Article

Achieving Sustainability in EU Tenders for Hungarian Universities

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ABSTRACT

The research examines the elements and factors affecting the sustainability conditions of tenders implemented by universities. The actuality of the topic is justified by the strengthening of the universities' three missions and the emergence of the sustainability aspect, notably its prominent appearance among strategic goals. This study analyzes Hungarian calls for European Union structural funds over two programming periods, focusing on how the conceptual and conditional system of sustainability is integrated to support the Higher Education Institutions (HEIs)' evolving innovative and third mission role. Regarding the method, the analysis focused on tender documentation from the Széchenyi 2020 (HRDOP) and the strategic guidelines for Széchenyi Plan Plus (EDIOP Plus) (2014–2027). A qualitative content analysis was performed on seven HRDOP calls. Agusdinata's Human-Centered Design (HCD) and Shared-Action Learning (SAL) framework were utilized to assess the alignment of the calls' objectives with sustainable development goals (SDGs), particularly concerning the cooperation of the quadruple/quintuple helix actors. The findings indicate that the HRDOP calls' target system encompasses the elements of the sustainability framework. While sustainability is often indirectly supported, project conditions serve as guidelines for HEIs to undertake SDG-aligned activities. The subsequent EDIOP Plus priorities further emphasize collaboration and cover all framework elements, though relationships with civil society and the educational mission require increased institutional self-contribution. It can be concluded that defining and highlighting these aspects provides guidance during project planning, enhancing the long-term sustainability of university tenders and regional impact.

KEYWORDS: sustainability; tender; innovative role of universities; SDG

INTRODUCTION

The aim of the research presented in this study is to examine the factors affecting the sustainability conditions of EU-funded calls targeting universities. The investigation focused on the conditions of the calls for EU development funds in Hungary, a Central-Eastern member state of the European Union, from the aspect of sustainability goals affecting higher education.

At the General Assembly of the United Nations (UN) in September 2015, the countries of the world adopted a fully developed, detailed and comprehensive agenda for the establishment of a sustainable system for the period up to 2030. The draft of the SDGs sets out 17 SDGs, with 169 associated targets, which serve to eliminate all forms of inequality and poverty on a global scale, as well as to mitigate climate change. The draft is divided into seven major topics, which are society, population, general economic indicators, popular movement, territorial data, economic sectors, and national data. As a result of the international agreements aimed at sustainability and the actions necessary to fulfil the SDGs published by the UN, priority was given to environmental protection and sustainable growth among the European Union grant funds, i.e., the so-called elements aimed at green themes.

The National Development and Territorial Development Concept (furthermore: NDTDC) [1] defines Hungary's long-term future vision and development policy goals for the period up to 2030. The NDTDC [1] formulates those development priorities for the development policy of the 2014–2020 program period, which are in line with the European Union's Europe 2020 Strategy and the related program-funding period between 2014 and 2020.

The partnership agreement between the European Commission and Hungary, concluded for the 2014–2020 period, outlines the development policy goals and principles that serve as the conceptual foundation for the EU funds' allocation. The document lays the groundwork for the content of Hungary's domestic operational programs, which utilize EU funds during the same period, and guides the country's strategic resource allocation [2].

According to NDTDC's [1] vision, in 2030 Hungary will be one of the leading economic and intellectual centers of Central and Eastern Europe, with a competitive economy that ensures a secure livelihood for its population and is based on the sustainable use of resources, with a growing population, strengthened communities, improved quality of life and environmental conditions. To achieve this, the concept envisioned an economic and social strategic turn in four areas, which are represented by the comprehensive objectives in the concept's target system.

The elements of the vision include:

- A growing population and communities, which the concept aims to achieve, even in the European context, through high-quality education, higher education, lifelong learning, marketable vocational training, innovation, knowledge, etc.
- Strategically utilized natural resources, which, according to NDTDC [1], can be achieved by responsible and efficient use of natural and cultural resources.
- A balanced spatial structure, to achieve a multi-centered, renewal-oriented territorial system, stopping the increase of territorial differences, and developing the potential of rural areas are necessary according to the concept.

The detailed thematic development of the subject areas and objectives included in the vision of the NDTDC [1] is given by the overall goals and the specific objectives assigned to them and in the 2014–2020 timeframe by the national priorities and the development topic areas assigned to them, so the implementation of the concept can be presented through these [2].

Sustainability should not be limited to the industrial or government sector, higher education has a significant task by development and transferring knowledge about SDG [3]. Universities, as key stakeholders in the regional ecosystem, must take a proactive role in promoting and modeling sustainable development practices, setting an example for the community to follow. The target system and implementation of the operational programs are related to the NDTDC [1] objectives and serve to achieve them. However, the planning and implementation of the programs is primarily determined not by the NDTDC [1], but by the European framework (EU thematic goals, EU priorities and related measures and indicator expectations), as well as policy goals and aspects.

Universities are increasingly understood as key actors within regional innovation ecosystems [4], influencing not only knowledge production but also economic, social, and environmental development at the regional level. Building on the innovation ecosystem literature, particularly the quadruple and quintuple helix models, universities are positioned as central nodes connecting academia, industry, government, civil society, and natural environment [5].

Sustainable Development covers economic, social and environmental sustainability, involving all the participants of quadruple/quintuple helix [5], industry, academia, government, third sector and the environment surrounding them. Innovation ecosystems can be conceptualized as multi-layered social networks that are either self-organizing or intentionally designed to achieve specific development objectives. Actors within these ecosystems participate with different motivations, governance logics, and decision-making structures, and therefore do not necessarily pursue identical goals [6,7]. This heterogeneity makes coordinated policy

intervention and governance mechanisms particularly relevant in ecosystem-based development approaches.

From the perspective of HEIs, the effective functioning of an innovation ecosystem requires intentional strategic orientation, institutional commitment, and leadership support. Innovation-related objectives need to be explicitly embedded in universities' missions and strategic goals, and governance arrangements within the ecosystem must be acceptable to all participating actors. The development of local and regional entrepreneurial ecosystems, based on partnership-oriented cooperation, is therefore a critical enabling condition [8].

From a governmental perspective, the provision of targeted policy instruments and financial resources plays a central role in shaping university-led innovation ecosystems. Public funding—often in the form of competitive grant schemes—serves not only to support collaboration but also to strengthen universities' capacity to generate own revenues in the longer term. Such revenue-generating capabilities are typically linked to industry-driven research activities, which align academic knowledge production with societal and market needs [9].

Research on EU cohesion policy suggests that Structural and Cohesion Funds can substantially contribute to SDG outcomes at regional level, particularly in areas such as poverty reduction, inclusive growth, and economic convergence across NUTS2 regions. Hence, integrating SDG perspectives into EU funding instruments is critical for delivering tangible sustainable development impacts [10].

The concepts of innovation ecosystems and entrepreneurial ecosystems have attracted increasing scholarly and policy attention in recent decades [11]. Policymakers worldwide, including in Central and Eastern Europe, increasingly frame innovation as a key driver of competitiveness and regional development within their strategic objectives [12].

Beyond short-term, market-oriented innovation, the support of long-term and curiosity-driven research is also recognized as a crucial factor in enhancing the innovation capacity of universities and their surrounding ecosystems [13]. In this context, policy instruments that encourage collaboration between universities, firms, and other ecosystem actors—particularly in regions with lower innovation capacity—are essential. Financing networking opportunities and cross-sectoral cooperation can help mitigate structural disadvantages and foster inclusive innovation dynamics [9].

HEIs play a key role in the social and economic development that urges to fulfill SDGs [14]. The universities' interdisciplinary and experiential approach can help achieve the SDGs while also fostering leadership and learning competencies, particularly when universities collaborate with non-governmental and industrial organizations [15]. According to Rasli et al. [16], the key conditions for the sustainability of HEIs include educational reform, digital transformation and effective resilience and

change management. Figure 1 illustrates the connection of universities to the SDG.

Figure 1. Connection of HEIs to SDG. Source: Own compilation by the authors based on [14,16].

The achievement of the SDGs explicitly relies on a partnership-based approach, as emphasized by the UN through SDG 17. In this context, universities' expanding role is closely linked to the growing importance of their three missions—education, research, and societal engagement—and to the increasing emphasis on sustainability within their strategic funding activities [17].

Recent empirical research underscores the concrete roles that HEIs play in advancing the SDGs. These findings support the argument that universities can act not only as knowledge producers but also as active agents for sustainable development implementation [18].

These considerations further justify the relevance of examining how EU-funded calls for proposals embed sustainability expectations and partnership requirements at the level of policy design.

This study conducts a policy-level qualitative content analysis of EU-funded calls for proposals targeting Hungarian HEIs. The analysis focuses on the design and conditionality of funding instruments, not on project applications or implementation outcomes.

Based on this, the study addresses the following research questions:

RQ1: *To what extent do EU-funded calls for Hungarian HEIs incorporate sustainability-related elements aligned with the SDGs?*

RQ2: *How are these elements structured in relation to the HCD–SAL framework and the quadruple/quintuple helix model at the level of policy design?*

MATERIALS AND METHODS

Research Design and Analytical Approach

This study applies a qualitative content analysis to policy documents related to European Union-funded development programs targeting Hungarian HEIs. The research is positioned as a policy-level analysis, focusing on the objectives, conditions, and prescribed activities of calls for proposals, rather than on individual project applications or implementation outcomes. The analytical approach follows established methodological guidance on qualitative content analysis, particularly the deductive category application described by Mayring [19]. This approach is appropriate in cases where categories are defined in advance based on a theoretical framework and are applied systematically to textual material using explicit coding rules.

Data Sources and Document Selection

The empirical material of the study consists of official calls for proposals and strategic policy documents published within the Széchenyi 2020 Program and the Széchenyi Plan Plus. In Hungary, the framework of European Union funds from 2014 to 2020 is provided by the Széchenyi 2020 Program [20], among its ten operational programs, the Human Resources Development Operational Program (hereinafter: HRDOP) [21] is explicitly targets HEIs.

In total, nine HRDOP calls related to higher education were identified based on their relevance to university education, research, innovation, or third mission activities. Of these, seven calls were included in the analysis. Two calls (HRDOP-4.2.1 and HRDOP-4.2.2), which focus exclusively on physical infrastructure development, were excluded because their objectives and conditions do not allow for a meaningful assessment using the selected analytical framework.

The exclusion of infrastructure-focused calls limits the scope of the analysis with regard to physical campus development; however, it does not affect the examination of governance-, cooperation-, education-, and innovation-related sustainability aspects, which constitute the core focus of the study. The comprehensive goals designated in the relevant HRDOP calls are in line with the medium-term political strategy "Graduate change in higher education", in the vision of which the quality of higher education is expected to increase by the 2030s [22]. These expectations are related to the social and economic megatrends experienced in recent years [23], such as technological revolution, globalization, demographic processes, social needs, and shrinking (energy) sources.

The policy tool Graduate change in higher education [22] defines the strategic goals by dividing them into three major areas—educational excellence, research excellence and social responsibility—which correspond to the three missions of higher education. The basic document of the HRDOP sets as a strategic goal the channeling of the knowledge base

available in higher education into the development and implementation of the smart specialization strategy and local economic strategies, thereby promoting progress in international value chains. By supporting the cooperation of the actors participating in the "quadruple helix" [5], it is possible to stimulate the economy and develop the regions.

Analytical Framework

After examining the content of the HRDOP tenders, we examined how the tenders can support universities in meeting the SDG goals. For this, we used the framework for developing university-led initiatives for the co-creation and implementation of SDG solutions. This framework has been created by Agusdinata [24] as a combined HCD and SAL framework. It is a structured approach for assessing and improving sustainability practices within organizations focusing on HEIs. It contains the following elements:

- Strategic Leadership: Involving top management in promoting sustainability as a core institutional value.
- Assessment and Goal Setting: Evaluating current sustainability practices and establishing clear, measurable goals for improvement.
- Stakeholder Engagement: Involving students, faculty, staff, and external partners in sustainability initiatives to foster a collaborative approach.
- Curriculum Integration: Embedding sustainability concepts across various disciplines in the academic curriculum to promote awareness and knowledge.
- Operational Practices: Implementing sustainable practices in daily operations, such as waste management, energy efficiency, and sustainable procurement.
- Monitoring and Reporting: Regularly tracking progress against sustainability goals and reporting outcomes to stakeholders to ensure accountability and continuous improvement.
- Innovation and Research: Encouraging research initiatives that focus on sustainability challenges and potential solutions.

Agusdinata's [24] study addresses essential questions such as how to integrate academic institutions with broader societal elements for SDG implementation and how to harness synergies among SDGs at the community level. A proposed solution involves combining HCD with SAL approaches. HCD emphasizes placing communities at the center of the design process, shifting focus away from internal organizational challenges. HCD is complemented by SAL, which fosters engagement among stakeholders by providing a shared vocabulary and framework for actionable plans and results [24]. The framework contains the key elements in three parts: the inherent synergies among SDGs, the various modes of solution identification, design, and implementation, and the different approaches to stakeholder involvement and interaction [24].

The qualitative content analysis was guided by Agusdinata's HCD and SAL framework [24], which provides a structured approach for assessing how HEIs can contribute to the co-creation and implementation of SDG solutions.

The framework was selected because it links sustainability objectives with institutional leadership, stakeholder engagement, collaboration, education, research, and operational practices, making it suitable for analyzing higher education–oriented funding instruments. In addition, the quadruple and quintuple helix concepts were used as complementary analytical lenses to interpret how the calls encourage cooperation among academia, industry, government, civil society, and the broader socio-environmental context.

The document analysis examines the HRDOP and Economic Development and Innovation Operational Program Plus (hereinafter: EDIOP Plus) [25] initiatives, focusing on their implications for HEIs. Drawing on the framework established by Agusdinata [24], specific factors and elements influencing the effectiveness and sustainability of educational programs are identified.

The content analysis followed a deductive coding strategy, as the analytical categories were predefined by the selected theoretical framework. Deductive category application was considered appropriate because the HCD-SAL framework provides explicit elements that can be operationalized and applied consistently across policy documents.

The research process evolved in several analytical steps. First, the textual content of the calls for proposals was examined with regard to the explicit occurrence and frequency of sustainability-related terms (e.g., sustainability, sustainable development, environmental or social responsibility). This initial step revealed a relatively low level of explicit sustainability references and has been documented in a previous publication by the authors [26].

In a subsequent step, the analysis shifted from keyword-based examination to the identification of activities and objectives that serve sustainability-related purposes, even if sustainability was not explicitly named. During this phase, activities supporting sustainability were systematically collected and assessed in terms of their presence in the calls.

Building on these earlier findings, the present study focuses on activities and objectives that can be linked to concrete SDGs. For each call, mandatory activities, prescribed indicators, and expected professional outcomes were examined to determine whether they contribute to SDGs. These SDG-related activities constitute the empirical basis of the categorization presented in Table 1.

Following this step, the identified activities and objectives were mapped onto the elements of the HCD-SAL framework, which served as the main deductive coding scheme. The framework provided clearly defined categories and coding rules, enabling a systematic assessment of

how the objectives and conditions of each call align with HCD principles, SAL, and stakeholder cooperation.

Table 1. Allocation of SDG goals in calls for proposals for universities.

Call Code Number	Title of the Call	Purpose of the Call	SDG Direct	SDG Indirect
HRDOP-3.4.3.-16	Higher education institutional developments in higher education to simultaneously improve its quality and accessibility	To increase the performance and accessibility of the Hungarian higher education system repair. Training, education and access goals (sectoral and horizontal) Goals related to the third mission of higher education Increasing the territorial coverage of higher education services. Increased involvement of domestic institutions in the European Higher Education Area, as well as achieving the increased attractiveness of international students of institutions. Incorporating SDGs into training and operational processes.	4a; 4c; 4e; 5a	
HRDOP-3.4.4-16	The skill development and implementation of communication programs, as well as STEM courses popularization in higher education	Increasing access to higher education, thereby increasing the level of higher education. Promoting STEM courses. Presentation of role models that represent an intellectual challenge and at the same time an inspiration for young people; Special support to young people who need help in some way.	4a; 4e; 5a; 5b; 5d;	4b
HRDOP-3.5.1-16	Dual and cooperative higher education courses, higher education vocational training and development of specialized further training	Improving the alignment of education and training systems with needs of labor market, facilitating the transition from learning to work, strengthening professional education and training systems. Strengthening the role of HEIs in economic development	4a; 4e; 5a	4c
HRDOP-3.5.2-17	Development of dual and practice-oriented higher education courses and educational innovation in the field of social work and helping professions as well as in the case of engineering pedagogy and professional teaching courses	Improving the alignment of education and training systems with the needs of the labor market, facilitating the transition from learning to work, strengthening professional education and training systems in the fields of social work, helping professions, vocational teachers, and professional teacher training.	4a; 4e; 5a	4c
HRDOP-3.6.1-16	Institutional developments for intelligent specialization	Building the quadruple helix model by expanding the research capacities of HEIs, developing their research services, enhancing social innovation, the knowledge base function of the R&D sphere, and strengthening the third mission of higher education. Development of a knowledge base and the establishment of research processes, which enables institutions to provide services that serve social innovation and meet the needs of the R&D sphere and to ensure the supply of researchers. Develop and conduct programs that encourage sustainable development.	4b; 4c; 4d; 5b; 5d; 5e; 9a; 9b; 9c; 17a; 17b; 17c	4e; 5c; 9d
HRDOP-3.6.2-16	Thematic research network collaborations	Improving the conditions for research and development in higher education requires human resources and with service development and strengthening cooperation with the economic sphere to research results and long-term financing of research activities.	4c; 4d; 4f; 5b; 5e; 9a; 17a; 17b	5c; 9d
HRDOP-3.6.3-16	Scientific workshops and programs for higher education students support	Support for the internal renewal of HEIs for the sake of quality education of academic staff. Operation and development of talent support programs, encouragement to the teaching or researcher career.	4b; 4d; 4f; 9a;9c; 9d	4e; 5a; 5b; 5d

Source: Own compilation by the authors based on HRDOP Calls.

Unit of Analysis and Aggregation of Results

The units of analysis were specific textual components of the calls for proposals, including stated objectives, eligible and mandatory activities, indicators, and professionally defined expected outcomes. These textual units were coded according to the predefined deductive categories.

The coded elements were subsequently aggregated at the level of individual calls, allowing for structured comparison across funding instruments and for the identification of recurring sustainability-related patterns within the HRDOP portfolio.

Reliability and Methodological Limitations

The coding process was conducted by the authors. To mitigate subjectivity, the analysis relied on a clearly defined deductive coding scheme derived from an established framework, and the coding was reviewed iteratively to ensure internal consistency.

While no intercoder reliability testing was performed, the transparency of category definitions and the systematic application of coding rules support the robustness and replicability of the analytical process.

Key aspects include the alignment of curriculum and lifelong learning with labor market demands, the promotion of research and innovation, and the integration of social responsibility within the educational mission. Social responsibility should not be a voluntary action, HEIs should actively involve students, staff, regulators and communities in their decision-making processes [27]. The analysis highlights how these initiatives provide a guideline for universities to elevate their roles in economic development by fostering partnerships with industry and other actors of quadruple/quintuple helix [5]. Furthermore, it explores the impact of funding allocations and policy directives on institutional strategies, emphasizing the need for adaptive governance structures that can respond to evolving socio-economic challenges. Through this lens, the analysis highlights the essential role of higher education in driving sustainable development.

Regarding the literature review, the primary focus of this research was to give a focused approach that relied on policy documents and established frameworks and to create a policy-to-practice linkage.

The research focused on the policy-driven context of higher education funding and strategic alignment within Hungary, specifically examining the relationship between:

- Overarching EU/National Development Policy (NDTDC, Europe 2020, Széchenyi Plans).
- Specific EU Grant Requirements for HEIs (HRDOP, EDIOP Plus calls).
- A validated Sustainability Framework (Agusdinata [24]) used for HEI evaluation.

The search strategy of literature was purpose-driven and iterative, prioritized the foundational documents that legitimize the study's analytical tool and its policy context, primarily involving the selection of authoritative policy and conceptual documents that framed the subsequent document analysis.

This study is aimed at examining academia as actors of the quadruple/quintuple helix [5] and the relationships established and operated by the universities. Within this context, the research focuses on identifying the types of poicy and support systems that encourage universities to establish relationships with the actors of the helix, which is one of the cornerstones of sustainable operation.

More specifically, the study explores how EU-funded calls targeting HEIs contain mandatory project elements (objectives, conditions, indicators and/or prescribed activities) that serve sustainable development. Academia serves as an independent source of knowledge, playing a crucial role in both assessing impacts and fostering breakthrough innovations [28]. By analysing these elements, the research seeks to assess the extent to which the examined funding instruments reflect the principles of sustainability-oriented cooperation, knowledge production, and shared action emphasized in the HCD-SAL framework and the quadruple/quintuple helix approach.

The relevance of this topic is supported by the growing importance of universities' three missions [17] and the increasing emphasis on sustainability in their strategic fundraising efforts. Through a qualitative content analysis of selected HRDOP calls [21] and EDIOP Plus, the study systematically examines how education-, innovation-, and sustainability-related criteria are embedded in the calls, and how these provide guidelines for universities in designing activities and setting goals that are in line with SDGs.

The results of this analysis are presented in the following sections.

RESULTS

SDGs from the Aspect of University Tenders

Sustainability and sustainable development are understood in this study as multidimensional concepts encompassing economic, social, and environmental dimensions [29–31]. From the perspective of higher education, these dimensions are operationalized through the three institutional missions of universities [26].

HRDOP [21] supports educational activities with educational innovation [31], programs that encourage retention, school enrolment and dual training programs.

The HRDOP [21] priorities emphasize human capital development and social inclusion, with a strong focus on education, employability, and innovation. From an SDG perspective, these priorities are primarily linked to SDG 4 (Quality Education), while specific measures targeting STEM

education and access relate to SDG 5 (Gender Equality). Infrastructure-related priorities show alignment with SDG 9 (Industry, Innovation and Infrastructure).

Among the SDG goals, these application goals are related to goal 4, the goal of quality education. Programs encouraging learning about technical and IT sciences and presenting them as a career path are linked to SDG 5, which aims for gender equality. The programs aimed at infrastructural development are related to the support of SDG 9, Industry, innovation and good infrastructure (Building adaptive infrastructure, creating comprehensive and sustainable industrialization, and innovation).

SDGs in Calls for Universities

The research and programs supported by the HRDOP [21] can contribute to achieving the SDGs by fostering innovation. As the calls address growing economic, environmental, and social sustainability expectations, they must incorporate innovative solutions to meet these demands. Such innovation is reflected at the level of policy design through the types of activities, outputs, and indicators prescribed in the calls, which frame the expected project results and implementation logic [32].

Table 1 presents the results of the qualitative content analysis of the HRDOP calls, indicating whether the main and sub-objectives of each call support the achievement of SDGs directly or indirectly, based on mandatory activities, indicators, and prescribed outcomes (Figure 1).

Sustainability appears explicitly in the text of those calls where the primary objective is to strengthen universities' third mission activities, while in education- and training-focused calls sustainability is predominantly embedded indirectly through objectives related to access, employability, and innovation. It is the government's intention to encourage universities' regional involvement, social responsibility [33] and third mission activities. Third mission activities play an increasingly important role in the accreditation processes necessary for both central funding and education. Responsive regulation requires regulatory engagement by institutions and fosters partnerships between regulators and universities [27].

Aspects of Sustainability in HRDOP and EDIOP Plus

Building on the qualitative content analysis, this section examines how the objectives and eligible activities of the HRDOP calls align with the elements of the HCD-SAL framework [24]. This framework can be used to examine the universities' potential in the fulfillment of the SDG goals based on a combined system of criteria of SAL and HCD. A qualitative content analysis has been conducted from the aspect of how the goals and eligible activities defined in the HRDOP applications fit with the elements of the framework. By the examination of the tenders the key themes related to innovative practices, collaboration, and quality assurance have been identified first. The analysis involved coding the content to categorize

these themes and capturing their strategic implications for educational initiatives. After synthesizing the information, we interpreted how the identified goals and activities align with the parts of the framework.

The analysis of the calls is shown in Figure 2; it describes how the specific tenders aim to support the goals in the framework.
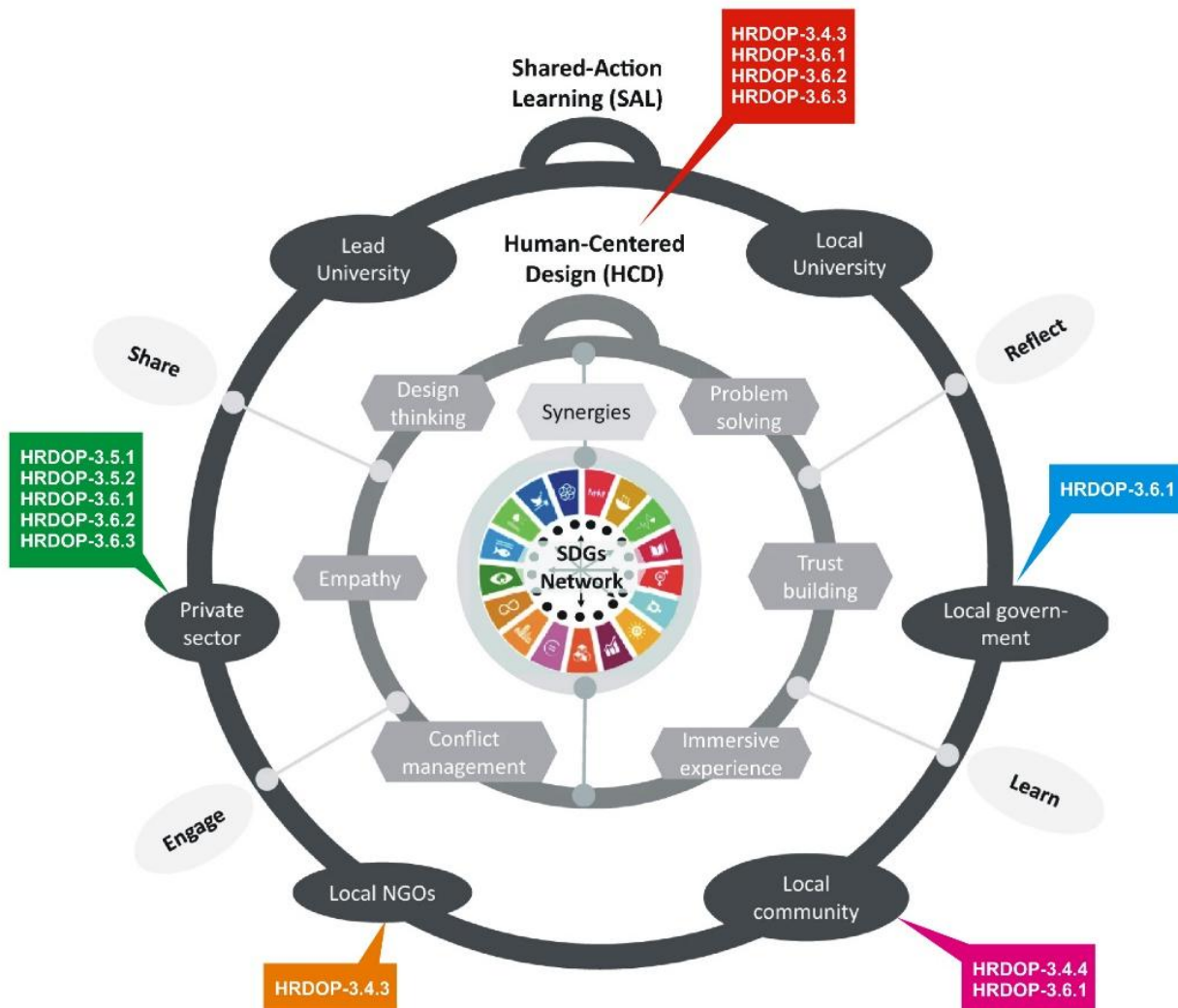

Figure 2. HRDOP Funds in the framework of Agusdinata [24]. Source: Own compilation by the authors based on the framework figure from Agustinata [24].

For the period 2021–2027 Széchenyi Plan Plus [34] is the development program that defines the goals and activities which are supported by EU sources. Széchenyi Plan Plus [34] has eight operational programs, and examining their beneficiaries EDIOP Plus [25] identifies higher education and the corporate sector Lee-Davies (2018) [35] as a primary target group.

EDIOP Plus [25] has the main aim to improve society's standard of living, to protect jobs, to expand employment, and to increase the competitiveness of Hungary and the EU. This will be achieved through the following priorities:

- P1. Business development

Interventions
Increasing the resilience, technological and organizational renewal of the SME sector, which forms the defining part of the economy
Business development by strengthening the competitiveness of SMEs
Development of priority areas according to the S3 strategy (e.g., green, circular economy and creative industry) is emphasized
Increasing trust and cooperation, introducing the so called "agency model"
The essence of the agency model is the coordinated cooperation of government institutions providing various services to businesses on a non-profit basis and organizations outside of them.

- P2. Research, development, innovation

Support of applied R&D activities reflecting market demand.
Interventions:
Support for knowledge production by strengthening R&D capacities and using them more effectively
Encouraging the flow of knowledge by supporting R&D collaborations: non-profit organizations, civil organizations, budget bodies
Competence centers, experimental development carried out in cross-sector cooperation, industrial research
Scientific innovation parks—with the participation of a HEI

- P3. Sustainable labor market

Expansion and development of the labor force, initiatives to promote employment opportunities, and support programs aimed at facilitating the entry and reintegration of disadvantaged individuals into the labor market.

- P4. Youth guarantee

Labor market initiatives aimed at supporting youth aged 15–29 who are neither employed nor enrolled in educational programs.

- P5. Higher education, vocational training

Creation of vocational training sector knowledge centers

The involvement of SMEs as collaborators helps to strengthen the connection between local education and the economy, the flow of innovation, its integration into training, as well as increasing the number of students participating in dual training and improving access to dual training for those participating in professional bachelor's training. HEIs are also involved as professional cooperation partners—encouraging the professional cooperation of HEIs and enterprises by the vocational training centers, coordinating the development of training cooperation at the local and regional level.

Researching the framework [24] with a focus on university relations from the point of view of the dynamics between the participants of the quadruple helix, it can be concluded that the priorities cover the elements defined in the framework.

Figure 3 shows the relevance of the priorities (P1–P5) in terms of supporting the cooperation between the actors of the Quadruple helix, applying the framework's double principle (SAL and HCD).
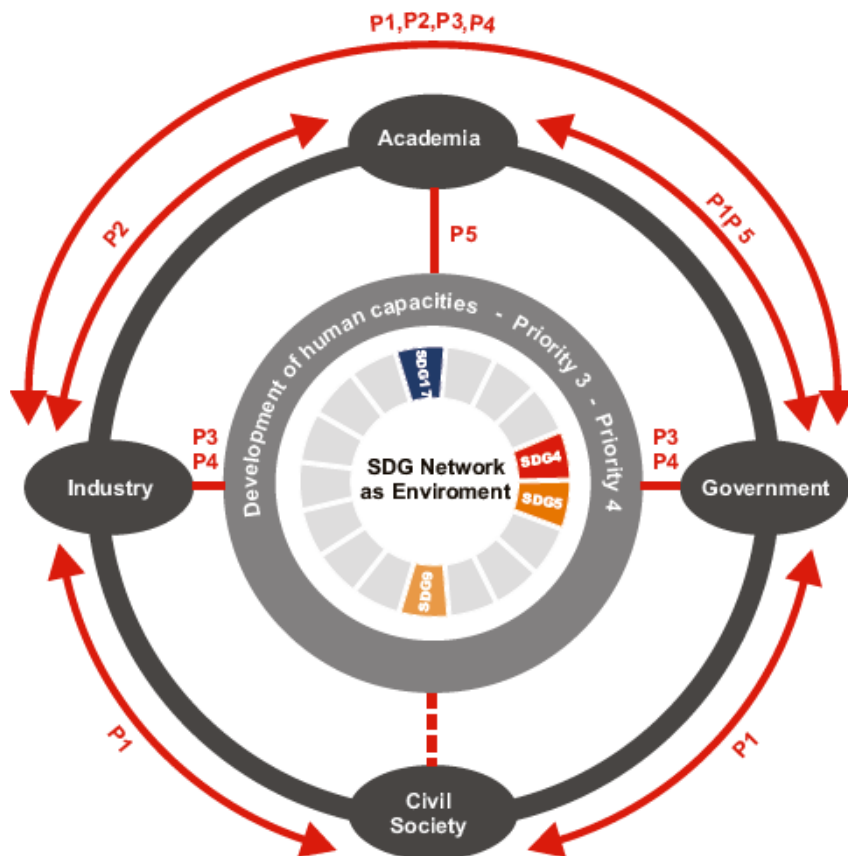

Figure 3. EDIOP Plus Funds [25] in the framework of Agusdinata [24] and quintuple helix [5]. Source: Own compilation by the authors based on the figure of framework from Agustinata [24] and the quintuple helix from Carayannis and Campbell [5].

DISCUSSION

The aim of this paper was to examine and analyze the elements and factors affecting the sustainability conditions [36] of 9 EU calls targeting Hungarian universities as one of the actors of the quadruple/quintuple helix. The findings of the policy-level content analysis align with the innovation ecosystem literature, which emphasizes the role of universities as coordinators and knowledge brokers within complex, multi-actor systems [4,5]. The HRDOP and EDIOP Plus calls reflect governance-oriented policy instruments that aim to steer ecosystem dynamics through conditionality, collaboration requirements, and sustainability-related objectives.

This study focused on how the conceptual and conditional system of sustainability is integrated into the HEIs and what kind of support system encourages universities to establish relationships with the actors of the helix. Examining the objectives of the HRDOP calls, it can be stated that sustainability aspects are not always directly addressed but are indirectly supported through objectives that promote sustainability.

Regarding funding allocation, universities received substantial financial support during the Széchenyi 2020 (7) programming period. The Széchenyi 2020 (for the period 2014–2020) [20] application system has facilitated collaborations with a diverse range of stakeholders from multiple angles. To access these funds, HEIs were required to align their institutional strategic objectives with the criteria specified in the respective calls. Such priorities were also embedded within regulatory frameworks, exemplified by the reformation of accreditation procedures, necessitating institutional adaptations driven by both funding and regulatory imperatives. As the programming period approached its conclusion, an increased focus was placed on ecosystem engagement and the development of corporate partnerships. This strategic direction is further emphasized in the Széchenyi Plan Plus [34], where universities are positioned as partners within corporate consortia under the EDIOP Plus [25] initiative.

CONCLUSIONS

The European Structural and Investment Funds constitute a significant part of the public resources designated for development, especially in Central and Eastern Europe [37]. In these regions, HEIs play an important role not only as educational and research institutions but also due to their impact on regional development. They can influence the growth and progress of the region [37]. Cohesion policy is the main investment policy of the European Union [38], and regional funding sources influence the outcomes of universities operating within these regions [37]. The new calls for proposals should include key elements that support their sustainable operation. Universities certainly have an influence on the fact that these resources are called for finding instruments that contain the elements of the framework, considering it by planning the projects. Preliminary examination of the operative programs suggests that the upcoming calls in EDIOP Plus [25] operative program will aim to foster collaboration between companies and HEIs. EDIOP Plus [25] covers all the actors and elements of the framework, but from the academia's point of view, universities should solve the relations with civil society on their own contribution or from other sources. The sustainability aspects identified within the framework have been implemented in accordance with cooperation principles. During project development, it is essential to plan project elements that serve HCD to ensure the project's sustainable outcomes. Following the framework's criteria [24], it will be essential for universities to pursue sustainability by establishing partnerships with

other entities, not solely relying on EU funding, but also utilizing alternative or independent resources.

Considering the three missions of HEIs EDIOP Plus [25] focuses on R+D, due to the main aim and priorities of the operational program, collaborations related to education and the third mission should be also solved from the universities' own resources or from other sources (EU or governmental funds).

The findings should be interpreted at the level of policy design rather than project implementation outcomes.

LIMITATIONS

At the time of the research, the calls within the EDIOP Plus [25] program had not yet been announced. Consequently, the analysis was limited to the various calls issued under the HRDOP [21] framework. The examination of future tenders associated with EDIOP Plus [25] presents a potential avenue for subsequent research; specifically, further studies could investigate the influence of strategic orientations articulated in strategic documents and operational programs on HEIs.

Based on the above, a potential topic for further research could be the implementation and representation of universities' sustainability goals in their strategic plans, such as institutional development plans, in the years following 2025 and 2026, in light of the upcoming calls announced within the Széchenyi Plan Plus (for the period 2021–2027) [34]. The research can serve as a strategic foundation for shaping the institutional development plan and the medium-term strategic objectives of Hungarian universities in the coming period.

DATA AVAILABILITY

The authors confirm that all data generated or analyzed during this study have been provided within the manuscript. The data that support the findings of this study are openly available on palyazat.gov.hu.

AUTHOR CONTRIBUTIONS

Conceptualization, NMH, MR-M and MKS; Methodology, NMH; Formal Analysis, NMH; Investigation, NMH, MR-M and MKS; Resources, NMH; Writing—Original Draft Preparation, NMH; Writing—Review & Editing, MR-M and MKS; Visualization, NMH; Supervision, MR-M and MKS.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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