors, not just the strategy itself. To test the extent to which the strategy was responsible for the change, it is necessary to estimate, using very technical statistical analysis of quantitative data, what would have happened in the absence of the policy.

Finally, answering whether the benefits of the strategy are bigger than the costs involves either calculating the cost of producing a unit of result, or, assigning monetary values to the results of the strategy and doing the calculations.

Understanding why a strategy operated in a certain way and had the effect that was measured generally involves balancing the information and analytical approaches of all three types of evaluation.

3.5 Dedicating resources

At this point, the key questions that shape the evaluation design have been answered. To make it happen, resources must be committed and specifically:

1. Financial resources: The cost of the evaluation has to be budgeted as part of the cost of the S3 having in mind that, depending on the timing, a considerable part of the cost will be incurred after the end of the strategy. In reality, budget is probably the first and most important factor that determines the design of an evaluation. Evaluations are rarely designed and then costed – they are designed to fit within specific budget ceilings, though there is always scope for some negotiation when specific design features are discussed. Having a well-designed and functioning monitoring system can reduce the burden of data collection and therefore lower the

cost of the evaluation. Since a S3 is both a complex and a novel policy, it will probably require thorough and concrete evaluation to build, almost from scratch, a robust evidence base on what works, assess return on investment and meet accountability requirements.

2. Human resources-commissioning body: Most probably, given the expertise and the effort required, the evaluation will be commissioned to external experts. However, the body commissioning the evaluation will have to dedicate a project officer with specialist technical expertise to assure quality, react to issues raised by the evaluation team and sign-off evaluation deliverables. The project officer will have to be supported by specialists in themes such as economics, statistics, operational research and social sciences both in the phase of proposal evaluation and during the course of the evaluation. Finally, a steering group consisting of key stakeholders can be considered to assist in quality assurance, in the interpretation of interim findings and to provide access to information and contacts.
3. Human resources-evaluation team. Staffing the evaluation team is a design issue from the perspective of the candidates. The headcount will have to be sufficient to complete the work given the schedule of the evaluation with some redundancy for unexpected developments. The specialist technical expertise will not be different to that in point 2 above. In terms of experience, in a typical setting, the candidate will have to demonstrate profound experience in the field of evaluations of programmes of the Cohesion Policy and also knowledge of context in the territory and of the concept of smart specialisation.
4. Data: The availability of statistical, administrative or general long-term survey data are important sources of background, context or explanatory data. Monitoring data may form the basis of an impact evaluation if the data is of sufficient quality and allows the estimation of a counterfactual. They also provide information to monitor the progress and performance of the S3 from its start and can contribute to a process evaluation. In any case, existing monitoring data have the potential to fulfil some or, on occasion, all the data needs for planned evaluation.

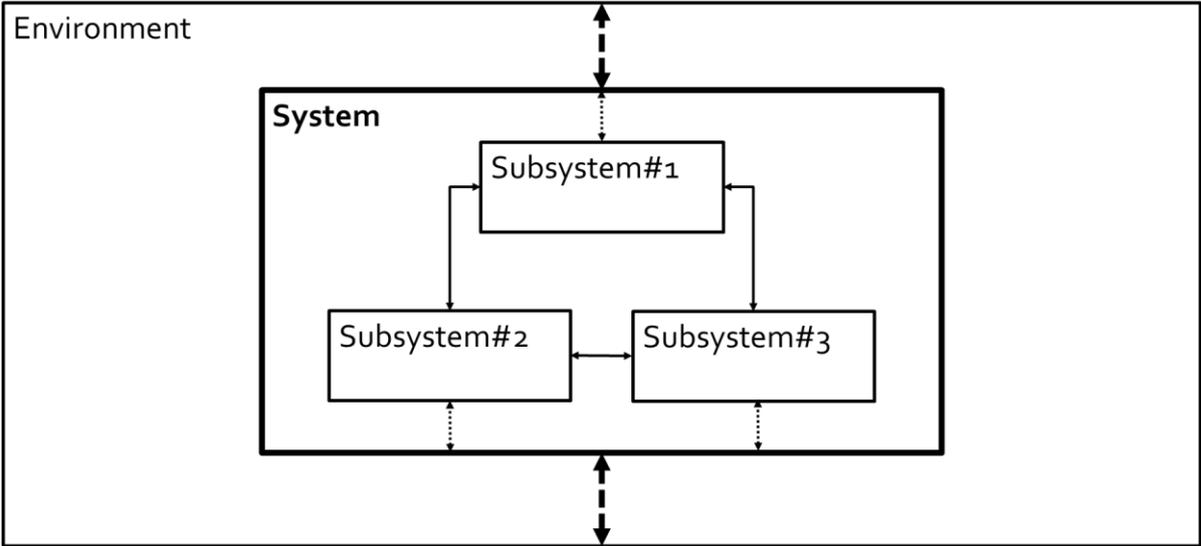
4 Remarks on Evaluation Tactics

The overall evaluation strategy that has been defined by reflecting on the issues described in section 3 will eventually have to be implemented either by an inhouse team or by external experts following a detailed design or a technical proposal. It is well beyond the scope of this report to examine the entire set of options regarding tactics and appropriate methods; the body of knowledge is huge and evaluation experts are masters of it. However, there are two points that deserve some critical remarks from the perspective of the S3, namely the definition of the system in focus and variables and indicators related to the structure and the processes of a territorial innovation system.

4.1 Defining the System in Focus

There is no dominant definition for an innovation system. By considering Edquist’s (1997, p. 14) definition of an innovation system being “*the set of economic, social, political, organisational and other factors that influence the development, diffusion and use of innovations*” within a territory, we can delineate the boundaries of the system to be evaluated as shown in . By design, in the context of a S3, the system boundaries of the system of innovation are defined primarily by geography and secondarily by priority areas. This means that, depending on the specific context of the S3, the system boundary will have to include the territorial factors (and actors) which are relevant to the priority areas specified by the strategy. Anything else belongs to the environment, which, under the perspective of access to global knowledge flows and global value chains that is embedded in S3 design can be the entire world. The system can harvest resources such as knowledge, skilled people and money from the environment. The environment can impose various types of constraints on the system and the system outputs can induce changes in the environment. These interactions between the system and the environment are marked by bold dashed arrows in .

FIGURE 1 SPECIFICATION OF THE SYSTEM TO BE EVALUATED.



SOURCE: ADAPTED FROM GUY (1996, P. 18).

Within the system boundaries there might be one or more sub-systems that are relevant to the S3 and therefore relevant for the evaluation. Each priority area of a S3 can be considered as a separate sub-system at the territorial innovation system, being characterised by its own structural components (key actors, networks of actors, culture, norms) and its focus (knowledge fields or activities/products/artefacts). Each subsystem

can compete with the others for resources but also collaborate with the same in exchanging needs and/or solutions knowledge. These interactions are marked with straight line arrows in the figure. The sub-systems also interact with the system itself by using structural elements of the system that can cut across specific priorities, such as human resources, general-purpose technologies and innovation intermediaries. Such interactions are marked with dotted arrows in the figure.

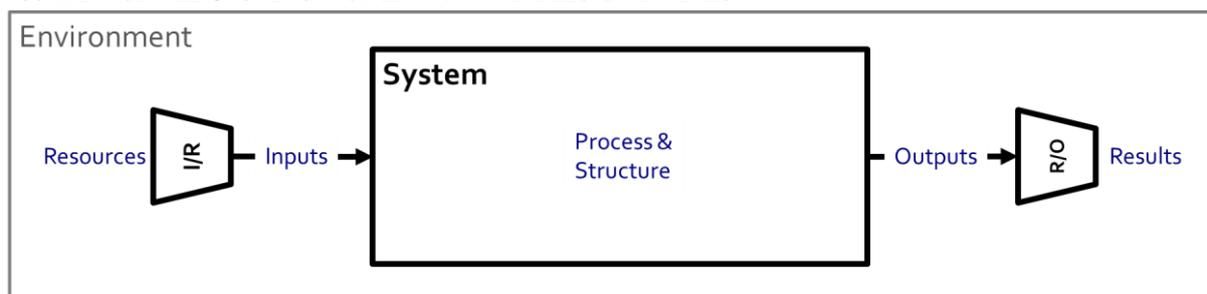
In principle, the system and its sub-systems have been mapped during the first step of the S3 process. The evaluator might consider updating this mapping by using a number of methods such as searching company databases, performing patent/bibliometric analyses, interviewing industry experts, performing network analyses and reviewing recent changes in the institutional framework.

4.2 Variables & Indicators

Knowing the boundaries of the system and its internal components leads to the selection of the system variables of interest that will be used to measure the evaluation issues that have to be explored. There are six categories of system variables, shown in blue in Figure 2:

- *Resource* variables characterise the origins of the many inputs into a system.
- *Input* variables describe the various inputs from the environment to the system.
- *Structure* variables help characterise the system itself.
- *Process* variables help define the way in which the system operates and functions.
- *Output* variables describe the range of system outputs which can exist.
- *Result* variables characterise the effect outputs have on the broader environment.

FIGURE 2 A SIMPLE SYSTEMS MODEL AND VARIABLES OF INTEREST



SOURCE: ADAPTED FROM GUY (1996, P. 20).

The relationships between system variables can be used to describe some of the issues of interest. For example, the ratio of the observed outputs to the observed inputs is a measure of efficiency while the ratio of the observed outputs to the planned outputs is a measure of effectiveness. Some other ratios can be used as proxies of the structure of the system itself such as the ratio of actual inputs to the available resources which is very relevant in cases where systems compete for maximising their share of a fixed pool of resources.

The task of reviewing options for indicators for each type of variable and selecting the most appropriate for the purpose requires will be owned by the evaluation team. Since

monitoring and evaluation are complementary activities, and ideally the design and requirements for each should have been considered together, many relevant indicators will have been already in the monitoring system.

An issue that is very relevant in the evaluation of S3s is the definition of suitable indicators for process and structure variables. Indicators for process variables that have been used in the past to measure the actual state of implementation in the context of OP evaluations can be readily repurposed in the context of S3 evaluations. However, we are still missing a set of indicators to describe "*how much S3 is in the system*" in terms of what characterises the S3 as a policy tool (i.e. collective governance, continuous entrepreneurial discovery process, balancing mainstream and experimental actions, agility and responsiveness to change, access to global knowledge and value chains) , and also the structural components that were discussed in the previous section (i.e. typology and classification of actors, areas of specialisation prioritised by the territory, distribution of economic activities by area of specialisation, formal and informal networks, entrepreneurial dynamics and others).

Given that due to the very nature of S3s result indicators cannot be homogenised and therefore aggregated at different geographical scales, process and structure indicators can be the only ones that can effectively be benchmarked EU-wide. In fact, some of these structure-related indicators could even be collected in an automated manner by data fusion from highly heterogeneous sources.

5 Conclusions

Key points:

- In the absence of any need for regulatory compliance for the 2014-2020 period, territories have considered the utility of complementing S3 monitoring activities with evaluation activities and reacted with very different approaches. One of them was doing nothing.
- S3 Evaluation (and monitoring) are now explicitly one of the fulfilment criteria for the 2021-2027 period. However, territories are left to their own devices regarding how to plan, execute and use S3 evaluation results, especially in relation to the Operational Programmes.
- The European Commission has not taken any official position in relation to S3 evaluation. Nevertheless, the EC Joint Research Centre, has recently organised several activities addressing the topic.
- Inter-regional comparison and aggregation of evaluation data is very difficult at the level of outputs and results due to the nature of the S3s. A conceptual scheme of S3 process and/or structure indicators would be a feasible option, especially if designed in a way to address issues that are related to fulfilment criteria such as minimisation of barriers to innovation diffusion, promotion of internationalisation, and improvements in territorial innovation systems.

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List of abbreviations and definitions

EARDF	European Agricultural and Rural Development Fund
EC	European Commission
ERDF	European Regional Development Fund
ESIF	European Structural Investment Funds
EU	European Union
JRC	Joint Research Centre
MA	Managing Authority of the Operational Programme
OP	Operational Programme
S3	Smart Specialisation Strategies

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