

GUIDELINE NOTE FOR A MONITORING
AND EVALUATION SYSTEM
FOR INNOVATION STRATEGIES (RIS3) IN POLAND

Disclaimer:

This volume is a product of the staff of the International Bank for Reconstruction and Development/The World Bank. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily reflect the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The World Bank Group has used its best efforts in the time available to provide high-quality services and has relied on information provided to it by a wide range of other sources. However, it does not make any representations or warranties regarding the completeness or accuracy of the information included in this report, or the results that would be achieved by following its recommendations.

Copyright Statement:

The material in this publication is copyrighted. Copying and/or transmitting portions or all of this work without permission may be a violation of applicable law. The International Bank for Reconstruction and Development/The World Bank encourages dissemination of its work and will normally grant permission to reproduce portions of the work promptly.

For permission to photocopy or reprint any part of this work, please send a request with complete information to the Copyright Clearance Center, Inc.,

222 Rosewood Drive, Danvers, MA 01923, U.S.A.,

telephone (+1) 978-750-8400, fax (+1) 978-750-4470, <http://www.copyright.com>.

All other queries on rights and licenses, including subsidiary rights, should be addressed to the Office of the Publisher, The World Bank,

1818 H Street NW, Washington, D.C. 20433, U.S.A.,

fax (+1) 202-522-2422, e-mail pubrights@worldbank.org.

Contents

iii	Contents
iii	List of Figures
iii	List of Tables
iv	List of Boxes
iv	Acknowledgments
vi	List of abbreviations
1	1. Executive summary
7	2. Main challenges – diagnosis of the RIS3/S3 M&E system
13	3. Coordination potential
17	4. Conclusions and recommendations
23	Annex1. Description of indicators types and feedback elements

List of Figures

2	Figure 1. Role of M&E in the policy cycle
5	Figure 2. Conceptual outline of the note
7	Figure 3. Model of an intervention logic (extended)
17	Figure 4. Prerequisites of high quality and sustainable M&E system
23	Figure 5. Model of an intervention logic
27	Figure 6. Relation between population, target group, and direct and indirect beneficiaries
28	Figure 7. Relation between intervention outcome and impact

List of Tables

24	Table 1. Indicator matrix
24	Table 2. Examples of context indicators at the policy level
25	Table 3. Examples of context indicators at the program level
26	Table 4. Examples of input indicators
26	Table 5. Examples of output indicators
28	Table 6. Examples of outcome indicators
29	Table 7. Examples of indicators that could be used in an impact evaluation
30	Table 8. An exemplary ID card for an indicator
30	Table 9. A template of a communication plan for presenting M&E information
31	Table 10. Participation matrix (exemplary fill in)

List of Boxes

- 2** Box 1. Definition of RIS3 – research and innovation strategy for smart specialization
- 3** Box 2. Definition of monitoring and evaluation
- 7** Box 3. Definition of an intervention logic
- 9** Box 4. Impact evaluation – main aspects and challenges
- 18** Box 5. Value added created by the M&E system – IWT (Belgium, Flanders)
- 18** Box 6. Cooperation between national and regional M&E units (Spain)
- 19** Box 7. Testing novel methodologies for RIS3 M&E (Poland, GUS)
- 19** Box 8. Mixing quantitative and qualitative information (France, PACA)
- 20** Box 9. Systematic information gathering (Poland, PARP)
- 20** Box 10. Information collection: obtaining export data (Poland, Zachodniopomorskie region)
- 20** Box 11. ImpactScan: information gathering and analysis
- 21** Box 12. Importance of skills
- 21** Box 13. Broad information dissemination (Austria, Lower Austria)

Acknowledgments

The note was prepared by a team comprising Grzegorz Wolszczak, Monika Matusiak, Marcin Piatkowski and Magdalena Rola-Janicka, with valuable comments provided by Tomasz Szuba and Peter Lindholm.

The team is indebted to Xavier Devictor and Aurora Ferrari for provided guidance during the preparation of the note.

The note has been developed based on a series of five workshops conducted in the first half of 2014 at the request of the Ministry of Infrastructure and Development. The note benefited from excellent collaboration with a dedicated team at the Ministry of Infrastructure and Development. In particular, the team is grateful to Agnieszka Kręcisz-Borowiec, Deputy Director of the Competitiveness and Innovation Department, and Katarzyna Kaczkowska, Head of the Individual Projects Unit in the Competitiveness and Innovation Department, for their intellectual input, strong commitment and ongoing support for the team. Furthermore, contributions from representatives of sixteen Polish regions participating in the workshops as well as representatives of other ministries and national agencies have significantly shaped this note.

List of abbreviations

EC	European Commission
EDP	Entrepreneurial Discovery Process
EU	European Union
GIG	Central Mining Institute
GUS	Central Statistical Office
KJE	National Evaluation Unit
M&E	Monitoring and evaluation
MID	Ministry of Infrastructure and Development
MoE	Ministry of Economy
MoF	Ministry of Finance
MoSHE	Ministry of Science and Higher Education
NCBR	National Centre for Research and Development
NIK	Supreme Audit Office
PARP	Polish Agency for Entrepreneurship Development
RIS3	Research and innovation strategy for smart specialization
ROP	Regional operational program
S3	Smart specialization
UPRP	National Patent Office

1. Executive summary

1. Poland will invest around 10 billion euro in supporting innovation during 2014-2020.

These will be financed by EU and domestic funds. The key objective of this investment will be to boost innovation and competitiveness of the country, move from importing to exporting ideas, and continue to converge with Western Europe from the current 68 percent of the EU-28 income level.

2. A well-functioning monitoring and evaluation (M&E) system is necessary for efficient investment in innovation at both the national and regional levels. To support innovation properly, Poland has to know where and how it wants to act, which programs and instruments bring high return on investment, and which do not work and have to be terminated or adjusted. Managers of the innovation resources will also have to be proficient in assessing the effectiveness of newly designed and introduced public interventions. This cannot be achieved without a well-functioning system of monitoring and robust evaluations (including impact evaluations) for innovation policy. Additionally, enhanced coordination of M&E efforts between the governance levels offers benefits of scale as well as paves the way for a certain degree of unification of M&E data. Greater comparability of data will improve management capacity of innovation-related funds at both the national and regional levels.

3. The M&E system should also play an important role in the entrepreneurial discovery process (EDP). On the one hand, proper M&E should encourage regular communication among actors of the innovation system. On the other hand, it provides stakeholders with data about results of a public intervention. That contributes to systemic learning and continuous improvement of the innovation policies and programs as well as trust building. Moreover, it facilitates dialogue between authorities, firms and other stakeholders, e.g. R&D units, business support institutions (BSIs), non-governmental organizations (NGOs). Thanks to such relations authorities can easier collect information on firms' needs and attitudes that is essential for design, implementation and modification of public intervention. This approach is especially useful in determining and modifying smart specializations, which are the focus of the EU innovation policy in the new programming period 2014-2020 and should be based on existing comparative advantage in economic and scientific terms. Areas of smart specialization should show significant growth potential and be a priority for public investment in innovation policy.

4. This note concentrates on monitoring and evaluation (M&E) of research and innovation strategies for smart specialization (RIS3s) in Poland and coordination of regional and national M&E systems. The conclusions form a series of five workshops constitute the basis of this note. These workshops were conducted with a threefold objective:

- i. To identify key challenges to the coordination of national and regional M&E systems for research and innovation strategies for smart specialization (RIS3s) (see **Box 1** for a definition of RIS3).
- ii. To recommend actions and indicate good practices that could address selected challenges of the RIS3 M&E system.
- iii. To design a scheme for improvement of the RIS3 M&E system coordination.

The workshops were carried out by the World Bank at the request of the Ministry of Infrastructure and Development (MID) during the first half of 2014. Representatives of all Polish regions, relevant ministries (Ministry of Infrastructure and Development – MID, Ministry of Economy – MoE, Ministry of Science and Higher Education – MoSHE), national agencies (PARP, NCBR, Central Statistical Office, National Patent Office, Supreme Audit Office, GIG, Revenue Office), as well as the European Commission (DG Regio) and other European regions and international institutions have participated in these meetings.

Box 1. Definition of RIS3 – research and innovation strategy for smart specialization

RIS3 is an integrated, place-based economic transformation agenda that does five important things:

1. It focuses policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development, including ICT-related measures;
2. It builds on each country's/region's strengths, competitive advantages and potential for excellence;
3. It supports technological as well as practice-based innovation aiming to stimulate private investment;
4. It gets stakeholders fully involved and encourages innovation and experimentation;
5. It is evidence-based and includes sound monitoring and evaluation systems.

Source: Commission (2012), *Guide to Research and Innovation Strategies for Smart Specialisations* (RIS 3).

5. A well-functioning M&E system can provide inputs to each stage of the policy cycle, as long as it is connected to clear goals of the intervention logic. Figure 1 shows a policy cycle composed of three phases – strategic planning, operationalization, and implementation – which subsequently follow each other. In the center of this policy cycle are stakeholders (both internal and external), who use information coming from either monitoring, evaluation or both at every stage of the cycle. For instance, at the planning and operationalization stage *ex ante* evaluations are useful to validate whether the envisioned intervention is feasible. At the implementation stage monitoring plays a vital role to keep track of the intervention development, which can be supplemented with ongoing evaluation. After the end of the intervention, *ex post* evaluation delivers knowledge about its effectiveness and delivery, which is indispensable for planning of following interventions. Generally, M&E data helps amend the implementation processes, distribute resources, adjust indicators, fine tune definitions etc. The multiplicity of uses of M&E data underscores the importance of a well-functioning feedback mechanism. However, if M&E is detached from intervention goals, or if these goals are not clearly stated, then the usability of M&E is limited, because it is not feasible to measure and assess the progress in the void where success or failure are not defined.



Figure 1.
Role of M&E in the
policy cycle

Source: World Bank

6. Current national and regional M&E systems for innovation policy have scope for improvement. Poland has been receiving EU funds for more than a decade and has built some experience to plan its current policies, programs and instruments. However, utilization of M&E has been limited and current strategic planning could benefit from a more developed base of evaluation studies and tested evidence, especially in the area of the innovation policy. Poland needs

an improved overview and understanding of how much money it spends on innovation at the national and regional level, where this funding goes (both in terms of company types and sectors of economy) and what result (change) it brings about, i.e. does public intervention work or not, especially in terms of its net impact on innovation, employment and growth, and finally how national and regional funds complement and reinforce each other.

7. Coordination of RIS3 M&E systems brings value added at the regional and national level. Coordination can take various forms that provide different benefits. On the one hand, it can save resources (time, employees, money etc.) of the regions, if an action can be performed by a central agency or a ministry, for instance by collecting data or conducting resource-intensive analyses, which are then distributed to the regions. In such cases, the regions obtain information for free, whereas the national level gets an overview of the situation in the regions. On the other hand, coordination promotes the compatibility and harmonization of the collected data as well as methods utilized for their gathering and assessment, thus increasing the comparability of information. That would help avoid a situation where similar activities are reported in an incompatible manner, e.g. several regions provide data about output of conducted trainings, but some report sessions held, while the others persons trained, etc. Furthermore, coordination of M&E systems can also enhance the quality of M&E by encouraging regular trainings for M&E staff, creating minimum standards for M&E and strengthening information flow between the regions and national ministries. These all have the potential to translate into better design of public interventions.

8. Monitoring is different from evaluation and they have to be considered separately. For simplicity reasons, a phrase “M&E” is applied throughout this note, however, there is a clear distinction between monitoring and evaluation (see **Box 2** for respective definitions). Monitoring and evaluation are related but separate processes and they can exist without each other, e.g. *ex ante* evaluation does not need monitoring to be accomplished. However, quality monitoring data can heavily improve evaluation by feeding it with information, for instance when an *ex ante* evaluation for a program is conducted, then monitoring data from similar previous experiences is invaluable.

Box 2. Definition of monitoring and evaluation

Monitoring keeps track of intervention implementation in real time – it is a continuous process taking place along the execution of intervention. Monitoring answers the question “What is happening?”. It allows regular measurement of the implementation progress of a strategy, program or instrument/action, i.e. it concentrates on obtaining information about real progress, e.g. how many milestones were achieved, is an intervention on track according to a plan, how much money has already been disbursed, is an intervention engaging the planned number of stakeholders, etc. Monitoring produces simple but instant managerial information (without judgment) that has to be interpreted and explained, the latter usually via evaluation. For instance, if the implementation of an intervention is going off plan, monitoring waves a red flag, thus providing a manager with an early warning and a signal that a corrective action may be needed. However, monitoring will not give an answer as to what has to be done to address the issue.

Evaluation explains whether, why and how an intervention works (or not) and generally it tackles questions such as “Are we doing the right things?”, “Are we performing them well?”, “Can it be done better?” Evaluation helps understand why given effects were achieved, whether this is good or bad considering the given circumstances, how it happened, and whether it was an intervention that caused observed changes or rather whether there were other factors that influenced the outcome. Evaluation gives meaning to data, enriches it with a broader context and offers in-depth understanding of processes. By and large, evaluations can be divided according to two major lines, i.e. time in relation to intervention execution and scope. Evaluation can take place either before intervention implementation (*ex ante*), during (ongoing) or after (*ex post*) and can focus on assessing either the goals achieved by an intervention (effectiveness), or the process of how the intervention functioned (efficiency).

Source: World Bank

9. Monitoring and evaluation are instruments to improve public intervention – not to punish. Monitoring has a particularly strong function of gathering information, i.e. gauging what is happening in an intervention and comparing it against the plan. When divergences appear between the plan and real implementation, action may be needed to address these divergences. Monitoring data offers a screenshot of the situation in a given moment (e.g. status of a project implementation) and does not interpret or judge it (this is the role of evaluation). Monitoring is an invaluable tool for checking the “pulse” of an intervention and its development. Evaluation helps improve public intervention by allowing a deeper understanding of whether an intervention works at all, and how it works. When monitoring flares a red light that things are going off plan (monitoring data constitute a basis for hypotheses on why an intervention is not going according to a plan), then evaluation analyzes why this is happening and what can be done to amend it (if needed). The change may be connected with fine tuning the delivery mechanism of the intervention or even revamping the overall sense of a given intervention, e.g. termination of an intervention, because its goals stopped being important to decision-makers, or adjusting the initial plan of delivery. Both monitoring and evaluation help improve policy making on a continuous basis and encourage systemic learning.

10. To become sustainable and successful, an M&E system must deliver timely and high quality information that constitutes value added for its users. An M&E system serves different masters. The information flowing from the M&E system must therefore match their needs, otherwise its usefulness and sustainability is at risk. An institution carrying out M&E is a service provider and generates information that should feed into a decision-making process of various actors, i.e. policy makers, firms and business support institutions (BSIs). If M&E systems bring no added value to these actors, they will neither finance nor use them, nor share information needed for future analyses. That, in turn, would inevitably halt the system.

11. M&E should have clear goals and rationale. It should be clear why a public intervention is monitored and which key indicators need to be assessed. M&E does not have to solely concentrate on effectiveness (achieving goals that were planned) and efficiency (achieving planned goals with lowest possible waste of resources – value for money), it can also serve other goals, for instance: enhancing transparency of policy making, ensuring accountability of decision makers, strengthening public dialogue and social participation, guiding budgetary processes (e.g. termination, continuation, expansion, scaling down of a program). One M&E system often cannot perform all these functions, because it becomes too complex. The main goal of the system will depend on local circumstances and the objectives of policy makers.

12. The main conclusions and recommendations of this note are as follows:

- i.** M&E capacity in the public sector leaves room for improvement;
- ii.** M&E should be strongly linked to intervention logic equipped with clear goals;
- iii.** Coordination of core and organizational aspects of the national and regional RIS3 M&E systems would enhance quality and sustainability of the overall system;
- iv.** Governance of the M&E system requires reinforcement – especially issues related to quality control and conflict of interests;
- v.** A feedback mechanism between an M&E system and innovation system stakeholders, especially policy-makers and firms, should be further strengthened.

13. The structure of this note is as follows: section two diagnoses the key challenges faced by the M&E system for innovation strategies (RIS3) and smart specialization (S3) at the national and regional level; section three discusses areas and concrete solutions suitable for enhanced coordination of national and regional M&E systems; section four concludes and offers recommendations as well as includes examples of good practices. The annex describes in detail different types of indicators, practical elements of indicator creation and the feedback mechanism. Across this note a twofold division of RIS3 M&E system features is applied to differentiate between core and organizational dimensions of this system (see **Figure 2**).

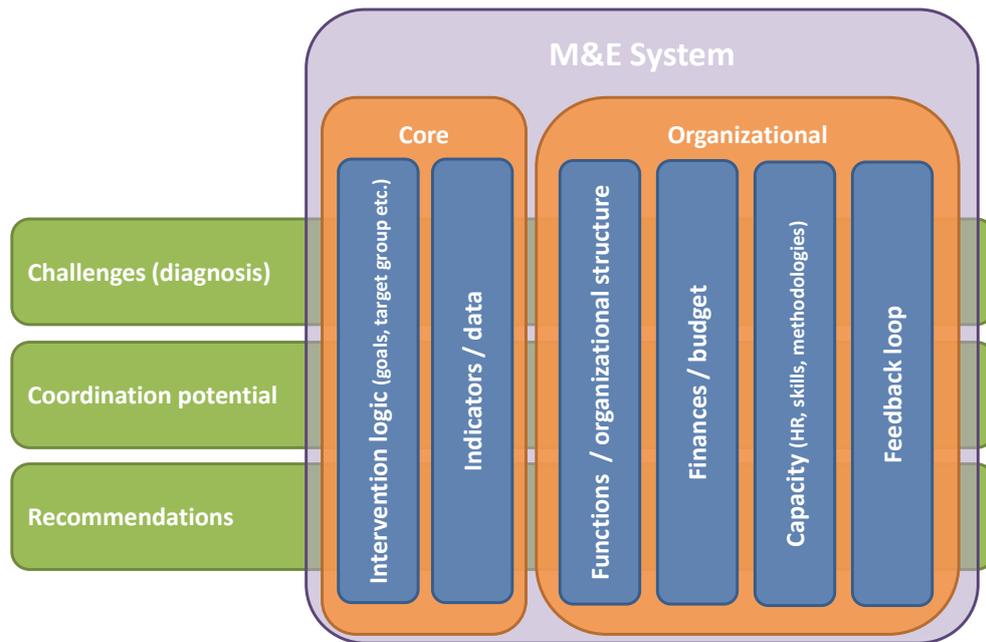


Figure 2.
Conceptual outline of
the note

Source: World Bank

2. Main challenges – diagnosis of the RIS3/S3 M&E system

14. This chapter presents the main challenges faced by the RIS3 M&E systems in Poland.

The challenges are divided into two main groups relating to core and organizational elements of RIS3 M&E systems. The first dimension, i.e. core aspects of the M&E or “software”, pertains to what an M&E system actually does in terms of designing and conducting monitoring and evaluation. This directly links M&E to an intervention logic of public policy, data gathering and indicator setting. The second dimension, an organizational one, constitutes “hardware” of an RIS3 M&E system. It relates to elements that are necessary to perform core M&E tasks in a smooth manner and concentrates on the “machinery” that delivers monitoring and evaluations. This mechanism is composed of human capacity, a well-structured system of incentives and responsibilities, financial resources and a feedback loop between the M&E system and decision making. It is clear then that the M&E system is a concept that goes beyond simple activities related to pure monitoring and evaluation.

Core (intervention logic, indicators, data, target group, etc.)

15. Strategic and operational goals in RIS3 strategies are not always fully clear and may not provide enough guidance. Without clear and specific goals it is not possible to design precise intervention logic and hence create a good M&E system, because it is unclear what is to be achieved and by what means. When goals of a policy or a program are imprecise because they, for instance, do not specify a target group that should be affected by a given intervention (or the group is all-encompassing), or they do not explain what kind of change an intervention is to bring about and by what means, then designing an effective M&E system is not possible. Monitoring and evaluation lose their clout when there is no reference point that could be set against information emerging from the M&E system.

Box 3. Definition of an intervention logic

An intervention logic represents a causal chain that shows how a public intervention will influence the behavior of the policy recipients (firms, R&D, society), how this change will lead to achievement of a strategic goal of an innovation policy, and in turn how it will be translated into the goal of the overarching economic development policy. Such logic elucidates how a change at the lower level leads to a planned change at the higher level and eventually how this contributes to the achievement of the strategic goal of the innovation policy and finally the main goal of the region / country. **Figure 3** schematically presents an intervention logic of a single (innovation) policy. For the sake of simplicity, this does not include other policies and external factors that influence achievement of the main goal.

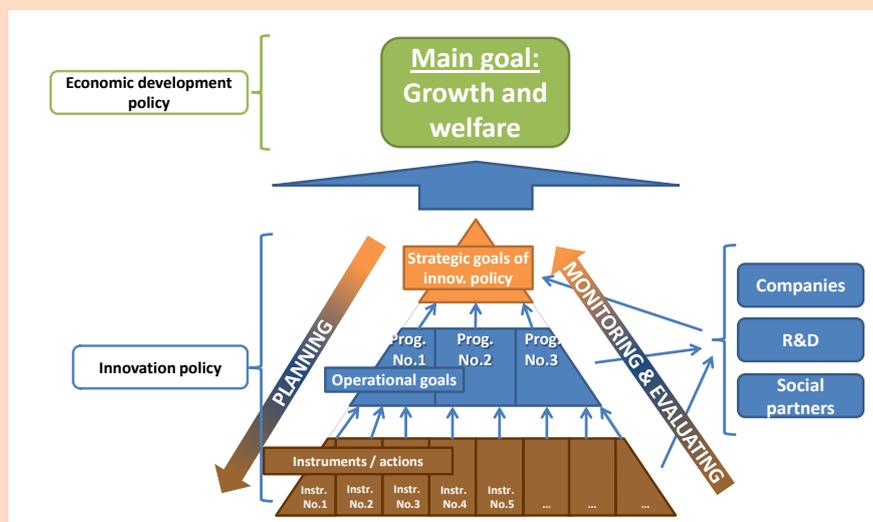


Figure 3. Model of an intervention logic (extended)

Source: World Bank

16. A clear and precise definition of goals in RIS3 documents is not easy to achieve and depends on the availability of information. There are three broad types of situations, where i) the smart specialization, or comparative advantage, of the region is apparent, i.e. it is easy to indicate region's strength within the global market; ii) the region's specialization is latent, i.e. comparative advantage is not evident from economic activity, but it might be recognized on the basis of location-specific assets that are non-tradable and/or on the basis of accumulation of common knowledge about a given economic area; and finally iii) specialization is unclear and no clear indicators are available as to the existence of such a comparative advantage both in terms of place-specific knowledge or material assets.¹

17. Setting clear goals for RIS3 faces several obstacles. In each of the three above-mentioned situations a clear definition of goals bears the risk of bias because of asymmetric and incomplete information possessed by the decision makers. Where a specialization (comparative advantage) is apparent, incumbents may exercise strong pressure and shape the goals according to their preferences, thus blocking potential new specializations. When a comparative advantage is latent, well-targeted policies can be useful to unleash dormant potential. In cases where specialization is unclear, the market could play a role in revealing the comparative advantage of the region.² However, the market is not always perfect and does not necessarily create sufficient incentives for discovery. This can be mitigated by a proper identification process of specialization(s) based on the bottom-up approach and an intensive and direct dialogue among the innovation system stakeholders, where a leading role is played by the private sector.³

18. Ambiguous description of target groups does not facilitate intervention planning and M&E. A target group of an intervention is a set of actors (a part of an overall potential population of a given intervention)⁴, whose behavior is to change in an expected way due to the public action. By and large, the higher the level of public intervention (i.e. policy, program, instrument), the broader the target group is. Hence, this granularity should be mirrored in the intervention logic in the way that a policy has the broadest scope of affected actors (target group), then programs⁵ narrow down this scope of actors to a certain fraction, and an instrument makes the target group even more specific. For instance, the innovation policy is directed to support R&D&I among enterprises in a country (broad target group). One of its programs is oriented toward enhancing the amount of innovative (new to market and new to country) products and services sold abroad by SMEs in the food industry (narrowing down the target group). Finally, one instrument of this program is to provide training and advisory services on market analysis to these innovative food industry SMEs, which do not export or whose export is below 10 per cent of their revenue.

19. Planning of the M&E system is impeded by unclear connection of strategic and operational documents. Both national and regional authorities have to make additional efforts to stronger link RIS3 strategies and operational programs. At the national level key innovation-related documents (e.g. *Economy Innovation and Effectiveness Strategy* (SIEG2020), *Enterprise*

1. Correa Paulo (2012), *Research and Innovation for Smart Specialization Strategy: Concept, Implementation Challenges and Implication, a background note prepared for the Workshop: "Smart Investment for Smart Specialization: a Regional Practitioners' Exchange"* - Warsaw, Poland 27-28 June 2012.

2. *Ibid.*

3. World Bank (2015), *Entrepreneurial discovery process (EDP) made in Poland* (forthcoming).

4. If an intervention aims at enhancing cooperation of innovative SMEs with R&D units, then an overall population for this intervention are all innovative SMEs in the region/country (not all enterprises – this means that population already narrows down the scope of potential beneficiaries). The intervention cannot though reach all of these companies, that is why a target group is selected, i.e. a subset of the whole population, to which the intervention will be directed. An example of a target group at a strategic goal level could be: innovative SMEs, at an operational level: innovative SMEs that have not yet used R&D to innovate (they only adopted existing innovations new to a company), at an instrument level: innovative SMEs that have not used R&D but took part in an innovation audit that showed it was an area they had potential to improve.

5. In the context of this note (as well as throughout the series of workshops) the term "program" is used to describe part of a public intervention that aims at achieving an operational goal. This should not be confused with "operational program", a term used in relation to documents such as Regional Operation Program or Operational Program Innovative Economy.

Development Program (PRP), National Smart Strategy (KIS) should be fully reflected in operational programs (e.g. *Smart Growth Operational Programme*, or SGOP), while at the regional level regional innovation strategies (in some regions this role is served by regional development strategies, or RDSs) should be strongly linked to the regional operational programs (ROPs), which guide the spending of EU funds. One way regions could approach this issue is to have three documents, namely a regional innovation strategy (or a similar document), then an action plan operationalizing the strategy (with a timeline of 1-3 years) and finally an ROP as a financial scheme.

20. Operational programs and RIS3s have separate M&E systems that are loosely connected. Synergies between M&E of strategies and operational programs are presently not fully clear. According to EU guidelines, the full intervention of allocation for the thematic objective 1 in ROPs (R&D&I) should be spent on smart specialization areas defined in RIS3 strategies. In the thematic objective 3 (competitiveness), a preference should be given to those areas. However, most ROPs are not fully compatible with RIS3 strategies (financed also from other sources) and the adopted sets of M&E indicators vary. This situation makes it difficult to monitor input indicators and leads in many regions to the creation of separate M&E structures for ROPs and RIS3s, which results in higher costs and atomization of resources.

21. Gathering data is a challenge for RIS3 M&E systems. There is on the whole a relative scarcity of quantitative data on the macro, mezzo and micro levels. For instance, data on labor productivity on the industry level in a region are not available, undermining planning for local development and efficient M&E. In addition, the operators of M&E systems have difficulties obtaining and analyzing qualitative information. This is caused not only by the passive attitude of public sector organizations (including BSIs and authorities that do not reach out to companies, which is partly caused by fear of corruption), but also by entrepreneurs' lack of trust towards administration and their disinterest in sharing information with an M&E system that does not create value added for them.

22. Centralized access to existing databases and available data is lacking. There is a number of valuable databases and data in the country (e.g. GUS, custom offices, revenue offices, patent office, etc.), however, they are scattered across various national and regional institutions. Such fragmentation of information raises the costs of data attainment, which is particularly challenging for M&E units with smaller financial and human capacities in the regions.

23. There is insufficient long-term data for conducting robust evaluations. Both the regions and the national level face similar problems in terms of evaluation of innovation policy, because data suitable for evaluation purposes, particularly qualitative information, are lacking. This is caused by the fact that M&E is not systematically planned together with the intervention logic and evaluation data is not being collected from the very beginning of an intervention, but often is collected *ex post*. However, this situation has begun to improve, for instance PARP (the Polish Agency for Enterprise Development) now gathers long-term data to evaluate the Operational Program Innovative Economy (implemented in 2007-2013).

Box 4. Impact evaluation – main aspects and challenges

Impact evaluation (IE) measures what the influence of a public intervention is, i.e. to what degree the intervention affected reality. However, impact evaluation is not about any change that took place over the time when an intervention was implemented, but a change caused by the intervention. Thus an impact evaluation has to compare the situation in which the intervention was conducted to a hypothetical situation of what would have happened without an intervention (the so-called counterfactual scenario).

Evaluating impact is a complex process that requires the use of appropriate methodologies. The gold standard is a randomized control trial (an experimental design, with a random selection of control and treatment groups). Less rigorous methods, but sometimes more feasible to carry out are e.g. quasi-experimental approaches such as non-equivalent match or hypothetical comparison group design and multiple time series design: longitudinal comparisons. Pre-experimental design does not allow the impact of the given policy to be measured. Additionally, various statistical techniques can be applied to construct a control group,

e.g. propensity score matching, nearest neighbor, matching by profile characteristics. However, prior to choosing a suitable model of evaluation, it is necessary to define several elements, namely: the goal of the intervention; the target group of the intervention; a transmission mechanism that leads to the achievement of the planned goals; financial, ethical and time constraints that will influence the evaluation. Two key aspects that an impact evaluation has to demonstrate are i) measuring the counterfactual and proving causality between the intervention and the outcome and ii) demonstrating the robustness of the evaluation by ensuring its validity and reliability.

Several challenges have to be addressed when conducting IE. Firstly, time lag, i.e. the period between the intervention and the moment when IE is executed. Focusing on a short-term effect may lead to underestimation of the overall impact of the intervention. On the other hand, emphasis on the long-term effects may underestimate the costs of initial adjustments, thus overvaluing the impact of the intervention. Secondly, intensity of treatment – oftentimes units of analysis in IE, e.g. firms, will be exposed to a different intensity of public intervention that is more diverse than the pure binary situation of obtaining or not obtaining support. Such cases pave the way for asking questions about the optimal level of intervention and not only about the rationale of the intervention as such. Thirdly, overlap of multiple interventions – when different interventions are in operation, IE can ask not only about the effect of a single intervention, but an accumulated effect of a couple of them, which might be cumulative or subtracting. Fourthly, heterogeneity of impact – due to the fact that a target group is usually not homogenous, its various units can be differently affected by the intervention (e.g. financially stressed firms can be affected differently by the same intervention than firms without strong financial constraints). Hence, measuring only an average value for the whole treatment group may be imprecise.

This box is based on: BIS (2011), *Guidance on evaluating the impact on interventions on business* and Crespi Gustavo, Maffioli Alessandro, Mohnen Pierre, Vázquez Gonzalo (2011), *Evaluating the Impact of Science, Technology and Innovation Programs: a Methodological Toolkit*, Inter-American Development Bank.

Organizational elements of M&E system (budget, functions, capacity, instruments, and feedback)

24. The current organizational structure of RIS3 M&E in Poland is heavily diversified. This applies to differences between the national and regional level, as well as among the regions. Differences can be found in various aspects of the system, e.g. human capacity, resources, data availability and information gathering, etc. In many cases, there are various constellations of M&E units in the regions and the responsibilities of these units are often different. Such diversity is not a drawback in itself, as long as individual parts of the M&E system can deliver standardized and high-quality information. This embedded organizational variety calls for standardization of M&E functions, since re-organization of individual structures along one unified model does not seem feasible.

25. The function of a quality controller asking “tough questions” remains underutilized, especially in the evaluation part of the RIS3 M&E systems. This role has special responsibility as it ensures the high quality of the results of evaluation analyses, both in terms of methodological aspects (e.g. planning of evaluation, proper use of statistical techniques etc.), as well as the substance of the evaluation (i.e. asking the right questions that provide important answers, despite the fact that the results can be politically sensitive). During the period 2007-2013 Monitoring Committees (composed of social actors, business representatives, administration, science and education units, etc.) were to play the role of such an external quality checker, however, this function could be more strongly emphasized during the current framework. It seems that social/business partners did not play a major role in these bodies and their influence over committee decisions has diminished.

26. An issue of conflict of interest also requires greater attention. Today, a public unit being evaluated is very often the same one that orders an evaluation. As a result, the incentive structure may not always yield robust and sincere evaluations. An external evaluator, even if chosen in a public tender process, will not be encouraged to provide a critical assessment (especially if it is to be a negative one) of a program/instrument managed by a department, if this department is

to decide in the future about its possible reemployment as an evaluator. If bodies commissioning and conducting evaluations are not independent from a unit implementing an evaluated program/instrument then a conflict of interests arises. Furthermore, if an evaluator does not have political and financial independence, its evaluations may be biased. That being said, an evaluator still has to work in close cooperation with an evaluated body, to gather data and understand the functioning of the latter.

27. Despite the critical importance of M&E for efficient investing of EU funds, resources for M&E of RIS3 are often limited. In some regions M&E of RIS3 is performed by one- or two-person teams with limited financial resources. The resources are only slightly larger at the national level. This situation significantly restricts the capacity of the public sector to conduct rigorous evaluations and sets a cap on its ability to outsource evaluations to independent experts.

28. Funding of RIS3 M&E units is also uncertain, which undermines long-term perspective of the M&E system. Several regions finance their RIS3 M&E activities from projects from the past EU perspective, which means that the funding of these units will cease in mid-2015. There is no certainty whether money will keep flowing into the M&E system.

29. Human resources are scarce and skills and methodological capacities are diversified. Regions have limited human resources devoted to M&E of RIS3. Moreover, advanced knowledge of M&E methodologies and skills to conduct robust in-house analyses is mixed. The national level actors seem more advanced in both aspects and possess track record of conducting advanced evaluation studies in cooperation with each other, where different datasets are matched and counterfactual techniques are applied.

30. A feedback loop between the RIS3 M&E system and decision makers remains loose. Evidence derived from M&E does not seem to play a strong role in strategic planning and decision making. There seems to be a perception among policy makers that M&E systems need to exist because they are required, but the expectations as to their usefulness are low. In addition, policy makers may sometimes prefer to keep M&E systems weak so as to increase their own decision-making power. Currently elaborated strategic documents could benefit from a stronger utilization of M&E data to underpin their goals and intervention logic.

31. If the feedback mechanism does not function properly, the whole M&E process is not reflected in policy making and implementation. In such situations, an M&E system cannot play its role and its existence should be reconsidered. Proper functioning of the feedback mechanism requires political will and commitment to evidence-based policy making as well as a well-thought-out method of engaging various stakeholders and a smooth reporting process.

32. The above chapter presented the key challenges of the RIS3 M&E, the next part elaborates on potential for coordination of M&E systems for RIS3.

3. Coordination potential

33. This chapter concentrates on elements of M&E systems that can be coordinated at the national and regional levels and proposes solutions for such coordination. Firstly, issues related to core aspects of the M&E system are discussed, then organizational elements are elaborated on. Coordination is understood as the collaborative effort of regional and national authorities to foster dialogue and bidirectional information flow related to M&E of innovation strategies that aims to work out joint M&E solutions. Coordination should not take the form of pure top-down or bottom-up imposition of schemes that would be unilaterally designed at any of the governance levels. While coordination has the potential to bring many positive results, as discussed below, it is also essential for regions to develop their own capacity to monitor and evaluate their regional innovation policy, especially in terms of region-specific interventions. A mix of information flowing from these two M&E sources should be the basis for feedback for regional decision-makers and dialogue with regional stakeholders.

34. Coordination of the RIS3 M&E systems brings value added for the regional and the national level. Value added refers to both quality of M&E information and data as well as financial savings. However, to accomplish this, the national and regional authorities should have a shared vision of the coordinated system, demonstrate commitment, and foster continuous cooperation with one another. Without these elements coordination efforts may be in vain.

35. Coordination helps harmonize the scope and format of data and enhances quality of information. That in turn allows easier aggregation of collected information and better understanding of the functioning and impact of the intervention. Conducting resource-intensive analyses at the national level, yet with regional disaggregation, will equip regions with information that they would not be able to acquire on their own due to high costs and resource or capacity scarcity, and allow more in-depth analyses of the regional innovation system. Coordination of trainings for national and regional M&E units can enhance information flow across the innovation system and contribute to the creation of minimum standards for functioning of M&E systems, which consequently can translate into higher quality M&E information and thus into better design of public intervention.

36. Coordination can also bring financial benefits. Coordinated collection and analyses of certain information, e.g. by a central unit, save resources that otherwise would have to be spent by each of the regions. Moreover, regular publication of specific information (needed by all the regions) regarding national and regional innovation policies in an agreed-upon format would relieve regional authorities from doing it separately by themselves. It could also be envisaged that in a coordinated M&E system, the national level provides regions with analyses needed for running their innovation policy and which meet regions' information needs. This however does not take away the responsibility of regions to monitor and evaluate their specific innovation interventions, which, due to their regional context, cannot be assessed at national level.

37. The entrepreneurial discovery process (EDP) requires functioning and coordinated M&E for RIS3. The EDP aims to "discover" the potential of regions/countries thanks to a bottom-up process. If this potential is unclear, experimentation is needed to test various possibilities. Experimentation with various policy options and instruments requires a robust M&E system to verify whether the intervention delivers what is planned and expected.⁶ Additionally, impact evaluations are needed to measure the effectiveness of experimental approaches. M&E data consequently feed into the EDP as an input for evidence-based discussion and decision making that supports the rationale behind smart specialization selection, modification, etc.

6. Correa Paulo (2012), *Research and Innovation for Smart Specialization Strategy: Concept, Implementation Challenges and Implication*, a background note prepared for the Workshop: "Smart Investment for Smart Specialization: a Regional Practitioners' Exchange" - Warsaw, Poland 27-28 June 2012.

Core elements of M&E system (indicators, data collection, target group and intervention logic)

38. Acceptance of the single conceptual scheme that links M&E to the intervention logic model is key. Conceptual uniformity fosters dialogue and mutual understanding by providing a common framework that allows comparisons and learning. An exemplary model that was presented during the workshops is depicted in **Figure 1** and **Figure 5**. Its main assumption states that a RIS3 M&E system works along the intervention logic of an innovation policy. Intervention logic demonstrates clear goals and targets groups at each level of public intervention (policy, program instrument/action), which is a prerequisite for conceiving a targeted and precise M&E scheme. Goals and target groups become more specific (narrower) towards the bottom of the intervention logic scheme and lower levels of intervention are to ensure realization of higher-level goals.

39. Joint creation of an Innovation Data Set (IDS), encompassing crucial indicators and information for M&E of RIS3/S3 seems of crucial importance for coordination mechanism. Such an Innovation Data Set (IDS) has been selected on the basis of a participative process engaging the regions, ministries, national agencies etc., and it encompasses context indicators for the innovation policy, as well as a limited number of input, output, outcome and impact indicators. The IDS is not an exhaustive set of information about implementation of RIS3 at the national and regional level; it concentrates on selected (key) aspects. The remaining elements of RIS3 implementation have to be monitored and evaluated by individual regions, ministries and agencies. The basis of IDS was aggregated from proposals submitted by regional and national authorities, which consequently were scrutinized through the prism of data availability and ability to generate new data, as well as the feasibility of its disaggregation at the regional level. Eventually, the agreed indicators should be utilized both in the national and regional RIS3 M&E systems. Regular IDS reports should be published at least once a year throughout the programming period.

40. A concept of IDS implies coordinated collection of data scattered across various databases to be used by all stakeholders. Currently data on innovation is scattered across many separate repositories; the national level should collect such innovation-related data needed for the IDS and regularly publish it in a form of a report, e.g. annually.⁷ Such an initiative will free individual stakeholders from acquiring this scattered, and often difficult-to-acquire data by themselves and will standardize data format and quality. This data should then be utilized by the regions to create regional M&E reports on implementation of RIS3 complemented with information specific for their regional interventions. Such reports could be published within a limited timeframe after the publication of the national report.

41. Coordination of M&E can also take the form of joint analyses that would be too resource-intensive for individual stakeholders. The national level could finance (or co-finance) analyses that are useful for M&E of RIS3 in all regions, but which are too costly or complex to be carried out on an individual basis. Such coordination could consist of enriching already existing national analyses with the regional dimension (e.g. by enlarging the sample of a study to allow regional disaggregation), if this was not available so far, or creating new needed analyses. Such analyses could be published together with the IDS report, and create value added to the innovation system stakeholders.⁸ One research topic could be a shift-share analysis or civilizational challenges facing Poland and its regions, which could pave the way for discussion of potential smart specialization at the national and regional level.

42. Unification and standardization of M&E methodologies requires coordination. Regional and national M&E systems will gather and produce a significant amount of data to keep track of RIS3 implementation (IDS gathers only a part of information). To make this information comparable there has to be a degree of compatibility among M&E methodologies, for instance

7. Publication dates could be flexible, but set well in advance to adjust them to the policy planning process and to ensure that M&E data comes at the right moment, i.e. when strategic decisions are to be taken.

8. Because of a relatively small number of firms that conduct R&D in Poland, presentation of data disaggregated by e.g. both regions and PKD (NACE) groups/sections is often impossible because of statistical confidentiality. However, defining S3 innovation more broadly than only R&D could help avoid this issue.

the application of the same indicator types that have the same definitions in all M&E systems (context, input, output, outcome and impact indicators), and their unified use at different levels of public intervention, i.e. policy, program and instrument. Another coordination aspect encompasses utilization of indicators that are created according to one standard. That requires identification of a set of minimum characteristics for indicators (an indicator ID) that would be applied in all M&E systems. Annex 1 presents detailed description of indicator types and exemplary indicator IDs, as well as other elements that could be utilized in coordination of M&E of RIS3.

Organizational (governance, budget, functions, capacity, and feedback)

43. Coordination of organizational aspects of M&E systems aims at introducing a set of indispensable organizational aspects that should be present in every RIS3 M&E. The goal of such coordination remains the same as in the case of core aspects, i.e. ensure uniformity (minimum standards) across M&E systems and the highest possible quality of RIS3 M&E at the national and regional level. This could apply to stable financing, continuous capacity building, presence of an independent unit verifying M&E methodologies and processes, feedback loop etc.

44. Poland has already taken steps to introduce more uniformity in financing RIS3 M&E systems. The MID has been working out a joint approach with the EC to enable utilization of structural funds for M&E of RIS3s. This is a step in the right direction, since so far the regions have not had clarity as to whether they can use EU money for M&E of an entire RIS3 (parts of RIS3 are not financed from the EU resources). Currently, it seems that such an option will be possible and funds from regional operational programs will be available for M&E of RIS3 – funding will be possible under thematic objective No. 1.

45. Structural and functional organization of M&E paves the way for enhanced coordination. The basic condition is to provide human resources responsible for and capable of performing M&E for RIS3. At both the national and regional levels this means the ability to plan and perform basic data gathering, analyses and communication, as well as presence of skills needed to coordinate work of external experts, if needed. Also, aspects such as the separation of the evaluation function from planning and implementation should be identified as a minimum standard for a high-quality system. Similarly, the role of an independent quality checker in the M&E system should be highlighted and its position should be strengthened to ensure a high level of M&E quality. Coordination of such aspects could improve the overall performance of the system.

46. Soft-skill trainings about the role and potential of M&E for decision-makers and administration would be beneficial. Policy makers, program managers and operational staff should be aware of the potential of the M&E system in facilitating and improving their work. More knowledge about advantages of utilizing accurate M&E data across the whole policy cycle (planning, operationalizing, implementing) seems needed at each policy level. Hence, a centrally coordinated long-term series of capacity-building workshops and trainings on the M&E topic could be designed to address the existing gap.

47. Enhancing cooperation between national agencies and the regions can improve the quality of M&E systems. There is already a track record of collaboration between national agencies in the area of evaluation of innovation instruments, namely between PARP and GUS. Moreover, GUS is currently preparing a pilot project that could be utilized for evaluation of innovation programs. The project aims to build up GUS's capacity to "create" a control group for a given policy instrument on the basis of a treatment group. If successful, such cooperation could enhance regions' capacity to perform M&E of RIS3 strategies.

48. Tutoring and substantial support for regional M&E units would also be useful. Some national agencies, e.g. KJE, PARP, NCBR or GUS, possess greater human and financial capacity than most regional M&E units for RIS3, and they already have experience in conducting robust and methodologically advanced M&E studies or elements of these. This creates an opportunity for systematic capacity building (analytical skills development, methodology workshops, good practices exchange etc.) that could be coordinated by these agencies. During the workshops regional representatives expressed interest in developing such an idea. One of the outputs of such

trainings could be a guidebook on conducting M&E and on the utilization of outcome information, as well as on reporting standards and techniques. An option here could be to establish an internal evaluation unit in GUS, which would ensure a degree of independence. Such a solution would also partly overcome the issue of statistical confidentiality, as GUS could work on data that it has at its disposal and present aggregated outcomes of its analyses. Another solution could constitute an M&E unit made of experts from GUS and KJE (and maybe other agencies). In such a team GUS could select and prepare the required data, which KJE could use for evaluation purposes and drawing conclusions and recommendations.

49. Experimenting with new methodologies and approaches towards RIS3 M&E and disseminating information seem easier to initiate at the national level. Testing new solutions to be used for M&E is inevitable to keep improving the M&E system for RIS3/S3. Greater financial and analytical capacity at the national level makes it a natural initiator of experiments and a developer of novel solutions that could be utilized in M&E of RIS3s, e.g. evaluating the impact of innovation policies etc. There are good examples of initiatives where the national level invites regions to collaborate in testing new solutions (see the GUS example in the “Good practices” chapter). The path of such joint projects should be utilized more often in the future.

50. A regular and coordinated review of the functioning of the innovation support system is needed. Such a monitoring and evaluation exercise, where procedures related to disbursement of innovation funds are scrutinized (especially from the viewpoint of the end user, i.e. an entrepreneur) should be undertaken on a regular basis. A collaborative effort of national and regional authorities in this respect would allow for streamlining the system and for mutual learning.

51. Standards on stakeholder engagement and participatory design of M&E could improve the effectiveness of the feedback loop. Stakeholders of an innovation system tend to be more receptive to information flowing from the M&E system if they have been previously engaged in creation of the system. The participatory setting of indicators, particularly of outcome targets, might be a lengthy and complex process, but it builds a sense of ownership amongst stakeholders. Additionally, such a dialogue helps identify the most critical and responsive indicators as well as ones for which data are available – which enhances the quality on an M&E system. For instance, a BSI will have a better understanding of why and how its performance is monitored and evaluated if it participates in setting indicators and agrees on their scope, content and values.

4. Conclusions and recommendations

52. Poland needs an effective and efficient M&E system to properly manage around €10 billion devoted to RIS3s/S3s during the programming period 2014-2020 and beyond 2020. If a robust and coordinated RIS3 M&E system is not established, effective management of innovation policy at the national and regional level will not be possible. The recommendations shown below are meant specifically for M&E of RIS3, but some are of more generic nature and can be used for M&E of other policies.

53. This note identifies key challenges to the RIS3 M&E system and offers policy recommendations that address them. This document is selective in nature and discusses the most important aspects that can hinder RIS3 M&E systems. By and large the note states that a well-functioning and sustainable M&E system is a demanding mechanism that requires many elements to be in place. **Figure 4** presents a schematic picture of these prerequisites.

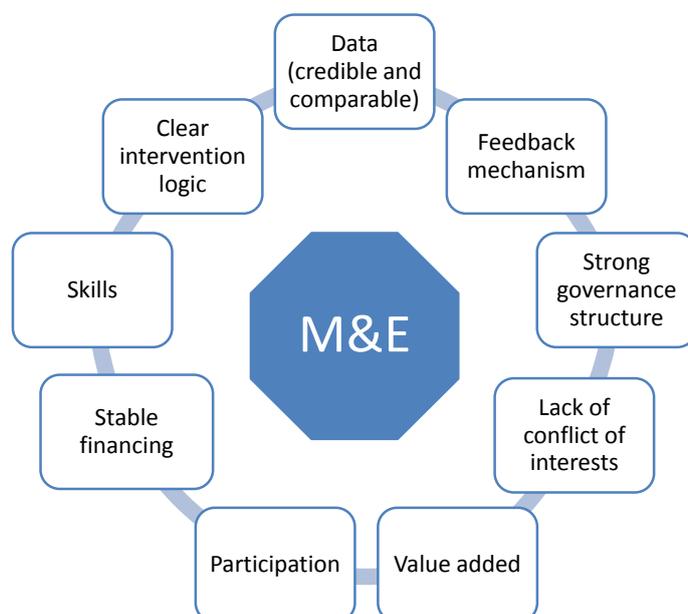


Figure 4. Prerequisites of high quality and sustainable M&E system

Source: World Bank

54. The below section presents the main prerequisites and recommendations for the RIS3 M&E system. A threefold division is applied to conclusions and recommendations. Firstly, aspects that cut across the whole M&E system are presented, next, core aspects are discussed, and finally, organizational issues are addressed. Some of the conclusions and recommendations are complemented with examples of good practices used in Poland (both at the national and regional level) and internationally. These are presented as food for thought to stimulate discussion about possible developments for the RIS3 M&E systems in Poland.

- **Create added value: A sustainable M&E system must provide value added to its multiple “masters”** (firms, BSIs, RDIs, program managers, policy-makers etc.), i.e. supply them with information that is valuable to them. At the same time, it should not burden its subjects (especially enterprises) with too many reporting obligations. That means the RIS3 M&E system should be kept simple and lean to gather only valuable data that can be processed and create value added for its various clients. Moreover, it is advisable that data from respondents, e.g. firms, is collected predominantly at the moment of providing them with a service or a piece of information that can be valuable for them to avoid a consultancy-fatigue effect. The latter emerges when firms are repeatedly asked for information but do not understand the purpose of the queries and they do not receive valuable feedback. This can be achieved by extracting data from existing databases and focusing on a relatively small number of indicators. Finally, the data gathering system should also be client-friendly, ideally based online for quick data access, input and retrieval.

Box 5. Value added created by the M&E system – IWT (Belgium, Flanders)

The IWT (an innovation agency in Flanders) is a good example of how to effectively gather information directly from beneficiaries. The model utilized by IWT is based on a simple rule stating that companies should receive feedback information or services that constitute value added in return for their information. That is why most of the data is obtained while providing direct services to firms and simple information gathering is avoided. In cases when a direct service is not provided during information gathering, value added may be created by processing of the obtained information, and channeling it back to the companies that provided the input.⁹ In the Lower Austria region, firms that obtain innovation support are subject to interim checks. Advisors contact supported companies and ask questions about the results achieved, time schedule, collaboration activities and budget spent. This exercise not only helps to feed the monitoring system, but it also provides companies with constructive feedback: in case the survey indicates that a company faces obstacles (or that they are expected to emerge) advisors help the company to solve the problem.

- **Coordinate: The efficient M&E of national and regional RIS3 requires coordination.**

Introducing standards of data quality and collection, taking advantage of economies of scale in the context of RIS3 M&E and building on experiences of other innovation system stakeholders require a degree of coordination of M&E efforts between the regional and national level. There is a fairly broad area where coordination in respect to RIS3 M&E is possible and can bring significant benefits, e.g. it could facilitate benchmarking of the Polish regions or utilized innovation support instruments as well as mutual learning; elaboration of a joint list of RIS3 indicators that reflect an intervention logic and a list of accurate data sources are important examples that could be highly visible and usable. These solutions could be financially attractive to all of the parties engaged. Also, organizational aspects of RIS3 M&E such as financing, skill development, introducing minimum standards and feedback mechanisms also leave room for enhanced coordination.

Box 6. Cooperation between national and regional M&E units (Spain)

In Spain partnership agreements between the main national evaluation unit and regional evaluation units are established. This promotes the harmonization of evaluation approaches and the development of an evaluation culture and quality standards within the public sector.

- **Monitor monitoring: An M&E system itself also needs to be monitored.** A manager of the RIS3 M&E system has to follow up as to whether information provided by the system is utilized and meets the expectations of its clients. Without such feedback the system will become neither sustainable nor successful. A simple questionnaire can be applied to attain information about the level of “client” satisfaction with M&E system’s outputs that can be handed out when delivering M&E reports.
- **Experiment: New approaches to monitoring and evaluation of RIS3 should be developed and tested.** The next seven years provide Poland with a perfect testing ground for developing and experimenting with new M&E approaches for RIS3 as well as impact evaluation, which are an indispensable element of the EDP. There are many interesting topics that could take RIS3 M&E to further levels of advancement and precision, e.g. return on public investment (RoI), spillover effects, and underutilized methodologies for identification of smart specializations (e.g. location quotient, cross-sectoral flow of goods and services and input-output analysis, shift share analysis, network analysis, etc.).

9. A similar approach is utilized by the World Bank in a project conducted at the request of the Ministry of Economy. The Bank’s experts meet companies on a one-to-one basis and gather information about what companies need to enable their faster growth and development of innovations. At the same time, the Bank’s team provides entrepreneurs with strategic advisory and an IT tool for assessing the company’s stand toward innovation, plus the possibility to benchmark itself against a broader background of enterprises. Companies seem interested in such an exchange, because they see the feedback information they obtain as valuable

Box 7. Testing novel methodologies for RIS3 M&E (Poland, GUS)

GUS intends to conduct a pilot project that aims to use propensity score matching methodology for the identification of control groups for evaluation studies. The novelty of this project is that GUS will select to the control group subject firms from the overall population of companies in Poland, since it has a vast database at its disposal. Thanks to this, matching could be more exact and effective. GUS invited a couple of regions to participate in the study to test and fine-tune this new approach. Such a collaborative approach to a pilot project between a national agency and regions constitute a good practice.

- **Appreciate evidence: Admitting failure should be treated as an opportunity for improvement.** The perception has to be changed among M&E system users that reporting a failure constitutes a problem, rather than an opportunity. In fact, such situations should be perceived as a window of opportunity to adjust an intervention to deliver better results or to invest resources in areas that bring higher (public) return on investment.

Core aspects

55. Intervention logic: M&E needs a well-articulated and -designed intervention logic to function properly. That is why RIS3 documents have to be able to clearly articulate their objectives, causal chain between strategic goals, operational goals and actions/instruments, as well as precisely describe target groups and intended effects that an intervention is to cause. It is vital that an intervention logic and an M&E system are designed together, to allow possible mutual fine tuning.¹⁰ While most of the time it is an M&E system that must be adjusted to a given intervention logic, it is also important that the programs and instruments that will implement a strategy are conceptualized with the thought in mind that they will have to be monitored and evaluated.

56. Quantitative and qualitative information: While accessing quantitative data is still a challenge and has to be further pursued, gathering qualitative data should also be emphasized to allow for in-depth analyses and a better understanding of effects resulting from innovation policies, programs and instruments. It is important to gather both intervention-specific data, as well as long-term panel data allowing for trend analysis of selected areas, attitudes and behaviors.

Box 8. Mixing quantitative and qualitative information (France, PACA)

Regular large-scale questionnaires help detect general changes in firms' attitudes. Conducting such regular surveys every 2-3 years allows for the monitoring of an overall picture of the innovation system as well as the evolution in stakeholders' attitudes. Such questionnaires, supplemented with in-depth interviews, could be a good source of information for policy evaluation. The PACA region (France) performs large-scale surveys of innovative SMEs every two years to prepare its SME Barometer. Firstly, firms answer a quantitative survey and its results serve as the basis for dividing the firms into five different profiles, with different needs in terms of innovation support. Thereafter, a qualitative survey is conducted on a limited number of firms to deepen the quantitative diagnosis. The whole process results in a better understanding of the innovation needs of firms, which allows for the improvement of services offered by the innovation agency and innovation intermediaries. In Poland, the Wielkopolskie region recently introduced a large-scale survey with a sample of 3,500 companies that will be repeated every three years.

10. This does not mean that M&E should fully guide the planning of the intervention, however, it is advised that interventions are designed in a way that facilitates their M&E. Sometimes minor changes in an intervention can strongly improve the robustness of evaluations.

Box 9. Systematic information gathering (Poland, PARP)

Systematic information gathering is necessary for systematic evaluations. Among various studies and evaluations performed by PARP, the Innovation Barometer is the most interesting in the context of RIS3/S3 M&E. In this study information is collected from the beneficiaries of instruments that have been carried out in the framework of Operational Programme Innovative Economy (during the 2007-2013 perspective). PARP encourages its clients to answer questionnaires and even though it has no way to “punish” those who do not, the response rates that the Innovation Barometer observes are impressive. Firms answer both quantitative and qualitative questions and extensive analyses are performed based on these data. Furthermore, as part of the Innovation Barometer, impact evaluations are conducted.

57. Data and its usage: Broad and easy access to existing data must be ensured. A coordinated effort by the regions and central authorities has been made to identify existing databases, gain joint access to this data and make it compatible with each other (conversion of various classifications, matching of subjects, etc.). This could pave the way for the design of a ranking of the most popular interventions and mechanisms for innovation support that would apply a unified methodology to benchmark performance of individual regions. Such a scheme could be similar to the World Bank’s Subnational Doing Business study. Such an index could serve an informative function about the regions, reflect their approaches toward innovation and foster information exchange.

Box 10. Information collection: obtaining export data (Poland, Zachodniopomorskie region)

Based on the experience of the Zachodniopomorskie region and the dialogue with representatives of the revenue office, it seems possible to obtain detailed data on exports at the regional level. Currently, few regions possess such information, which in fact is invaluable for planning regional development. At the national level, such information could be obtained in a coordinated manner from the Ministry of Finance or jointly from the revenue office.

Box 11. ImpactScan: information gathering and analysis

ImpactScan is a monitoring methodology that allows for linking information regarding inputs, outputs and outcomes of innovation policy. It is composed of three matrices – in the first step, inputs allocated to a given policy objective are tracked to particular intermediaries. In the second step, funds received by intermediaries are assigned to a particular service provided. Finally, step three relates services to the actual impacts of innovation support on innovation enablers within companies. Data for this system comes from innovation agency records (on the allocation of funds to policy objective and to intermediary), intermediaries (on services provided using these funds) and firms (the impact on innovation enablers within firms is measured by company surveys). Additionally, ImpactScan gathers information regarding the innovation context of the region with the use of a set of 31 indicators (qualitative and quantitative) on issues such as the employment, management or regional innovation policy, demand for innovation, etc. The system was developed as part of an EU-funded pilot project, and was tested in seven European regions. It allows for an instant overview of the state of an innovation system and offers an opportunity for comparison with other regions. The most valuable part of it is that it allows various analyses to be performed in a simple MS-Excel environment.¹¹

Organizational aspects

58. Capacity: Regular capacity-building activities are needed at the national and regional level. The creation of a strong team of professionals working within the administration (regional and national) that tackles M&E across the country is necessary. To achieve this, a set of regular trainings and coaching sessions could be designed to build up both the methodological and technical skills among M&E practitioners. Such trainings and ongoing tutoring could be

11. Based on: Impactscan4innopol (2007). *IMPACTSCAN: Users Guide*, and Scinnopoli (2011). *Policy Recommendations for monitoring and evaluating the impact of regional innovation policies*.

offered by the leading national-level institutions, such as KJE, PARP, NCBR or external advisors (the national level, by and large, seems to be more advanced in terms of RIS3 M&E than the regions). The European-level support could also be considered at this point to transfer good practices and ensure coherence among the member states. Additional advantages of such a solution would be improved coordination and information sharing between the national and regional level and among the regions. At the same time, already-initiated collaboration between national agencies in the area of M&E of innovation policy should be continued to further improve methodologies and facilitate knowledge exchange.

Box 12. Importance of skills

Limited human resources do not hinder M&E activities if the proper skills are present (Zachodniopomorskie, PACA). The Zachodniopomorskie region possesses an M&E team with a limited number of skilled people, who are proactive and look for novel data sources to improve the output of its RIS3 M&E system. Similarly, the PACA region has developed its M&E system initially based on a team of two or three people. However, PACA also had substantial financial resources for hiring external experts, consulting companies and outsourcing some activities to develop its monitoring and evaluation activities. Both examples indicate that a high level of analytical expertise may mitigate the small size of M&E units. However, to develop this a suitable training or recruitment policy is needed.

59. Feedback: reinforce a feedback mechanism to ensure utilization of results of the M&E systems. The mechanism transmitting M&E results to stakeholders of the innovation system requires strengthening. This includes an aspect of raising awareness among stakeholders (not only decision makers) about the potential of M&E information, tailoring M&E reports to the needs of individual stakeholders, as well as ensuring that M&E data is credible, timely and high-quality. Proper feedback mechanisms enhance the transparency of policy making and implementation.

Box 13. Broad information dissemination (Austria, Lower Austria)

Lower Austria conducts semi-annual review sessions between regional governments and intermediaries, during which the results from the Program Balance Scorecard studies are analyzed to adjust previously established targets. During such meetings new challenges are identified and plans for the following period (a year) are agreed upon. This practice ensures that all stakeholders are aware of the results of the M&E system and are stimulated to act upon them.

60. Governance: The governance structure of the M&E system could be reinforced. The position of an institution asking difficult questions should be especially clearly defined and promoted with its role to check the quality and robustness of statistical methods used for M&E processes. In some countries, e.g. Australia and Canada, a strong central unit plays this role, but its role is not limited purely to quality check, but also to capacity building and provision of support services. In the Polish landscape, there are several potential bodies that could play this role, e.g. monitoring committees, which are already partly endowed with issues related to evaluation; or an inter-agency unit composed of KJE, GUS and PARP, with their good track record of conducting advanced evaluations.

61. Conflict of interests: Situations allowing for a conflict of interests should be eliminated. An evaluator should be clearly separated from a unit planning or implementing interventions. Ideally, such a task should be performed by an independent institution. However, it could also be either another department, or an external specialized agency, a unit in a ministry, or a private sector/civil society actor. This role should certainly not be played by a unit responsible for either planning or implementation of the innovation strategy or operational program. Additionally, critical assessment from an evaluator should not negatively influence its potential future employment, to avoid situations where an evaluator is discouraged from critical assessment.

62. Financing: High-quality M&E systems require sufficient and stable funding. Monitoring and evaluation require human resources, skills, expertise (including external expertise) and

time; all these need to be properly funded. Money spent on M&E can potentially provide great leverage, because it helps improve the quality of public investments, allocate public resources optimally, and transfer them to areas where return on investment is higher. Operational programs at the national and regional level should earmark resources for an M&E system, and the EU allows for this. One solution is to assign a percentage of the total amount of resources for M&E – usually this amount varies between 1 and 5 percent of the total budget of a program. The exact number depends on the overall size of the budget, but in general, the bigger the budget, the smaller the percentage devoted for M&E. Without a stable budget, long-term planning (e.g. data gathering for M&E purposes, human resource development, etc.) and the use of external professionals are hindered. In 2007-2013, outlays on M&E were relatively small and could be expressed in per mills rather than percents of overall investments. In the private sector, the controlling departments are perceived to be critical to the quality of company management and are well staffed and funded. It is thus recommended that both national and regional authorities increase allocations for M&E to ensure that the regions avoid being “penny wise, but pound foolish”.

63. Participation: The M&E system should ensure the full involvement of key innovation stakeholders. Without such broad engagement, there is a risk that an M&E system will remain on paper and its results will not be utilized by the innovation system stakeholders. All kinds of actors should be encompassed by an M&E system for RIS3, i.e. companies, intermediary institutions (BSIs), R&D actors, society and public authorities. A participation matrix can be elaborated to ascertain that every stakeholder group is engaged in the system, although different groups will be more prevalent in various phases of the M&E process (for details see Annex 1 **Table 10**). In terms of enterprise coverage, the M&E system should include not only firms that have obtained public support, but also those that have not, to see whether public intervention makes any difference (which is possible only if there is a suitable control group).

Annex1. Description of indicators types and feedback elements

64. This annex describes types of indicators used in the context of RIS3 M&E at various levels of public intervention and provides practical information related to the feedback mechanism. Firstly, context indicators are described, since they are the most general and set the scene of the intervention. Secondly, input indicators are elaborated on, followed by separate sections on output, outcome and impact indicators.¹² The final section discusses selected practical elements of the feedback mechanism that could be useful for the design of a coordinated approach, which is in tune with the indicator thematic. The annex provides features and examples of each indicator type, which are matched to individual levels of public intervention (policy, program, instrument/action). The same indicator types, e.g. output or outcome, can be used at different intervention levels, but they then possess different characteristics (scope, target group, frequency of measurement, etc. – see **Table 1**).

65. The precision of indicators increases towards the bottom of the intervention logic pyramid. **Figure 5** shows that planning of the intervention logic takes place in a top-down manner, i.e. firstly strategic goals at the policy level are chosen to address the challenges identified in the diagnosis, as well as the aspirations of the region / country; secondly, operational goals at the program level are formulated, which will lead to realization of the strategic goal; finally, instruments and actions are planned that will implement the programs. Strategic goals are relatively broad (but specific) because they are directed to a large target group and time horizon is usually long. That is why indicators at this level are also relatively general. When moving towards the bottom of the intervention logic pyramid, the goals of individual levels should become more specific due to the fact that target groups become smaller and the time envisaged for achieving planned outcomes becomes shorter.



Figure 5.
Model of an intervention logic

Source: World Bank

66. Frequency, the scope and richness of monitored and evaluated data differ at individual levels of a public intervention. **Table 1** presents a general matrix matching indicator types to the public intervention level, as well as the frequency with how often they should be monitored or evaluated. At different levels of intervention the same types of indicators can be utilized, yet their characteristics will be different. For instance, context indicators at the policy level are different than the context indicators at the program level. By and large, the frequency of indicator

12. This terminology follows a traditional approach to naming indicators type and does not follow the EC's new system of naming of indicators that will be applied during the 2014-2020 financial perspective. More information about the EC's approach can be found here: http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf. Poland will follow EC's guidelines and will use following scheme of indicators: input, output, result (direct outcome of a public intervention), strategic result (change in the target group caused by both a public intervention and other factors), context.

reporting increases towards the bottom of the intervention logic scheme, i.e. instruments and actions should be monitored much more frequently (even quarterly) than indicators at program or policy level. When it comes to outcome indicators it is reasonable to expect that the effects of instruments will materialize faster than the effects of programs and the latter will be faster than the effects of a policy.

Intervention level	Type of indicator	Frequency*	M / E	Function / description
Policy	Context	Every 2 years	M	Defines or modifies an area of intervention
	Impact	Every 3 years (mid-term and ex-post evaluation) ¹³	E	Checks whether the achieved change is satisfactory and can be attributed to the intervention
	Input	Annually	M	Checks if there is enough input to achieve the planned change
Program	Context	Every 2 years	M	Checks if the specific situation in the area of intervention has changed and if there is a need to modify the intervention
	Impact	2-5 years	E	Checks whether the achieved change is satisfactory and can be attributed to the intervention
	Outcome	Annually	M	Shows if the intended results of the program have been achieved
	Output	Every 6 months	M	Checks if the implementation of actions (accumulated) is going as planned
	Input	Every 6 months	M	Checks the outlays against the envisaged plan
Instrument	Outcome	Every year	M	Shows if the planned results of an action / instrument have been achieved
	Output	Quarterly	M	Checks if the implementation of each action is going as planned
	Input	Quarterly	M	Checks the progress of spending against the plan

Table 1.
Indicator matrix

* This table provides exemplary frequency of indicator measurement. However, the frequency should be adjusted to the indicator being utilized. For instance, when an instrument is not able to deliver outputs on a quarterly basis, then the measurement frequency should be adjusted accordingly, and if so, the frequency of measurement of input indicators should be adjusted as well.

Source: World Bank

Context indicators

67. Context indicators show general changes in the socio-economic situation and are used to define or modify the scope of public intervention. They should be interpreted as relative indicators and therefore analyzed in comparison to other regions or countries. Context indicators do not reveal the effect (or impact) of policies because they are dependent on too many interrelated factors, including external factors that are beyond control of the public sector. In the case of innovation policy, they are used to present the overall level of competitiveness and innovativeness of a region / country and to benchmark against respective “competitors”.

68. Context indicators should be measured at the policy and program level. They are more precise at the program level. Context indicators should also be used to analyze changes in an economic and scientific specialization of a territory (i.e. region, country). There they can support the definition or the modification of the areas of smart specialization. **Table 2** offers a couple of examples of policy-level context indicators that could be used for an innovation policy or smart specialization.

Table 2.
Examples of context indicators at the policy level

Source: World Bank

Policy-level context indicators for an innovation policy	Policy-level context indicators for a smart specialization
<ul style="list-style-type: none"> • Contribution of R&D activities to tax revenue per capita; • Share of innovative companies in industry and services; • R&D expenditure as share of GDP. 	<ul style="list-style-type: none"> • Exports of hi-tech sectors, as share of total exports in the region; • Share of innovative companies per sector; • Export intensity per sector, as share of total revenue; • Patent applications and patents per sector; • Revenue from IPR (licenses, patents, trademarks); • Value of venture capital investment.

13. Important: evaluation of the strategy also involves the evaluation of strategic programs and actions. This means that the actions and programs are also evaluated, although this is not shown in other parts of this table.

69. Context indicators gain importance if an overall assessment of economic and scientific specialization of a territory is regularly conducted to indicate general trends. Such an assessment can also be performed on the basis of more complex indicators, which traditionally are used to identify economic specializations of a region / country. However, in the field of innovation policies and RIS3s, these more complex context indicators could also be utilized to define as well as reassess areas of smart specialization, and they could include:

- Location quotients for employment, value added or number of companies per sector (showing territorial concentration of human resources, firms in economic sectors, and their significance to GDP).
- Location quotients for patents and scientific publications per area of science (showing territorial concentration of scientific potential that can be matched with economic sectors).
- Shift-share analysis that reveals changes of importance for economy of different sectors over time.
- Input-output (economic and spatial) analysis could present spatial and sectorial flows of goods and services within and outside a territory.

70. At the program level, context indicators are more specific than at the policy level and they show a more detailed background of a planned intervention. Some examples for both an innovation policy and smart specialization areas are presented in **Table 3**.

Program-level context indicators for an innovation policy	Program-level context indicators for a smart specialization
<ul style="list-style-type: none"> • Share of companies incurring outlays for innovation activities • Share of companies implementing marketing innovation • Share of companies cooperating within clusters 	<ul style="list-style-type: none"> • Change of the number of innovative companies in economic areas encompassed by a specialization • A number of new companies in economic areas included in a specialization

Table 3. Examples of context indicators at the program level

Source: World Bank

Input indicators

71. Input indicators keep track of resources used to achieve the planned change and they encompass financial, organizational and human-resource dimensions. In this note, the main focus is on financial inputs because they are the most important for programming RIS3s. However, units implementing the strategy also have to plan and monitor these other dimensions. It must be ensured that there is enough human and organizational capacity to perform high-quality M&E tasks.

72. Monitoring inputs is possible only if they are clearly spelled out in the intervention logic. From the outset of a public intervention it should be clear what change is planned to be achieved with an intervention (a character and degree of change, a target group, time frame etc.) and what resources will be devoted to achieve it. Inputs should be specified for each level of intervention, i.e. an instrument, action, program, policy. If such a structure is in place, a proper monitoring of inputs can take place.

73. During the current budgetary perspective input planning should be stepped up. While both national and regional authorities have been able to provide general estimates of planned innovation inputs at the level of thematic objectives in their operational programs, information is lacking on inputs devoted to individual actions or goals, as planned in RIS3s. This makes it impossible to assess if the planned change is realistically achievable or whether inputs are sufficient to address the needs of a target group. It is therefore essential to plan the financial inputs along the intervention logic in RIS3s at both the regional and national levels.

74. The inputs can be measured in total or relative terms. This can include the overall cost of a policy, program or instrument (total amount) or outlays per company or other beneficiaries of an innovation policy (BSI, R&D employee etc.) It is prudent to compare incurred inputs to achieved results at all intervention levels, e.g. to compare the most costly instrument with the most effective one, i.e. the one that brings the best results. In more advanced M&E models it is

possible to group inputs by the type of beneficiaries and strategic objectives to analyze if designed concentration of funding brings expected effects – an example of using this good practice are ImpactScan matrixes and graphs. Results of such a comparison can then be utilized to modify the structure of expenditures (see the chapter on good practices for more details).

75. The frequency of input monitoring is high, though it varies depending on the intervention level. Input data that usually originates from implementing agencies or units can be virtually monitored on a the day-to-day basis. However, for practical reasons it seems reasonable to aggregate input data at the instrument level every 3 months, at the program level every 6 months and at the policy level every year.

Table 4.
Examples of input indicators

Source: World Bank

Financial inputs for implementation of an innovation strategy (RIS3)	Inputs per target group
<ul style="list-style-type: none"> Yearly, compared to other regions During the whole programming period, compared to other regions Per strategic objective/program 	<ul style="list-style-type: none"> Inputs per company in a target group Inputs per scientist in a target group Inputs per BSI in a target group
Financial inputs at program level	Financial inputs at action level:
<ul style="list-style-type: none"> Per strategic objective/action Per type of the beneficiary in target group 	<ul style="list-style-type: none"> Per beneficiary in target group Per strategic action

76. A RIS3 M&E system has to include overall innovation inputs. At the regional level this means that besides ROPs, an M&E system has to track funds flowing from centrally managed operational programs as well as other EU-wide programs, e.g. H2020, and non-EU sources. Additionally, private investment should be monitored where possible. Proper input monitoring constitutes a challenge that must be addressed during the current perspective and one that calls for improved coordination and information flow between the regional and national levels. The following indicators would be helpful to incorporate into RIS3 M&E systems:

- Total amount of inputs acquired by regional actors from European programmes that contribute to the achievement of RIS3 strategic objectives, per objective,
- The total amount of inputs acquired by regional actors from national programmes that contribute to the achievement of RIS3 strategic objectives, per objective,
- The total amount of inputs acquired by regional actors that contribute to the achievement of RIS3 strategic objectives, per type of actor (also from national and European programmes)
- The aggregated private investment measured as a beneficiary’s own input into a project, per objective and type of actor.

Output indicators

77. Output, or product, indicators measure the direct results of an innovation action / instrument or program. Their role is to monitor performance and they should be measured every quarter at the action level and every six months at the program level, where they show aggregated actions. Product indicators usually are specific to the intervention and not comparable across various instruments / actions. Nevertheless, at the regional and national level, several key product indicators could be agreed on, because many regions run similar innovation support interventions. The role of such key product indicators would be similar to key performance indicators in business monitoring and they could be used to benchmark regions as well as to enhance coordination.

Table 5.
Examples of output indicators

Source: World Bank

Examples of output indicators at the program-level	Examples of output indicators at the instrument / action-level
<ul style="list-style-type: none"> Number of innovation audits in companies. Number of R&D projects in cooperation with scientific institutions per area of specialization. Number of companies taking part in an internationalization program. 	<ul style="list-style-type: none"> Number of applications per instrument. Number of projects per action <p>Note: aggregated action outputs should add up to program outputs</p>

Outcome indicators

78. Outcome indicators show the change of behavior in the target group of an intervention. What is measured by outcome indicators are not only direct effects of the intervention, but also the influence of external factors, as well as two other aspects, namely spillover and additionality. Outcome is measured among both direct and indirect beneficiaries of the intervention (see **Figure 6**)¹⁴ Outcome indicators reflect overall changes in the whole target group (i.e. a part of an overall population of actors to which a given intervention is directed – this includes both direct and indirect beneficiaries). However, they do not indicate which part of the change is caused by an intervention.

79. Spillover effect reflects spreading positive changes in behavior to actors that have not been supported by the interventions (i.e. direct beneficiaries). For instance, a certain type of business process or model becomes widespread in a given sector despite the fact that only a few enterprises (direct beneficiaries) obtained support to introduce it. Benefits flowing from a given solution encourage other actors (from the whole target group or even beyond) to adopt a given model, thus increasing the scope of intervention.

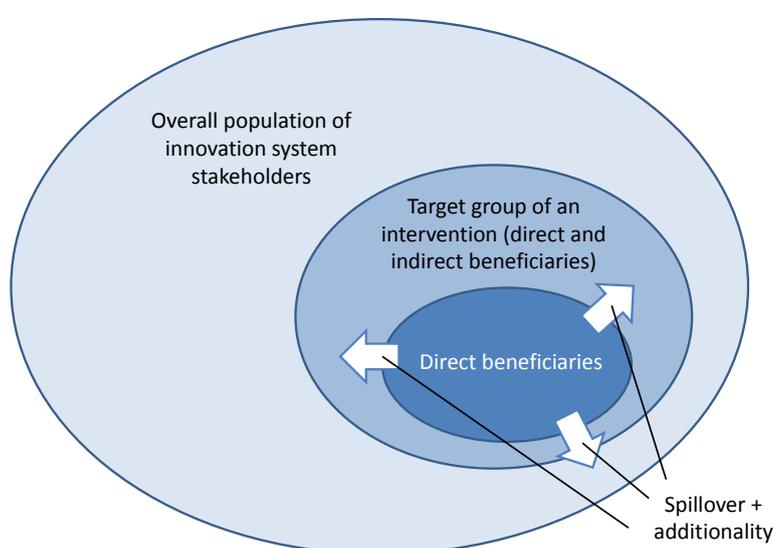


Figure 6. Relation between population, target group, and direct and indirect beneficiaries

Source: World Bank

80. The additionality effect is an extra contribution (“top-up”) from the beneficiary side caused by public intervention that would not have materialized had the intervention not been introduced. Additionality can take three forms: input, output and behavioral additionality. Input additionality refers to the fact that public intervention encourages actors to invest more resources in an area where the intervention is directed; without the intervention an actor would not spend these extra resources. Such a public intervention should avoid crowding out the private intervention in the given area. Output additionality reflects the increased number of products related to a given intervention, for instance a company engages in a larger number of innovative projects or cooperations as the result of the intervention. Finally, behavioral additionality “can be defined as the persistent change in what the target group of the policy is doing and how they are doing it, whereby this change is attributable to the policy.”¹⁵ For instance, a company starts to engage in more risky or larger undertakings as a result of the intervention, or starts collaborating with new counterparts, e.g. R&D units. Such a behavioral change may also be continued beyond the intervention span, while the results of the two former types of additionality can be relatively easy to scale down after the intervention ends.

14. Direct beneficiaries are ones that obtain support within a given intervention. Indirect beneficiaries are ones that do not receive direct support within the intervention, but can indirectly benefit from the intervention, e.g. via spillover coming from direct beneficiaries.

15. Gök Abdullah and Edler Jakob (2012), ‘The use of behavioural additionality evaluation in innovation policy making’, *Research Evaluation*, pp. 1-13.

81. Outcome indicators should be measured at least once a year and should be regularly communicated to actors of the innovation system. If the change caused by the intervention has a long-term character, i.e. results show with significant time lag, one can also measure strategic outcomes (comparable to key result indicators in business monitoring) at the policy level. In such a case they sometimes can have some features of impact indicators. Outcome indicators must have a baseline and, where possible, they should have a target value (which can be changed at fixed dates and on a solid basis, e.g. data from evaluation). Outcome targets can be set either in relative or absolute terms. Only when previous experience is scarce and more precise estimation impossible, then expressing an outcome indicator in terms of trends could be allowed. These indicators and targets can strongly benefit from being set in a deliberative process.

82. The EC will pay special attention to outcome indicators in the new programming perspective. In fact the EC has recently updated its approach toward outcome indicators. In its new paradigm the EC differentiates between input, output, result and context indicators. "Outcome" is not utilized by the EC anymore, yet it is still present under its results indicator, although with a modified meaning. In the Commission's approach, result indicators are driven by two factors, i.e. impact of the intervention and other factors. Impact is understood by the Commission as "the change that can be credibly attributed to an intervention", while the remaining part of change in the result indicator is caused by factors other than intervention.¹⁶

Table 6.
Examples of outcome indicators

Source: World Bank

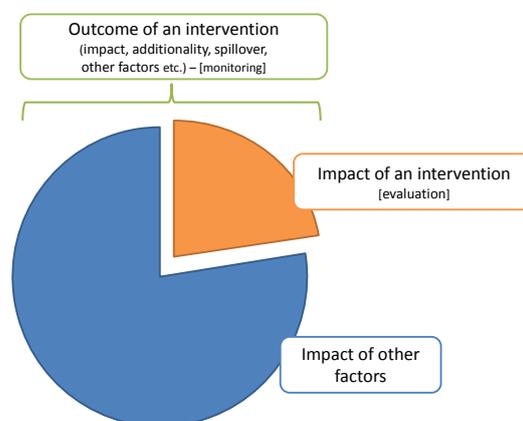
Examples of outcome indicators at the program level	Examples of outcome indicators at the instrument / action level
<ul style="list-style-type: none"> Number of companies that have implemented innovation strategies or innovative business models after an innovation audit. Number of companies in the areas of specialization that have developed prototypes of new products or services after an R&D project in cooperation with scientific institutions. Number of companies that started exporting after having taken part in an internationalization program. 	<ul style="list-style-type: none"> Share of companies exporting for the first time due to the project. Share of companies starting or advancing in an innovation process due to the project. Share of companies continuing innovation activities beyond the project's end. <p>Note: aggregated action outcomes should add up to program outcomes</p>

Impact indicators

83. Impact indicators show the extent to which a public intervention has influenced the change among the actors, which is measured on the basis of evaluation. Impact is a subset of intervention outcome (Figure 7); it is the change that was caused by an intervention and which would not have materialized had the intervention not been implemented. By subtracting costs of an intervention from this (gross) impact, one arrives at the net impact, or additionality, of the intervention. Impact is assessed during an impact evaluation on the basis of qualitative and quantitative data (see Box 4).

Figure 7.
Relation between intervention outcome and impact

Source: World Bank



16. Source: http://ec.europa.eu/regional_policy/sources/docoffic/2014/working/wd_2014_en.pdf

84. Evaluation studies may engage a considerable amount of resources. For this reason they must be planned with care, because it is impossible to run a separate evaluation of every single instrument or action.¹⁷ Since regional RIS3s are not very large, it is recommended for the regions to concentrate on overall evaluation of a whole innovation strategy at the policy level, i.e. such evaluation would encompass the whole intervention logic at once. The regions can also consider running evaluations for experimental programs or instruments to see whether they work or not and whether it is reasonable to scale them up. At the national level, where individual innovation programs are large it seems rational to run evaluations at both the program level and policy level.

85. Four types of evaluation help design and implement a good public intervention. Firstly, prior to intervention implementation, an independent *ex ante* evaluation should be conducted to verify the planned intervention logic, as well as envisaged inputs, outputs and outcomes. Secondly, a mid-term evaluation usually takes place about three years after the start of the intervention. This evaluation concentrates on the already achieved (visible) results and the feedback from regional stakeholders, including implementing bodies and policy beneficiaries. Mid-term evaluation can lead to policy / program adjustment, or in some cases to program termination, if it is deemed unnecessary or impossible to fix. Thirdly, an ongoing evaluation can be performed throughout the implementation of the intervention. This resembles monitoring in some ways, but unlike monitoring, an ongoing evaluation does not only focus on gathering information, but it also explains it. Finally, an *ex post* evaluation assesses the impact of a policy / program on a target group, i.e. the change of behavior that happened in the target group under the influence of the intervention.

86. Evaluations can concentrate on process, product and a theory underpinning an intervention. This is a vital division as it influences the choice of questions asked during the analyses. Process evaluations focus on the efficiency of an implementation mechanism of a given intervention. Product evaluations ask whether the intervention works at all, why it works and which transmission mechanisms produce results. Theory-based evaluations investigate whether the assumptions constituting the foundation of an intervention are viable and whether they work well in the reality in which the intervention is implemented.

87. Impact indicators can aim to address one of five main evaluation criteria. These criteria describe the main focus of the evaluation and guide analytical questions that are posed during the evaluation process. The five main criteria are as follows:

- Adequacy – asks whether objectives and instruments were designed appropriately – can be measured in *ex ante*, ongoing and mid-term evaluations.
- Effectiveness – asks if objectives were achieved – measured in *ex ante*, ongoing, mid-term and *ex post* evaluations.
- Efficiency – compares achieved results against inputs – measured in *ex ante*, ongoing, mid-term and *ex post* evaluations.
- Utility – asks whether needs of beneficiaries were fulfilled or socio-economic challenges addressed – measured in *ex post* evaluations.
- Durability – asks if achieved results were maintained after an intervention had been finished – measured in *ex post* evaluations.

Possible impact indicators for innovation policy / program

- Public return on investment (RoI)
- Change of R&D expenditures in a target group
- Change of the number of innovative companies in a target group
- Net and gross effect of a policy/program
- Change of network relations in areas of smart specialization (evolution of a number or depth of relations)
- A leveraging effect of public support, i.e. additionally of inputs observed among companies that received public innovation support

Table 7.

Examples of indicators that could be used in an impact evaluation

Source: World Bank

17. In fact, the EC requires the evaluation of each instrument that is financed from the Structural Funds, this, however, does not mean that each of them has to be evaluated separately and joint evaluations are possible.

Closing remarks about indicators

88. Indicators should fulfill a set of general criteria, which make them robust and intervention-specific. They should have the following characteristics:

- change value as a result of a public intervention (be responsive to the public intervention, otherwise they do not measure the effect of the intervention),
- reflect the essence of the planned change,
- minimize the manifested apparent effects,
- minimize the possibility of distortion,
- be statistically robust,
- enable straightforward interpretation,
- be easy to collect and measure without excessive costs,
- be possible to disaggregate.

89. Each of the utilized indicators should possess its own ID card specifying its characteristics. There are many elements that can be included in such a description, but the most common include the type of indicator, name, unit of measurement, data source, frequency of measurement and specific date, methodology of measurement, disaggregation pattern, and baseline and target value. An exemplary ID card for an indicator is presented in **Table 8**.

No.	Name	Type	Unit of measurement	Data source	Frequency and date of measurement	Methodology of measurement	Disaggregation pattern	Baseline value	Target value

Table 8.

An exemplary ID card for an indicator

Source: World Bank

90. Indicators have to be precise, and the SMART approach helps improve precision. The SMART indicator fulfills a set of characteristics; it has to be specific (S), i.e. clear about what it measures, thus avoiding diverging definitions; measurable (M) – allows for checking whether progress is achieved; achievable (A) – possible to obtain with provided resources; relevant (R) – an indicator measures the change it should measure; and time-bound (T) – limited in time.

Feedback loop – selected aspects

91. An effective feedback mechanism is necessary for the operation of any M&E system.

M&E information is utilized when it reaches its potential users and when it provides value added to innovation system stakeholders. There are different groups that potentially use information from RIS3 M&E: decision makers, program/instrument managers, firms, intermediary organizations (e.g. BSIs), R&D and society. An individualized feedback mechanism has to be suited to each of them, which means that each of these groups needs different data, with a different granularity of information, and at different times in different forms. A handy tool for tailor-made reporting is a matrix that includes information on who is a receiver (an end user) of M&E output, what kind of data is needed by this user, when it is needed, how this user will be approached, etc. (**Table 9**).

Table 9.

A template of a communication plan for presenting M&E information

Source: World Bank

An end user of M&E outcome information	Way of approaching the user	Main information needs of the user	Frequency and dates when information is needed to the user	Other
Possible users: <ul style="list-style-type: none"> • Policy makers • Program / instrument managers • Intermediaries (BSIs) • Firms • R&D • Society / NGOs • Other 	Possible communication forms: <ul style="list-style-type: none"> • Written report • Press release • Multimedia presentation • Personal briefing • Factsheets • Other 	Need types: <ul style="list-style-type: none"> • Strategic planning • Managerial planning (fine tuning) • Benchmarking with other actors 	Possible frequencies: <ul style="list-style-type: none"> • Annually • Monthly • At a given date • A quarter before a specific event/ date • Other 	<ul style="list-style-type: none"> • ...

92. An M&E system should describe who and how is involved at different stages of the M&E process. A participation matrix helps systematize involvement of individual stakeholders (Table 10) and is usually prepared at the beginning of the process of creating an M&E system. It allows identification of key internal and external actors of the innovation system, i.e. those with the greatest influence on shaping innovation policy, description of their needs, capabilities to contribute and mandates framing their possible engagement (e.g. organizational statutes, etc.). Having identified key players, the scope, form and timing of their engagement in the M&E system must be specified. Their participation varies and takes different forms e.g. mere receiver of information, consultation of proposals, partner in implementation, supervisor of the processes and procedures (e.g. as a steering committee member that can shape implementation of a RIS3), etc.

Table 10. Participation matrix (exemplary fill in)

Source: World Bank

M&E stage	Participation types				
	Information	Consultation	Partnership	Supervision	Other?
Indicator selection	<ul style="list-style-type: none"> Potential beneficiaries of individual actions, who are listed in the regional database 	<ul style="list-style-type: none"> Representatives of clusters, social organizations, educational institutions etc. National coordinator of the M&E system 	<ul style="list-style-type: none"> Members of the Regional Forum of Smart Specializations Companies, R&D units, BSIs 	<ul style="list-style-type: none"> Units responsible for M&E in the marshal office (regional authority) 	<ul style="list-style-type: none"> ...
Information about applied indicators	<ul style="list-style-type: none"> All participants of the indicator selection process 				<ul style="list-style-type: none"> ...
Measurement	-	<ul style="list-style-type: none"> M&E experts 	<ul style="list-style-type: none"> Collaboration networks within each of smart specializations 	<ul style="list-style-type: none"> Units responsible for M&E in the marshal office (regional authority) 	<ul style="list-style-type: none"> ...
Result interpretation	<ul style="list-style-type: none"> Potential beneficiaries of individual actions, who are listed in the regional database 	-	<ul style="list-style-type: none"> Members of the Regional Forum of Smart Specializations Companies, R&D units, BSIs 	<ul style="list-style-type: none"> Units responsible for M&E in the marshal office (regional authority) M&E experts 	<ul style="list-style-type: none"> ...
Result communication	<ul style="list-style-type: none"> Internal and external beneficiaries – according to a communication plan and description of information needs 				<ul style="list-style-type: none"> ...
Utilization of M&E results to adjust an intervention	<ul style="list-style-type: none"> Potential beneficiaries of individual actions, who are listed in the regional database 	<ul style="list-style-type: none"> Representatives of clusters, social organizations, educational institutions etc. National coordinator of the M&E system 	<ul style="list-style-type: none"> Members of the Regional Forum of Smart Specializations Companies, R&D units, BSIs 	<ul style="list-style-type: none"> The regional management board or a unit responsible for implementation of a RIS3 and an operational program 	<ul style="list-style-type: none"> ...

93. M&E for RIS3 also has to provide feedback information to firms and decision makers. Oftentimes it seems that M&E focuses mostly on managerial aspects of public intervention, which puts operational units (BSIs, public agencies, implementing departments) as central, and almost exclusive, users of M&E information. While managing program / instrument implementation is important, the M&E system should also serve other clients, e.g. firms and decision makers to assist them in taking decisions on the basis of gathered and analyzed data. Decision makers decide on money devoted to M&E, if they do not see benefits flowing from the M&E information, resources will be limited. On the other hand, companies provide the M&E system with valuable data. They will be more willing to share information used in M&E if they receive valuable information from the system in return.

94. Stakeholders' involvement is necessary to design proper reporting. Stakeholders should have a say about the format of reporting, its scope, frequency and other details. Their active involvement at the M&E planning stage also increases the likelihood of their future follow-up with evaluation recommendations. In general, decision makers need less technical information but more focus on a general picture, impact and potential trade-offs that have to be taken into account

when taking decisions. Program managers are often interested in the efficiency of processes and whether an intervention is in line with plans. Intermediaries seek information about needs of companies and their level of satisfaction with provided services. Entrepreneurs might be interested in general development trends and possibilities to benchmark themselves against a broader background etc. These differences should be reflected in the communication plan (Table 9).

95. M&E reports must be reader friendly. They must be concise, rich in graphics, written in plain language, attractive and easily comprehensible. The form of report presentation does matter. Lengthy reports are not more valuable than short and focused ones that are adjusted to the needs of a targeted group of readers. Utilization of basic software to create graphics and figures is a must; sometimes one graph can substitute pages of text. For instance a spider diagram is a simple but efficient tool for showing benchmarking results or creating a profile of e.g. region's economy or a BSI's service offer etc. This is why skills must be built up in the field of data presentation. In short, form and substance have to go together.

