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Western Balkans

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List of abbreviations used in this document

CSOs: civil society organizations

EDP: entrepreneurial discovery process

EU: European Union

GDP: Gross Domestic Product

QH: Quintuple Helix

RIS3: Research and innovation strategies for smart specialization

RRI: Responsible Research and Innovation

R&I: research and innovation

S3: Smart Specialization Strategies

S4+: Smart Specialization Strategies for Sustainable and Inclusive growth

SMEs: Small and Midsize Enterprises

SDGs: sustainable development goals

STEM: Science, Technology, Engineering, and Mathematics

SWOT: Strengths, Weaknesses, Opportunities, and Threats

WB: Western Balkans

WBC: Western Balkan countries



Executive summary

- This document presents the policy related results of the WBC-RRI.net project in relation to implementing RRI infused S3/S4+ strategies in the Western Balkan region.
- Although S3 strategies have been an *ex-ante* conditionality for EU member states only, the concept has taken off in the WBC, where S3 and subsequently S4+ strategies are considered tools for strengthening the regional national economies and for enhancing the countries' potential for EU membership.
- Despite the widespread importance placed on adopting S3/S4+ strategies in the Western Balkan region, most economies are not in the implementation phase yet, and the few that have reached this stage, are faced with issues in realizing these policies.
- Despite the different degrees of implementing S3/S4+ strategies in the WBC, some common themes emerge, such as enhancement of the dialogue between policy and academia, the importance of green and digital transition, applying RRI principles and utilizing the place-based approach.
- Two overarching themes are highlighted in the policy recommendations: applying a **QH framework** when engaging with stakeholders and utilizing **directionality** when in policy design and implementation. The two themes are inexplicably intertwined highlighting the WBC's agency process, societal and environmental inclusiveness and future-oriented sustainability in all phases of policy making, i.e. design, implementations and monitoring/evaluation.
- The document starts with an overview of EU policies, before discussing the status of progress of **S3/S4+strategies** in each one of the five WBC, Albania, Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia. The document concludes with policy recommendations for a future vision of S3/S4+ strategies in the region.



1. Introduction

This policy document aims to provide an overview of the current situation and progress of innovation and smart specialization in Western Balkan countries (WBC). Furthermore, it aims to make specific recommendations to emphasize the dimensions of responsible research within the WBC's individual innovation agendas. This paper focuses on the paths of smart specialization in five WBC: Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia. These countries have made significant progress in recent years in their efforts to foster growth and economic development through innovation. Nonetheless, the gaps in both policy design and implementation act as hurdles towards the full transition of the region towards **Smart Specialization Strategies (S3)/ Smart Specialization Strategies for Sustainable and Inclusive growth (S4+)**. The paper utilizes the results from the WBC-RRI.net project activities to identify specific issues related to S3/S4+ strategies by individual country and propose specific **Responsible Research and Innovation (RRI) principles** informed policy recommendations driven by **directionality** and including **quintuple helix (QH)** stakeholders.

2. State of the art and meaning of embedding RRI policies in S3

Having had recognized the importance of regional innovation as a driver for economic growth as early as the 2000s, a decade later in 2010, on the back of the financial crisis, the European Commission introduced the concept of Smart, Sustainable and Inclusive growth as part of its 'Europe 2020 Strategy' ([EU Commission 2010a](#)).

The three pillars on which the strategy was envisaged to materialize were:

- Smart growth: developing an economy based on knowledge and innovation;
- Sustainable growth: promoting a more resource efficient, greener and more competitive
- Economy;
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion ([EU Commission 2010a](#)).

With the central goal of fostering cooperation among different stakeholders and driving innovation-led sustainable growth to combat poverty, unemployment and the developmental gap among the different regions, while keeping the European Union (EU) economy globally competitive, the main idea was to encourage local identification of unique strengths in areas of specialization ([EU Commission 2010a](#)). The concept of S3 was also promoted regionally through the 'Regional Policy contributing to smart growth in Europe 2020', highlighting the central role of the regions in the implementation of the said strategies ([EU Commission 2010b](#)). In 2012 the European Commission produced the 'Guide to Research and Innovation Strategies for Smart Specialization (RIS3)' ([European Commission 2012](#)). The Guide was updated in 2013 in order to enhance the assessment guidelines ([European Commission 2013](#)). The document introduced the place-based approach, emphasizing region-specific strengths and opportunities in order to guide and facilitate the development of locally designed smart specialization strategies for enhancing Europe's capacity to deliver smart, sustainable and inclusive growth ([European Commission 2012](#)).



According to the Guide, regional research and innovation strategies for smart specialization (RIS3) are integrated, place-based economic transformation agendas based on five pillars:

- A focus on policy support and investments on key national/regional priorities, challenges
- and needs for knowledge-based development, including ICT-related measures;
- Building on each country's/region's strengths, competitive advantages and potential for
- excellence;
- Support technological as well as practice-based innovation and aim to stimulate
- private sector investment;
- Involvement of stakeholders and encouragement of innovation and experimentation;
- Evidence-based and inclusion of sound monitoring and evaluation systems ([European Commission 2012](#)).

[Smart Specialization \(RIS3\)](#) is also included in the 'Cohesion Policy 2014-2020', where the notion of the RIS3 *ex-ante* conditionality is introduced ([EU Commission 2013](#)). The importance and novelty of the introduction of the RIS3 *ex-ante* conditionality in the 'Cohesion Policy 2014-2020' was that the Commission proposed to make RIS3 strategies a pre-condition for ERDF funding ([EU Commission 2013](#)). The place-based approach continues to be a key component of the European Regional Development Fund (ERDF) and other EU funding programs for the 2021-2027 period ([Council of the European Union 2021](#)). Additionally, Smart Specialization has been integrated with other transformation policy frameworks, such as the Green Deal ([EU Commission 2020](#)), incorporating the concept of mission oriented innovation policy ([EU Commission 2019](#)), and the Digital Europe Program ([EU Commission 2021](#)), combining horizontal directionality with place-based identification of strategic needs and capabilities. This is especially valuable at times of crisis, such as regional responses to the COVID-19 pandemic or the socio-economic challenges arising from the ongoing Russian invasion in Ukraine.

The introduction of S3 to the WB aligns with the EU's enlargement strategy, which provides an accession perspective for these economies and envisions support for various policy areas, including socio-economic development (see for example the [Western Balkans Investment Framework](#) or the [Smart Specialization implementation framework for the EU Enlargement and Neighborhood Region](#)). The EU accession process includes the utilization of outcomes from the smart specialization process to develop or upgrade industrial policies. The S3 approach plays a vital role in the socio-economic development of the WB, emphasizing the importance of innovation and research in their growth trajectories (see for example the 2023 [New Growth Plan for the Western Balkans](#)).

While the implementation of S3 is not obligatory for non-EU member states, it is an *ex-ante* conditionality for EU regions and member states in order to spend European Regional Development Funds for research and innovation. (Kleibrink, 2014) In this regard, several attempts have been made to revamp the Western Balkans' research sector and to promote innovation in recent years, not only at national level, but also at regional one. However, in the implementation of regional programs, asymmetry in national research and innovation systems is noticeable. (Vujović, 2014).



Current mapping and analysis of the potential for developing S3 in the WB highlight the fact that industries like agri-food, automotive, machinery, and metals exhibit considerable potential for further growth through export diversification (OECD, 2019). To realize this potential, it's crucial to strengthen cooperation between the private sector and academia, promote the adoption of innovative technologies, and implement effective skills development policies (Kleibrink et al., 2018). Additionally, S3 can play a pivotal role in advancing the region's economic progress by promoting cross-sectoral innovation. S3 aligns with existing strategic frameworks and policy documents in the WB, directing public investment towards priorities that contribute most to innovation-driven economic growth (Radonavic et al., 2019).

This policy paper makes recommendations for embedding RRI in the S3 phases in the WB, by utilizing the results of the WBC-RRI.NET project. The recommendations are presented linked to the three stages of policy formation (design, implementation, monitoring), taking into consideration RRI principles, keys and dimensions such as holding research to high ethical standards, safeguarding gender equality in the scientific community, producing policies which avoid the harmful effects of innovation, using tools in order to engage the communities affected by innovation and ensuring the flow of information and knowledge by furthering science education and Open Access.

The recommendations are in accordance with the five pillars of the RIS3 *ex-ante* conditionality. This concept introduces a requirement to EU Member States and regions to adopt smart specialization strategies that:

- Are based on a SWOT or similar analysis to concentrate resources on a limited set of research and innovation priorities;
- Outline measures to stimulate private research, technology and development investment;
- Contain a monitoring and review system;
- Adopt a framework outlining available budgetary resources for research and innovation;
- Adopt a multi-annual plan for budgeting and prioritization of investments linked to EU priorities (e.g. [European Strategy Forum on Research Infrastructures –ESFRI](#))

Additionally, the paper discusses in brief the integration of sustainability dimensions into the S3 process in the WB, recognizing that deliberation on how these strategies can effectively address Sustainable Development Goals (SDGs) has been an ongoing discourse in the EU (Nakicenovic et al, 2021). Developing such strategies (S4) calls for an evolution of the concept towards place-based innovation strategies for sustainability and subsequently, for solidarity and inclusion (S5, etc) (Mccann, et al., 2020). This paper will highlight the contextual potential of the WB innovation ecosystems to provide solutions to economic, societal, and environmental challenges in this regard.



3. The 3 stages of specific recommendations for embedding RRI in the S3 phases in the WB

3.1 Design Phase

In the context of devising S3 in WBC, it is essential to emphasize the importance of **public participation**. This includes involving all relevant stakeholders in the S3 design process, employing scientific methodologies comparable to foresight practices, and utilizing a variety of instruments including questionnaires, interviews, citizens' assemblies, citizens fora and Delphi analysis.

Diversity in engagement methods is encouraged to accommodate varying stakeholder preferences and requirements. This includes closed-door interviews to obtain confidential insights, questionnaires for the accumulation of quantitative data, and open dialogue workshops for collaborative discussions. These methods offer a comprehensive perspective of stakeholder insight, allowing for informed decision-making. All these methodologies should take into consideration indicators relevant to RRI from the very beginning of data collection for purposes of S3 creation.

Open dialogues facilitated by organizations such as the Chamber of Commerce, various employers' associations, Small and Midsize Enterprises (SMEs) etc, which encourage women's entrepreneurship, provide a compelling illustration of promoting gender equality within S3 initiatives. One of the good practices comes from Serbia where university leadership has been engaged by delegating experts in fields such as open science, gender, and ethics exemplifies a successful model for stakeholder engagement. Involving specialists at a hierarchically significant level, such as clusters, ensures that the interests and expertise of all stakeholders are adequately represented.

In the spirit of promoting collaborative networks, it is suggested that members of a working group establish strong ties with specific stakeholder groups. In addition, empirical data collected through **interviews, questionnaires**, and seminars should be utilized to inform decision-making, potentially within the working group.

Multidisciplinary and inclusivity should be the governing principles for S3 design. It is crucial to communicate that the selection of S3 priority areas does not detract from the significance of other disciplines, but rather highlights comparative advantages. For the success of S3 initiatives, clear science and innovation policies and adequate financial support from ministries and administrations are indispensable. To ensure consistency and synergy in the development process, alignment with other national strategies is necessary. This congruence increases the likelihood that S3 initiatives will effectively contribute to the national agenda overall.

Transparency and accessibility are important to the success of S3 initiatives. Making data used in the S3 design process available online promotes open science, and the transparency of documents allows for open consultation and feedback from stakeholders, enriching the decision-making process.

Integrating a **gender perspective** and setting targets for gender-balanced participation in workshops and interviews is a proactive step and engaging Civil Society Organizations (CSOs) focused on gender issues, even outside of specific sectors, can enrich the diversity of perspectives and experiences presented.

To promote inclusiveness, it is important to convey that S3 initiatives will ultimately benefit all groups. This message can be amplified by launching **promotional campaigns** that clarify the benefits of S3 in layman's terms and by involving CSOs representing vulnerable groups in decision-making processes. Interviews can provide perspectives on the potential for positive change and enhanced prospects for everyone.

In conclusion, during the design phase of S3 in WB countries, prioritizing public engagement, diversifying engagement methods, drawing inspiration from successful examples, engaging experts, fostering networking and collaboration, promoting inclusivity and multidisciplinary, ensuring alignment with national strategies, maintaining transparency, integrating a gender component, and communicating the benefits of S3 to all groups are essential elements for incorporating RRI principles. These recommendations aim to increase the inclusiveness and efficacy of S3 initiatives in the WB region.

3.2 Implementation Phase

During the implementation phase of S3 in WBC, a multifaceted strategy is required to ensure that RRI principles are effectively incorporated. This phase entails actions to promote inclusion, empower underrepresented groups, engage stakeholders, and align education with innovation priorities.

To foster a more inclusive innovation ecosystem, we need to **prioritize funding for SMEs/ Start-ups** and ventures led by women entrepreneurs. In addition to providing funding opportunities for family enterprises that employ people with disabilities, economic inclusion can be promoted by offering such opportunities. By focusing on these factors, S3 initiatives can contribute to a more diverse and equitable innovation landscape.

A multifaceted approach is recommended in order to establish the necessary conditions for **women** to participate actively in innovation. Initiatives should commence at the grassroots level, encouraging young girls to pursue Science, Technology, Engineering, and Mathematics (STEM) education and relevant careers from there on. However, it is equally essential to go beyond the simple representation of women in research and innovation. Efforts should address work-life balance issues and actively promote women to decision-making responsibilities within the innovation ecosystem. In addition, criteria for large-scale investments should include the presentation of a plan for gender equality, ensuring that gender considerations are integral to innovation initiatives. To further support gender equality, initiatives should involve both genders in gender equality initiatives, recognizing the value of collaboration in attaining equitable innovation results.

Motivating young people to pursue careers in priority sectors, such as agriculture, while emphasizing the importance of innovation can ensure the long-term success of S3 strategies. This includes undertaking ethics analyses of innovation investments and mapping all stakeholders, including human, non-human, and environmental parties. Evaluating the effectiveness, urgency, and agency of stakeholders facilitates responsible decision-making. To cultivate inclusivity and ethical practices, it is important to engage in dialogues with civil society organizations, municipalities, and society as a whole to ensure that innovation initiatives take into account a diverse range of perspectives and interests.



Developing a comprehensive **plan for public engagement** is essential for significant investments under S3. This includes engaging with local communities to ensure their perspectives are heard and their concerns are addressed throughout the process of implementation. In all phases of project development and implementation, transparency should serve as a guiding principle. Furthermore, it is recommended to implement training programs that improve communication between the scientific community and the media. This involves educating media professionals on scientific topics as well as educating scientists and innovators on effective methods of public engagement through media channels.

Aligning the **education system with S3 priorities** is crucial for cultivating a talent pool aligned with the region's innovation objectives. This alignment should encompass all levels of education, including postsecondary education and professional training. Therefore, making S3 a top priority for key decision maker bodies ensures that educational curricula and programs are developed to support the innovation goals of S3. In addition, securing targeted funding for the laboratories, materials and appropriate equipment, by the relevant Ministries (Education, Science and/or Economy) for the institutions providing S3 related education and training, is important to equip youth with competencies related to S3 priorities in each of the WBC.

Clusters can serve as forums for discussing and promoting RRI principles. However, the effectiveness of clusters in this capacity depends on their promotion from the bottom up, in line with the specific interests and needs of their member organizations. It is vital to promote clusters to incorporate RRI principles into their operations and initiatives, thereby fostering a culture of ethical and responsible innovation within their respective industries.

Clusters, as collaborative networks of businesses, research institutions, and other stakeholders, have the unique potential to act as catalysts for RRI principles. Their effectiveness as forums for discussing and promoting RRI hinges on a grassroots approach, where initiatives are driven by the actual interests and needs of their member organizations. To maximize this potential, it is essential to actively promote the integration of RRI principles into the operational frameworks and strategic initiatives of clusters.

Clusters can facilitate sharing of best practices and experiences related to RRI among their members and play a pivotal role in creating a culture of open dialogue and transparency. By organizing round-table discussions and open forums that focus on ethical practices, sustainability, and societal impacts of innovation, they can bring together diverse stakeholders, including industry leaders, researchers, policy makers, and representatives from civil society. These interactions encourage member organizations to not only understand the importance of RRI but also to see the practical benefits of its application, foster an environment where various perspectives on responsible innovation are shared and debated, leading to more holistic and inclusive approaches.

Furthermore, clusters can actively contribute to policy-making processes by providing insights and recommendations on RRI. Their unique position at the intersection of industry, academia, and government allows them to offer valuable perspectives on how RRI principles can be effectively integrated into regional and national innovation strategies.

In addition, clusters can also implement internal policies and guidelines that emphasize ethical practices, gender equality, and societal engagement in research and innovation. By setting standards within the



cluster, they can influence member organizations to adopt similar practices, thereby amplifying the impact.

Lastly, national innovation funds and other relevant funding mechanisms in WBC are institutions that importantly support development of innovation with significant support to innovation related activities mainly for start-ups and small and medium companies. It will be wise to link criteria for awarding these grants and other financial support mechanisms with S3 priorities and with RRI principles.

In conclusion, the implementation phase of S3 initiatives in the WB provides an opportunity to incorporate RRI principles. By prioritizing inclusivity, empowering underrepresented groups, engaging diverse stakeholders, and aligning education with innovation priorities, these recommendations seek to promote ethical, responsible, and inclusive innovation in the region. Such an approach ensures that the benefits of innovation are available to all, thereby contributing to the long-term prosperity and sustainability of WBC.

3.3 Monitoring/Evaluation Phase

During the monitoring phase of S3 in WBC, it is advisable to develop a **comprehensive set of indicators** for measuring the progress and impact of S3 initiatives, which include indicators relevant to RRI principles. These indicators cover long-term, medium-term, and short-term objectives, ensuring that principles of RRI are effectively incorporated into the strategic planning process.

Active participation of key stakeholders can ensure the success of S3 initiatives. Long-term (5 years), the objective is to attain a participation rate of 80 percent, indicative of a comprehensive engagement of relevant parties. The target for the medium term (3 years) is 60% participation, indicating significant progress. In the short term (one year), the immediate objective is to map key stakeholders as a first step toward engagement, with an initial target of 40 percent.

It is necessary to **educate the general public** about S3 initiatives. Long-term, the objective is to reach 45 percent of the population via numerous online and offline channels. Organizing one to two professional events per year related to S3 domains is an effective medium-term promotional strategy. The number of events organized becomes a good monitoring indicator.

It is crucial to evaluate **the economic impact of S3 initiatives**. This includes keeping note of the number of new jobs created, mapping the current employment landscape, and encouraging long-term employability. In addition, monitoring the number of new businesses and their viability becomes a major medium-term objective. Focus should be placed on the number of new individuals enrolled in pre-acceleration/ acceleration/ incubation programs and the number of newly established businesses to gauge progress.

Indicators pertaining to **patents, newly developed products/services**, and academia-business collaborations may be used for measuring innovation. Keeping track of the number of contracts between academia and businesses, grants/funds provided for various stages of company development, and funding from venture capitalists or angel investors for start-ups provides a comprehensive view of innovation development. To assure the successful implementation of S3 strategies, it is necessary to establish a



department with a budget. This is consistent with the long-term objective of strengthening the S3 implementation body.

Innovating responsibly requires an **inclusive approach**. During the monitoring phase, initiatives that include vulnerable groups should receive additional points. This incentive correlates with the S3 framework's broader objective of promoting inclusivity and equity. Monitoring the development of infrastructure related to S3 and monitoring sectoral Gross Domestic Product (GDP) growth and increased exports within S3 domains are essential indicators of economic development and the efficacy of S3 strategies.

The number of events organized to engage the public and the **increase in government funding** allocated to S3 projects demonstrate a commitment to involving the broader community and securing financial support for innovation initiatives. Within the strategic framework, monitoring the adoption of new legislation to support S3 implementation and the potential transition from S3 to S4+, including the circular economy, demonstrates adaptability and foresight.

Integral to responsible research and innovation are the incorporation of **ethical considerations** into S3 implementation and the promotion of open access to knowledge and resources. Extra points should be awarded to initiatives that give these principles priority.

During the monitoring phase of S3 in WB countries, it is crucial to follow a comprehensive set of indicators to evaluate progress and impact. These indicators need to be designed to ensure the incorporation of RRI principles throughout the entire S3 strategic planning and implementation process.

4. Specific policy recommendations by country

4.1 Albania

The Government of Albania is expected to approve the national S3 in June 2024. Currently the Working Team is working closely with external and local experts to enhance the findings from the Entrepreneurial Discovery process, while simultaneously articulating a well-structured Action Plan; Policy Mix and set of monitoring indicators. The recommendations for embedding RRI into this strategy are timely in addressing, both, the enhancement of research and innovation (R&I) dimensions of the action plan; as well as in anticipating and factoring in the 'environmental sustainability' dimensions for the mid-term period, looking forward to a S4+ in 2030.

While the priority domains are articulated and cannot be drastically changed, it is recommended that indicators for monitoring and assessing the baseline are articulated **according to the SDGs**, and in line with the **monitoring framework of the Green Agenda** in WB. This ensures both anticipation, as well as coherence at the regional scale.

It is strongly recommended that all proposed actions are accompanied by concerns regarding their environmental impact (either positive or negative) and the mitigation measures. Further **inclusion of civil society** in addressing/consulting these issues (especially environmental civil society organizations (CSOs)



is important to have a multifaceted representation of social innovation, while also reducing the gap of representation of civil society within other QH actors (as was observed during the engineering design process (EDP)).

In regards to the RRI dimensions (and keys), the Strategy needs to delve deeper, by specifically addressing how the action plan is:

- 1) anticipative of future trends, like brain **drain/gain**; **digital literacy**; **needs for specialized education**; EU integration, etc.
- 2) responsive to current challenges (both in STI, but also at the territorial scale): climate change; lacking research infrastructure; unproductive agricultural sector;
- 3) inclusive in terms of **fostering collaborative milieus** among QH stakeholders through **better open networks**; **new knowledge hubs**; **establishment of incubators and support to innovative startups**; but also in terms of catering to the needs of the **most vulnerable** (social inclusion). Citizen Science initiatives may be promoted to foster both knowledge transfer, as well as enhanced scientific products.
- 4) reflexive of all other initiatives in Albania and WB that **support innovation, youth development; entrepreneurship**; etc, by assessing their success (if possible) and capitalizing on current best practices. In any case the digital twins (innovation and green agenda) need to be fully aligned and transparent.

It is highly recommended that the programs / project fiches designed in the action plan are ranked and prioritized based on a multi-criteria assessment, integrating RRI keys (gender-balanced research; open access and data; science education; public engagement; research ethics and governance) and other sustainability- related indicators.

4.2 Bosnia and Herzegovina

Given that the S3 in Bosnia and Herzegovina, and in the Republic of Srpska, is in the design phase, and moving at a slow pace, it is highly recommended for the bodies leading the process to make sure there is **transparency** behind the actions in the EDP. This can be achieved only by timely and actively **engaging the relevant stakeholders across the QH** (and wider than the currently established working group) through an **inclusive and bottom-up process**. In this way, entrepreneurial knowledge and innovative potential can be uncovered, as well as new potential activities and opportunities, particularly for the open science and open innovation application in the implementation phase as well. To ensure the successful implementation of the S3 strategy, an effort should be made to involve all relevant stakeholders and ensure transparency during the design phase. In fact, these stakeholders should be the ones to implement the strategy. To achieve transparency, it is important to educate stakeholders on the entire chain of actions involved in the S3 strategy preparation more effectively and frequently. In fact, these stakeholders should be the ones to implement the strategy. To achieve transparency, it is important to educate stakeholders on the entire chain of actions involved in the S3 strategy preparation more effectively and frequently.



4.3 Montenegro

The S3 strategy of Montenegro adopted in July 2019 is the umbrella strategy in the field of R&I. **Montenegro was the first country outside the EU to adopt the S3 Strategy and ensure the continuous functioning of the Implementation Framework of innovation and smart specialization.** The Council for Innovation and Smart Specialization is a key advisory body of the Government which manages innovation activity through cooperation among state administration bodies, local self-government units, businesses and other entities. The Council enabled the continuation of the EDP process and development of programmes within the S3 policy. The Innovation Fund of Montenegro positioned itself as a central implementation body for key S3 initiatives. Inter-institutional S3 Group and Innovation working groups are an important part of the Implementation Framework of innovation and smart specialization. The total expenditure for the Action Plan implementation of the S3 for the period 2021-2022 was 46 million euros.

Observing the implementation of activities from the perspective of Strategic Goals, the largest part of funds was invested within the framework of Strategic Goal 4: Support for innovative activities in the economic sector 65%, then within Strategic Goal 3: Improvement of cooperation within the system of innovations 25%. The structure of funding sources indicates that the major part of funding came from the national budget (65%), followed by the EU programmes (26%), private sector (6%), and donor programmes (3%). Programme lines designed to support the innovation development are focused at fostering innovation programmes and projects in identified priority areas of Smart Specialization, with a focus on “Energy and Sustainable Environment”, which is relevant from the aspect of implementation of measures set out in the Green Deal, as well as on “Information and Communication Technologies”, as a horizontal priority that supports the digital transition through the different sectors. The work on the interim evaluation of the S3 and the Operational Programme for the period 2019-2022 is underway. In December 2023, Montenegro has fulfilled the criteria from the conditional positive opinion for the S3 and is ready for the final assessment of the European Commission. The preparations for the next programming period (2025-2029) will be further improved, in line with the European Green Deal and Blue Growth. This will pave the way for a sustainable smart specialization, which marks the evolution of policy logic from S3 to S4+. The recommendation is to incorporate Responsible Research and Innovation principles (such as gender-balanced research, open access and data, science education, public engagement, research ethics, and governance) into the new S4 strategy.

4.4 North Macedonia

The Government of the Republic of North Macedonia on December 12, 2023, adopted the ["Smart Specialization Strategy of the Republic of North Macedonia 2024-2027"](#) and ["Action Plan 2024-2025"](#). It can be noticed that some of the RRI principles are already incorporated in the list of main S3 objectives: (1) Creating foundations for **scientific excellence**; (2) **Improving the innovation ecosystem**; (3) Improving the competitiveness and **environmental sustainability** of the business sector; (4) **Development of human capital and skills for innovation, green and digital transformation**; (5) Digital transformation of the economy and society; and (6) As a cross-functional objective: **Ensuring continuous dialogue** for smart specialization and good governance.



It is important that S3 is fully incorporated in the country's umbrella strategy - [National Development Strategy 2042-2044](#), where within the first pillar Sustainable, Innovative and Competitive Economy all activities related to S3 are prioritized.

4.5 Serbia

In Serbia, where the **Smart Specialization Strategy (4S)** was officially adopted in 2020, **significant strides have been made towards innovation and smart specialization**. With the implementation of the second Action Plan 2023-2025, it has become increasingly important to sustain and further develop the momentum gained. A critical recommendation for Serbia is the ongoing emphasis on the EDP. The said process, as a vital tool for stakeholder engagement, ensures that all relevant stakeholders remain integrally involved in the implementation of the Strategy and are responsive to necessary adaptations and refinements. EDP is key to identifying emerging opportunities, aligning with evolving market trends, and ensuring that the strategy remains dynamic and reflective of the current economic and technological landscape. Beyond the EDP, it is also recommended that Serbia focuses on enhancing inter-sectoral collaboration and fostering synergies between academia, industry, and government. This can be achieved through targeted initiatives such as innovation hubs or collaborative research programs, which would serve as platforms for knowledge exchange and joint development of new technologies.

Serbia should prioritize the **integration of digital transformation and green technologies within its 4S framework**. This aligns with global trends and EU directives, positioning Serbia at the forefront of sustainable and digital innovation. Encouraging investments in these areas, such as the recent BIO4 Campus initiative, along with supporting education and skill development related to these sectors, will be crucial for future-proofing Serbia's economy.

Also, to ensure the effectiveness and relevance of the 4S, Serbia should establish robust monitoring and evaluation mechanisms. These mechanisms should not only track the progress of various initiatives but also assess their impact on economic growth, job creation, and overall societal well being. Regular assessments and feedback loops will enable timely adjustments to the strategy, ensuring its alignment with national goals and international best practices. In summary, the continued focus on the Entrepreneurial Discovery Process in Serbia, coupled with enhanced cross-sector collaboration, a commitment to digital and green transformation, and robust monitoring and evaluation, are key to realizing the full potential of its Smart Specialization Strategy.



5. Conclusions and Policy Recommendations

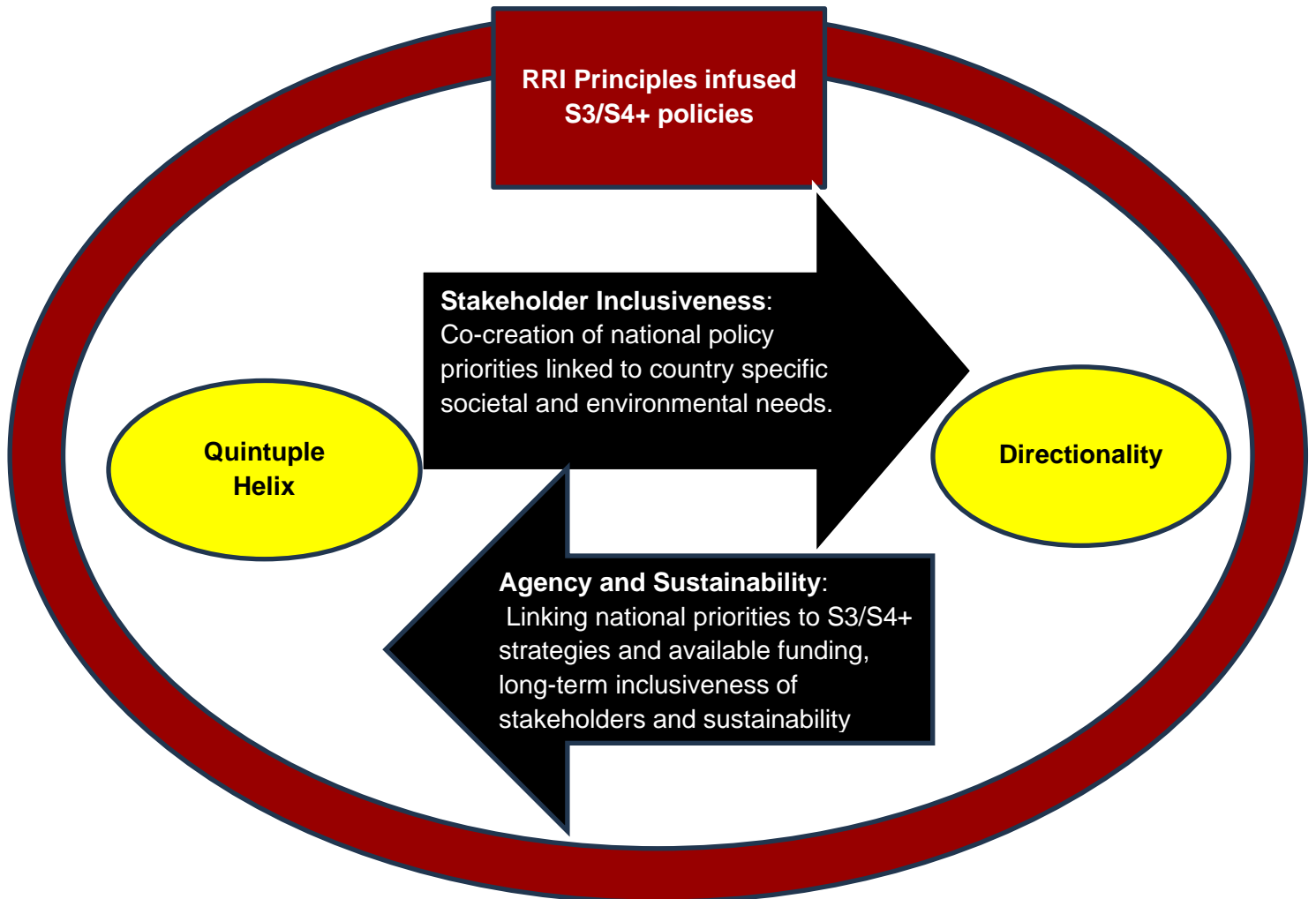
5.1 Conclusions

Although S3 strategies have been an *ex-ante* conditionality for EU member states only, they attracted a lot of attention in the WB where their value and usefulness were recognised as a vehicle for both strengthening national and regional economies, as well as enhancing their EU candidate membership status. The results of the WBC-RRI.net project highlight two overarching themes, which are central to the future vision of S3/S4+ policies in the region, applying a QH framework when engaging with stakeholders and utilizing directionality when in policy design and implementation. The two themes are inexplicably intertwined highlighting the WBC's agency process, societal and environmental inclusiveness and future-oriented sustainability in all phases of policy making, i.e. design, implementations and monitoring/evaluation. They are also relevant for any future attempt of the WB countries to elaborate and implement a regional approach to innovation strategy, like the currently implemented initiative "Partnerships for Regional Innovation" or any future analogous effort.

Despite the widespread importance placed on adopting S3/S4+ strategies in the Western Balkan region, most economies are not in the implementation phase yet, and the few that have reached this stage, are faced with issues in realizing these policies. This phenomenon indicates that there are gaps in both the design and implementation phases of policy production. The adoption of an RRI principles methodology for QH involvement, strengthens inclusiveness and agency by creating synergies among various stakeholders and thus reflecting the specific needs of the national economies. Furthermore, it facilitates long-term stakeholder engagement via co-creation of policy focus and thus sustainability. Likewise, directionality based on stakeholders' needs and national priorities while driven by RRI principles, provides thematic focus for both policy design and implementation, such as co-design of policies or alignment of country specific access to structural funds with national investments and priorities, a strategy followed by many EU member states which ensures a more improved implementation and sustainability.



Diagram 1: Interrelation and mutual reciprocity in designing, implementing and monitoring RRI principles infused S3/S4+ policies in the WB



5.2 Policy Recommendations for future design and implementation⁴

Recommendations in relation to improving the future design and implementation of RRI infused S3/S4+ policies strongly informed by the QH framework and directionality include the following:

- Encourage strong collaboration between academia and industry on both national and regional level and create curricula by taking into consideration S3/S4+ priorities.

⁴ The recommendations are based on a multi-stakeholder workshop entitled 'Workshop for policy paper in relation to regional innovation systems and S3', conducted during the closing WBC-RRI.net conference in Skopje, North Macedonia on February 8th, 2024, where the future vision of S3/S4+ strategies in the WB was discussed.

- Adapt S3/S4+ strategies to local national strengths to reinforce thematic prioritization and directionality.
- Ensure that the bodies responsible for S3/S4+ strategies, from design to implementation and monitoring, work transparently by engaging all QH stakeholders in dialogue.
- Use co-creation methods when engaging with QH stakeholders to boost participatory practices at the early stages of innovation, action research or impact driven research promotion practices.
- Work with R&I funding organizations to develop a framework for embedding RRI in the selection and monitoring of funding for R&I projects.
- Coordinate strategies at the regional level, including implementation and monitoring.
- Consider the WB as part of the economies of the Danube region, the Mediterranean region and/or the Adriatic region when developing S3/S4+ strategies, not only as a region within itself. Encourage cross-border collaboration within the 2 Macro-regions that the WB belong to (Danube-EUSDR and Adriatic/Ionian- EUSAIR) by common funding initiatives, joint capacity building and cross border investment.



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