Enhancing the sustainable development component in the Action Plan of the STI for SDGs Roadmap in Serbia

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Abstract

Serbia is one of the first countries that joined the Global Pilot Programme on STI for SDGs Roadmaps. Supported in this process by the Joint Research Centre (JRC) of the European Commission and UNIDO, the country developed its roadmap using smart specialisation approach. This policy brief provides an overview of the process and methodology adopted by Serbia to embed the Sustainable Development Goals into its Smart Specialisation Strategy. Additionally, it provides examples of research and innovation projects that were funded and implemented in line with national SDGs priorities. Finally, this brief provides recommendations to further strengthen the sustainability component into stakeholders' dialogue process and preparation of the new action plan.

Background

Serbia is the first country that successfully adopted the Science, Technology and Innovation (STI) for Sustainable Development Goals (SDGs) Roadmap based on the smart specialization approach as a part of the Global Pilot Programme on STI for SDGs Roadmaps, supported by the Joint Research Centre (JRC) of the European Commission and UNIDO.

Starting in 2017, Serbia launched the Smart Specialisation process, coordinated by an Interministerial working group for the development of the Research and Innovation Strategy for Smart Specialisation established by the Ministry of Education, Science and Technological Development (European Commission, 2022).

Consequently, Serbia entered the UN Global Pilot Programme on STI for SDGs Roadmaps in the first group of pilot countries. Supported by IRC and UNIDO, Serbia committed to include sustainable development aspects into the Smart Specialisation Strategy of the Republic of Serbia for the period 2020–2027 (hereinafter: Serbia's Smart Specialisation Strategy - 4S) that was adopted in 2020. In 2021, the Action Plan for the period 2021–2022 for the implementation of the Smart Specialisation Strategy (hereinafter: Action Plan) designed as the STI for SDGs Roadmap, was developed and adopted (European Commission et al., 2021). Being successfully designed and implemented, the Roadmap itself and Serbia's experience can be effectively used as an example of best practice in the development of STI roadmaps for sustainable development and was included into the "Guidebook for the Preparation of Science, Technology and Innovation (STI) for SDGs

Roadmap" (the Guidebook) (UN-IATT and EC/JRC, 2021).

Within the framework of the Global Pilot Programme, Serbia participated in the development of a pilot methodology for mapping Sustainable Development Goals in the context of Smart Specialisation Strategies, the result of this process was embedded in the current Action Plan. Serbia is currently updating the Action Plan and plans to further strengthen the SDGs component.

In this policy brief, the key stages and components of the roadmap development SDGs implementation will be analyzed. An overview of the approach used to link STI priority areas to SDGs challenges in the Action plan will be given, as well as the approach used for stakeholders' involvement in collaborative decision-making, and the action plan implementation. Finally, the policy brief will provide recommendations on a possible approach to further integrate the SDGs into Entrepreneurial Discovery Process¹ and the Action plan's monitoring system. This brief could be used by policymakers around the globe, interested in the development of the STI for SDGs Roadmap, as a practical example of STI for SDGs Roadmap development based on the smart specialization approach.

Approach and methods

In this brief, we analyse the development of <u>Serbian STI</u> <u>for SDGs Roadmap</u> based on the Guidebook for the preparation of STI for SDGs roadmaps and the JRC methodological framework for smart specialisation for

an inclusive and evidence-based process driven by actors' engagement and attention to market dynamics.

¹ In Smart Specialisation methodology, it is the stakeholders' dialogue phase during which investments are prioritised based on

SDGs ². In addition, the work draws from the <u>Pilot</u> methodology for mapping Sustainable Development Goals in the context of Smart Specialisation Strategies developed for Serbia and it is based on the analysis of the Action plan's implementation, including horizontal activities and key vertical projects to support concrete priority areas. The relevant information was obtained through expert interviews and fieldwork with the stakeholders working on the STI for SDGs Roadmap in Serbia.

Elaboration of the Serbia's Smart Specialization Strategy and the action plan

In 2018, JRC started methodological reflection on development of the STI for SDGs Roadmaps based on the integration of the SDGs in Smart Specialisation Strategies, widely adopted and implemented in the EU member states and regions, as well as in enlargement and neighborhood countries and economies (European Commission et al., 2021).

According to this approach, Serbia's pilot mapping of the SDGs in the context of Smart Specialisation Strategy included:

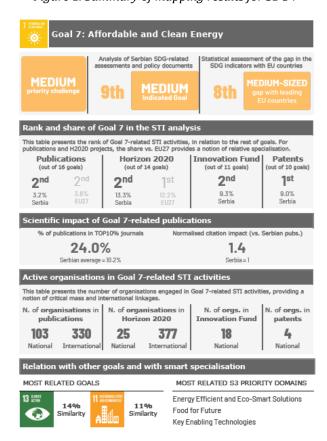
- Analysis of existing policy mandates based on the analysis of the national SDG framework. The analysis takes into account the main challenges indicated in official documents on SDGs
- Statistical analysis of sustainability challenges: a statistical assessment based on data available for the SDGs' indicators at goal and target leve
- stakeholder and an expertvalidation of the SDGs' challenges,
- scientometric identification of the STI potential,
- identification of the national STI capacity gaps and partnerships.

The work on the Strategy and Action plan's development included creation of the unique policy framework on the crossing of the STI, SDGs and smart specialisation policies, analysis of economic, innovative, technological and scientific potential to address the SDGs with further selection of priorities and corresponding policy measures, monitoring and financial framework and organizational framework for implementation. The complex and holistic nature of the mapping allowed carrying out quite extensively the elaboration of the existing SDGs challenges in the

context of the priorities identified in Serbia's Smart Specialisation Strategy. The analysis resulted in the meaningful inclusion of sustainability dimension in the Action plan and a summary of the potential impact of the Smart Specialisation on the selected SDGs.

The mapping of the scientific, innovative and technological potential in SDGs context (Fig 1) allowed the identification of stakeholders and their networks that could be mobilized to address these challenges (Fig. 3) and development of mechanisms analyzing how Smart Specialisation priority domains could contribute to the SDGs.

Figure 1. Summary of mapping results for SDG 7



The results of the mapping included in the Action Plan give an overview of the preliminary impact analysis of Serbia's smart specialization strategy (Fig. 2).

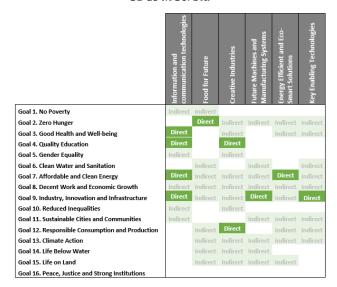
As can be seen in Figure 2, 5 priorities were defined in Serbia's Smart Specialisation Strategy - 4 of them vertical:

- Information and communication technologies (ICT),
- Food for Future,

Development Goals via Smart Specialisation. Towards a theoretical and conceptual framework; Smart Specialisation, Sustainable Development Goals and Environmental Commons

² See methodological background here: <u>Overview of the existing STI for SDGs roadmapping methodologies - Background paper Progress Report of the Global Pilot Programme on STI for SDGs Roadmaps</u>; <u>Addressing sustainability challenges and Sustainable</u>

Figure 2. Summary of the potential impact of the priority areas of the Strategy to the main challenges resulting from SDGs in Serbia



Source: European Commission et al., 2021

- Machines and Manufacturing Systems and
- Creative industries,

as well as one horizontal priority: Key Enabling Technologies (KET). These priorities were analyzed in accordance with their direct and indirect impact on the SDGs, as an integral part of the Action Plan. To further strengthen the sustainability component of the Action plan, the Government of Serbia together with JRC and UNIDO are working on a pilot approach for the integration of SDGs into the entire Entrepreneurial Discovery Process (EDP), including the mobilization of stakeholders key for specific SDGs and in the EDP's institutional set-up (described in detail in the next paragraph of this policy brief).

Stakeholders' involvement in collaborative decision-making

Stakeholders' involvement plays a key role in the effective implementation of the 2030 Agenda for Sustainable Development. According to the "Stakeholder Engagement and the 2030 Agenda: A Practical Guide" Developed by UN DESA and UNITAR, it is important to ensure involvement of the representation of the local Major Groups and other Stakeholders (MGoS) that took an active part in the development and adoption of the 2030 Agenda (United Nations, 2020).

In consonance with the JRC's smart specialisation approach, the EDP took place as the next stage of the strategy and action plan development, following the pilot mapping. The EDP allowed the dedicated Interministerial working group to specify the strategical priority areas through the inclusive evidence-based process based on the stakeholders' engagement.

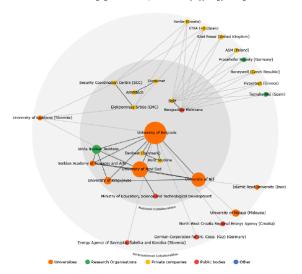
During the design phase of Serbia's Action plan, EDP included 178 conducted interviews and 17 EDP workshops with the total amount of 550 workshop participants. Stakeholders in this bottom-up consultative EDP process were distributed among the quadruple helix model in the following relation business sector (57%), government institutions (10%), academia (21%) and civil society (12%). According to pilot mapping methodology. work stakeholders in Serbia was additionally focused on the identification of STI collaboration networks on the national and international level, which could be helpful for addressing the SDGs challenges of Serbia (Fig. 3).

Figure 3. Example of the STI collaboration network for Goal 7 identified during the mapping process



SDG-oriented STI collaboration networks

The following schema presents the collaboration network of the top 15 national and top 15 international actors engaged in Goal 7, classified by typology of organisation.



The continuous nature of the EDP implies that stakeholders are continually involved in revising the priority areas, rethinking, and updating the policy instruments for implementing the strategy, and its governance and monitoring mechanisms. In this context, the revision and development of the new Action plan, planned by the Serbian government for the end of 2022, is seen as an integral component of the continuous EDP.

The pilot mapping of the STI for SDGs methodology allows elaboration on the Strategy and its priorities in terms of the specified challenges resulting from the SDGs, followed by the definition of additional policy instruments and indicators, contributing to the SDGs achievement. Recommendations on further blending of the SDGs in the next version of the Action plan's monitoring system as a part of the continues EDP is given in more details in the recommendations as part of this policy brief.

Action plan implementation

The implementation of measures and activities of the Action Plan is key to the successful achievement of Serbian Smart Specialization's Strategy goals in the SDGs context and follow up the pilot activities on mapping and stakeholders' engagement.

The first Serbia Smart Specialisation Strategy's Action Plan has been developed for the period 2021–2022. To support the continuity, the revision of the goals and identified policy measures, which is already planned in the form of a new Action plan in continuous dialogue with all stakeholders, implementing the measures and projects.

From an execution perspective, Serbia's Action plan is setting the framework and targets for the Smart Specialisation Strategy's implementation following the logic of intervention divided in 3 levels. The Priority areas define 4 vertical and 2 horizontal priority domains for public investment in research and innovation. This level is accompanied by the strategic goal and corresponding monitoring indicators. The Policy measures level includes a set of concrete policy measures, activities and corresponding output indicators for each of the specific objectives (Fig.2).

The intervention logic described above is accompanied by the policy mix – a set of public policy instruments that will implement the strategic goal and objectives of the Roadmap and which includes dedicated budgetary measures. Most of the funding for the implementation of the Action plan comes from national public funds and partly from international organizations. In total there is about 151 million euro allocated for the period 2020 – 2022. More than 110 million euro already have been invested to support the policy measures planned in the Action plan. Preliminary analysis has shown that the policy measures implemented under the Action Plan in 2020-2022 are mostly supply-side, relating to financial, technological, human resources and infrastructure

Figure 1. Intervention logic of the Action plan for the Serbia's Smart Specialisation Strategy



support to the business and R&D to stimulate research and innovation activities on the business side, mostly through the direct financing of R&D costs of the enterprises. In line with this, the key institution for the implementation of the Action plan is the Innovation Fund of the Republic of Serbia (IF). The flagship programmes of the IF in terms of the Action plan implementation are the following:

- Collaborative Grant Scheme Programme, designed to incentivize private sector companies and public sector R&D organizations, to engage in joint R&D projects with the goal of creating new products and services, as well as innovative technologies with significant future impact in 4S areas.
- Matching Grants Programme, developed for enterprises in all Strategy's priority areas, looking for significant financial resources for the commercialization of research and development, stimulating the knowledge-based development of innovative enterprises and encouraging the establishment of partnerships with international partners.
- Mini Grants Programme, aimed at private young enterprises in 4S areas, which are engaged in the development of technological innovations, and designed to support the Serbian entrepreneurs to grow effective business capacities through which they will launch their innovations on the market.

 4S Voucher Programme, aiming to financially stimulate SMEs in all Strategy's priority areas to collaborate with R&D institutions, thereby engaging SMEs in innovation activities and making their products more competitive on the market.

All the programs described above were mainly targeting all priority areas horizontally. Taking into account that Serbia's Smart Specialisation Strategy defines 4 vertical priorities - ICT, Food for Future, Machines and Manufacturing Systems and Creative industries, as well as one horizontal priority - KET, some additional vertical instruments were also put in place in terms of the Action plan implementation.

With regards to priority areas, particular support was provided within the Food for Future and ICT priority areas with the following flagship programmes for Food for Future priority:

- Investments in physical assets of agricultural holdings, aiming to increase productivity and competitiveness of the agri-food sector through technological improvement. By supporting new mechanization and new technology, the programme also contributes to the mitigation of the climate change impact on the agriculture sector in Serbia.
- Investments in physical assets related to processing and marketing of agricultural and fishery products, that supports the food processing industry and associated marketing in Serbia in the modernization of technology, enrichment of assortment of products. strengthening market of chains and improvement of production efficiency and product quality.
- Diversification of agricultural holdings and business development aims at improving job opportunities in rural areas by addressing the major sustainable development social problems of rural areas lack of job opportunities, high dependency on agriculture and decreasing quality and accessibility of basic services and infrastructure, via providing investment support the expansion of economic activities in the country in the field of rural tourism.

Within the ICT priority area, the Programme for the development of projects in the field of artificial intelligence could be highlighted. The program aims to encourage excellence and relevance of scientific research in the field of artificial intelligence and to encourage the application of the results in the development of the Serbian economy.

Among the activities supported by the Innovation Fund as a part of the Action plan implementation, several flagship projects can be singled out. Especially noteworthy are those in which the integration of the sustainable development component is combined with cross-sectoral support for several strategy priorities at once. For the ICT and Energy efficiency priorities, the Smarticity - Energy management platform based on Artificial Intelligence project, aiming to completely automate the finding of optimal patterns in energy production connected consumption and renewable energy sources and energy storage capabilities, is supported by the Innovation Fund in the total amount of about EUR 294.000,00 and is implemented in cooperation of University of Kragujevac and Noleko company. Another flagship project "Increased sustainability of plant protection by innovative approaches in Bacillus-based biological plant disease and pest control" between the University of Novi Sad and Bacillomix company has Innovation Fund participation for about EUR 272.000,00 and is connected with the Food For Future and ICT priority areas. Among other multi-priority and sustainable projects, it is important to mention the projects Navsteer, with an autonomous and easy to install autopilot system with cloud data analytics for farmers, Strawberry Smart Board, moving beyond traditional outdoor sitting infrastructure via creating sustainable digital furniture, including about EUR 300.000,00 and 294.000,00 investments respectively.

As the pandemic approached, Serbia used the STI roadmap and funding to tackle the health crisis. The "Special research program on COVID-19" to contribute to an effective STI response to the COVID-19 pandemic was launched in the Science Fund of the Republic of Serbia. This program is supporting applied scientific research and creation of the interdisciplinary and multidisciplinary projects. In the frame of the program, 14 projects were supported in total. In the period 2020-2022, 2 million euros budget for approved and implemented projects was allocated by a World Bank loan through the Serbia Accelerating Innovation and Growth Entrepreneurship Project.

Despite a large amount of horizontal and vertical instruments in the developed policy mix of the Action plan, the limited amount of funds remains a key challenge for the wider implementation of the STI for SDGs Roadmap in Serbia. In addition, there is the need to create mechanisms for deeper integration of the SDGs into all policy tools of the new action plan, which will be described in more detail in the final part of this policy brief.

Being strongly committed to the SDGs achievement, Serbia has become the first country, developing the STI for SDGs Roadmap based on the Smart specialisation approach while participating in the United Nation's Global Pilot Programme on STI for SDGs Roadmap. The methodological and policymaking efforts on Smart Specialisation for sustainable development resulted with inclusion of the SDGs component in the Serbia's Smart Specialisation Strategy and development of the STI for SDGs Roadmap in the form of Strategy's Action plan. In addition, it resulted in the development of the pilot methodology that could be used by policymakers in other countries interested to develop STI for SDGs roadmaps based on smart specialisation approach.

The methodology for mapping Sustainable Development Goals (SDGs) in the context of Smart Specialization Strategies piloted in Serbia, allows identifying priorities to achieve the Agenda 2030 and defining the key challenges connected with the SDGs priorities in the country. In addition, the methodology performs the mapping of the STI potential in the SDGs context, including identification of stakeholders that could be mobilized to address these challenges and mechanisms to identify how Smart Specialisation priority domains could contribute to the achievement of SDGs. As a result of the implementation of this approach in Serbia, key challenges associated with SDGs were identified and an analysis of the potential impact of Smart Specialization Strategy priorities on these challenges was made, including the identification of the SDGs that are directly and indirectly connected with the priorities.

Implementation approach and policy measures included in the Serbia's Action Plan have mostly supply-side nature, stimulating research and innovation activities on the business side by focusing the financial, technological, human resources and infrastructure support to the business and R&D to support Serbia's sustainable and innovative development and the achievement of the SDGs.

The key institution for the implementation of the Action plan is the Innovation Fund of the Republic of Serbia. Among the flagship projects of the Fund, putting in place cross-sectoral support for several Smart Specialization Strategy priorities, the following project can be highlighted:

- the Smarticity, energy management platform based on the Artificial Intelligence project for the ICT and Energy efficiency priorities,
- "Increased sustainability of plant protection by innovative approaches in Bacillus-based biological plant disease and pest control"

- contributing to both the Food For Future and ICT priority areas,
- Navsteer, with an autonomous and easy to install autopilot system with cloud data analytics for farmers supporting Future Machines, Food for Future and ICT, and
- Strawberry Smart Board, creating sustainable digital furniture for outdoor infrastructure in the energy efficiency priority domain, with almost 300 thousand euro investments of the Innovation Fund for each project.

Serbia has also used STI funding to tackle the global pandemic and the resulting health crisis. The Science Fund of the Republic of Serbia has launched the "Special research program on COVID-19" to contribute to an effective STI response to the COVID-19 pandemic. This program is supporting applied scientific research and creation of the interdisciplinary and multidisciplinary projects. In total, 14 projects were supported, and all projects are being implemented in the period 2020-2022 with the budget for approved projects in the amount of 2 million euros, financed by a World Bank loan through the Serbia Accelerating Innovation and Growth Entrepreneurship Project.

This policy brief has summarized Serbia's current pilot methodology and approach in development and implementation of the STI for SDGs Roadmap in the form of the Serbia Smart Specialisation Strategy's Action plan. It summarized how the Serbian experience could be used by other counties willing to develop STI for SDG roadmaps.

This process could be done by identifying:

- current national priorities to achieve the Agenda 2030,
- challenges resulting from SDG goals and targets
- areas of specialisation and excellence of the countries STI ecosystem that can be mobilised to respond to the challenges resulting from the SDGs.
- key knowledge gaps between the identified SDGs challenges and STI potentials
- international stakeholders' STI collaboration networks and partnerships and matching the identified knowledge gaps and potentials,
- determining to which extent the identified challenges, potentials and knowledge gaps relate to Smart Specialisation priority domains.

Based on the analysis of Serbia's Action Plan and the pilot SDGs' mapping methodology, it is recommended to further strengthening the SDGs components in the STI for SDGs Roadmaps through the EDP process while working on the new Action plan in 2022.

Considering that in the pilot methodology the mapping of the SDGs was realized only at the level of Serbia Smart Specialisation Strategy's priorities, in the new Action plan foreseen by end of 2022, a deeper integration of the SDGs' component at goal and objectives level, as well as in specific measures of the Action Plan is recommended. It could be practically implemented via stronger integration of the SDG components into the EDP workshops, improvement of the stakeholders' interaction approach and the Action plan's monitoring system.

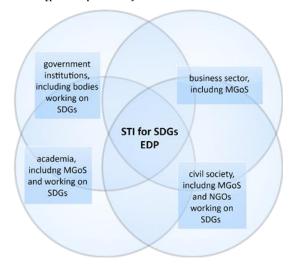
Thus, the following methodological and policymaking steps are recommended:

1. Advancement of the SDGs Stakeholders' involvement in collaborative decision-making

Stakeholders should be involved throughout the policy cycle. In particular, it is recommended to use the stakeholder dialogue to build consensus and sequentially embed logical connections between the relevant SDGs, Smart Specialization Strategy's priorities, goals and specific objectives of the plan, as well as the deployment of dedicated measures related to the implementation of SDGs challenges.

Following the recommendation that iterative SDGs' integration processes could be carried out as part of regular workshops planned for the development of a new Action plan, it is important to ensure the integration of the additional stakeholders described below. Based on the UN DESA and UNITAR "Stakeholder Engagement and the 2030 Agenda: A Practical Guide", it is recommended to identify and ensure the involvement of the representation of the local Major Groups and other Stakeholders (MGoS) (United Nations, 2020), that took an active part in the development and adoption of the 2030 Agenda in Serbia during the revision and development of the new Action plan. In practice, in the planning and design stages for the new circle of EDP workshops, it is advised to ensure that stakeholders' groups with the representative of the SDGs related MGoS groups, as well as governmental bodies and civil **SDGs** society representatives working on implementation and monitoring in Serbia, are integrated into the existing quadruple helix model (Fig. 3).

Figure 5. Proposed stakeholders map for EDP in Serbia with enhanced [participation of the SDGs related stakeholders.



Such activities would require further raising of the stakeholders' awareness.

2. Further integration of SDGs at all levels of the Action plan

It is important that SDGs are reflected not only at the diagnostic or vision-setting stage, but also during implementation and monitoring stages. It means that the specific policy instruments, financing streams and monitoring indicators should have a clear link to priority SDGs. The synergies and trade-offs between the SDGs and Strategy's priorities should also be clearly defined.

The policy mix can include SDGs calls, targeted programmes or other fiscal or non-fiscal tools.

3. Strengthen the SDGs component in the Action plan's monitoring system

Work on further integration of the SDGs component on the levels of goals and objectives requires the development and improvement of the monitoring indicators, included in the Action plan on these levels, defined during the EDP workshops.

Depending on the level and type of indicators, it is proposed to revise and supplement the existing pool of indicators in the context of the existing SDGs' targets. SGs in Serbia have sufficiently developed and described targets for monitoring that are recommended

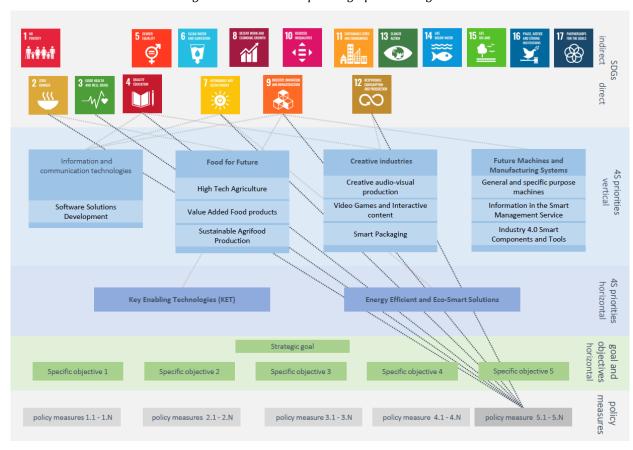


Figure 6. EDP workshop's design process diagram

to include in the monitoring system via developing additional indicators based on the SDGs' targets. For example, for output indicators, additional monitoring of the number of SDGs related projects and applications implemented could be integrated into the Action plan.

The pilot methodology described in this policy brief can be used by countries and regions willing to improve their existing smart specialisation strategies to achieve SDGs, as well as by those interested to start developing STI for SDGs Roadmaps based on smart specialisation approach.

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