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The Case of North Central Bulgaria

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1 Introduction

This technical report presents the results of a case study into the role of Higher Education Institutions (HEIs) in the implementation of Smart Specialisation in North Central Bulgaria. It is one of a series of case studies within the project on Higher Education for Smart Specialisation (HESS), managed by the European Commission's Joint Research Centre in cooperation with DG Education and Culture. The aim of the project is to understand how HEIs can play a stronger role in the design and implementation of Smart Specialisation Strategies (S3), which are an integral part of the EU Cohesion Policy. It also aims to build partnerships between HEIs and their local and regional authorities as well as suggest improvements to EU funding frameworks that will provide incentives for HEIs to engage more in the S3 process.

The case of North Central Bulgaria¹ has been challenging in the context of the HESS project's aims and objectives, notably in building partnerships with local and regional authorities. For the purposes of EU Cohesion Policy, Bulgaria only has one official S3 at national level. North Central Bulgaria does have a non-binding S3 but there are no financial means to implement it and this territorial level (NUTS II) in Bulgaria have no administrative competences. The only sub-national level with any administrative competences (but not for research and higher education) and capacity to engage is the municipality. Therefore the case study team (the JRC and an external expert) worked with two municipalities within the region: Ruse on the Danube border with Romania and Gabrovo, an old industrial city in the middle of the country.

After exploratory meetings in the region, a set of semi-structured interviews were carried out to around the following themes:

- Alignment of HEIs activities to Smart Specialisation
- Incentives for HEIs to be involved in S3 implementation and regional development
- Interregional Cooperation

This report begins with an analysis of the background in which HEIs operate, in relation to the HE system, patterns of regional development and governance and the new policy of smart specialisation. Results of the research are then presented followed by some conclusions and policy recommendations.

¹ The North Central Region is called Severen Tsentralen in Bulgarian and sometimes referred to as this in the references.

2 Background to regional development, smart specialisation and higher education in Bulgaria and the North Central region

2.1 Governance structures and regional administration

Bulgaria is a highly centralized country, where the central government manages all policy areas through relevant ministries. NUTS II regions are administrative units, which do not have an independent governance or administrative structure. Their boundaries also change often due to changes in the population or other administrative and political considerations. At NUTS III level, each district has a governor appointed by the national Council of Ministers. District governments are dependent on the national budget and generally lack the necessary human and financial resources to implement regional policies and initiatives. Municipalities (NUTS IV) are the only elected governance structures at the local and regional level that possess their own budget and independent decision-making powers. They are closest to businesses and universities and are therefore the most relevant public authorities to build quadruple helix partnerships in the context of smart specialisation

2.2 Higher education system in Bulgaria

2.2.1 Structure and governance

Bulgaria has 51 Higher Education Institutions (HEIs), of which 37 are public and 14 private. The majority (44) are universities while the remainder (seven) are specialized higher schools. In the North Central region there are a total of five universities and specialized schools located in Ruse, Gabrovo, Veliko Tarnovo and Svishtov.

Education policy in Bulgaria is centrally coordinated. The Higher Education Act² stipulates that the Ministry of Education and Science (MES) proposes the establishment or closure of higher education institutions (HEIs), the number of students to be admitted to each programme in all public universities and the size of tuition fees (based on the proposals from each HEI). These are approved by the Council of Ministers and then by Parliament. A key institution in the Bulgarian HEI system is the National Evaluation and Accreditation Agency (NEAA), an independent structure under the responsibility of the Council of Ministers, which performs programme and institutional evaluations and accreditations of HEIs and determines their institutional and intake capacity. Local and regional authorities have no formal influence or jurisdiction over HEIs, and therefore their capabilities to intervene in the system are highly limited.

One aspect of the system favourable to quadruple helix development is that the Higher Education Act stipulates that the Board of Trustees of each university (composed of seven members), must include business representatives. Local businesses are consulted during the preparation and updating of curricula in order to ensure that students have the skills needed in the labour market. Furthermore, universities tend to establish various other links with companies in their region and organize internships and practical lectures on an ad-hoc basis. Both Ruse and Gabrovo universities have developed different ties with local businesses.

However, the current higher education system suffers from several shortcomings identified in the Strategy for Development of Higher Education in Bulgaria³:

² Higher Education Act, first adopted on 27 December 1995, last amended on 23 February 2018, Source: <https://lex.bg/bg/laws/ldoc/2133647361> [Accessed on 14 March, 2018]

³ Strategy for Development of Higher Education in the Republic of Bulgaria for the 2014 - 2020 Period, Ministry of Education and Science, 2014 Source: <https://www.mi.government.bg/en/themes/inovacionna->

- A mismatch between the structure and profile of students and the needs of the labour market, particularly in technical fields and in the public sector, as well as between the expected competences and skills of recent graduates and their performance in practice;
- Public funding for research in universities is distributed proportionately among all HEIs, rather than based on merit and achievements and the number of scientific publications is declining, especially in social sciences;
- Although HEIs have gained more independence in recent years, there is a lack of institutional accountability, as universities are self-managed by academics and business representatives, public institutions and students are not sufficiently involved in the management process;
- Over 90% of the state subsidy for all HEIs depends on the number of students enrolled in the university and there are only limited efforts to attract external sources of funding such as commercialization of the research results;
- Lack of incentives for lecturers and academics to improve their teaching and research performance, as they are not remunerated based on their achievements.

2.2.2 Funding sources for HEIs

HEIs in Bulgaria have a number of funding sources at their disposal. Their main source of financing is the state budget, which allocates funds to each state-owned university on a per-student basis. The state allocated budget is intended to cover teaching expenses, research activities, publishing of textbooks and scientific papers, maintenance expenses and capital investments⁴. HEIs also charge tuition fees, which vary between €150 and €500 per semester. The Ministry of Education and Science approves both the number of students to be admitted and the cap on tuition fees.

The National Science and Research Fund (NSRF)⁵ is a competitive instrument intended for funding research projects of Bulgarian public and private research organisations, but it mostly finances projects submitted by universities and the Bulgarian Academy of Science. The Fund is a legal entity under the Ministry of Education and Science. It funds projects in six priority research areas: mathematics and informatics, natural sciences, biology and medical sciences, agricultural sciences, technical sciences, public sciences and humanitarian sciences. For 2016, the total indicative budget of the NSRF was just over €7.5 million. While the fund is the oldest research funding vehicle in the country, it has recently been plagued by a string of corruption and incompetence allegations by leading researchers, which resulted in the resignation of ministers of science and education⁶.

European union funded operational programmes⁷ (OPs) have gradually become the key funding source for the implementation of innovation, science and higher education policies in Bulgaria. During the 2007 – 2013 programming period (the first for Bulgaria as a Member State), HEIs were eligible only for a limited number of funding procedures under OP Human Resources (OP HR)⁸ and OP Competitiveness (OP C)⁹. Under OP HR,

strategiya-za-inteligentna-specializaciya-na-republika-balgariya-2014-2020-g-i-proces-na-i-1470-287.html [Accessed on 14 March, 2018]

⁴ Art. 91 Higher Education Act, first adopted on 27 December 1995, last amended on 23 February 2018, Source: <https://lex.bg/bg/laws/ldoc/2133647361> [Accessed on 14 March, 2018]

⁵ Source: National Science and Research Fund official website <https://www.fni.bg/> [Accessed on 14 March, 2018]

⁶ Source: Dnevnik Online website: https://www.dnevnik.bg/bulgaria/2017/09/05/3036709_nikolai_lazarov_e_noviat_predsedatel_na_fond_n_auchni/ [Accessed on 2 April 2018]

⁷ Source: Unified Management Information System for the EU Structural Instruments in Bulgaria <http://umispublic.government.bg/opPriorityLines.aspx?op=5> [Accessed on 14 March, 2018]

⁸ Source: <https://www.eufunds.bg/index.php/en/operational-programmes/human-resources-development> [Accessed on 14 March, 2018]

⁹ Source: <https://www.eufunds.bg/index.php/en/operational-programmes/competitiveness> [Accessed on 14 March, 2018]

universities received funding for upgrading curricula in line with the needs of the labour market, modernizing management systems, capacity building for lecturers, development of a rating system for HEIs and support for students and graduates, including through scholarships. OP C supported the creation and strengthening of Technology Transfer Offices and Technology Centres in different economic sectors, which were mainly established in HEIs, and also funded projects supporting research institutions. However, HEIs were only able to access funding from OP C through eligible companies. This limited the participation of HEIs in the OP and led to the establishment of a separate OP in the new programming period, specifically targeted at universities.

During the 2014 - 2020 programming period, OP "Science and Education for Smart Growth"¹⁰ was established to specifically support science and education projects. However, its implementation has been delayed significantly. Following a mid-term audit of the programme, which revealed mishandling of funds, the European Commission decided to freeze all payments. A new Managing Authority had to be established in the form of a separate agency directly controlled by the Minister of Education and Science, the original MA of the OP, in order to separate the funding from one of the main beneficiaries of the programme – the Ministry itself. The call procedures have been plagued by extensions and lack of transparency, which makes following the implementation of policy priorities difficult. The two most important calls for the universities have been for the "Creation and Development of Centres of Excellence", and for the "Creation and Development of Centres of Competence" but their implementation has also been delayed substantially.

The Information System for Management and Monitoring of EU Funds in Bulgaria 2020 shows that as of April 2018 there have been three projects approved for HEIs from the North Central region with a total amount of € 24 887 000. But actual disbursements of funds under the programme so far in this region have been negligible at just € 376 000. The most important project related to the national and regional RIS3 priority topics has been awarded to the Technical University of Gabrovo.¹¹ It is for the creation of a Centre of Competence "Smart Mechatronic, Eco- and Energy Saving Systems and Technologies" and totals € 23 570 000. It was awarded in March 2018 and no actual disbursements have been made yet under the project. The project is scheduled to last for 69 months.

2.3 Higher Education institutions in North Central Bulgaria

The North Central region is home to the following five universities and specialized schools:

- Ruse University "Angel Kanchev"
- Technical University of Gabrovo
- St. Cyril and St. Methodius University of Veliko Tarnovo - Veliko Tarnovo
- Dimitar A. Tsenov Academy of Economics - Svishtov
- National Military University "Vasil Levski" - Veliko Tarnovo

*Ruse University "Angel Kanchev"*¹² has about 11 000 students (2016/2017). The education activities are led by 499 lecturers, including 49 professors, 177 associate professors and 296 doctors and doctors of science. The university has the following eight faculties:

- Agrarian and Industrial Faculty
- Faculty of Mechanical and Manufacturing Engineering

¹⁰ Source: Ministry of Education and Science official website <http://sf.mon.bg/?qo=page&pageId=55> [Accessed on 14 March, 2018]

¹¹ Source: Unified Management Information System for the EU Structural Instruments in Bulgaria <http://2020.eufunds.bg/en/7/0/Project/Details?contractId=Q4GTaBUxy5o%3D> [Accessed on 14 March, 2018]

¹² Source: Ruse University "Angel Kanchev" official website <https://www.uni-ruse.bg/en> [Accessed on December 20, 2017].

- Faculty of Electrical Engineering, Electronics and Automation
- Faculty of Transport
- Faculty of Business and Management
- Faculty of Natural Sciences and Education
- Faculty of Law
- Faculty of Public Health

The university also has a branch in Silistra, which offers courses in Literature, Linguistics, Foreign language, Physics, Information Technologies and Energy efficiency, and a branch in Razgrad, which specializes in Biotechnologies and Food Technologies, Inorganic and organic chemical technologies.

Ruse University has a dedicated research department, which deals with the financial and administrative aspects of research, development and consultancy activities carried out by lecturers, PhD candidates, students and technical experts. The department also manages the University's Technology Transfer Centre, the Centre for Intellectual Property, the Centre for Entrepreneurship and the University's Publishing Centre. The university offers financial stimuli for preparing and winning external projects and attracting external funding has become part of the internal assessment of the lecturers. Although the University has established a formal infrastructure to facilitate research and innovation activities, interviews with academic staff suggest that these are ultimately dependant on the individual initiative of lecturers and students. The university is active in the EU's Horizon 2020, Interreg and Erasmus programmes.

*The Technical University of Gabrovo*¹³ has about 5400 students in Bachelor and Master's programmes, 60 of which are international students. The university has four faculties:

- Faculty of Electrical Engineering and Electronics
- Faculty of Mechanical and Precision Engineering
- Faculty of Economics
- Department for Language and Specialized Training

The University has a dedicated Strategy for the Development of Scientific Research for the period 2015 – 2020, which is in line with the four thematic priorities of the national smart specialization strategy, but is mainly focused on the field of mechatronics, where the University has the most expertise. The University has a Centre for Scientific Research and Technologies, which could increase its activities according to interviews with senior university officials, as well as a Centre for International and National Programmes and Projects, which focuses primarily on Erasmus exchange projects. The University has not yet participated in any Horizon 2020 project.

The region is home to two branches of the Higher School of Agribusiness and Development of the Regions – Plovdiv¹⁴ in Ruse and Veliko Tarnovo, as well as a number of vocational training centres, licensed by the National Agency of Vocational Education and Training, which support continuing professional development. In 2014, the Bulgarian Academy of Sciences established a Regional Academic Centre at the Ruse University "Angel Kanchev", with the goal of integrating research and innovation activities within the local business environment. The Institute of Agricultural and Seed Science "Obraztsov chiflik"¹⁵ near Ruse is the oldest educational institution in the field of agriculture in Northern Bulgaria and is currently within the structure of the National Academy of Agricultural Sciences, which itself is part of the Ministry of Agriculture, Food and Forestry.

¹³ Source: Technical University Gabrovo official website https://www.tugab.bg/index.php?option=com_content&view=featured&Itemid=298&lang=en [Accessed on December 20, 2017].

¹⁴ Source: HSADR official website: <https://www.uard.bg/> [Accessed on December 20, 2017].

¹⁵ Source: Institute "Obraztsov chiflik" website: <http://izs-ruse.org/en/> [Accessed on December 20, 2017].

2.4 Strategies for Smart Specialisation at the national and regional levels

2.4.1 Strategic documents

Regional innovation policy in Bulgaria is managed at central level by the Council for Smart Growth¹⁶ within the Council of Ministers, chaired by the Prime Minister. The Council determines the development trends and priorities for smart specialization, while the Ministry of Economy and more specifically the Directorate for "Economic Promotion Policies" is responsible for the practical implementation of the key strategy in this field - the Innovation Strategy for Smart Specialisation 2014-2020¹⁷ (IS3) at national and regional level. EU Structural Funds, and more specifically OP "Innovation and competitiveness" (OP IC)¹⁸ and OP "Science and Education for Smart Growth", are the main funding mechanisms for the implementation of the IS3.

IS3 does not foresee the development of innovation strategies for smart specialization at the regional level (NUTS II), but instead aims to address regional needs and challenges by prioritising the most relevant thematic areas for each NUTS II region, in order to support their identified strengths. Project proposals for calls under OP IC and OP SESG receive bonus points if they fall within the respective thematic areas for the region, where the project will be implemented.

IS3 has identified four thematic priority areas for the whole country: Mechatronics and clean technologies; Informatics and information and communication technologies; Industry for a healthy life and bio-technology; and New technologies in creative and recreational industries. The thematic focus of Ruse district is on "Informatics and ICT" and "New Technologies in the Creative and Recreative Industries", while Gabrovo district prioritizes the thematic areas "Informatics and ICT" and "Mechatronics and clean technologies". The IS3 also highlights Gabrovo University's plans to establish an innovative Centre of Competence in the field of "Eco and energy-saving technologies". It should be noted that while Ruse has a rich historical and cultural heritage and Gabrovo has strong traditions in mechatronics, neither district has yet established itself as a leader in the field of "Informatics and ICT", despite this being considered a horizontal priority across Bulgaria.

Alongside the national IS3, Ruse and Gabrovo municipalities, among others, have developed their own S3 strategies or plans, despite the dearth of independent funding sources at the local level. The North Central region has its own non-binding RIS3¹⁹ up to 2020, developed by the Business Support Centre for Small and Medium Enterprises – Ruse. The municipality of Ruse also has a smart specialization strategy for the period 2016 – 2025²⁰. Within the framework of its Municipal Plan for Development²¹, Gabrovo has a dedicated Implementation Plan for Innovation.

¹⁶ Source: Council of Ministers official website: http://saveti.government.bg/web/cc_1501/1 [Accessed on 7 January, 2018].

¹⁷ "Innovation Strategy For Smart Specialisation The Republic Of Bulgaria 2014-2020", Ministry of Economy ,Source: official website of the Ministry of Economy: <https://www.mi.government.bg/en/themes/inovacionna-strategiya-za-inteligentna-specializaciya-na-republika-balgariya-2014-2020-g-i-proces-na-i-1470-287.html> [Accessed on 7 January, 2018].

¹⁸ Source: OP Competitiveness official website: http://www.opcompetitiveness.bg/module6.php?menu_id=296 [Accessed on 7 January, 2018]

¹⁹ "Smart specialization strategy for the Severen Tsentralen region 2015 – 2020", Source: Business Support Centre for Small and Medium Enterprises – Ruse official website: http://ruse.bg/uploads/wysiwyg/files/Smart%20Specialization%20Strategy-SCR_2015-2020.pdf [Accessed on 5 January, 2018].

²⁰ "Innovation Strategy for Smart Specialization for Ruse Municipality, 2016 – 2025", Ruse Municipality, Source: Ruse Municipality official website: <http://www.ruse-bg.eu/bg/pages/531/index.html> [Accessed on 5 January, 2018].

²¹ Source: Gabrovo Municipality official website: <https://gabrovo.bg/bg/article/14782> [Accessed on 5 January, 2018].

2.4.2 The role of HEIs in smart specialization

The national IS3 states, that *“the current education structure is not conducive to transition to innovation-based growth”*²² and that educational programmes should be linked much more closely to the needs of the private sector. Under Objective 1 *“Focus the investment for the development of innovation potential in the smart thematic areas (for creation and development of new technologies leading to competitive advantages and increase in the added value of domestic products and services)”*, key activities foreseen for the improvement of human resources are:

- Strengthening the link between higher education and the requirements of the labour market;
- Stimulating training in technical and engineering specialties;
- Enhancing the practical application of higher education.²³

The main instrument for implementing these activities is the OP *“Science and Education for Smart Growth”*, which should provide incentives and mechanisms for partnerships between universities and businesses, including joint development of curricula and programmes and offering of targeted scholarships for students.

The regional S3 for north Central region, as well as the two municipal S3 documents all emphasize the key role that local universities play in the innovation ecosystem of the region and also include priorities related to the need to develop academic curricula in collaboration with local businesses²⁴, in order to prepare students for the demands of the labour market. Furthermore, Ruse Municipality’s strategy also proposes to establish a university cluster along the Danube River, which would stimulate inter-regional academic cooperation between Ruse University and other higher education institutions. In Gabrovo, a key measure to support the University aims to stimulate joint projects between academics and local businesses in order to enhance the innovation ecosystem.

2.4.3 Regional intermediaries

Among the most active intermediaries in the North Central region are the Business Support Centre for SMEs in Ruse (regional node of the Enterprise Europe Network) and the Business Incubator in Gabrovo. Several co-working spaces have opened across the region, which foster the development of entrepreneurship, especially among young people (e.g. StartUP Factory in Ruse, Freedom21 in Veliko Tarnovo and In progress in Gabrovo). Nevertheless, local stakeholders and authorities have suggested that the regional innovation system suffers from a general disconnection between research, academia and industry in the innovation transfer process and that intermediary organisations have not fulfilled their potential in the region.

²² *“Innovation Strategy For Smart Specialisation The Republic Of Bulgaria 2014-2020”*, Ministry of Economy
Source: Ministry of Economy official website: <https://www.mi.government.bg/en/themes/inovacionna-strategiya-za-inteligentna-specializaciya-na-republika-balgariya-2014-2020-q-i-proces-na-i-1470-287.html>
[Accessed on 7 January, 2018].

²³ Ibid

²⁴ Ibid

3 Research results

These results are based on information collected during two workshops in the region of North Central Bulgaria, one in Ruse and one in Gabrovo, as well as a series of semi-structured interviews detailed in Annex 1.

It should be noted that during the 2014-2020, Bulgaria had not planned for the development of innovative strategies for smart specialization at the regional level (NUTS II) but only a national one, which was only approved in 2015. The Innovation Strategy for Smart Specialization (IS3) of the Republic of Bulgaria 2014-2020 was intended to reflect regional needs and challenges and assign priority sectors for development to each of the six NUTS II regions.

Although for the North Central region the identified priorities in the fields of Mechatronics and Clean technologies, Industry for Healthy lifestyle and BioTech and Informatics and ICT sectors are in line with the region's economic potential, both Ruse and Gabrovo have further worked on developing their own strategic documents to stimulate smart specialization. The Business Support Centre for Small and Medium Enterprises, located in Ruse, has developed a targeted Smart Specialization Strategy for the north Central region 2015-2020. Furthermore, Ruse Municipality has also developed its own S3 for the period 2016-2025. Gabrovo Municipality, in its own right has developed and is working on implementing an innovation plan, as part of its Municipal Plan for Development.

3.1 Alignment of HEI to RIS3

3.1.1 Engagement of HEIs in RIS3 design

Both Ruse and Gabrovo universities, as well as the representatives of the local governments, were consulted during the preparation of the national Smart Specialization Strategy, but only at the final stage, when they were invited to provide comments on the document. However, they were not involved in the analytical preparation of the strategy.

Ruse University confirmed that it was involved in the development of all three strategies (national, regional and municipal for Ruse), but only in a "reactive way" i.e. the institution was asked to provide feedback on already developed documents. The process was discussed during the Academic Council meetings at the university, and the heads of faculties could discuss this further with their colleagues, at their own discretion. It was suggested that some of the academic staff dealing with more technical disciplines view such strategies primarily as theoretical and administrative documents, rather than a useful and practical tool for developing the curriculum.

The main use of such strategies is for applying for funding both through national Operational Programmes (OP's) and for EU-wide programmes, where a higher score is awarded to projects in the priority fields of the region. No specific steps have been taken at Ruse University to align academic activities to the smart specialisation strategies, since the identified priorities are already in line with the disciplines offered at the university.

Gabrovo University was also consulted in the development of the national strategy, again at the final stage. The feedback provided by the university was crucial in including the field of Mechatronics as a key priority area for the North Central region. Similarly to the internal process at Ruse University, the Academic Council was kept up-to-date with the process surrounding the national strategy and it was up to each head of faculty to inform their team regarding this process. Since the national S3 was only approved in 2015 and its priorities are in line with the courses offered at the university, the only main change, which has been implemented to support the specialisation process, is the explicit alignment of the university's Research Strategy with national S3.

3.1.2 Implementation phase

Ruse University has a long history in the fields of engineering, electronics, transport, agrarian studies and the priorities identified in both the regional and municipal strategies

(ICT and creative and recreative industries) are in line with the disciplines already offered at the university. According to the university no significant changes are therefore needed in terms of adding new disciplines.

Although not directly related to the regional priorities established in the national S3, an "Industrial Design" course was introduced in the academic year 2016 – 2017 at Ruse University, which can be seen as related to the regional specialisation in the creative industries. Other programmes, which are indirectly linked to this field include computer design of furniture; business programmes for small business owners in the tourism industry and the establishment of the Faculty for "Public health" (inaugurated before the national S3 was approved), which offers courses in physiotherapy and acupuncture among others that can be considered part of the health tourism industry.

Although not in response to the national, regional or municipal strategies, Ruse University supports entrepreneurship among its students through several means. A dedicated Centre for Entrepreneurship offers a variety of services to the students including competitions for business plans. The Faculty of "Business and Management" offers a Master's programme in "Entrepreneurship and Innovation". Finally, business representatives, who are members of the Faculty Broad, can set assignments or dissertation topics, which are directly related to their companies' needs, and offer internships to students.

Gabrovo University confirmed that mechatronics is included as a priority in the national and regional strategies and in the municipal innovation plan, which is in line with the main focus of the university. No new disciplines are planned in order to align the curriculum to the strategies any further.

3.1.3 Barriers and gaps in the engagement process

The main barrier to the effective participation of universities in the EDP identified by the interviewed stakeholders is the top-down approach taken by the authorities, who developed smart specialisation strategies, particularly the national one, which the representatives of both the universities and local authorities suggested was largely based on statistical data, rather than local knowledge collected from the relevant stakeholders in each region²⁵. A common view expressed by the interviewees is that strategies shouldn't be just administrative documents, but actually reflect the local needs, have measurable goals and be accompanied by implementation mechanisms at the regional level. The RIS3 for the North Central region was developed by an independent Business Support Centre for Small and Medium Enterprises in Ruse and there are no formal mechanisms put in place to ensure that it is implemented, including with regards to the involvement of the University or any other stakeholders.

In Ruse, university representatives suggested that the research and technical capabilities of the university are not being used to their full potential in developing the local economy. One of the main reasons is because businesses rarely approach the university to look for technological solutions, as they believe that academics work mainly on a theoretical level. At the same time, the university representatives also suggested that the Technology Transfer Centre, which showcases patented technologies developed in-house, is not sufficiently active in promoting these and local businesses are not being actively engaged.

The interviewees suggested that businesses approach the university mainly to communicate what kind of skills and knowledge they require from students in order to potentially employ them. A possible way of stimulating closer and more practical cooperation between academics and companies would be to include a formal

²⁵ According to Mr. Kunev, Ruse University has applied for projects, which were not approved because they weren't in line with the regional priorities, thus highlighting the importance of collecting and using real data and information collected at the local level when developing the national strategy.

requirement, for example in national OPs, for projects to include an element of research and compulsory partnerships with academic or research institutions in their proposal.

In Ruse, the geographical focus and identity of not only the university, but also for local authorities and NGOs, is primarily on the Danube area and the related EU strategy. On the other hand, Gabrovo Technical University suggested that it is appropriate for S3 to be developed at the national level.

3.2 Incentives to HEIs and university researchers to be involved in RIS3 and regional development activities

3.2.1 Self - awareness

The representatives of both Ruse and Gabrovo universities see their institutions as a key actors in the development of the region. Ruse University believes it plays a key role in the Danube region. Unlike the Svishtov Academy of Economics²⁶, which has a very narrow focus on economics, Ruse University offers a wider range of programmes (technical programmes, business, law) and can more easily set-up an interdisciplinary teams necessary to participate in projects. Also, Ruse has a wider geographical coverage in the region as it has local branches in Silistra (machine-building; food technology), Razgrad (pharmaceuticals) and Vidin (although the city is in a different NUTS II region). Therefore, Ruse University has a better understanding of what is happening in the region and consequently it can play a key role not only in the development of the city, but of the North Central region as a whole. According to all interviewees, the key stakeholders for the EDP are businesses, local authorities and NGOs, alongside the HEIs.

The Bulgarian Academy of Sciences has one research centre in the field of security, located in Ruse, but it has a small number of staff and is not active in collaborating with the universities. Several companies in the region also have their own research units, but these are not related to the universities.

In both Ruse and Gabrovo, the universities' Academic Councils are the main unit, which was responsible for dealing with both the preparation and implementation of smart specialisation strategies. In both cases it was up to the discretion of the heads of faculties to share this process with their colleagues. Both universities suggested that it is not necessary for all academic and research staff to be informed about the strategy.

3.2.2 Funding

Neither university has implemented projects specifically related to any of the strategies. However, Ruse University has been particularly active in several funding streams, as participation in projects and attracting external funding has recently become part an important indicator for assessing the university's performance. The university explained that each funding source is scored differently and that projects tend to be educational (e.g. aimed at developing teaching materials) and purely scientific (the latter are mainly funded by the Ministry of Science and Education and the National Science Fund). In absolute terms, the biggest funding sources are Horizon 2020, COST, Erasmus+, OP Human Resources and Cross-border programmes (with Romania and Greece).

Ruse University suggested that one way of supporting collaboration between universities and other regional actors is for the government to provide co-funding in a more institutionalized way, which is often lacking not only in Ruse, but across HEIs throughout the country.

Gabrovo University is less active in implementing EU projects and is mainly active in the Erasmus + programme for exchange of students and professors.

²⁶ A university in the neighbouring town of Svishtov, which is not in the Severen Tsentralen region, but is also on the Danube river.

3.2.3 Knowledge transfer

Ruse University suggested that “business” is sometimes seen as a “dirty word” by some of the academic staff, who don’t want to communicate with companies and commercialise their work. To some extent, this has been mitigated by the growing requirements for outside collaboration on projects (as described above). However, there are no formal mechanisms that support spin-offs, although it was emphasized that the university must work in this direction to remain competitive and support the economic development of the region. It was also suggested that there is little initiative for faculty members to establish a spin-off or a commercial business entity, even though this could also be a solution to the disproportionately low funding rates that Bulgarian scientists receive in international projects, compared to their European counterparts.

Gabrovo University has close links to local businesses, which are involved in the development of the curriculum so that it is in line with the needs of employers in the Gabrovo locality. As an example, the automation company [AMK](#) specifically requested a number of qualified students, who ultimately graduated and were hired by the company. Furthermore, there have been several initiatives for spin-offs between the University and other stakeholders (eg. the Bulgarian Chamber of Commerce and Industry and foreign universities), but these are no longer active. The Technical University has three spin-off companies, which are no longer active (no further details were provided). The University’s career centre, ran by prof. Stefan Ivanov, provides support to students seeking career advice and organises company presentations from prospective employers.

The Association of Danube River Municipalities “Dunav” suggested that from an outside perspective, it appears that Ruse University doesn’t have the necessary independence to hire a specialised team to develop the entrepreneurial spirit of the university itself, promote entrepreneurship among students and strengthen the university’s position deal with management of projects, international links and innovation.

3.3 Interregional cooperation

Ruse University is part of a number of networks and associations, which bring together partners from the Danube Region, which are eligible for funding under the Danube programmes. As an active member of the “Danube University Rectors Conference”, Ruse University is often invited as a partner in projects. An example of a past project funded under the Danube Transnational Programme, the university worked on enhancing the cooperation between academic institutions and businesses at the local level. As a result of the project [Danube-INCO.NET](#), Ruse University was part of a knowledge transfer with other academic institutions with more experience in this process and received training on how to perform “innovation audits” for local companies and thus stimulate the local economy by enhancing cooperation between Ruse University and businesses in the area.

Gabrovo University is less active in international projects. It was suggested that one of the main reasons is the outdated infrastructure and facilities such as laboratories necessary to take part in large research projects. Therefore, the international projects of the university are mainly funded through the Erasmus+ programme and are centred around academic exchanges of students. According to the Mayor of Gabrovo, the university needs a dedicated team to work on its international profile and increase its participation in such projects.

3.4 RIS 3 Governance

Ruse Municipality described the process of developing the national smart specialization strategy as “top down”. Neither the municipality, nor the regional administration was

involved in the analytical part of the development of the strategy, which according to the municipality means that it is not particularly relevant or specific enough for the region. It was suggested that the process should be decentralized to the regions, or even to cities, and that the national strategy is based on the regional strategies, rather than the opposite way around.

Therefore, the municipal S3 for Ruse aims to compensate for the lack of a more precise and specific thematic focus in both the national and regional S3. The municipality suggested that neither document took into account the city's links to the Danube River (where most economic activities are concentrated), the proximity to Bucharest and its leadership role in cross-border cooperation (including in the fields of education, the numerous cross-border projects with Romanian partners and the joint master plan with the city of Giurgiu across the river). As the Municipality has the necessary autonomy to approve strategic documents, the authorities decided to perform an in-depth analysis of the city's strengths and potential for development and develop their own strategy. The process aimed to stimulate dialogue among all relevant stakeholders (Ruse University, local businesses and NGO's) and also included a public hearing. "Ruse: Free Spirit City" Foundation and its "Knowledge and Growth" Fund, which supports projects related to the identified priority fields for the city, are the main implementation tools of the municipal strategy. The regional analysis showed that Ruse has great potential in the field of ICT (in industry and manufacturing) and creative and recreative industries (in relation to a sports arena complex, completed in 2015, which the city plans to develop into a multifunctional event centre, as well as Ruse's role as coordinator of the Culture and Tourism axis 3 of the Danube Strategy). The municipal Strategy was developed also in accordance with OP "Science and Education for Smart Growth" and more specifically the possibility to establish Centres of Competence²⁷.

Box: Ruse Free Spirit City Foundation – Municipal Foundation

The foundation was originally established to prepare Ruse's bid for European capital of culture. This was ultimately unsuccessful, but the Municipal council unanimously agreed to continue its activities and support projects in the fields of culture, science, education, technologies and sport. Each year the municipality provides a budget of 100 000 leva, but the organization is becoming more financially independent through contributions from several businesses, which have overtaken the public subsidy. The "Knowledge and Growth" Fund is managed by the foundation and supports projects in the fields of innovation, alternative education methods and science with the University, local schools and NGO's.

Gabrovo Municipality explained that its Regional Development Strategy from 2013 didn't include smart specialization, as the national S3 was not yet approved, but it will be included once the interim evaluation of the regional strategy is completed. It was noted that the regional administrations are not eligible for most funding sources, both national and European. They have very little decision-making power, as they need the formal approval of the Council of Ministers on most issues, and they have very limited financial and human resources at their disposal. It was suggested that one of the main problems with their participation in the implementation of S3 is the fact that the NUTS II regions are primarily an administrative rather than an economic/ cultural unit. Therefore, each region deals with the implementation of the national S3 however they see fit, because there is no dedicated structure at the regional level that has the necessary decision-making powers and resources.

The regional administrations participated in the preparation of the national S3 when they were asked to provide a justification of which two priority themes, out of the total four priorities identified by the central government for the whole country, should be prioritised

²⁷ The Municipality, E-Kont and Ruse University plan to establish such a centre even if they don't receive funding from the OP "Science and Education for Smart Growth" (where the funding procedure has been significantly delayed by the managing authority).

in the North Central region. Regional administration structures participate in the bi-annual meetings with the Regional Coordination Committees, which also have representatives from all OPs. During these meetings the main results of the OP-funded projects are presented for each NUTS II region. As these are expert-level meetings, they only serve the purpose of relaying information, but don't have any decision-making power that can affect the implementation of the programmes. Furthermore, regional administrations also participate in the monitoring process of OPs. Each year they are asked by the Ministry of Economy to gather information and data about what has happened in their region. So far there have been only a few meetings and very little communication between the central coordinator and the regions. There is also no form of feedback and the reports prepared by the Ministry of Economy are not shared with the regions. Gabrovo Municipality suggested that to improve the process of developing and implementing the new S3, there should be much more dialogue with regional stakeholders and ways to provide feedback, instead of using only statistical data.

The team from Gabrovo Municipality reiterated several times that because NUTS II regions in Bulgaria are only administrative units that don't necessarily share a common economic and social profile, it makes the development and implementation of regional strategies particularly challenging. However, they emphasised that the development of the national S3 should take a bottom-up approach and be based on the regional specifics first. In the current programming period, the development of the national S3 involved consultations with the Regional Development Councils, whose members are mayors and representatives from different regional and local institutions. However, these councils have no budget; they don't take their own initiative for regional development projects through the OPs and don't hold public consultations.

It was suggested that as the national S3 wasn't developed with the involvement of the relevant stakeholders, they don't feel like they have ownership over the strategy. Instead, S3 appears to be only relevant for those who can be beneficiaries of the OPs (especially OP "Science and Education for Smart Growth"). However, the beneficiaries of the OPs are more focused on using the available funding to upgrade their facilities, rather than stimulating the academic and research community as a whole. Businesses as a whole aren't very familiar with S3 and only view it through the perspective of the OPs as funding mechanisms, rather than tools for regional development. Furthermore, it was pointed out that businesses in the Gabrovo region don't really know each other. Some of the municipal initiatives aimed at addressing this issue include yearly Entrepreneurship Week and a weekly radio show to present business in the region. The municipality was also intent to carry out interviews with local companies and perform an in-depth business analysis.

Gabrovo also underlined that municipalities are only allowed to participate in OP funded projects as "associated partners". Instead it was suggested that the OPs should have calls targeting regions specifically and allow them to create a structure aimed at supporting regional initiatives. A possible mechanism to stimulate regional innovation could be in the form of public-private foundations (involving universities, businesses and municipalities), as currently the municipality doesn't have a dedicated budget for this purpose and must seek projects to link S3 with other local activities.

The team from Gabrovo were convinced that that Technical Universities can contribute greatly to the prosperity of the region. However, in their opinion, when businesses approach the university, this often doesn't lead to much cooperation afterwards. It was suggested the university would benefit from a dedicated marketing and management team working on positioning it at the centre of the local innovation ecosystem and also increasing its participation in international projects as a way of linking Gabrovo to the outside world.

4. Conclusions

The case study in North Central Bulgaria has highlighted the difficulties of implementing Smart Specialisation in Member States without experience of regional innovation policies and with weak sub-national governance structures. While the Cohesion Policy regulations allow for S3 to be developed at national or regional level, the concept of smart specialisation is predicated on a bottom up process of entrepreneurial discovery whereby the knowledge of innovation actors is used to set priorities. However, in Bulgaria its HEIs and other innovation actors were not involved in an EDP, and the local and regional authorities were only consulted on how their territories may fit into pre-determined national priorities established only through technical analysis. HEIs were more involved in the development of local development strategies, including an S3 for the city of Ruse, but these lack the financial resources to be implemented. In this way we can argue that in Bulgaria, the power to frame funding is disconnected from knowledge of innovation which prevents the proper functioning of its smart specialisation strategy. Member States are of course free to organise their own forms of sub-national governance, and smart specialisation does not require stronger local and regional authorities per se; however, the existence of intermediary institutions which connect innovation actors with the national S3 is a pre-requisite for successful implementation.

Another conclusion from the case study is that the existence of a national Operational Programme for Education and Science, while in some ways welcome, is in other ways problematic for the development of quadruple helix partnerships. While it is not yet fully functional, if the programme is not linked to the competitiveness OP and focuses on HEIs that carry out education and research activities as sole beneficiaries, the links with business may be lost. Conditionality on funding to form partnerships with business is more likely to lead to innovation, whether through the co-design of education and training programmes or the commercialisation of research.

Annexes

Annex 1. List of interviews

- **Maria Tsankova** – Executive Director, Association of Danube River Municipalities “Dunav” (10 January 2018, 11:00)
- **Strahil Karapchanski** – Deputy-mayor of Ruse for “European Development” (also present at the meeting: Radostina Kulisheva, expert in the Directorate for “European Development”) (10 January 2018, 13:30)
- **Svilen Kunev**, PhD – assistant professor in the Faculty of “Business and Management”, Ruse University “Angel Kanchev” (10 January 2018, 15:00)
- **Asen Asenov**, PhD – professor in the Faculty of “Transport”, Ruse University “Angel Kanchev” (10 January 2018, 17:30)
- **Nevena Petkova** – Regional Governor of Regional Administration Gabrovo (also present at the meeting: Maria Hubanova and Mihaela Stoianova, senior experts in the Directorate for “Administrative Control, Regional Development and State-owned property”) (11 January 2018, 09:30)
- **Tanya Hristova** – Mayor of the Municipality of Gabrovo (also present at the meeting: Nela Rachevitz, Deputy-mayor of Gabrovo for “Social and economic development” and Desislava Koleva, chief expert in the Directorate for “Projects and Economic Development”) (11 January 2018, 11:00)
- **Prof. Iliya Zhelezarov** – Deputy Rector of Technical University – Gabrovo (also present at the meeting: prof. Stefan Ivanov, Faculty of “Electrical Engineering and Electronics”) (11 January 2018, 13:00)
- **Georgi Marinov** – Director of Regional Governance of Education – Gabrovo (11 January 2018, 15:00)
- **Cvetana Kyumurdjieva** – Director of Mathematics and Natural Sciences High School “Academician Ivan Gyuzelev” (11 January 2018, 17:00)

Annex 2. Ongoing projects in Ruse University "Angel Kanchev" and Technical University of Gabrovo

Ruse University "Angel Kanchev"²⁸

Funding source	Project name	Start date	End date
National programmes			
OP Science and Education for Smart Growth	Student Practices - Phase 1	29.03.2016	29.10.2018
America for Bulgaria Foundation	Soil protection in Bulgaria	01.07.2014	01.07.2018
International programmes			
ERASMUS +	Student mobility for Studies and Placement, Teaching and Training Mobility for Teachers and Staff	01.03.2014	02.03.2020
ERASMUS +	Sustainable learner-centered Teaching-Advanced Recourse for Georgia and China (STAR)	15.10.2016	14.10.2019
ERASMUS +	Innovative Solution for enhancing social responsibility education and civic skills in creating sustainable businesses Edu4Society	01.11.2016	31.10.2018
ERASMUS +	Speech and Language Pathology Interactive Tools for Teachers at Initial Education	01.09.2017	31.08.2020
ERASMUS +	BBEurope: Building Bridges for Europe	01.10.2017	30.09.2019
ERASMUS +	ReSTART- Reinforce entrepreneurial and digital skills of students and teachers to enhance the modernization of higher education in MOLDOVA	15.10.2017	14.10.2020
ERASMUS +	InoLearn4BEEs - "Innovative Student-Centered Learning Practices fuelled with ITC-tools and university-industry cooperation towards reinforcement of Business & Engineering Entrepreneurship education	01.11.2017	30.04.2020

²⁸ Source: Ruse University "Angel Kanchev" official website: <https://www.uni-ruse.bg/projects/Pages/default.aspx> [Accessed March 20, 2018]

Transnational cooperation Interreg "Balkan-Mediterranean 2014-2020"	Innovative Vocational Entrepreneurial Training - INNOVENTER	01.09.2017	31.08.2019
Transnational cooperation Interreg "Balkan-Mediterranean 2014-2020"	Forest Monitoring System for Early Fire Detection and Assessment in the Balkan - Med Area	02.10.2017	01.10.2019
Horizon 2020	Researchers in the Knowledge Triangle		
Archive of past projects: https://www.uni-ruse.bg/projects/archive			

Technical University of Gabrovo²⁹

Funding source	Project name	Start date	End date
National programmes			
OP Science and Education for Smart Growth	National center of mechatronics and clean technologies		
International programmes			
ERASMUS +	Strategic Partnership in the field of Mechatronics for innovative and smart growth of European manufacturing SMEs	01.11.2016	31.10.2018
ERASMUS +	Educational mobility for citizens	01.06.2017	30.09.2018
ERASMUS +	Developing Innovative Science Outreach for Vocational Education to Encourage STEM Careers and Education	01.10.2017	30.09.2019
ERASMUS +	Apprenticeship Cluster for Industry-ready Engineers of Tomorrow	01.10.2017	30.09.2019
Archive of past projects: https://www.tugab.bg/index.php?option=com_content&view=article&id=482&Itemid=593&lang=en			

²⁹ Source: Technical University of Gabrovo official website: https://www.tugab.bg/index.php?option=com_content&view=article&id=90&Itemid=376&lang=bg [Accessed March 20, 2018]

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