

Periodic Assessment of Research, Development, Artistic and Other Creative Activities VER 2026

Final Report of the Agricultural, Forestry and Veterinary Sciences Sub-panel

1 - Assessment of Current State of Science in Slovakia

Sub-panel opinions are mostly positive, ranging from moderate to excellent/outstanding. One Sub-panelist sees the current state of science in Slovakia in a transitional phase, trending toward innovation. Slovak research system has solid institutional bases, centered on Universities and the Slovak Academy of Sciences, but some limitations are identified. Although Slovakia benefits from an existing research infrastructure, EU integration, and an industrial economy with innovative potential, its scientific advances are held back by low levels of investment, fragmented governance structures, administrative bureaucracy, and a persistent brain drain. Slovakia's economy has historically relied on foreign investment and cost-efficient industrial production. This model supported economic growth in the early 2000s but subsequently revealed its limitations. Compared to other European Union countries in terms of innovation, Slovakia ranks among the "emerging innovators". The strategy therefore frames the transformation of the research and innovation ecosystem as a broad and comprehensive process of change, requiring coordinated policy adjustments, increased investment, and improvements in governance, talent development and retention, and collaboration between research institutions and private sector. One Sub-panelist finds the current state of science in Slovakia to be excellent. Many researchers produce publications in highly relevant fields of study of significant importance beyond Slovakia's borders. They tend to broadly collaborate with international scientists, which results in diverse and rich authorship collectives outputting peer-reviewed articles in high impact scientific journals. Among the areas of interest to this Sub-panel, forest and ecosystem

science and wood products research in Slovakia is improving. More works submitted for assessment are internationally recognized or internationally excellent. Importantly, research institutions have developed clear strategic directions and are providing productive and supportive environments for researchers, including strong international collaborations, local partnerships, and paths to generate social, environmental, and economic impacts. More outputs are being produced through pan-European collaboration, an encouraging sign of outward looking research perspectives and increased capacity to engage in, support and lead research in key areas such as climate change impacts and adaptation and effects of large-scale environmental disturbances.

2 - Perceived Strengths

Relevant, current, and impactful research involving interinstitutional and often international collaborations is a major strength. Some of the research conducted by the institutions demonstrates high social impact in that it drove government policy of significant importance to society. Creative resources exist for researchers to pursue high quality research in a supportive environment. Slovak scientific system is characterized by strong talent pool and growing integration into international research networks. The country benefits from a well-trained research community, many of whom are internationally renowned. Scientific publications are also often of high quality, have an international impact, and are increasing in number, especially in specialized fields. High-quality research is concentrated at the leading institutions such as universities and research institutes of the Academy of Science. Overall, Slovakia's strengths lie in its competent researchers, growing global collaboration, and specialized centers of excellence within a research landscape that is evolving and aligning with other European countries. Some of the evaluated institutions have a high-level working environment that fully complies with modern European standards (sustainability, culture of collaboration, continuous professional development, and ability of balance work and family). Many players in the Slovak research landscape perform well in including

vulnerable/disadvantaged subgroups (e.g., Roma population) into their research. Another notable strength is in traditional areas of forest and wood products research, with strong laboratory and analytical capacity and a focus on local environments and ecosystem management challenges. Strong local connections have been established with environmental managers and growing international linkages are being forged.

3 - Perceived Weaknesses

Some institutions submitted a large number of review articles of varied quality, which while relevant, do not represent original hypothesis-based research per se. Reviews, like original research articles, can have significant impact and are not inherently better or worse than original works. However, the high proportion of reviews suggests that some evaluated institutions rely more on the impact and high citation rate of review articles than on original research. This approach seems insufficient for an experimentally focused research structure, especially one that promotes its instrumental analytical capabilities on its homepage. In some cases, social impact was not well documented and appeared to cover more of the research that was done than actual evidence of its impact. Some outputs reporting laboratory or livestock animal trials lacked statistical power and replication, resulting in publications in obscure journals. Even though impact factors and citations were not evaluated, it was noticeable that some such studies were mostly self-cited, failing to attract readership and reporting only marginal or incremental advances. Slovakia's science and research system in general is perceived as suffering from several shortcomings, primarily linked to insufficient funding, fragmentation, and structural difficulties. Investment in research and innovation remains relatively low compared to the EU average, which limits innovation and the ability to retain top talent, often leading to a brain drain. Institutional research outputs are often uneven: high-quality outputs are concentrated in a few institutions, while others lag behind. Even within the same institution, there was often a lack of a uniform trend or balanced quality; there are researchers who clearly do not meet high

research standards. Collaboration between academia and industry remains underdeveloped, reducing the influence of research on economic growth and social impact. Furthermore, bureaucratic complexity and fragmentation in the allocation of funding can hinder the competitiveness of the research environment. Institutional online presence is often lacking, and the homepages need thorough updates. There are many empty links, and it is difficult to find relevant information. Adding concise content could improve visibility and enhance social impact. In many cases, evaluated research tends to focus on narrow disciplinary topics, description of local issues, situations and processes and narrowly framed hypotheses. Often, Slovak researchers are participants or minor collaborators in multi-country studies, contributing data to extend the environmental space of investigation but not perceived to be leading the development of ideas and approaches.

4 - Recommendations

Slovak scientific institutions should continue to select relevant and current topics of research, collaborate widely, and ensure that the research they conducted has a measurable social impact. The Slovak system should promote the quality of research through greater competitiveness and a more rigorous peer-review system, aiming for full integration into the European research framework. A collaborative network of doctoral programs could be developed, requiring the hosting of students from other countries to stay for medium- to long-term periods (at least six months) and making the European label mandatory for doctoral students who are required to spend a period abroad. A program could be developed to encourage visiting professors by attracting internationally renowned researchers for a period of no less than six months. Specific calls for projects could be developed that make it mandatory to include at least one prestigious foreign partner (university or research center). It would be advantageous, as in other European countries, to encourage the involvement of younger, dynamic researchers in the creation of start-up companies nurtured by translational research and small business incubators, as this would

provide access to specific European funds. It would be beneficial to introduce a performance-based incentive system for the salaries of individual researchers and administrative staff who support the management of competitive national and international projects. This would encourage greater interest in submitting grant proposals and obtaining funding to increase individual salaries. The research system should be more focused on connecting with the demands of stakeholders within society. The priorities of research projects should be guided by the requests and needs of the population and aimed at studying solutions in the agronomic and veterinary medicine sectors with high social impact. It would be especially useful to organize events to disseminate results by using simple and direct methods, such as science outreach days in schools or in public spaces (e.g., town squares and community areas). Prevention days focused primarily on companion animals, with particular attention to zoonotic diseases, could also be very useful. It was observed that some of the interdisciplinary outputs relied on publications in MDPI journals, which are known for publishing a high volume of articles with varying levels of quality reflecting their accelerated peer-review model. Researchers should take more time to ensure the rigor of their work and aim for higher standards by targeting renowned publishers such as Wiley, Springer, or ACS. Publishing in more prestigious journals would enhance the credibility of the research. At least one of the evaluated research institutes appears to be hierarchically organized. It is recommended to assess employee satisfaction through institutional coaching to potentially counteract this.

5 - Definition of Outputs with the Potential to Achieve a High Evaluation in VER by Individual Sub-panel Members:

- Research with international implications and importance, involving international scientists and published in high impact journals. The results of the research may have broad implications for advancing scientific knowledge internationally.

- A level of scientific research quality that ranks among the top in the international academic community, distinguished by its originality, rigorous methodology, and the relevance of its results.
- A research study can be defined as internationally excellent when it contributes significantly to the advancement of knowledge within its disciplinary area, is innovative in nature, demonstrates a recognized and measurable global impact, and produces solid, reproducible evidence that is potentially transferable to practical applications. Such excellence is also reflected in the research's acceptance and recognition in highly prestigious scientific journals, its ability to stimulate further research developments, and its serving as a point of reference for the international scientific community.
- A paper that is internationally excellent further develops research methods. It does not only apply the methods. An international paper that is excellent is not only deductive but has a strong inductive component. A paper that is internationally excellent is not only consolidating, but with new original ideas. A paper that is international excellent answers research questions that extend beyond Slovakia, which do not remain within the realms of the country, though it may take country-specific stimuli as a starting point.
- Internationally excellent quality is attained when an output reports novel, paradigm shifting concept and/or approach, and consequently becomes a widely used and cited resource for the worldwide scientific community.

Sub-panel members

Michael Hellwig, Technische Universität Dresden

Rodney Keenan, The University of Melbourne

Istvan Rajcan, University of Guelph

Peter Sutovsky, University of Missouri (Sub-panel Chair)

Vincenzo Veneziano, Università degli Studi di Napoli Federico II