

Transforming S3 to S4+ through RRI

Towards a Framework and Methodology for Measurement

Table of contents

Introduction	3
Who should use the proposed monitoring and evaluation framework?	5
Assessing the RRI dimension in existing smart specialisation strategies	5
Guiding principles of smart specialisation strategy (S3) design	5
RRI value dimensions	5
Five guiding principles towards a monitoring and evaluation framework for RRI	7
Developing a four-dimensional self-assessment framework to embed RRI into S3	7
Dimension 1: People	8
Dimension 2: Processes	13
Dimension 3: Data	15
Dimension 4: Engagement and support	18
Operationalising the framework: methodology and process	19
Self-assessment methodology	19
Self-assessment process	20
Conclusion	21
References	22
Annex 1.A. Overview of proposed self-assessment questions	23

Tables

Table 1. Engaging key constituencies for monitoring and evaluation: why, when, and how	18
Table 2. Proposed self-assessment rating system	20

Figures

Figure 1. Four dimensions of RRI monitoring and evaluation	8
Figure 2. A three-step process to measure the inclusion of stakeholders in RRI processes within S3	9
Figure 3. Spectrum of stakeholder engagement	11
Figure 4. Setting up a monitoring and evaluation process	13
Figure 5. Self-assessment structure with an example	20

Boxes

Box 1. Self-assessment questions to reflect on the RRI value dimensions in S3	6
Box 2. Self-assessment questions: People dimension	12
Box 3. Self-assessment questions: Process dimension	15
Box 4. Monitoring the RRI maturity level of technology centres in Valencia, Spain	16
Box 5. Self-assessment questions: Data dimension	17
Box 6. Self-assessment questions: Engagement and support dimension	19

Acknowledgements

The document is the outcome of a series of OECD-MARIE events that took place between February and June 2022 in the framework of the project “Transforming S3 to S4+: Towards a Framework and Methodology for Measurement”. The objective of the MARIE (MAinstreaming Responsible Innovation in European S3) Interreg project in general is to improve regional public policy that supports delivery of RRI in the context of smart specialisation.

The OECD’s Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) would like to thank the participating regions of the MARIE project: Regional Council of Tampere and University of Tampere, Finland; Region of Attica, Greece; CISE, Italy; Southern Regional Assembly, Ireland; UEFISCDI, Romania; GAIN, Spain. This document draws on the insights and discussions derived from the events with participation of these partners and their regional stakeholders. Particular thanks goes to Giulia Bubbolini and Jessica Huntingford for co-ordinating the work with the OECD and providing support throughout the project.

Within CFE, the project was co-ordinated by Maria Varinia Michalun and the final summary document was drafted by Sandra Hannig with inputs from Luca Tacconi. The work was carried out under the supervision of Dorothee Allain-Duprée, Head of the Regional Development and Multi-level Governance Division in CFE.

Introduction

Responsible Research and Innovation (RRI) is a new way of understanding and practising innovation policy. It aims to mobilise innovation to address major societal and environmental challenges, such as those identified by the Sustainable Development Goals (SDGs). RRI is also an experimental approach seeking to promote learning and achieving societal change (Owen, Von Schomberg and Macnaghten, 2021^[1]). These features distinguish RRI from other approaches to innovation policy and, therefore, require a different approach to monitoring and evaluation.

Smart Specialisation Strategies (S3) are one channel for implementing RRI at a regional level. They support a place-based approach to regional development, building on a region's unique assets, resources and competences to boost economic activity. Two of the most common problems associated with S3 are that a) they can be high-jacked by entities or individuals with strong agendas and influence at a regional or local level (e.g. a dominant industry cluster or research organisation); and b) the S3 stakeholder consultation process is often a consultation among experts, detached from the concerns of citizens and society. Integrating RRI into S3 may help overcome these problems because it addresses such questions as how to involve society in discussions and decision-making for science, research, and innovation, and how to use science and innovation to tackle major societal problems such as inequality or climate change.

In order to address the shortcomings of S3 and make it more sustainable, eight partner regions¹ worked to integrate RRI into their S3 as part of an Interreg Europe initiative to mainstream responsible innovation in European S3 (MARIE). Today, MARIE partners are interested in knowing if they successfully turned their smart specialisation strategies into inclusive and sustainable strategies with an RRI dimension. Knowing if the goal of integrating RRI into S3 has been achieved, however, can be challenging and draws on various aspects of governance systems supporting innovation policy and regional development, especially monitoring and evaluation.

The OECD has been working since the beginning of 2022 with six MARIE partners towards articulating a measurement framework to determine whether existing S3s are evolving into S4+ (sustainable and inclusive smart specialisation strategies). This document identifies the basic components of a monitoring and evaluation framework to measure such shifts, using as a basis the insights from a series of OECD-MARIE events that took place between February and June 2022, as well as additional OECD work and publications, and secondary research.

This document does not present yet a full monitoring and evaluation framework for RRI within smart specialisation. Instead, it outlines how a future monitoring and evaluation framework could look like and provides initial suggestions on how to operationalise these dimensions in practice. It starts with a description of guiding characteristics and principles on which the proposed approach to monitoring and evaluating the integration of RRI into S3 is built. It then proposes a framework to monitor and evaluate the incorporation of RRI into smart specialisation strategies based on four key dimensions for monitoring and evaluating RRI systems: i) people, ii) processes, iii) data, and iv) engagement and support. Following the discussion of these dimensions, a methodology and process to operationalise the framework are proposed. The final section concludes with a summary of key insights.

¹ Tampere, Finland; Centre-Val de Loire, France; Schleswig-Holstein, Germany; Attica, Greece; Province of Forlì-Cesena and Rimini, Emilia-Romagna, Italy; Southern Regional Assembly, Ireland; Bucharest-Ilfov, Romania; Galicia, Spain. As of 2022, there are 6 partner countries and regions: Tampere, Finland; Attica, Greece; Province of Forlì-Cesena and Rimini, Emilia-Romagna, Italy; Southern Regional Assembly, Ireland; Bucharest-Ilfov, Romania; Galicia, Spain.

Who should use the proposed monitoring and evaluation framework?

The monitoring and evaluation framework outlined here is developed for regional and local authorities and policymakers. It can also be used by NGOs, community leaders, and project beneficiaries who want to engage in monitoring and evaluating RRI within smart specialisation strategies.

This document offers a step-by-step guide for readers with monitoring and evaluation experience. Therefore, it does not provide a generic introduction to monitoring and evaluation. Nonetheless, less experienced readers could also find innovative solutions and methods within the document, but may wish to consult additional, generic, material on monitoring and evaluation, too.

Assessing the RRI dimension in existing smart specialisation strategies

A successfully integrated RRI dimension to transform S3 into S4+ means that the S3 focus has shifted from predominantly supporting technological innovation to supporting a range of innovations that drive broader economic, environmental and social transitions.

For this purpose, S3 should explicitly embrace RRI policy dimensions, processes and outcomes. Promoting RRI should be part of the strategic orientation of S3, alongside boosting economic growth and regional competitiveness. Importantly, the S3 strategic framework should also make clear that there is no trade-off between RRI and non-RRI innovation, which could make it more appealing to some actors.

Guiding principles of smart specialisation strategy (S3) design

The original guide to S3 proposes four guiding principles for the design of S3 (Foray, 2017^[2]):

1. **Choices and critical mass:** S3 should be based on a limited number of priorities selected according to the strengths of the country and the region.
2. **Competitive advantage:** S3 should mobilise talent by matching research and innovation capabilities with business needs through a process of entrepreneurial discovery.
3. **Connectivity and clusters:** S3 should develop world-class clusters and provide arenas for cross-sectoral linkages, which drive specialised technological diversification.
4. **Collaborative leadership:** S3 should support efficient innovation systems based on public-private partnerships (quadruple helix) and provide an experimental platform to give a voice to actors that are usually underrepresented in regional innovation planning processes.

RRI value dimensions

In addition to considering the S3 guiding principles, a number of processes are important for achieving RRI outcomes. An assessment of if and how smart specialisation strategies support RRI needs to take into account the following value dimensions of RRI:

- **Diversity and Inclusion:** Diversity, both inherent (e.g., ethnicity, gender) and acquired (e.g., experience, education and cultural background), is increasingly seen as an asset for companies and research teams. RRI should be as diverse and inclusive as possible, both for democratic reasons and because it is generally believed that diversity can lead to more creative thinking and problem-solving than would be the case in homogeneous teams (OECD, 2017^[3]).
- **Openness and Transparency:** The development of an innovation policy with an outcome-oriented monitoring and evaluation system for RRI requires a clear articulation of objectives and measurement methods. This can be achieved through greater openness, transparency and

accountability on the part of the regional government and other key actors who have to provide data and information. This is a crucial factor in building public trust in R&I (OECD, 2021^[4]).

- **Responsiveness and Adaptive Change:** Responsiveness means being able to take into account what society needs and wants. RRI is about anticipating how research and innovation decisions might shape our future (i.e., their impact on our environment and society). Local economic and social responsiveness is not only about a region's ability to withstand and repel shocks and challenges, but also about its ability to adapt and reorient its structures to create new economic, social and cultural pathways and solutions (OECD, 2021^[4]).

One way of reflecting on these value dimensions and whether the current S3 incorporates them is through self-assessment questions, such as those proposed below (Box 1).

Box 1. Self-assessment questions to reflect on the RRI value dimensions in S3

Diversity & Inclusion:

- Does the S3 stakeholder engagement process ensure broad, inclusive and continuous participation of stakeholders relevant to the integration of RRI into the smart specialisation strategy?
- Are there any regional indicators on diversity (e.g. on gender) in research and innovation projects available? If yes, can those be used to measure diversity in projects funded through S3?
- Are there any tensions in the type of innovation supported through smart specialisation in your region and the RRI principles (e.g. privacy vs security concerns in patient surveillance innovation)?
- What are the incentives, drivers and barriers to including RRI-related objectives in the S3 priorities?

Openness & Transparency:

- Did you have a discussion within your S3 design and implementation process on potentially harmful impacts of your research and innovation projects on the public or the environment?
- Are there any criteria to assess RRI-related benefits and risks in your smart specialisation projects? If not, would you be able to come up with such criteria in your region?
- Are tasks and responsibilities to assess the impacts of S3-related innovation on society and/or the environment clearly allocated among relevant actors in your region (e.g. policy makers, or researchers in charge of innovation projects)?
- Does your S3 incorporate any regional ethical code of conduct?

Responsiveness & Adaptive Change:

- How are the views of CSOs and/or citizens included in evaluating RRI within S3?
- Is there any exchange with peers, researchers, and innovators from different disciplines in RRI projects that are supported through S3?
- How do you ensure that research and innovation projects funded under S3 can adapt to unforeseen events or societal changes (e.g. making changes in research plans possible)?
- Can you dedicate resources to support RRI projects within your S3 or add an RRI dimension to already existing projects (e.g. can you hire an RRI staff expert)?

Five guiding principles towards a monitoring and evaluation framework for RRI

The proposed assessment approach rests on five key principles:

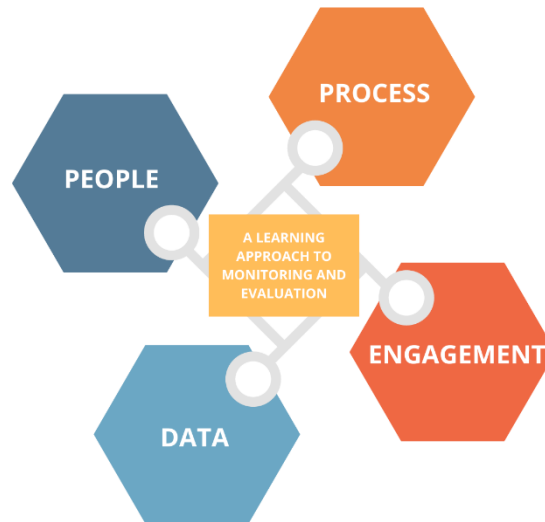
1. **Integrate evaluation into the policy design and implementation processes:** Monitoring and evaluation are part of the policy process and should be coherent with the stated objectives of innovation policy and the S3 strategy.
2. **Variety of methods:** Choose different methods and techniques during the evaluation process depending on the context, rather than only using standard protocols. Qualitative and participatory techniques can help increase the inclusivity of the assessment process and allow for more horizontal stakeholder involvement.
3. **Participation and inclusiveness:** Make open debate possible. Diverse groups and communities with different roles, interests, and access to resources should be involved in an open and reflective process.
4. **A multi-level approach:** Consider the different levels of policy intervention, from specific projects at the local level, to programmes incorporating several projects, to higher-level policy interventions composed of different programmes developed at higher levels of government. Monitoring and evaluation should be carried out coherently and consistently at all levels.
5. **A regional RRI vision:** Base monitoring and evaluation on a clear (regional) vision of what RRI is and what it can achieve in the region since the regional context. A responsible innovation policy can look quite different, depending on how a region collectively defines its benefits and purpose. Therefore, understanding what is “responsible” or “socially desirable” is not given objectively but is a matter of political and collective negotiation among levels of government (Fitjar and Rodríguez-Pose, 2011^[5]).

Developing a four-dimensional self-assessment framework to embed RRI into S3

Once MARIE regions have assessed whether they have incorporated RRI value dimensions into S3, they also need to think about the incorporation of actual RRI projects, processes, and outcomes within S3. Assessing how and to what extent RRI has been incorporated using the following four dimensions (Figure 1) is one way to do so:

1. **People:** Focuses on the different roles of stakeholders in monitoring and evaluating RRI in S3. Successful RRI outcomes depend on a structured dialogue between key stakeholders. The pillar puts particular emphasis on citizen engagement.
2. **Processes:** Focuses on whether the appropriate internal structures, rules, and procedures are in place to develop a learning culture around RRI.
3. **Data:** Looks at the data-driven evidence and indicators underpinning monitoring and evaluation.
4. **Engagement:** Addresses the regional culture of monitoring and evaluation; and whether there is a supportive culture.

Figure 1. Four dimensions of RRI monitoring and evaluation



Source: OECD elaboration based on the insight gathered during the OECD-MARIE events that took place between January and June 2022

The suggested four-dimensional framework follows a series of characteristics:

- **Clear:** The framework is split into several dimensions and sets out a methodology for taking action.
- **Open:** While the framework sets important parameters around a set of four proposed dimensions, within each dimension there is flexibility, so that the framework can be applied to diverse regional and local monitoring and evaluation contexts (e.g. available data may differ from region to region).
- **Expandable:** The dimensions presented can serve as a platform for a more complete RRI monitoring and evaluation framework or toolkit.
- **Regularly reviewed:** As monitoring and evaluation theory and practice keeps evolving, the ongoing relevance of a framework should be regularly reviewed with respect to its conceptual design, as well as possibilities for practical application.

The rest of this document describes why each dimension matters when assessing the integration of RRI into S3 and highlights action(s) MARIE partner regions can take to improve their monitoring and evaluation framework(s). Each dimension is split into several action areas. At the end of each dimension, a series of self-assessment questions is proposed. These questions are meant to help MARIE partner regions think through the issues raised and facilitate a structured dialogue. The document's last section proposes how these self-assessment questions could be used in a dedicated assessment process.

Dimension 1: People

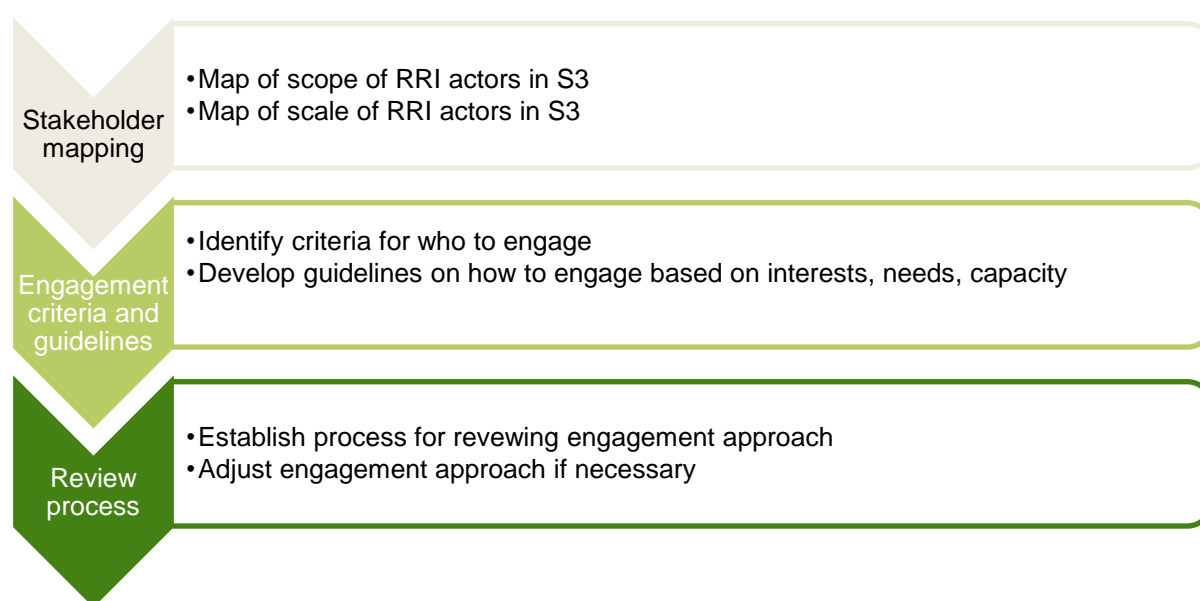
Important questions to clarify in a monitoring and evaluation framework are:

- Which stakeholders should participate in monitoring and evaluating RRI;
- When should they participate; and
- How their inclusion contributes to the responsible innovation monitoring process.

A three-step process for monitoring and evaluating stakeholder participation in RRI processes within S3

A three-step process could be applied to answer the questions posed above. The first step is a stakeholder mapping to monitor and evaluate the scope and scale of regional RRI actors within S3. The second step is to evaluate whether any guidelines were established on how to involve stakeholders, including citizens. If no guidelines exist, a starting point would be to develop good engagement guidelines and criteria to measure stakeholder engagement. The final step proposes evaluating whether a review process for stakeholder management for RRI within S3 has been developed (Figure 2).

Figure 2. A three-step process to measure the inclusion of stakeholders in RRI processes within S3



Source: OECD elaboration.

Step 1: Stakeholder mapping

A good regional RRI assessment depends on a robust mapping of stakeholders. Stakeholder mapping itself is a two-stage process. In a first stage, all stakeholders are identified in relation to their involvement in regional and local RRI processes and the potential linkages with other stakeholders (e.g., between companies and research institutes). A mapping should include stakeholders with formal decision-making powers (such as policymakers in charge of smart specialisation), as well as stakeholders with a material or social interest or who might be affected by the RRI project or its outcomes.

In the second stage, the mapping evaluates the potential contribution that the various stakeholders can make and whether they can advance or hinder RRI projects and processes. The mapping helps illustrate the key responsibilities of the identified RRI stakeholders (e.g., policy making, research, advocacy, finance), the interactions between stakeholders (from information sharing to partnerships, coordination etc.) and how interested they are in the topic at hand (ranging from low to high). The process sheds light on which stakeholders have the greatest influence on regional and local RRI processes, helps identify potential gaps and overlaps, and considers the 'unheard voices' of previously uninvolved stakeholders (OECD, 2015^[6]).

Integrating stakeholder mapping as part of a monitoring and evaluation framework can help policy makers not only identify who to involve, but also how the involvement can occur. Mapping can highlight important

factors, such as stakeholder opportunity to participate in RRI and their role in RRI engagement processes within S3. It may also help coalesce the diversity of the public and institutions that can participate in the innovation process and governance of RRI.

Step 2: Providing clear guidelines on who to involve and for what purpose

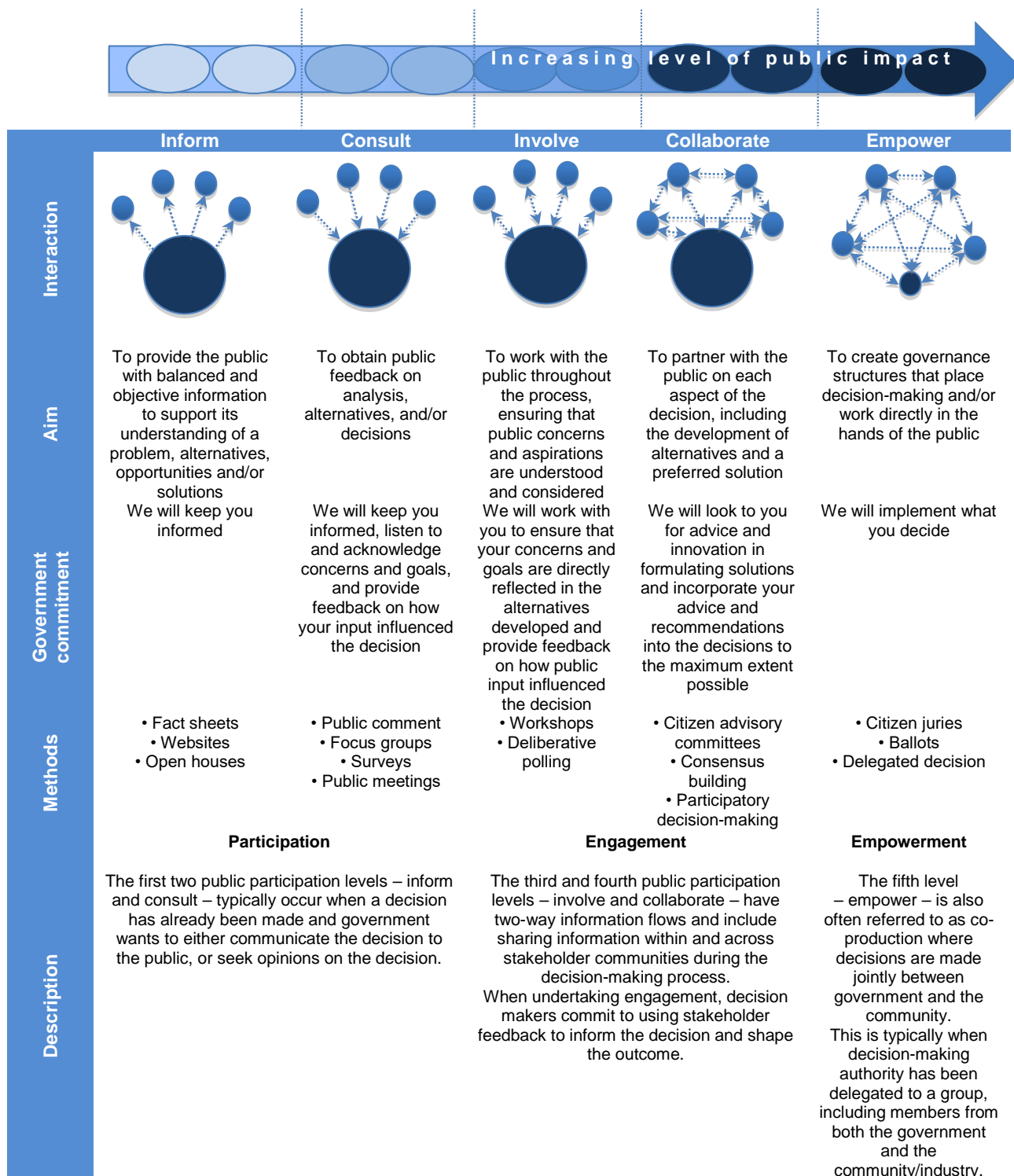
Putting in place clear guidelines on who to involve in RRI monitoring and evaluation is important for measuring its success. While engaging key RRI stakeholders, such as researchers, is rather obvious, citizen engagement is often overlooked. It is an important point, however, as there may be a tendency for technology actors to dominate in RRI, potentially reducing the voice of citizens, who matter as users of responsible innovation. For example, healthcare patients can contribute to improving the final design of a product so it better meets their needs or limitations. This can make it necessary to create spaces and educate citizen on the subject(s) to which they can contribute and to create opportunities to listen to them.

The first step in determining who to engage is to establish the goal or purpose of the engagement. Several different objectives may exist, such as:

- Using stakeholder knowledge to incorporate RRI values or projects into existing S3,
- Raising public awareness about existing RRI processes and outcomes within S3 to gain public support for RRI, or
- Knowledge and capacity building around RRI to educate citizens about its benefits and applications. This enhances the chance of getting citizens involved.

Once the question of who to engage is answered, MARIE partner regions need to think about how to engage the identified stakeholders in the monitoring and evaluation process. Different types of engagement practices exist with differing engagement objectives and intensities. Figure 3 presents a spectrum of stakeholder engagement that grows in its interactive intensity. It goes from informing stakeholders about RRI policies or projects to consulting, involving, collaborating and empowering stakeholders. The type of interaction selected will depend on the aim of the engagement, the degree to which the government wishes to commit to the results of the engagement, and the most appropriate type of engagement method (which can also be a function of available resources). This will vary by MARIE partner region, and can also vary by RRI initiative.

Figure 3. Spectrum of stakeholder engagement



Source: (OECD, 2017^[7])

Motivating people to participate in stakeholder engagement exercises may not always be easy, and even more so for RRI projects that can seem disconnected from a person's daily life. The OECD MARIE workshops point to several principles that can support citizen engagement:

- **Make engagement useful:** Stakeholders may have different reasons to participate. They might want to share their expertise or learn from others. Stakeholder engagement can also stem from a desire to socialise and to meet policy makers and other citizens. Organisers should understand these motivations to manage the different expectations that citizens may have.
- **Build trust:** The degree to which people trust that their voice is heard determines whether they want to spend time and effort on participation. Trust building may require efforts from consultation teams to openly and transparently discuss monitoring and evaluation plans and their use.
- **Communicate well:** Good communication has three parts. First, the physical engagement location and duration needs to be well communicated. In addition, the physical location needs to be accessible to stakeholders and in an environment in which they will be comfortable. If the process is virtual, it is important to be sure that the targeted group of stakeholders lives where there is an appropriate level of connectivity. Second, the relevance of RRI to stakeholders and the need for their input into the policy, project or monitoring and evaluation process also needs to be clearly and convincingly communicated. Third, communicating the objectives of the consultation is important, as is putting stakeholders – especially citizens – at ease regarding capacity to engage, as this is one obstacle to stakeholder participation.

Step 3: Setting up a review process for stakeholder management in RRI

Reviews of the scope and scale of stakeholder engagement at regular intervals throughout the S3 cycle² help assess stakeholder engagement for RRI. The questions in Box 2 can be used in regional and local monitoring and evaluation processes to identify potential issues before completing an S3 innovation policy or project with an RRI dimension.

At the end of an RRI project or policy, the results of stakeholder engagement processes should be consolidated and reviewed before being disseminated. If actions are carried out thanks to stakeholder (citizen) engagement processes, stakeholders should be informed. They should also be informed if their input is not taken into consideration, with an explanation as to why.

Box 2. Self-assessment questions: People dimension

Stakeholder mapping for RRI

- Is there a lead institution in your region or local authority that could conduct a mapping of the all RRI parties involved? If not, is there an existing institution that could undertake such an activity or is a new institution called for?
- To what extent are important RRI stakeholders (e.g. academia, youth, civil society organisations and the private sector) included in the S3's design and implementation and in innovation projects funded under S3?
- How to address the risk of capture by established dominant players who might be less interested in the objectives of RRI?

Engagement criteria and guidelines

² The S3 cycle refers to the policy cycle in which the S3 takes place, going from S3 design and vision-setting to programme and project implementation and monitoring and evaluation, which feeds back into the design.

- Are there sufficient tools and mechanisms to engage with citizens and other stakeholders, in general and for RRI?
- Are there sufficient resources to undertake stakeholder engagement in the region (e.g. to create an engagement plan, to identify and connect with stakeholders, to do budget planning for stakeholder engagement etc.)?
- Does your region succeed in engaging stakeholders who are less informed and less accustomed to engaging with RRI dimensions, for example, open science or gender balance?
- Are there clear engagement criteria and guidelines on how to include different groups of stakeholders and for what purpose?
- How does your region intend to maintain dialogue in the future with stakeholders?

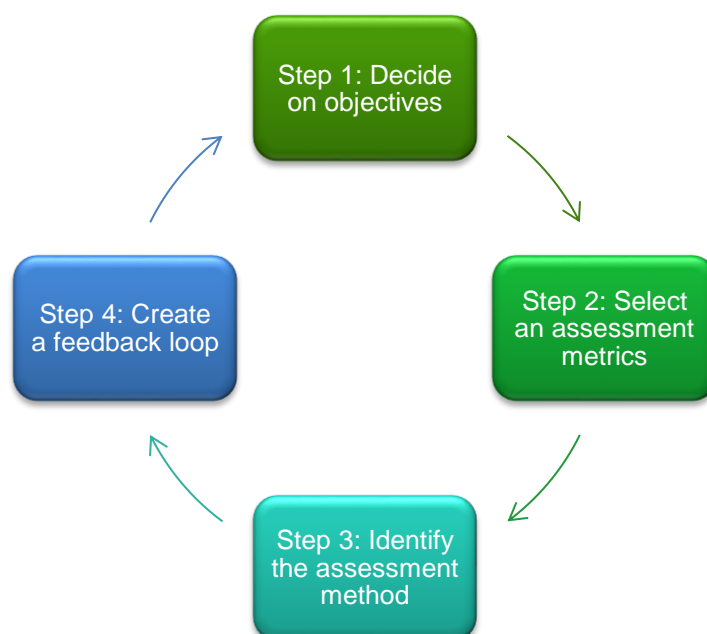
Review process

- Does your region periodically identify stakeholder strengths and weaknesses in engaging with RRI issues and debates in existing S3 strategies?
- Did your region come up with an engagement plan on how to engage RRI stakeholders in S3?
- Are “opponents” of RRI policy and measures included in a structured RRI dialogue?
- Are conflicting values dealt with in stakeholder engagement processes (e.g. privacy versus security)?

Dimension 2: Processes

Assessing whether RRI has been successfully integrated in S3 strategies requires governance systems and structures in place that foster open dialogue and collaboration among stakeholders. It also requires that MARIE partner regions have established appropriate procedures and processes to monitor and evaluate the integration of RRI in S3 (Figure 4).

Figure 4. Setting up a monitoring and evaluation process



Source: OECD elaboration.

Step 1: Decide on the primary objectives of the RRI assessment

A regional or local assessment of RRI integration into S3 requires setting clear monitoring and evaluation objectives. Hence, MARIE partner regions need a good understanding of how they define success in order to be able to measure the progress made towards set goals. An RRI assessment should also promote collective thinking among stakeholders, foster peer-to-peer learning, improve transparency, reduce information asymmetries, and enhance accountability. It is important to agree on the objectives among those involved in the process. Stakeholders should be able to see how their contribution can help improve current institutional settings, policies, actions and programmes to implement RRI. It is therefore crucial that the lead institution and stakeholders discuss and agree on the objectives and scope of the RRI assessment.

Step 2: Select an assessment metrics

An assessment metric can focus on different dimensions and actions to support effective integration of RRI into S3. Here, two different evaluation metrics are proposed. A small-scale evaluation could look at the RRI value dimensions outlined above and assess whether they have been integrated into the design and implementation of S3 projects. A more comprehensive assessment could follow the four dimensions outlined: people, data, processes, and engagement and support. However, an evaluation metric could also include additional dimensions outside the scope of this document, such as an explicit ethics dimension for S3 projects and policies, for example. Each MARIE region needs to decide on the evaluation metrics following their understanding of RRI and their evaluation objectives. MARIE partner regions could also decide to use the same evaluation metrics for all regions to allow comparability of results between regions. Which approach to choose depends on the learning objective from the assessment – either it could be to improve RRI projects and policies within the regional S3 or to understand better strengths and weaknesses in one region in comparison to other regions.

Step 3: Identify the assessment method

The chosen assessment metrics can be measured using a variety of qualitative and quantitative methods. MARIE partner regions should use a combination of the most appropriate methods that also match resource capacity.

Often, internal records can be used as a low-cost and easy accessible option. They are especially useful for input and activity indicators on how RRI has been integrated into S3. An example of such record data could be to measure the share of S3 funded projects with an explicit gender dimension, or the increase of open access of research material within a region. The weakness of this approach is that it rarely provides data on the effect and impact of proposed objectives.

Data on the integration of RRI into S3 could also be collected through short surveys or semi-structured interviews. Such data are mostly relevant for intermediate outcomes through the perception and opinion of stakeholders, including citizens. The weaknesses of such methods include a lack of flexibility and potential cost. Workshops can also be a good way to collect data. They are especially useful for obtaining data on the satisfaction and opinion on specific situations. Their weakness lies in that they can be resource intensive, before, during and after the event, and outcomes can depend a great deal on who participates (Gertler, 2016^[8]).

There is also the possibility to regularly assess progress over time by undertaking qualitative exercises (e.g. interviews or surveys) on a periodic basis. It is also possible to complement such an assessment with relevant quantitative input and output indicators (Gertler, 2016^[8]).

Step 4: Create a feedback loop

Assessing the successful integration of RRI into S3 does not automatically mean that people learn from the insights obtained. To embed learning into the assessment process requires discussion and reflection among key implementers. Several tools can be used to generate learning, including focus group meetings or workshops to discuss results and next steps.

Box 3. Self-assessment questions: Process dimension

Integrating RRI into the S3 diagnostic and vision

- Does your S3 diagnostic include evidence on the impact of RRI in your territory, such as for example social and/or environmental improvements from science in the region, or newly introduced responsible innovation processes in companies?
- Does your regional S3 vision include a reflection on how RRI can promote an inclusive and sustainable transition pathway?

Integrating RRI into S3 priorities and processes

- How important is RRI for your chosen S3 priority domains?
- Are there any co-ordination mechanisms in place to integrate RRI into existing S3?

Integrating RRI into an S3 action plan(s)

- Did the inclusion of RRI projects change the selection and design of policy instruments and portfolios used to implement S3?
- Were any of the RRI value dimensions incorporated into selection criteria for the S3 action plan?

Integrating RRI into S3 policy learning

- Does your monitoring and evaluation system for S3 include indicators and processes that can help capture RRI outcomes?

Dimension 3: Data

The lack of adequate measures of RRI is a barrier to mainstreaming RRI. While some MARIE partner regions have developed RRI indicators, for example as criteria in research-funding proposals, the identification of useful indicators and metrics remains a challenge. Against this backdrop, the data dimension is essential to the development of indicators that could support RRI measurement and highlights the type of information that would be useful to collect and how.

Benefits of indicator systems and types of indicators

An indicator is a measure that captures essential information and provides insights that can be used in the context of decision-making. Using indicator systems to design, implement, and monitor RRI policies or projects can reduce and ideally eliminate information gaps among regional stakeholders. Setting up meaningful indicators empowers regional actors and civil society, giving them responsibility and making them feel part of the decision-making process. For instance, integrating indicators from multiple sources, such as public, private and civil society entities has advantages in achieving a more holistic picture of RRI.

It is recommended to use qualitative (e.g., interviews or surveys) and quantitative (e.g., numbers, ratios) indicator collection methods. They have different objectives and are highly complementary. Four main categories of indicators exist:

1. **Input indicators:** Reveal what resources are used to produce and deliver goods and services (e.g., funds allocated to RRI);
2. **Process indicators:** Reveal how activities are undertaken and implemented (e.g., development of a stakeholder consultation mechanism);
3. **Output indicators:** Capture the goods and services that activities produce (physical and intangible output (e.g., firms coached on collaborating with universities);
4. **Outcome indicators:** Capture change as a result of an intervention (policy, programme, or project) and the outputs produced.

Some monitoring and evaluation frameworks also use impact indicators. They measure the intended outcome of the policy intervention on the wider economy or society (e.g., change in regional Gross Domestic Product (GDP)). A good example of how RRI indicators were developed presents the example of measuring the maturity of RRI in technology centres in Valencia, Spain (Box 4).

Box 4. Monitoring the RRI maturity level of technology centres in Valencia, Spain

The association REDIT, a Network of Technological Centres of Valencia Region, runs 11 Research and Technology Organisations (RTO) in Valencia, Spain. It conducted an RRI evaluation for all of its technology centres to examine how each implements RRI and how they transfer results to society. The evaluation set short-, medium- and long-term RRI objectives. The short-term objectives of the study were to monitor the RRI maturity level of the 11 RTOs. REDIT identified four different levels of maturity:

1. **Unconscious:** the organisation is unaware of the need to include RRI in RTO innovation processes.
2. **Reactive:** the organisation includes RRI because it is legally obliged to do so.
3. **Proactive:** the organisation is aware of the benefits of RRI for the RTO and seeks to integrate it into its innovation processes and projects.
4. **Strategic:** the organisation has adopted RRI as one of its strategic activities.

REDIT selected RRI performance indicators across five dimensions to conduct the evaluation: i) gender equality, ii) environment, iii) public engagement, iv) education for innovation, and v) inclusive innovation. To collect information and data on the five dimensions, 45 interviews were carried out. All information on the results of the study is publicly available on the REDIT website.

Source: PowerPoint Presentation "Series for MARIE: REDIT - RRI". Given by Arantxa Viñals Yuste, REDIT-Red de Institutos Tecnológicos de la Comunitat Valenciana on 29 April 2022, <https://www.redit.es/actualidad-redit/publicaciones-redit/>

Barriers to using indicator systems

The collection of meaningful data and indicators is crucial for monitoring and evaluating the integration of RRI into S3. However, it is not always easy to do in practice. Currently, most data collection on RRI is qualitative. During the OECD-MARIE workshops, participants agreed that a more rigorous quantitative analysis of RRI would be helpful. However, it is often challenging to identify quantitative indicators relevant to RRI because public statistical offices do not necessarily collect data such as R&D budgets specifically allocated to RRI projects. Reasons behind a lack of data are not necessarily a lack of motivation, but can be due to limited human resources and/or expertise to translate the need for more data into actual indicator sets and data collection activity.

Furthermore, even when data is available, regional or local administrations may not be able to interpret it, or to present it in an attractive and informative manner. Using clear language and a story-based approach

to interpret data in a meaningful way can be important. It could also be useful to organise training courses on quantifying, choosing and measuring RRI indicators.

Setting indicators for integrating RRI into S3

The following considerations should be taken into account when building indicators for measuring the integration of RRI into S3:

- Project managers and policy makers should be realistic and set targets that are neither insufficiently ambitious (that do not encourage efforts) nor overly ambitious (so unattainable that they are discouraging). Moreover, targets should not be overly binding, as they should be adapted according to regional development challenges that may emerge and the evolving understanding of RRI.
- There is no optimal number of indicators. Indicators must meet the information needs of different stakeholders and be adapted to the regional understanding of RRI. However, when defining indicators, regions should keep in mind that an excessive number of indicators and targets might erode their usefulness.
- Objectives and indicators should be developed in consultation with relevant partners. This is intended to empower them and encourage their efforts in reaching the RRI targets set. There should also be agreement on who collects indicators.
- A purely top-down approach will fail to reflect regional specificities when deciding which indicators to use. Furthermore, requirements imposed from above might be perceived as an additional burden on regional actors, resulting in political resistance.
- The development of incentives may be a useful way to push regional actors to participate in establishing an RRI indicator system. For instance, rather than relying on the intrinsic motivation of regional actors to collect and share information and data, indicator systems can be designed to produce competition by presenting information that facilitates relative comparisons (OECD, 2009^[9]).

Box 5. Self-assessment questions: Data dimension

Availability of RRI indicators

- Are RRI input indicators available in your region?
- Are RRI process indicators available in your region?
- Are RRI output indicators available in your region?
- Are RRI outcome indicators available in your region?
- If yes, have you used existing RRI indicators to measure the integration of RRI in S3 projects?
- Does the S3 strategy already include targets and indicators that could be relevant for RRI measurement?

RRI indicator collection and use

- Are different sources of RRI-relevant data (e.g. quantitative and qualitative indicators) integrated in the regular S3 monitoring and evaluation framework?
- Are RRI-relevant indicators within S3 collected at regular time intervals?
- Does your region have a dashboard to visualise progress on RRI through indicators?

- If yes, do regional or local stakeholders have access to upload and/or visualise their indicators in the dashboard?
- Is your monitoring and evaluation framework sufficiently adaptable to account for change or adjustments in objectives and indicators?

Dimension 4: Engagement and support

Assessing if RRI has been integrated into S3 requires, political engagement and good management, as well as technical support to carry out the assessment and to learn from its findings. Table 1 summarises the why, when and how of engaging with different audiences to ensure support for assessing the integration of RRI into S3.

Table 1. Engaging key constituencies for monitoring and evaluation: why, when, and how

	RRI/S3 programme staff and managers	High-level policy-makers	RRI development practitioners and researchers
Why?	Can become champions of monitoring and evaluation and the use of evidence.	Need to understand why the issue is important, how an RRI assessment can help them make better decisions, and ultimately, what the evidence says about where their energies (and available financing) should be directed.	Need evidence about the impact of RRI programmes in order to design new programmes or replicate successful ones, and conduct research that can help RRI.
When?	Ideally early on, even before the assessment has started and with frequent interactions throughout. They are the first to comment on evaluation results.	Early on, when defining the assessment questions and before the evaluation begins, and again when results have been finalised.	Information should be disseminated once results are finalised and have been approved by programme staff and policymakers. Selected researchers could also take part in an RRI assessment.
How?	Introduce the role of evidence in RRI integration in S3 in a workshop to engage programme managers in the evaluation design. Follow up with meetings at key points: immediately after collection of data, after collection of intermediate results, and during the discussion of follow-ups.	Can establish direct meetings with senior-level staff to explain the work. Can encourage programme managers to keep a lead institution informed about RRI developments within S3.	Public events, conferences, working papers, journal articles, media coverage, and web-based materials, are all channels for reaching these audiences.

Source: Adapted from (Gertler, 2016^[10])

Having strong political support ensures the quality and use of outcomes by making sure that the following is in place:

- Institutionalising RRI monitoring and evaluation as an integral component of the policy development and implementation cycle, including a budget allocation for policy monitoring and evaluation.
- Establishing clear organisational structures for collecting, analysing and reporting RRI-related monitoring and evaluation information, backed up by clear roles, responsibilities and lines of authority, both at the organisational and political level.
- Creating and maintaining the technical and managerial skills required for planning, managing and operationalising an RRI monitoring and evaluation framework, including adequate staffing.

- Committing financial resources for the management of the RRI assessment(s), including training and professional development of relevant staff, and development and maintenance of data collection and processing systems.

Lastly, there is an important role for strong monitoring and evaluation champions inside and outside regional governments and authorities. These champions can serve as advocates for an evaluation culture across government and its agencies and delivery partners (Magro and Wilson, 2019^[11]).

Box 6. Self-assessment questions: Engagement and support dimension

Engagement commitment

- Is there public sector commitment and leadership to support RRI in your region?
- Is there private sector commitment and leadership for RRI in your region?
- Does your region succeed in promoting RRI monitoring and evaluation as a benefit and not additional burden to local authorities or (other) beneficiaries?
- Does your region have a culture that encourages the monitoring and evaluation of RRI results?

Supporting resources

- Does your region have the necessary human resources and expertise to integrate RRI into S3 and, consequently, to monitor and evaluate its results?
- Do regional and local companies feel that integrating RRI principles into S3 positively or negatively affects their competitiveness and profits?

Operationalising the framework: methodology and process

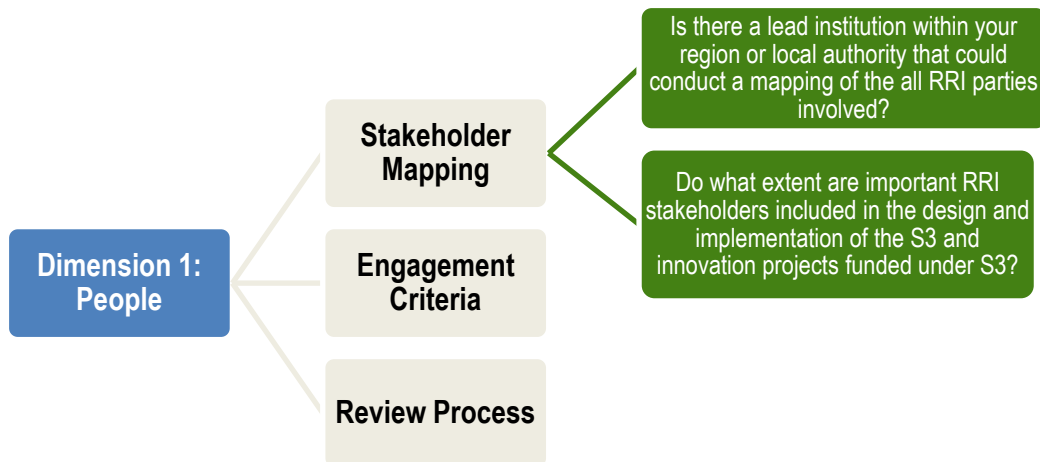
One way to operationalise the assessment approach outlined above is through the development of a self-assessment tool. The self-assessment tool could focus on the proposed dimensions and several actions within those to consider whether RRI has been effectively integrated into existing S3 strategies. While the self-assessment tool does not provide for an independent evaluation, it can support a differentiated and subjective analysis of the extent to which RRI has been integrated into S3.

The self-assessment tool can be used by all relevant S3 and RRI stakeholders in MARIE partner regions. For example, it can be used by S3 teams in each MARIE region to assess where, how, and to which extent RRI dimensions have been integrated into S3. It could also be used as a collective self-assessment exercise where different stakeholders take the self-assessment individually and then compare and exchange their findings in a joint workshop.

Self-assessment methodology

The self-assessment methodology proposed is based on the four already proposed dimensions: i) people; ii) data; iii) processes; and iv) engagement and support. Each dimension is associated with a number of action areas that were briefly outlined above and could be elaborated in a full monitoring and evaluation framework. These action areas highlight important activities that determine whether RRI has been integrated in existing S3 or not, and how. For each action area, a series of self-assessment questions are developed (see above and Annex 1A). The figure below illustrates the methodology with the example of the stakeholder mapping action area in the people dimension:

Figure 5. Self-assessment structure with an example



Source: OECD elaboration.

The self-assessment questions help MARIE partner regions assess whether an action, project or process has been implemented to integrate RRI into S3 and how they can further strengthen RRI integration in future S3 strategies. The OECD proposes a four-point scale (plus a “not applicable” option) corresponding to the level of RRI integration in S3. This scale should help facilitate the discussion and enable a structured dialogue. It also acknowledged that not all self-assessment questions may be applicable to all regional contexts.

Table 2. Proposed self-assessment rating system

Rating	Category	Description
4	In place, functioning well	All relevant action <i>has been taken</i>
3	In place but needs improvement	The framework/action is in place, but the level of implementation is not complete
2	Under-developed	A framework/action is under development, but not yet implemented
1	Not in place	The framework/action does not exist and there are no plans or action to develop it yet
-	Not applicable	The question/reference is not applicable in the context in which the assessment takes place

Source: OECD elaboration.

The proposed approach allows the MARIE partner regions to identify performance in different dimensions and action areas for RRI. The colour scheme provides a visual aid to highlight where RRI integration has been successful, and can help raise awareness of RRI weaknesses.

Self-assessment process

The self-assessment process consists of a number of steps:

1. **Preparation:** A lead institution needs to be identified to undertake the self-assessment. Carrying out the self-assessment can be done as an “individual” or as a “group” exercise. It would be up to each MARIE partner to decide who should take part in a group exercise.

2. **Self-assessment:** The designated individual or group carries out the self-assessment. Given that this may entail the need for additional data collection in the region, the lead institution should have the financial and human resources to do so. The lead institution could also ask regional or local RRI stakeholders to take the self-assessment in parallel.
3. **Interpretation of findings:** The designated individual or group carrying out the self-assessment should aggregate the rating scales and undertake an analysis for their region or locality. The findings from the self-assessment could be combined with additional information, for example from existing quantitative indicators on RRI, where useful. If several individuals or groups take the self-assessment in parallel, aggregating scales helps benchmarking and comparison. The findings of several self-assessments could be compared in a dedicated workshop.
4. **Communication:** Following the self-assessment, a discussion could take place on how to use the findings, for example to adjust existing activities assuming this is possible or to consider when developing the next S3.
5. **Optional follow-up actions:** The findings could also feed into an action plan. An action plan could be developed through a workshop or any other form that MARIE partner regions find useful to discuss the conclusions and generate follow-up actions. The action plan should also ensure that RRI stakeholders, and citizens, play a role in improving policy outcomes for future ambitions to integrate RRI into S3.

When carrying out the self-assessment exercise, open communication and transparent discussions are key to success. Any misinterpretations of self-assessment questions and/or reasons for diverging opinions on the rating scale should be openly discussed. In case of disagreement, causes need to be explored.

Conclusion

The successful integration of an RRI dimension into existing S3 means that these have incorporated a set of RRI values, such as diversity and inclusion, openness and transparency, and responsiveness and adaptive change. It also means that S3 projects support a range of innovations that drive economic, but also social and environmental change.

Given the multi-faceted nature of RRI, measuring the successful integration of it into S3 requires looking at a series of important dimensions. The assessment approach presented here focuses on four: people, processes, data, and engagement and support. All dimensions are equally important when assessing RRI integration into S3.

Assessing the integration of RRI into S3 also rests on a set of principles, which include embedding evaluation processes in policy design and implementation, using a variety of methods (including quantitative and qualitative techniques), actively promoting inclusive participation, taking a multi-level approach, and basing action on a shared regional vision for RRI.

Fundamental to every assessment approach is a solid assessment methodology and process – one that supports collective and structured dialogue among assessors. The methodology proposed here is not founded on an independent evaluation. Rather it is presented as a tool that can be used by all MARIE regions and others to assess where, how, and to what extent RRI dimensions have been integrated into existing S3.

References

- Dahler-Larsen, P. (2011), *The Evaluation Society*, Stanford University Press, Redwood City, <https://doi.org/10.1515/9780804778121/HTML>. [12]
- Fitjar, R. and A. Rodríguez-Pose (2011), “When Local Interaction Does Not Suffice: Sources of Firm Innovation in Urban Norway”, *Environment and Planning A: Economy and Space*, Vol. 43/6, pp. 1248-1267, <https://doi.org/10.1068/a43516>. [5]
- Foray, D. (2017), “The Economic Fundamentals of Smart Specialization Strategies”, in Radošević, S. et al. (eds.), *Advances in the Theory and Practice of Smart Specialization*, Academic Press. [2]
- Gertler, P. (2016), *Impact Evaluation in Practice - Second Edition*, World Bank and Inter-American Development Bank, <https://www.worldbank.org/en/programs/sief-trust-fund/publication/impact-evaluation-in-practice> (accessed on 31 August 2022). [10]
- Magro, E. and J. Wilson (2019), “Policy-mix evaluation: Governance challenges from new place-based innovation policies”, *Research Policy*, Vol. 48/10, <https://doi.org/10.1016/j.respol.2018.06.010>. [11]
- OECD (2021), *Regional Innovation in Piedmont, Italy*, OECD Publishing, https://www.oecd-ilibrary.org/urban-rural-and-regional-development/regional-innovation-in-piedmont-italy_7df50d82-en. [4]
- OECD (2020), *Improving Governance with Policy Evaluation: Lessons From Country Experiences*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://dx.doi.org/10.1787/89b1577d-en>. [8]
- OECD (2017), *Making Decentralisation Work in Chile - towards stronger municipalities*, <https://www.oecd-ilibrary.org/docserver/9789264279049-en.pdf?expires=1661801793&id=id&accname=ocid84004878&checksum=CA5CF100E43F78163685AF56B687A4A5>. [14]
- OECD (2017), *Making Decentralisation Work in Chile: Towards Stronger Municipalities*, OECD Multi-level Governance Studies, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264279049-en>. [7]
- OECD (2017), *Making Innovation Benefit All: Policies for Inclusive Growth*, <https://www.oecd.org/innovation/inno/making-innovation-benefit-all.pdf>. [3]
- OECD (2015), *Stakeholder Engagement for Inclusive Water Governance*, OECD Studies on Water, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264231122-en>. [6]
- OECD (2009), *Governing Regional Development Policy: The Use of Performance Indicators*, OECD publishing, http://www.pintoconsulting.de/Images/References/OECD_M&E_SME_Strategy_Moldova.pdf. [9]
- Owen, R., R. Von Schomberg and P. Macnaghten (2021), “An unfinished journey? Reflections on a decade of responsible research and innovation”, <https://doi.org/10.1080/23299460.2021.1948789>. [1]
- Serrat, O. (2017), “Bridging Organizational Silos”, *Knowledge Solutions*, pp. 711-716, https://doi.org/10.1007/978-981-10-0983-9_77. [13]

Annex 1.A. Overview of proposed self-assessment questions

Dimension	Action Area	Assessment Question	Scale					Notes and Suggestions
			4	3	2	1	n.a.	
PEOPLE	<i>Stakeholder mapping for RRI</i>	Is there a lead institution in your region or local authority that could conduct a mapping of the all RRI parties involved?						
		If not, is there an existing institution that could undertake such an activity or is a new institution called for?						
		To what extent are important RRI stakeholders (e.g. academia, youth, civil society organisations and the private sector) included in the S3's design and implementation and in innovation projects funded under S3?						
		How to address the risk of capture by established dominant players who might be less interested in the objectives of RRI?						
	<i>Engagement criteria and guidelines</i>	Are there sufficient tools and mechanisms to engage with citizens and other stakeholders, in general and for RRI?						
		Are there sufficient resources to undertake stakeholder engagement in the region (e.g. to create an engagement plan, to identify and connect with stakeholders, to do budget planning for stakeholder engagement etc.?)						
		Does your region succeed in engaging stakeholders who are less informed and less accustomed to engaging with RRI dimensions, for example, open science or gender balance?						

		Are there clear engagement criteria and guidelines on how to include different groups of stakeholders and for what purpose?							
		How does your region intend to maintain dialogue in the future with stakeholders?							
	<i>Review Process</i>	Does your region periodically identify stakeholder strengths and weaknesses in engaging with RRI issues and debates in existing S3 strategies?							
		Did your region come up with an engagement plan on how to engage RRI stakeholders in S3?							
		Are “opponents” of RRI policy and measures included in a structured RRI dialogue?							
		Are conflicting values dealt with in stakeholder engagement processes (e.g. privacy versus security)?							
<i>Dimension aggregate score</i>									
PROCESS	<i>Integrating RRI into S3 diagnostic and vision</i>	Does your S3 diagnostic include evidence on the impact of RRI in your territory, such as for example social and/or environmental from science in the region, or newly introduced responsible innovation processes in companies?							
		Does your regional S3 vision include a reflection on how RRI can promote an inclusive and sustainable transition pathway?							
	<i>Integrating RRI into S3 priorities and processes</i>	How important is RRI for your chosen S3 priority domains?							
		Are there any co-ordination mechanisms in place to integrate RRI into existing S3?							
	<i>Integrating RRI into an S3 action plan(s)</i>	Did the inclusion of RRI projects change the selection and design of policy instruments and portfolios used to implement S3?							

		Were any of the RRI value dimensions incorporated into selection criteria for the S3 action plan?							
	<i>Integrating RRI into S3 policy learning</i>	Does your monitoring and evaluation system for S3 include indicators and processes that can help capture RRI outcomes?							
<i>Dimension aggregate score</i>									
DATA	<i>Availability of RRI Indicators</i>	Are RRI input indicators available in your region?							
		Are RRI process indicators available in your region?							
		Are RRI output indicators available in your region?							
		Are RRI outcome indicators available in your region?							
		If yes, have you used existing RRI indicators to measure the integration of RRI in S3 projects?							
		Does the S3 strategy already include targets and indicators that could be relevant for RRI measurement?							
	<i>RRI indicator collection and use</i>	Are different sources of RRI-relevant data (e.g. quantitative and qualitative indicators) integrated in the regular S3 monitoring and evaluation framework?							
		Are RRI-relevant indicators within S3 collected at regular time intervals?							
		Does your region have a dashboard to visualise progress on RRI through indicators?							
		If yes, do regional or local stakeholders have access to upload and/or visualise their indicators in the dashboard?							

		Is your monitoring and evaluation framework sufficiently adaptable to account for change or adjustments in objectives and indicators?							
<i>Dimension aggregate score</i>									
ENGAGEMENT AND SUPPORT	<i>Engagement commitment</i>	Is there public sector commitment and leadership to support RRI in your region?							
		Is there private sector commitment and leadership for RRI in your region?							
		Does your region succeed in promoting RRI monitoring and evaluation as a benefit and not additional burden to local authorities or (other) beneficiaries?							
		Does your region have a culture that encourages the monitoring and evaluation of RRI results?							
	<i>Supporting resources</i>	Does your region have the necessary human resources and expertise to integrate RRI into S3 and, consequently, to monitor and evaluate its results?							
		Do regional and local companies feel that integrating RRI principles into S3 positively or negatively affects their competitiveness and profits?							
<i>Dimension aggregate score</i>									



For more information on this project, please contact:

OECD: **Maria Varinia Michalun** (MariaVarinia.Michalun@oecd.org) and **Sandra Hannig** (Sandra.Hannig@oecd.org)

MARIE Interreg Project: **Giulia Bubbolini** (Gbubbolini@ciseonweb.it) and **Jessica Huntingford** (Jessica.Huntingford@resolvo.eu)

About Interreg Europe MARIE

[Interreg Europe MARIE](#) (2017-2022) is a European Territorial Cooperation project, co-funded by the European Regional Development Fund (ERDF) through the Interreg Europe Programme. MARIE focuses on mainstreaming RRI in Regional Smart Specialisation Strategies (RIS3) to support transformative innovation at regional level. MARIE is coordinated by [CISE - Centre for Innovation and Economic Development](#), Italy.

About the OECD

[The Organisation for Economic Co-operation and Development \(OECD\)](#) is an international organisation that works to build better policies for better lives. Together with governments, policy makers and citizens, the OECD provides a unique forum and knowledge hub for data and analysis, exchange of experiences, good-practice sharing, and advice on public policies and international standard-setting.

About CFE

[The OECD Centre for Entrepreneurship, SMEs, Regions and Cities \(CFE\)](#) provides comparative statistics, analysis and capacity building for local and national actors to work together to unleash the potential of entrepreneurs and small and medium-sized enterprises, promote inclusive and sustainable regions and cities, boost local job creation, and support sound tourism policies.

Twitter: #OECD_Local #OECDregions

Linkedin: oecd-local

Email: regions@oecd.org

Subscribe to CFE newsletter: <http://oe.cd/CFEnews>

