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Monitoring Mechanisms for Smart Specialisation Strategies

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Abstract

In the context of innovation strategies for smart specialisation (RIS3), monitoring mechanisms perform three fundamental functions: (1) inform about what the strategy achieved and whether implementation is on track and making this information available to decision makers; (2) clarify the logic of intervention of the strategy and make it comprehensible to the broader public; (3) support the constructive involvement and participation of stakeholders through transparent communication and promote trust building. RIS3 monitoring focuses on tracking the developments related to policy interventions within the specific priority areas identified in the strategy. The monitoring mechanism should be able to capture and follow the relevant expected changes that are foreseen in each RIS3 priority by means of an appropriate choice of result indicators; it should also capture and follow the policy output that ought to make expected changes happen. Regions and countries with extensive experience in monitoring innovation strategies and territorial development policies in general should build on existing monitoring structures; those with limited experience in this field should begin to develop their own internal capacities and experience starting with simple indicator systems, following the practical guidelines of this brief.

Keywords: Policy monitoring, Intervention logic, Indicators, Innovation policy, Smart specialisation

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Introduction

The term monitoring usually encompasses all sorts of activities that have to do with the collection and processing of information about the achievement of expected results and the degree of implementation of policy measures. In this policy brief, we start from this simple definition and take you on a journey that increases our understanding of what monitoring really is, what its rationale, its goals and implications are in the context of smart specialisation. We do this by means of enriching the way we conceive monitoring, and by discovering the many ways we all - the community interested in smart specialisation policy - can benefit from it. Evaluation is closely related to and builds on monitoring data. While monitoring captures if we are actually doing what we set out to do according to the planned logic of intervention, evaluation provides an ex-post validation of the intervention logic by assessing how and why policies, programmes and projects have actually had the desired effects. Monitoring does not substitute for evaluation; it rather complements it.

This policy brief is not intended to provide binding prescriptions on how RIS3 monitoring activities should be organised or how the monitoring mechanism or system should look like in a RIS3 document. Rather, it should be regarded as a guided reflection on the meaning of monitoring leading to the formulation of possible ways to operationalise it; we provide a minimum standard for the elements of a sound monitoring system. In addition, this brief emphasises that, whatever RIS3 monitoring architecture is put in place and whichever indicators are selected, it is crucial that the bodies responsible for these actions explain why they made certain choices, what the objectives are, and how the devised policy measures are thought to contribute to results and to the achievement of objectives.

The guidance provided is neither meant to substitute for the good practices and the experience that many regions and countries may have. Public administrations with substantial experience in monitoring activities are encouraged to maintain this focus, further deepen their capacities to build monitoring systems for RIS3, and to share their knowledge with other public administrations across Europe. Regions and countries with limited experience in monitoring activities or which are still in the development of their RIS3 may probably benefit most from the reflections contained in the present document.

The brief is organised as follows. Section 1 explores the different rationales for monitoring RIS3 processes; Section 2 provides a conceptualisation of the logic of intervention of RIS3; Section 3 frames the monitoring activities according to the logic of intervention of the strategy; Section 4 discusses some relevant issues related to the choice of indicators; Section 5 reports main challenges and opportunities related to data sources and availability; Section 6 highlights governance challenges; Section 7 provides a list of practical recommendations to build a consistent and complete RIS3 monitoring mechanism.

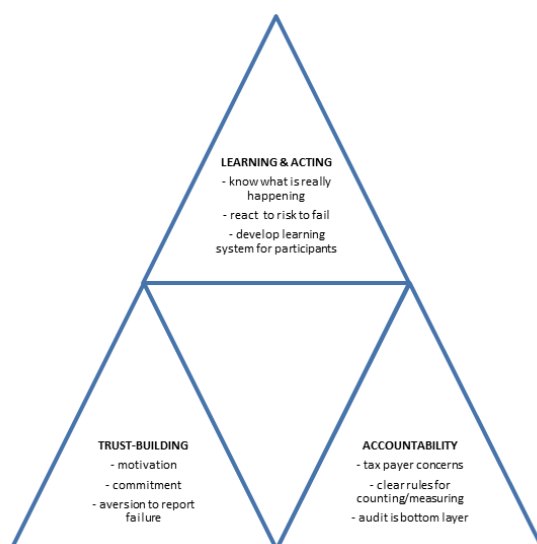
1 Why should we monitor RIS3?

Let us consider the short description of monitoring provided in the introduction and ask why these activities are so important and why they should be regarded as crucial for maximising the expected

results of RIS3 aimed to promote transformations of national and regional economies. There are several reasons for this.

All things considered, we can identify three main purposes of the RIS3 monitoring system: (i) learning about actual transformation processes and informing policy (re)actions accordingly; (ii) building and reinforcing trust and cooperation with and among stakeholders and citizens; (iii) guarantee accountability of policy making.¹ Figure 1 summarises these elements. The monitoring system serves these purposes by performing three key functions: gathering information and making it available to decision makers; clarifying the purpose and functioning of the strategy and making it comprehensible to the broader public; supporting the constructive involvement and participation of stakeholders through transparent communication.

Figure 1: Monitoring for learning-and-acting, accountability and trust-building



Monitoring as a system to gather and process information

Monitoring is first of all a process of information gathering and systematisation. The main purpose of monitoring in this respect is to enhance our understanding of the achievements that have been put in place through policy interventions. When we monitor we collect data on policy implementation (output indicators) and changes in the result variables (result indicators) that best capture the expected changes we want to bring about. In this understanding, monitoring is key for

RIS3 vs. Operational Programme

One of the main differences of RIS3 monitoring compared to Operational Programmes is the focus on RIS3 priorities. Monitoring the strategy implementation should by definition keep track of the developments within prioritised areas.

ensuring accountability of policy making *vis-à-vis* stakeholders and citizens. Moreover, monitoring is a pre-condition for conducting any meaningful evaluation. It may be useful to set up a monitoring system in parallel to the evaluation design, so that the right metrics required for evaluation are also collected.

¹ These are all conceptual rationales for monitoring. Apart from this, there is a clear legal requirement to establish monitoring mechanisms for RIS3, see ANNEX XI, Part 1 of EU REGULATION 1303/2013.

We need the monitoring system in order to learn what is actually happening in the region or country with regard to our policy implementation decisions; even more so, we need the monitoring system in order to realise when actual changes are not going in the expected direction. In its original Latin meaning, the word monitor refers to a supervisor or to something that reminds or warns us. This indeed reveals how monitoring can serve as an early warning system that informs us when things are taking the wrong direction and may allow taking well-timed countermeasures to steer processes towards goals. In this understanding, monitoring allows to learn from failure before processes become irreversible. Furthermore, the wealth of information gathered through monitoring constitutes the basis for periodic refinement or refocusing of RIS3 priorities.

Monitoring as a transparent crystallisation of the logic of intervention

The monitoring system is also a way to spell out concisely the logic of intervention that lies behind the RIS3. The purpose of the monitoring system in this respect is twofold. On the one hand, laying down the monitoring system represents an opportunity for strategy designers to streamline and distil the very essence of the RIS3 logical chain that links means to ends, in this way ensuring consistency of the various elements and their appropriateness to the achievement of ultimate goals. In other words, once it is properly and fully defined, the monitoring system is a way to effectively describe the role of priorities, policy instruments and their relationship with strategic objectives. In this way, monitoring systems can help people in charge of policy implementation, stakeholders and citizens to understand the rationale of policy interventions, enabling them to constructively engage in strategy improvement and to quickly react to early warnings.

In this respect, it is useful to remember that even the most sophisticated monitoring system alone cannot allow for a complete and precise identification of the causal impact of policy interventions on the selected result indicators net of the effects of "other factors" or socio-economic dynamics that are external to the cause-effect chain linking policy measures to results.² Impact evaluations are needed in order to properly identify the contribution of policy measures to the observed changes in the result variables. Although monitoring and evaluation are often used as one conjoined term, this note treats them separately and exclusively focuses on monitoring. We should be aware of the fact that monitoring systems are only a representation of the logic of intervention of RIS3 and thus cannot be regarded by any means as a validation of such logic.

Monitoring as a communication device

A third important role of monitoring derives directly from the previous points. A transparent monitoring system that concisely communicates the relevant information about RIS3 implementation contributes to the credibility and reputation of the ambitious transformational plan contained in the RIS3. As an ideal type, monitoring activities are organised as a continuation of the dialogue with those stakeholders that were involved during the design of the RIS3. In this function, monitoring contributes to building and maintaining dialogue and consensus. Stakeholders can either be involved in the follow-up of monitoring activities or be empowered by having access to factual information on progress made. In this way trust, ownership and commitment can be built up and maintained.

² On this topic, see for instance the Commission Guidance Document on Monitoring and Evaluation available at http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf.

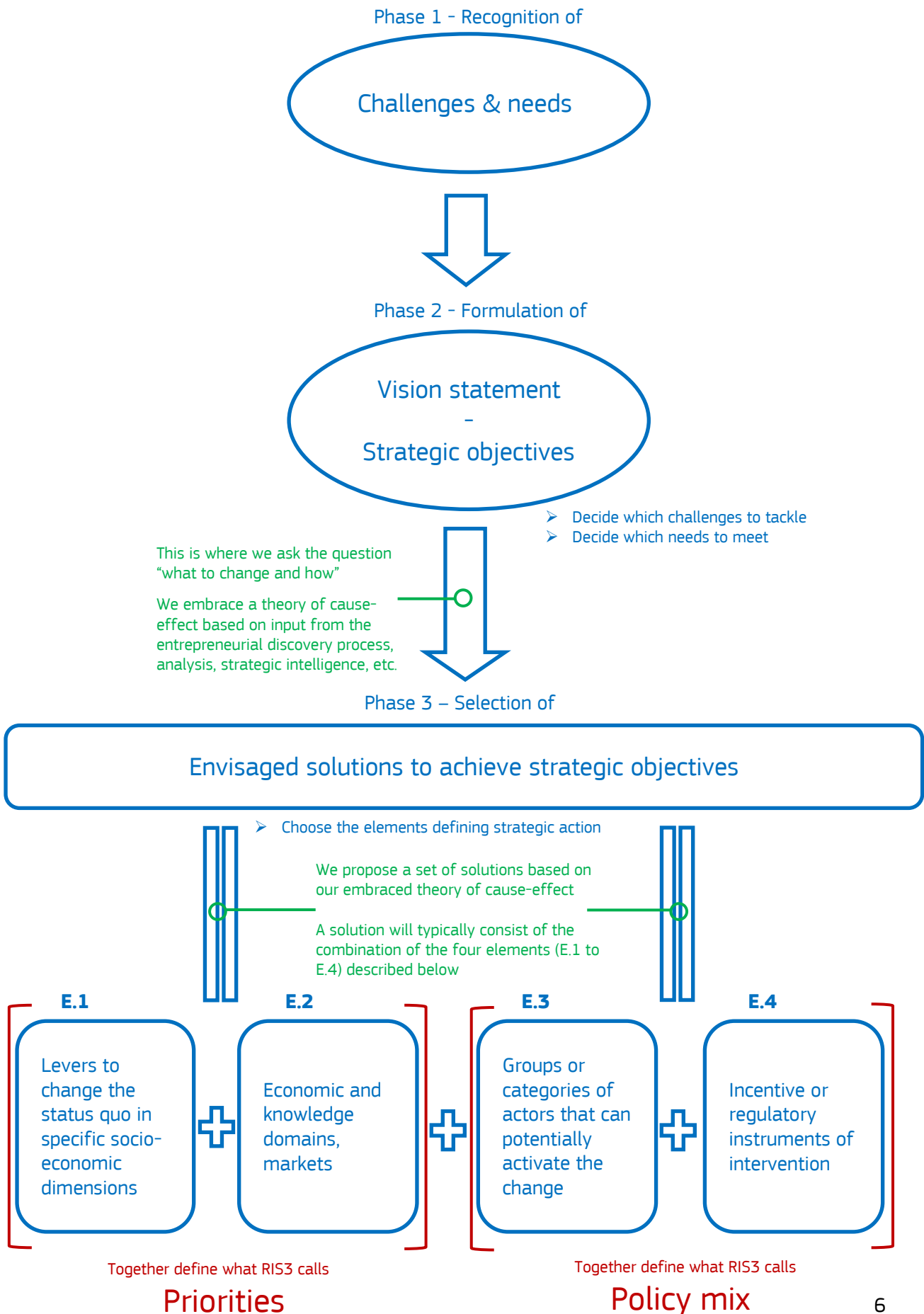
2 RIS3 logic of intervention revisited

Once we accept the need for a monitoring system, we can try to define more precisely how it should look like, and what its constituent elements are. The central questions to answer in this respect is what exactly we should monitor and how. To be able to answer these points, first of all we need to make sure we identify correctly the conceptual building blocks of a RIS3 and understand how they are causally and logically interlinked. Monitoring can only be understood based on its fundamental relationship with the strategy's structure, i.e. with the causal sequence of propositions constituting the very essence of the RIS3.

It is important to ensure that suggested casual links have already been proved in a rigorous way (e.g. based on good practices established in other contexts, regions, countries, lessons learnt from past policy experience, emerging analytical evidence based on sound causal inference, etc.). In the case of rather experimental interventions, the envisaged measures should count on wide support from stakeholders and experts; policy makers should establish a mechanism to test whether this suspected causal link actually works in practice. This would be part of an evaluation plan.

In order to proceed with a more focused discussion, we propose a concise (re)definition of the prototypical structure of a RIS3 from which we can derive an operational definition of monitoring (Figure 2).

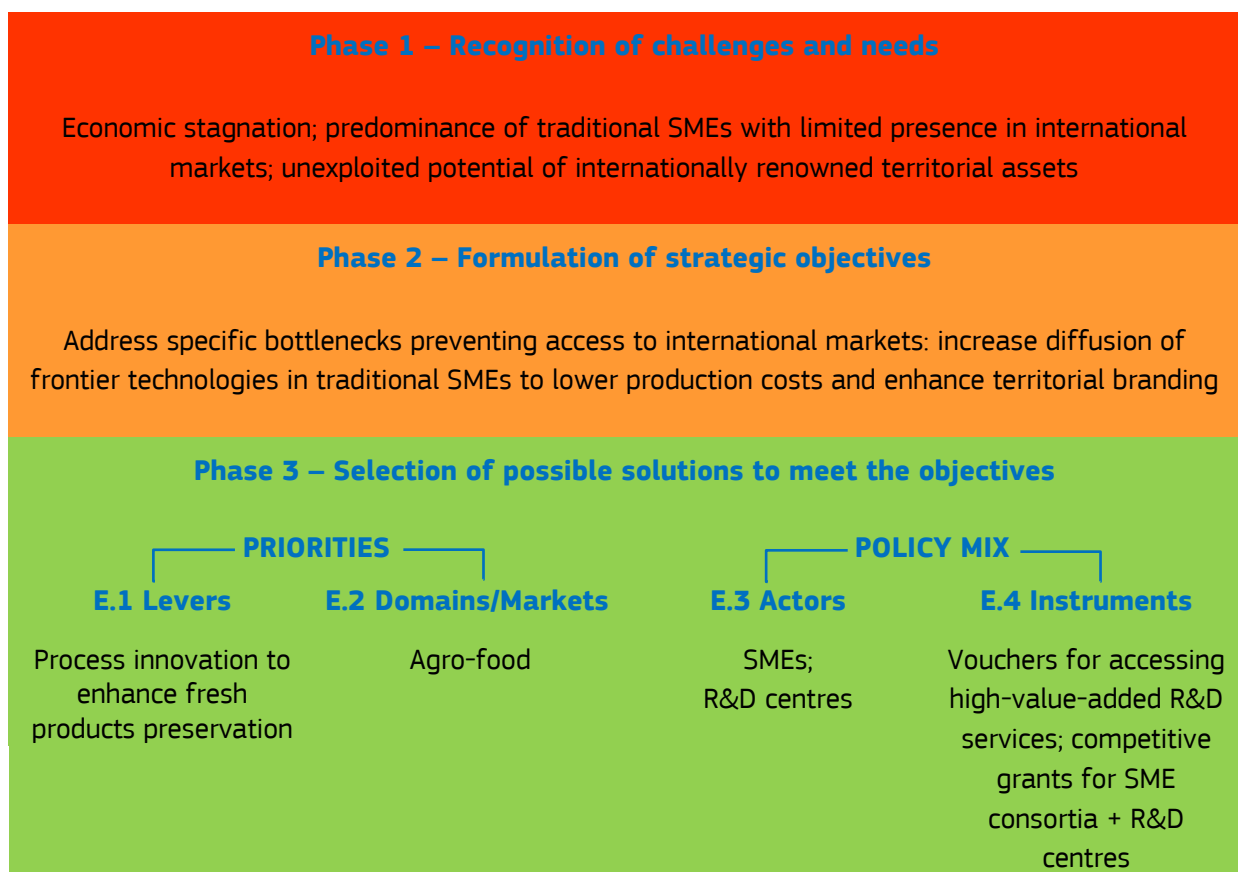
Figure 2: The RIS3 structure



In Figure 2 we highlight the three phases constituting the minimum and necessary steps of any strategic approach: detection of needs and challenges, i.e. identification of problems (Phase 1); decision on the desired transformations, i.e. selection of the most urgent needs and their reframing in terms of strategic objectives (Phase 2); definition of the responses to put in place in order to meet the objectives, i.e. formulation of solutions to selected problems (Phase 3).

The needs and challenges are expressed by the society and the community of citizens and social and economic actors. The strategic objectives are the 'big' desired and expected changes for the entire socio-economic system of a region or country ultimately endorsed by the bodies entitled to political representation. The responses aimed to meet strategic objectives can be seen as operational solutions consisting of specific combinations of four elements: (E.1) levers to change the existing state of affairs in specific socio-economic dimensions; (E.2) economic or knowledge domains, specific markets; (E.3) groups or categories of subjects that can potentially activate the change; (E.4) economic or regulatory instruments of intervention. Figure 3 provides a practical example.

Figure 3: Example of RIS3 logic of intervention



The example depicted in Figure 3 is necessarily a simplification of reality. A single solution will typically address a strategic objective from a specific angle; therefore, a broad objective may be addressed by devising and implementing an array of different but consistently complementary solutions. On the other hand, different operational solutions may hinge upon the same domains or

levers, while the same category of instruments can be used to activate different levers in different fields of activity.

Let us focus on the passage between Phases 2 and 3. It is here that the RIS3 moves from general to specific. You need first to choose and then to apply a specific theory of cause-effect which matches desired goals to specific solutions. Such a theory is nothing but assuming a causal mechanism which is derived based on stakeholder contributions, general experience and analysis. In the RIS3 context, this assumption can naturally emerge in the entrepreneurial discovery process, with the support of analysis, relevant scientific literature, and perhaps strategic intelligence. The strategy designer should in any case make sure that the causal mechanism is well understood and explained.

For a mere illustration purpose, let us assume a case where the general goal of a RIS3 is to enhance the internationalisation of innovation processes. A strategic solution to meet this goal would be to support internationalisation processes of regional or national firms. Such a conclusion derives precisely from the application of a theory of cause-effect, in this particular case supported for instance by the fact that numerous economic studies and practical experience demonstrate how opening up to foreign markets enhances productivity and induces learning processes that strengthen the firm's knowledge base.

The first element of a strategic solution is a (set of) lever(s) to be activated in order to modify the existing way of conducting processes, organizational procedures, and inter-organisational relationships. A lever is a specific means or agency for achieving an end. It is usually denoted by a category of actions the social and economic actors perform or behaviours they adopt. It may be framed as a technological trajectory, a defined aspect of production processes, or a type of inter-actor relationship (the range of actual possibilities can be quite diverse, e.g. R&D activities, marketing, international subcontracting, collaborations, logistic services, virtualisation of services and communication, social networking, energy saving practices, waste reduction, production efficiency practices, learning activities in general, etc.).

In general, the determination of specific matches of levers (E.1) and target activities (E.2) give rise to what in a RIS3 is referred to as a set of priorities. In actual RIS3 documents, such matches can be made more or less explicit, but we can safely say that when it comes to identifying priorities, the strategy designer should have in mind both the types of levers to activate and the domains/market segments where to activate them.

3 From strategic design to monitoring

To identify elements E.1 to E.4 means giving names to the chosen levers, domains/markets, groups of relevant actors and instruments. In particular, the specification of elements E.1 and E.2, i.e. the characterisation of RIS3 priorities, allows determining the nature and scope of the desired and realistically achievable change we aspire to in a given socio-economic dimension (E.1) within a given socio-economic system (E.2). In a strategic context, this is what we call the expected change. The mix of policy instruments targeted at a definite group of actors, E.3 and E.4, will then be chosen in order to contribute to the defined expected change.

The explicit identification of the expected changes is equivalent to setting specific objectives for the RIS3 and hence it is a fundamental element of a strategic outline and essential in order to construct a monitoring system. An expected change can be specified in several ways, but in general it is necessarily and sufficiently defined by three aspects:

- A variable of socio-economic nature that can effectively capture the direction and relative and absolute magnitude of the change in qualitative or quantitative terms and that can be observed and measured;
- Baseline and target values for the variable;
- A timeframe for observing the actual evolution of the variable.

The variable capturing the expected change is the result indicator associated to it. Once the result indicator is selected, it is essential to identify baseline and target values. Only in this way we can indeed appreciate whether a change is actually materialising (baseline vs. actual value) and whether the actual change is going in the desired direction at the desired pace (actual value vs. target value).

The choice of the instruments (E.4) that are assumed to make the expected change happen will allow identifying the output of the policy action that is the 'product' the instrument delivers. Such a product and its generative process can be captured by one or more output indicators defined as an exactly measurable variable that quantifies the extent to which the actions provided for by the instrument actually reach the target population. Finally, associated to each output we can also identify an input indicator in the form of an exactly measurable variable that capture the expenditure process quantifying how funds flow to the policy instrument.

In the context of RIS3, the activity of monitoring has the primary and to some extent new goal of following the evolution of output and result variables over time with respect to target values, while accounting for input flows. We suggest thinking of RIS3 monitoring according to a backward-looking approach that starts with the expected change, to be measured with adequate result indicators and requiring suitable inputs and outputs. Moreover, when establishing monitoring methodologies and the related data collection processes, we should carefully consider that priorities may be defined both in a vertical fashion, i.e. specific to a single or restricted group of domains/markets, and in a more horizontal fashion, i.e. cutting-across several domains, markets or industries. These different approaches should be properly reflected in the determination of the expected changes and the associated result indicators.

Monitoring results by means of tracking the values of result indicators allows a judgement on whether or not the expected changes are actually materialising. If they are not, this can prompt reflections on the appropriateness and effectiveness of interventions or on the appropriateness of the chosen result indicators. Monitoring result indicators is especially relevant as this is how early warning signals can be grasped and countermeasures to steer processes towards goals can be subsequently taken. Monitoring results is not the same as an evaluation. Even if expected results do not materialise this does not necessarily mean the intervention was a failure; the situation could have been much worse without the intervention. To properly assess the additionality of public interventions we normally need more detailed analyses as part

$$\begin{array}{c} \text{CHANGE IN RESULT INDICATOR} \\ = \\ \text{CONTRIBUTION OF INTERVENTION} \\ + \\ \text{CONTRIBUTION OF OTHER} \\ \text{FACTORS} \end{array}$$

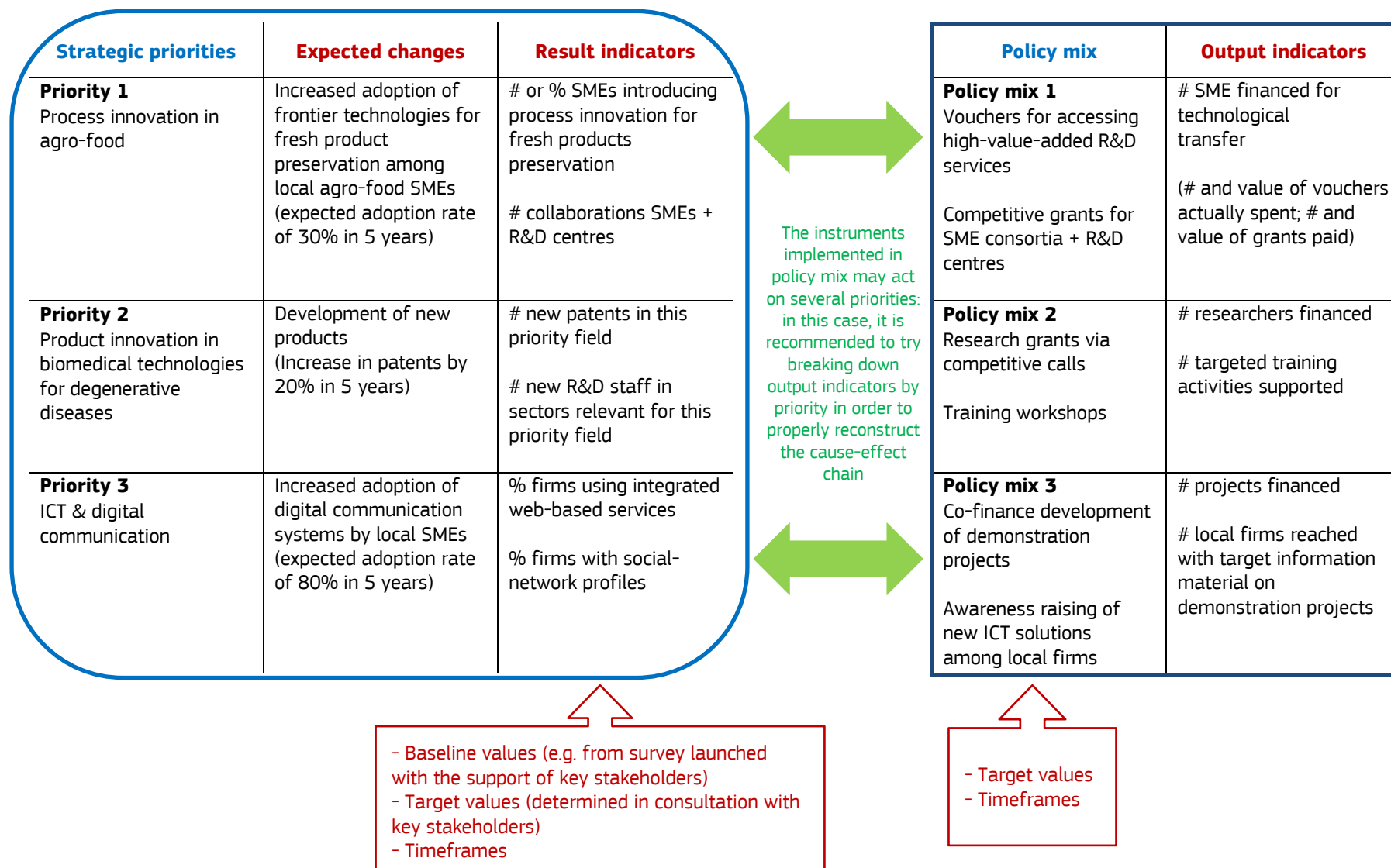
of evaluations, e.g. through randomised control trials, counterfactual analysis or benchmarking with prior conditions.

Monitoring outputs means to observe whether intended products are delivered and whether implementation is on track. It is a way to gain an appreciation, on one side, of how the administrative machine that is managing the RIS3 and related policies actually works, and, on the other side, of the adequacy of the policy mix to the reality and the specific conditions of the socio-economic system in which innovation actors operate.

Monitoring inputs means to supervise the factors allocated (in terms of funds, staff, etc.) to each policy instrument and how much of them are actually employed in the end. This is by no means a trivial task. Both the planned and the actual resource allocation must be measured accurately if we want to be able (i) to understand how many resources are allocated to policies and how many resources are actually being absorbed, and (ii) to ensure the credibility of policy making.

At this point of our journey we can advance a proposal for the visualisation of a RIS3 monitoring system with the help of a hypothetical region with priorities in process innovation in the conservation of fresh food products, technology and product patenting in biotechnologies for degenerative diseases, and digital communication. Figure 4 depicts a simplified example of a lean dashboard-like monitoring system associated with the combination of elements proposed in Figure 3. It should be noticed that, while the proposed visualisation is useful for its clarity and compactness, it should by no means be regarded as a sufficient account of monitoring activities in a RIS3 document. The information visualised in the dashboard should be complemented with the definitions of the elements included in the tables, their justification in the light of the overall logic of intervention of the strategy, the explanation of their inter-linkages, and a balance of the pros and cons of using the chosen indicators or an account of the limitations they may have and how to improve them in the course of time.

Figure 4: Dashboard for a monitoring system and its connection with RIS3 with illustrative examples



4 Choosing indicators

Having clarified that an ideal monitoring system has to include output and result indicators, we may still be concerned by the fact that, arguably, monitoring such a complex phenomenon like innovation can easily result in a highly sophisticated and therefore hard to implement and even harder to follow indicator system. But it is simplicity instead that can actually be the ultimate form of sophistication. Let us compare an indicator system to the dashboard or control panel of a car. Modern cars are very complex entities, yet the driver has to focus on very few parameters while driving: speed, fuel availability, basic engine condition and related controls. Overwhelming drivers with too much information would distract them from safely steering the car. Similarly, policy makers and stakeholders should not be buried under a massive amount of information. Rather, concise and targeted information is needed in order to validate if everything is on track. The Dashboard in Figure 4 illustrates this idea of having a simple aggregate overview of annual change in the key indicators.³

The perhaps most difficult and delicate task for designing RIS3 monitoring systems is to identify suitable result variables. This may be of insurmountable difficulty if thought as standing alone and disconnected in logic and time from the rest of the strategy design. However, this task becomes rather straightforward once it is correctly understood in its interdependencies with the rest of the strategy, as we have explained in the previous sections.⁴

No single or preferred measure of innovation or smart, inclusive and sustainable growth is available. Knowledge-intensive social and economic transformation processes are in general characterised by a multiplicity of observable developments: changes in firm behaviour, such as size growth or organizational modifications; changes in the population dynamics of the business ecosystem, such as an increase in new firms; scientific or technological achievements such as patents and scientific publications; the development level of the regional innovation infrastructure; changes in the nature and intensity of interactions between the actors of the innovation system within the region and with actors located in other regions; and many others.

Surveys of end-users

Satisfaction surveys of beneficiaries or 'end-users' indicate how well-suited measures were to the needs of firms, research institutes, universities and NGOs.

The choice of result variables is always specific to the type of expected results associated to RIS3 priorities. Result variables - even when they are determined only after the RIS3 is defined in its main constituents - should be logically associated in a direct way to the definition of the expected changes. This also implies that, if you have a strategy, but you think you do not have result variables to monitor, it is most likely because you have just not noticed them. They are most likely hidden in the folds of the strategic document. Let us see how to discover them with simple thumb rules:

³ Visually simple and yet informative online dashboards are only slowly increasing in numbers. One example is the Economic Dashboard of Canada's Alberta Province, available at: <http://economicdashboard.albertacanada.com>.

⁴ On this topic, and more in general on the role of result indicators, see also the "Guidance Document on Monitoring and Evaluation, European Cohesion Fund and European Regional Development Fund - Concepts and Recommendations" edited by the European Commission, Directorate-General for Regional Policy, 2015, available at: http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf.

- Try to mentally re-organise the elements of the strategy according to the approach laid out in Figure 2.
- In particular, try to isolate and make explicit the expected changes you want to realise. Think of variables that can best represent the type of expected changes you would like to achieve for each of the RIS3 priority in order to meet the strategic objectives.
- Start from defining a set of possible variables for each expected change.
- Work within each of these preliminary sets of variables in order to refine your choice, trying to match the potential result variables with the specific policy instruments you want to employ. Retain the best match(es) and discard the redundant variables.

It is a common experience to find several variables which reflect the same aspect of a given innovation process. This is not a problem. In such cases, several result indicators may be at first associated to the same expected change. At a later stage, a single preferred formulation can be chosen.

After choosing a result variable, it is necessary to determine its baseline value, the final target value, as well as a set of intermediate target values to be reached at various stages of implementation of the corresponding policy measures. Baselines and targets can be quantitative or qualitative. Baselines may be derived from objective analyses of specific situations, but in general it is advisable to try to quantify them more precisely based on the latest available data. Qualitative targets would define the direction of the expected change or a range of value. Target values should be determined by the strategy designer and RIS3 implementation authority together with the relevant stakeholders of the strategy and possibly with relevant target organisations (firms, researchers, etc.). This is in order to set ambitious but realistic goals, while ensuring the commitment of the interested actors to achieve them. This does not mean, however, that defined targets should be further pursued if during the implementation it becomes evident that the indicator was not suitable.

A result indicator should ultimately consist of a specific variable that is measurable according to the relevant timeframe of the strategy and a set of target values that are determined according to an inclusive negotiation process. Notwithstanding these general principles are quite simple, defining result indicators in practice poses a number of challenges.⁵ Stakeholders are often well-suited to help finding solutions to specific issues concerning the identification and measurement of result indicators.

Apart from the already mentioned lack of regionalised data for defining baselines, another important problem is the trade-off between the accuracy of available information on socio-economic processes and the rapid pace at which such information becomes available. This may be due both to time lags in the availability of data and in the time scales over which results become apparent. If we deem it particularly important to receive quick signals about strategy implementation, we will most likely decide to use some sort of imperfect information (e.g. not exactly measurable or based on probabilistic assumptions) to feed our indicator system. When

⁵ A useful review of possible challenges in the definition of result indicators can be found in the document “Indicators for Monitoring and Evaluation of Regional Innovation Strategies for Smart Specialisation (RIS3) – Background Note” prepared by the European Commission, JRC-IPTS, S3 Platform for the Thematic Workshop “Economic Indicators and Monitoring and Evaluation Tools for Smart Specialisation Strategies (RIS3)” (24-25 January 2013, Groningen, NL), available at: http://s3platform.jrc.ec.europa.eu/documents/10157/63241/Background_note_result_output.

signals are quick, they tend also to be weak, in the sense that, besides being possibly small in magnitude, they are imperfect measures of the real processes. Yet, weak signals, as they were originally defined by strategic management scholars,⁶ may be an appropriate basis for quick action within an early warning system. To the extent that we want to emphasise the role of the RIS3 monitoring system as a provider of early warnings, we should carefully consider these implications.

Unfortunately, there is not a single solution to the problem of choosing the 'right' result indicators. Nor is there a unique solution to the problem of designing a monitoring system for RIS3. For the reasons listed above, the monitoring system is inherent in the RIS3 architecture and is hence strategy-specific. Trial-and-error, accumulated experience as well as peer-learning at the national and transnational level are all useful ways to gain experience and the right skills for this task. RIS3 constitutes an opportunity for experimenting with innovative solutions for the monitoring system, as well as for the policy mix, the governance structure, and for the methods used to select priorities. It is therefore welcomed to propose non-standard ways to measure results, provided that their rationale is made explicit and that the ability of the indicators to capture results is assessed along the process. Regardless of the chosen indicators, it is important to be transparent and explicit about the suspected causal link embodied by the indicators. Also, policy makers should be aware of the inherent limitations of indicators and what they can measure and approximate.

Concerning input indicators a standardised approach in terms of budget/actual expenditure has the benefit of comparability and would allow aggregated overviews within regions and across Europe. For instance, this would allow measuring how much funding is going to supporting business innovation and growth across Europe. At an EU level, this would also allow to start building an open data platform that not only tells us how much money is spent on business support of different types and forms, but also who is benefiting from it (in terms of technologies, firms characteristics, location, etc.). Gaining this kind of insights would substantially improve innovation monitoring and hence policy making in these areas.

5 Data challenges and opportunities

Data availability and comparability at regional level are central challenges in many countries. Being able to feed the RIS3 monitoring system by triangulating a variety of regionalised data would be ideal. The challenges for strategy designers and policy managing bodies are numerous in this respect, but there are also many opportunities already available that can be easily implemented. National and regional authorities across Europe have used a rich variety of partly very sophisticated data sources in the strategy formulation phase. Interestingly, this massive data analysis has not been fully carried over to the monitoring mechanisms. Current versions of monitoring mechanisms often lack a comprehensive data basis and show little innovative approaches to data collection and tools.

The information displayed in a RIS3 monitoring dashboard can be in the form of quantitative and qualitative data. As for statistical data, these may come from public institutions at the local, national and international level, like for instance the regional, national or European statistical offices. Quantitative information may also come from surveys, registers, directly from the accounts

⁶ Ansoff, H. Igor. 2007 [1979]. *Strategic Management*. Basingstoke: Palgrave Macmillan, pp. 63-64.

of supported projects, or from less widely used data sources. These could be, for instance, data on administrative behaviour⁷ or broader socio-economic data like the European Value Survey,⁸ the OECD Better Life Index,⁹ etc. More qualitative information can be derived from focus groups and other interactive formats where key informants and stakeholders discuss and assess progress.

Before collecting new data, both quantitative and qualitative, a thorough revision of the existent sources should be done, at all levels. For instance, many academic projects develop data that should serve for further purposes beyond the scope of specific research studies; additionally, many transnational cooperation projects seek to improve existent data, and the information they collect sometimes is not used beyond the actual project development. Having access to all this information is extremely relevant, for it can avoid unnecessary duplications and, at the same time, provide access to data that otherwise would be difficult or costly to collect.

Especially when identifying the result variables in a RIS3 monitoring system, it is useful to have an open attitude towards different types of information sources, both official statistics and ad hoc data collection, without discarding the possible need to engage directly in field research and surveys.¹⁰ Result indicators are inherently strategy-specific and priority-specific. For these reasons, and given the novelty of the RIS3 approach, suitable data to feed the corresponding indicators may not be available in the desired form, or with the desired granularity and timescale. Recent developments in big data analytics offer new opportunities by, for instance, tracking social media to capture satisfaction of beneficiaries with initiatives, projects and programmes or by situating local sectors in global value chains.

When no suitable data for result indicators is available from existing sources, there are two options for filling this gap. (i) The first and preferred is to plan and establish a targeted process of data collection through surveys (also using online tools) or ethnographic interviews. In case this is not a viable option due to time and cost constraints and lack of specific skills, (ii) resorting to a close proxy of the 'ideal' result indicator might be an appropriate alternative. That is, to monitor a different variable that approximates the behaviour of the would-be result indicator. In this latter case, the choice of the proxy variable should be supported by an explicit reasoning or evidence.

Regionalised data

Non-availability of subnational data is an obstacle for many regions. Entering a dialogue with national statistics offices or resorting to alternative low-cost data collection (focus groups, online surveys, etc.) can be the solution.

Data challenges differ depending on the kind of region. For smaller regions it may be easier to obtain relevant and accurate data, whereas large regions have to obtain data on more complex processes involving many more organisations. Yet, access rights to regionalised data can be very costly.¹¹ Influencing data provision by EUROSTAT is likely to be a lengthy process.¹² Exchanging data

⁷ <http://qog.pol.gu.se/data>.

⁸ <http://www.europeanvaluesstudy.eu>.

⁹ <http://www.oecdbetterlifeindex.org>.

¹⁰ For guidelines on conducting surveys and more general discussions of innovation measurement see: OECD and EUROSTAT (2005). *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd Edition. www.oecd.org/sti/oslomanual.

¹¹ For the widely used Community Innovation Survey at firm level, see: http://ec.europa.eu/eurostat/statistics-explained/index.php/Innovation_statistics.

collection mechanisms (and the data itself) between regions can also improve not only the monitoring system, but also the quality of data; or cross-checked evaluations can also provide additional points of view and even more information on data sources and data treatment.

In order to monitor the relative progress made compared to other regions and states periodical benchmarking should be done. Benchmarking is very valuable for preparing and re-drafting of strategies; identifying structurally similar regions with better innovation performance allows more targeted benchmarking and policy learning from similar contexts. For this, policy makers can first look for similar regions using the S3P regional benchmarking tool.¹³ Once suitable similar regions across the EU are identified, the following non-exhaustive list of relevant data sources is a good starting point: the Cluster Observatory,¹⁴ the KETs Observatory,¹⁵ the European Service Innovation Scoreboard,¹⁶ the Regional Innovation Scoreboard,¹⁷ OECD regional statistics,¹⁸ and EUROSTAT.¹⁹

6 Governance

Entrepreneurial discovery is the primary process governing RIS3 implementation. Monitoring is a key element in this process. Not only is it vital to involve stakeholders somehow in the design of monitoring indicators and the collection of data, it is imperative to streamline monitoring and its follow-up in broader and continuous entrepreneurial discovery processes.

Driving the entrepreneurial discovery process

Monitoring is crucial for informing and keeping stakeholders on board. Making it an integral part of the broader governance structure facilitates continuous exchange.

In the development of RIS3, project, programme and strategy levels should be seen as parts of one broader picture at different levels of abstraction (see Figure 5). It is in the web of these connections between governmental and non-governmental organisations that causal narratives based on monitoring data can be developed. This is also why, as a general principle, the design and use of the RIS3 monitoring

system should be carried out with the participation of the stakeholders involved in the strategy process. Not only because stakeholders are direct recipients and beneficiaries of the information produced by the monitoring system, but also because only by participating in the relevant decisions about indicators they can feel the ownership of the transformation processes set in place through the RIS3.

¹² EUROSTAT activities are governed by the European Statistical System Committee chaired by the Commission and composed of the representatives of member states' national statistical institutes. Changing the work programme and access to regionalised data is a longer-term process.

¹³ <http://s3platform.jrc.ec.europa.eu/regional-benchmarking>.

¹⁴ http://ec.europa.eu/growth/smes/cluster/observatory/cluster-mapping-services/cluster-mapping/mapping-tool/index_en.htm.

¹⁵ <https://ec.europa.eu/growth/tools-databases/ketsobservatory>.

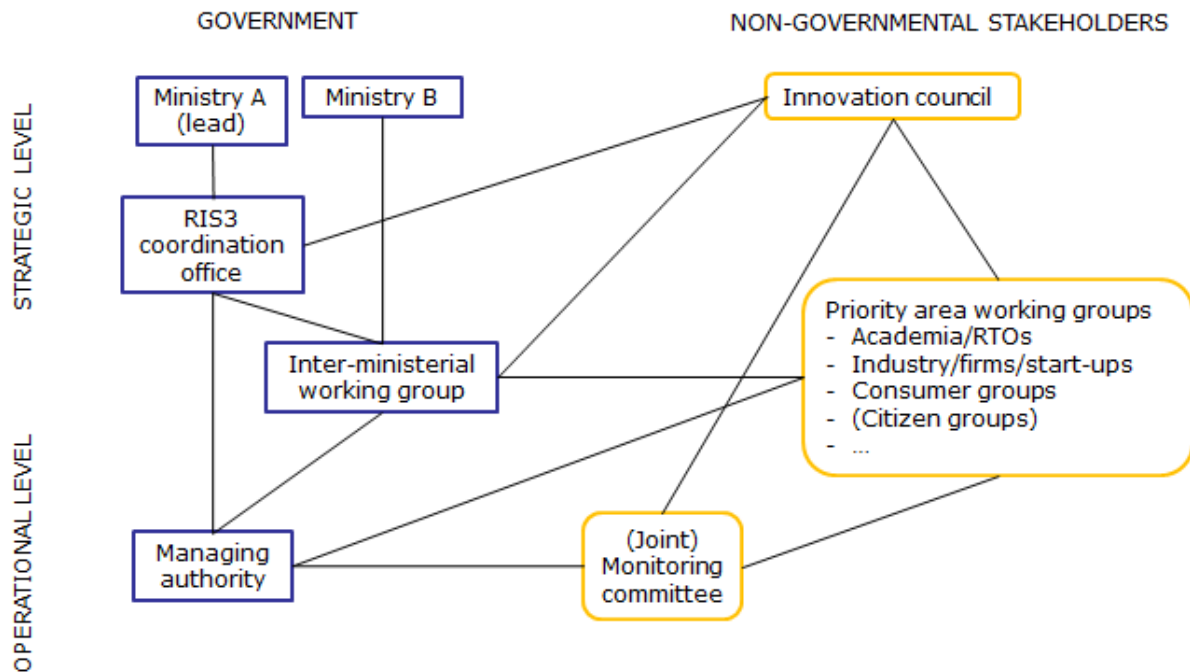
¹⁶ http://ec.europa.eu/growth/tools-databases/esic/scoreboard/regional-scorecards/index_en.htm.

¹⁷ http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards/index_en.htm.

¹⁸ http://www.oecd-ilibrary.org/urban-rural-and-regional-development/data/oecd-regional-statistics_region-data-en.

¹⁹ <http://ec.europa.eu/eurostat/web/regions/overview>.

Figure 5: The web of innovation governance



One single body, ideally the RIS3 implementing body, should collect the monitoring data based on the definition of indicators agreed with the stakeholders. This would help to systematise strategy development and to have leaner governance. Innovation councils involving a broad variety of stakeholders may also play an important role in supervising monitoring, the follow-up and in acting as checks and balances of implementing and funding bodies. Their great strength is the credibility and legitimacy their membership entails. Yet, these bodies often have very limited capacities and lack real political clout. In order to be truly effective, they should be assigned sufficient supervisory powers and resources, provided that this is not just creating excess bureaucracy.

Institutional contexts influence monitoring and this is not only referring to government institutions with their varying roles in different regions and countries. Rules, norms and practices affect what and how monitoring takes place. Since RIS3 is a new process for many policy makers, new governance arrangements may have to be established or existing ones adapted to this new reality. When new governments and administrations take office, additional re-framing may be necessary to give them ownership over the RIS3.

Besides influencing the innovation agenda and discourse in a given region or country, monitoring activities may also empower regional authorities in otherwise rather centralised member states. If regional bodies are assigned a formal role in monitoring, they get access and influence in their regional innovation system. In general, the question on how regionalised monitoring should be is politically sensitive and very much depends on the political and administrative structures of states. Multi-level governance is not an easy process; it requires an on-going dialogue between national and regional authorities and stakeholders.

Both awareness and the necessary technical skills for effectively conducting monitoring are often under-developed in the public sector. Regular annual events are a way to structure the follow-up process of a monitoring mechanism, to maintain stakeholder ownership (also by keeping communication in the local language) and to build capacities.²⁰ Such events would be a second 'honeymoon' for the monitoring community and provide a platform for discussing data with a broader audience. In this context, opening up to the community of peers (i.e. policy makers coming from other regions and countries) and using peer reviews as a complementary monitoring tool is strongly recommended. Only outsourcing this task to external contractors is not sustainable. It is preferable to use platforms like the S3 Platform, relevant INTERREG projects and similar initiatives to break administrative routines and build capacities. Dedicating sufficient funding for RIS3 monitoring from ERDF Technical Assistance and other sources is vital.

7 Recommendations for building RIS3 monitoring mechanisms

Establish a structured mechanism of stakeholder involvement for the definition of RIS3 monitoring.

- You need stakeholders in order to devise meaningful solutions for complex problems with regard to implementation/monitoring issues. Remember that within the priority areas of RIS3 the stakeholders are the ones (sometimes the only ones) who have the specific knowledge about how to represent and measure certain phenomena.
- Assess whether your internal administrative capabilities are sufficient to coordinate the implementation of monitoring mechanism. Identify the main challenges and possible solutions to this.

Identify the main building blocks constituting the logic of intervention of the RIS3 and make sure you share this logic with stakeholders.

- Clearly identify the needs and challenges initially recognised, the overall objectives of the strategy, and the proposed operational solutions to achieve these objectives based on your choice of priority areas for intervention.

For each RIS3 priority, define explicitly the expected change(s) reflecting the specific and operational objectives you want to achieve.

- Explain your choices and the underlying assumptions in the text of the RIS3 document.
- Be sure the expected changes are realistic enough to be largely supported by stakeholders while being ambitious enough to represent a true improvement over the current state of affairs.

²⁰ Baden-Württemberg e.g. organises annual thematic events where monitoring data is the basis for discussions. Other initiatives, like INTERACT, already organise regular events related to territorial cooperation (<http://www.interact-eu.net>). But at these events, it is difficult to raise awareness outside the group of already interested parties; it is rather about 'preaching to the converted'. Nonetheless, such fora are important to embed monitoring activities in the broader innovation ecosystems.

Identify appropriate result indicators measuring expected changes.

- Whenever official statistics cannot effectively capture the expected changes, consider the use of proxy indicators and explain why they have been chosen, what their limitations are, and discuss plans for improving their precision.
- Consider using alternative data collection approaches like surveys of end-users or focus groups.
- Consider entering a dialogue with national and regional statistical offices on new information to be collected.

Define a set of output indicators which can quantify the implemented measures (mix of policy instruments) for achieving each of the expected changes.

- Explain how the choice of indicators reflects cause-effect relations of policy instruments and results.

Organise the indicators into a dashboard-like visualisation device.

- Be sure the dashboard is included in the RIS3 document together with all relevant definitions of its elements, explanations of the logical links, description of the process of definition of the elements and contributions of the stakeholders.
- Give visibility to the monitoring dashboard through the internet and other means that can reach stakeholders, potential beneficiaries, and citizens.

Describe how the follow-up of RIS3 monitoring will be ensured.

- Define how the monitoring mechanism and the resulting data are linked to your innovation governance system.
- Define how the mechanism engages with other governmental and non-governmental stakeholders (e.g. through periodical innovation fora) and how it actually supports a continuous entrepreneurial discovery process.

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Abstract

In the context of innovation strategies for smart specialisation (RIS3), monitoring mechanisms perform three fundamental functions: (1) inform about what the strategy achieved and whether implementation is on track and making this information available to decision makers; (2) clarify the logic of intervention of the strategy and make it comprehensible to the broader public; (3) support the constructive involvement and participation of stakeholders through transparent communication and promote trust building. RIS3 monitoring focuses on tracking the developments related to policy interventions within the specific priority areas identified in the strategy. The monitoring mechanism should be able to capture and follow the relevant expected changes that are foreseen in each RIS3 priority by means of an appropriate choice of result indicators; it should also capture and follow the policy output that ought to make expected changes happen. Regions and countries with extensive experience in monitoring innovation strategies and territorial development policies in general should build on existing monitoring structures; those with limited experience in this field should begin to develop their own internal capacities and experience starting with simple indicator systems, following the practical guidelines of this brief.



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