Fellowship Report

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Bridging the Research and Innovation Gap: Lessons from Serbia for the Republic of Srpska[1]

Introduction: The Innovation Imperative in the Western Balkans

The Western Balkans region stands at a critical juncture in its development trajectory, where the strength of research and innovation ecosystems will increasingly determine economic competitiveness and social progress. Within this context, Serbia has emerged as a regional leader in building research infrastructure and fostering industry-academia collaboration. At the same time, the Republic of Srpska (RS), despite sharing cultural and linguistic ties, faces systemic challenges in developing comparable capacities. This extended analysis examines the structural foundations, policy frameworks, and practical implementations that differentiate these two systems, while identifying transferable lessons that could accelerate research and innovation in both entities.

Figure 1: POLICY ANSWERS fellow Dragan Dragomirović (UNIBL) with mentor Sanja Popović Pantić (IMP)

[1] The article is the result of a study visit by D. Dragomirović from the University of Banja Luka to the partner organization "Mihalo Pupin" Institute in Belgrade, in December 2024, as part of the POLICY ANSWERS project. Responsibility for the content, the views, interpretations and conditions expressed herein rests solely with the author and can in no way be taken to reflect the views of the WB Info Hub or its participants, partners, donors or the European Union.

Part I: Research Infrastructure Foundations

1.1 Institutional Landscapes and Human Capital

Serbia's research ecosystem demonstrates remarkable institutional density and diversity. The country hosts 459 research and development organizations employing over 27,000 professionals, supported by a comprehensive network of 130 faculties, 66 research institutes, and 8 institutes under the Serbian Academy of Sciences and Arts (SANU). This institutional richness is further amplified by four Science and Technology Parks (Belgrade, Novi Sad, Niš, and Čačak), with a fifth one underway in Kruševac, plus over 20 regional innovation centers. The system's digital infrastructure is particularly noteworthy, featuring two sophisticated online registries - eInovacije (innovation system registry) and eNauka (researcher and organization database) - that enhance transparency and connectivity across the innovation value chain.

In stark contrast, the Republic of Srpska's research infrastructure remains embryonic. The majority of research activities are concentrated within its two public universities (University of Banja Luka and University of East Sarajevo) and their approximately 30 constituent faculties. The absence of independent research institutes of scale and the underdevelopment of digital research infrastructure (the former SARNET academic network was dissolved in 2019) significantly constrain the entity's research capacity. While plans exist to establish the first Science and Technology Park in Banja Luka with UNDP support, current research support systems remain fragmented and under-resourced.

The human capital dimension reveals even starker disparities. Serbia's higher education system serves nearly 250,000 students, supported by over 16,800 faculty members, while RS's universities enroll about 26,700 students, supported by over 2,000 faculty members – an 8 to 9-fold difference that inevitably impacts the talent pipeline for research and innovation. This educational asymmetry is compounded by Serbia's ability to attract and retain researchers through more stable institutional funding and competitive grant mechanisms.

1.2 Governance and Policy Frameworks

The governance structures for research and innovation in these two entities reflect fundamentally different approaches and levels of development. Serbia has established a bifurcated but coordinated system where the Ministry of Science, Technological Development and Innovation oversees research and innovation policy, while the Ministry of Education handles higher education. This separation allows for specialized focus, supported by four key legislative instruments: The Law on Science and Research, The Science Fund Law, The Innovation Activity Law, and The Higher Education Law.

The Republic of Srpska employs a consolidated model where the Ministry of Scientific and Technological Development and Higher Education assumes responsibility for both research and higher education. While this could theoretically enable better coordination, in practice, it has led to the dominance of higher education priorities over research needs. The entity operates with just two primary laws: The Law on Scientific Research and Technological Development and The Higher Education Law, creating a less nuanced regulatory environment for research and innovation.

A critical differentiator is Serbia's adoption of a Smart Specialization Strategy (S3) for 2020-2027, which provides a coherent framework for prioritizing research areas with competitive advantages. The Republic of Srpska lacks such a strategy, though development efforts at the Bosnia and Herzegovina state level are underway. This strategic planning gap leaves RS without clear direction in allocating its limited research resources.

Part II: Financial and Support Systems

2.1 Funding Landscapes

The financial commitment to research and innovation reveals perhaps the most dramatic divergence between the two systems. Serbia allocated more than €300 million to its Ministry of Science in 2024, representing a substantial investment in research infrastructure, competitive grants, and institutional support. This funding sustains three specialized mechanisms: The Science Fund (established in 2019 with World Bank support through the SAIGE project), the Innovation Fund (2010), and the Young Talents Fund for scholarships (2008).

The Republic of Srpska's 2024 science budget of €68.4 million appears modest by comparison, but the reality is more concerning - over 95% of these funds are absorbed by higher education salaries, leaving less than €3.5 million for actual research activities. The entity's entire R&D allocation for 2023-24 amounted to just €15 million, with no dedicated innovation fund comparable to Serbia's mechanisms. The only significant research-focused financial instrument is the "Dr. Milan Jelić" Fund.

This funding disparity manifests in physical infrastructure. While Serbia has developed multiple modern research facilities through its STPs and university partnerships, RS researchers often work with outdated equipment in inadequate spaces. The STP in Banja Luka, established in June 2024, represents a potential turning point, but its impact will depend on sustained investment and proper integration with the broader innovation system.

A milestone in the development of research infrastructure in Serbia is the new Law on Research and Innovation adopted in 2019. One of the key people who worked on the adoption of this law is the then Deputy Minister in the Government of the Republic of Serbia, Saša Lazović, Scientific Advisor and Deputy of the Institute of Physics of the University of Belgrade. (These experiences are synthesized in the book Lazović et.al, Nauka i inovacije u Srbiji, 2024)

Figure 2: Saša Lazović is a Research Professor and Deputy Director for Innovation at the Institute of Physics Belgrade

Lazović believes that the formula for success in the new model lies in the mechanisms of financing "science" in Serbia in 2 or 3 ways: institutional (stability), project (competitiveness), and combined

financing of science. According to Lazović, researchers and decision-makers in Serbia are ready for stronger support and cooperation with colleagues from Republika Srpska. He is convinced that his own experiences can be used for the development of the research infrastructure of the Republic of Srpska. The Republic of Srpska can learn rapidly from Serbia's reforms, says Saša Lazović, emphasizing institutional funding stability, competitive grants, and combined financing models as key drivers.

2.2 Intellectual Property and Commercialization

An important segment in the field of Research and Innovation is also the issue of Intellectual Property Rights. Assistant Director in charge of the Patent Sector of the Intellectual Property Office of the Republic of Serbia, Aleksandra Mihailović, states that some of the most significant developments are defined by the 2019 law. Among other things, Mihailović says that Serbia's 2019 legislative reforms introduced transformative changes to intellectual property management, particularly regarding inventions arising from publicly funded research. The law mandates that 50% of profits from such inventions go to the inventors themselves, creating powerful incentives for commercialization. According to Mihailović, the Intellectual Property Office of Serbia, celebrating its centenary in 2020, provides robust support through training programs, patent databases, and fee waivers for public research institutions. Its integration with the Espacenet patent data base and membership in the European Patent Organization (EPO) and the World Intellectual Property Organization (WIPO) give Serbian researchers access to global knowledge networks.

Figure 3: Aleksandra Mihailović, Assistant Director in charge of the Patent Sector of the Intellectual Property Office of the Republic of Serbia

In addition to all that, Mihailović says that the Intellectual Property Office of Serbia has very good cooperation with colleagues from Republika Srpska, that is, Bosnia and Herzegovina, and that the challenges they face are very similar and demanding. The comparisons lead us to the conclusion that the Republic of Srpska lacks comparable IP infrastructure and support systems. While the entity technically shares Bosnia and Herzegovina's IP framework, implementation remains inconsistent, and awareness of IP rights among researchers is limited. This creates uncertainty that discourages both innovation and potential industry partners. The absence of clear, attractive commercialization pathways represents a major barrier to transforming research into economic value.

Part III: Industry-Academia Collaboration

3.1 Serbia's Evolving Ecosystem

Serbia's progress in bridging the academia-industry divide offers instructive examples. The establishment of Science Technology Parks has created physical and institutional spaces for collaboration, with Belgrade STP serving as a notable success in startup incubation.

Miloš Milošević, PhD, Head of the Center for Rapid Prototyping in the Innovation Center of the Faculty of Mechanical Engineering in Belgrade, emphasizes the role of international networks like the Enterprise Europe Network (EEN) in building these connections. Milošević notes that participation in EU projects forced academics to develop language and processes that industry understands. We stopped being an isolated academic island, he says. Milošević also notes that the Innovation Center of the Faculty of Mechanical Engineering exemplifies how academic units can directly support industry through services like rapid prototyping and innovation management consulting. Milošević concludes that the heart of Serbia's success lies in its pragmatic partnerships between universities and businesses. Take the STP in Belgrade, which helps firms commercialize research through EU-funded programs. A decade ago, universities and companies spoke different languages, Milošević added, now, STPs serve as translators.

Figure 4: Miloš Milošević, Head of the Center for Rapid Prototyping in the Innovation Center of the Faculty of Mechanical Engineering in Belgrade

3.2 Republic of Srpska's Collaboration Challenges

The Republic of Srpska faces systemic barriers to effective industry-academia collaboration. Without functional STPs or innovation intermediaries, connections depend heavily on personal relationships rather than institutional channels. The Banja Luka STP could address this gap, but its success will require careful design to avoid becoming just another real estate project rather than a true innovation hub.

Current collaborations tend to be small-scale and project-based, often dependent on international donor funding rather than sustainable business models. The absence of a structured approach to knowledge transfer and commercialization means that even promising research frequently fails to reach the market. This represents both a lost economic opportunity and a demotivating factor for researchers.

Part IV: Policy Recommendations and Pathways Forward

4.1 Immediate Priorities for the Republic of Srpska

Immediate priorities for the Republic of Srpska could be expressed in four theses: First, Strategic Planning: finalize and implement a Smart Specialization Strategy to focus limited resources on areas of comparative advantage. Second, Funding Reallocation: dedicate a minimum of 1% of the entity budget to competitive research grants, separate from higher education funding (which would be around €30 million for 2024, for example). Third, STP Development: Accelerate the work of the Banja Luka STP with clear performance metrics and industry engagement requirements. Fourth, IP Framework Strengthening: Adopt RS-specific guidelines for IP management in public research, modeled on Serbia's successful approach.

4.2 Long-Term Institutional Development

Viewed from the perspective of long-term institutional development, several important fields of action may be proposed: First, Research Capacity Building: Establish at least two independent, multidisciplinary research institutes focused on priority sectors. Second, Digital Infrastructure: Develop a modern research information system to replace the defunct SARNET, possibly through adaptation of Serbia's eNauka platform. Third, Cross-Border Collaboration: Formalize research partnerships with Serbian institutions through joint funding mechanisms and shared facilities.

Conclusion: The Urgency of Action

The research and innovation gap between Serbia and the Republic of Srpska reflects more than just resource differences - it reveals fundamentally different approaches to knowledge economy development. While Serbia has made strategic choices to align with EU innovation policies and create enabling environments for research commercialization, the Republic of Srpska remains trapped in a cycle of inadequate funding and fragmented governance.

Yet the shared language, cultural ties, and geographic proximity between these two entities create unique opportunities for accelerated learning and collaboration. Serbia's reforms demonstrate what's possible in the Western Balkans context, while the Republic of Srpska's challenges highlight the costs of delay. With focused political will and smart policy adaptations, the Republic of Srpska could leverage Serbia's experiences to compress its development timeline dramatically.

The alternative - maintaining the status quo - risks cementing the Republic of Srpska’s position as an innovation laggard, with long-term consequences for economic competitiveness and youth retention. In an era where knowledge drives development, research infrastructure isn't just about laboratories and funding; it's about building the future. The Republic of Srpska must act now, as must Bosnia and Herzegovina as a whole.