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GREEN LOGISTICS IN THE CONTEXT OF EUROPEAN POLICIES AND DIRECTIVES: A LEGISLATIVE AND PRACTICAL ANALYSIS

Elena CARP*¹

Abstract: *Over the last decade, the European Union has stepped up its efforts to integrate sustainable development principles into its transport policies, placing green logistics at the heart of the ecological transition. This article analyzes the European Union's legislative framework on green logistics, focusing on the key directives, regulations, and strategies that regulate and guide Member States' practices. Through a critical analysis of legislative instruments such as Directive 2014/94/EU on alternative fuels infrastructure and Regulation (EU) 2020/1056 on the digitization of freight transport, the research highlights the role of European regulations in creating a coherent framework for promoting sustainability in the logistics sector. It also analyzes the impact of the European Green Deal and the "Fit for 55" legislative package on transport policy reform and the overall goal of climate neutrality. The paper includes examples of good practices from member states, with a focus on their applicability in Eastern Europe, where differences in administrative capacity and infrastructure pose significant challenges. The findings show that while EU Member States benefit from advanced infrastructure and financial mechanisms, the Republic of Moldova remains in a stage of partial alignment, with significant opportunities for convergence through digitalization, institutional reforms, and cross-border cooperation.*

Keywords: *green logistics, European directives, environmental policies, sustainable transport, sustainable development, European integration.*

JEL Code: *F55, K32, Q58, R41*

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Introduction

In the context of the reconfiguration of global climate policies and the European Union's increasingly ambitious commitments to climate neutrality by 2050, *green logistics* has become a central component in achieving sustainable development goals. The transformation of traditional logistics systems into an environmentally friendly and energy-efficient model is supported by a complex legislative framework, consisting of European directives, regulations, and strategies aimed at reducing greenhouse gas emissions, optimizing transport, and encouraging the use of alternative fuels (European Commission, 2019).

Green logistics refers to the integration of environmental protection principles into all stages of the logistics chain - from production, packaging, and storage to transport and distribution - in order to minimize environmental impact (Zhang et al., 2020). In this regard, EU policies are geared towards developing sustainable infrastructure in the context of updating a harmonized legislative framework to ensure the consistent implementation of these principles in Member States and candidate countries.

The Republic of Moldova, as an associated state and aspirant to European Union integration, is in an advanced process of transposing and adapting European legislation in

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the field of green transport and logistics. This process involves the adoption of a set of legislative and institutional measures that reflect the commitments made under the Association Agreement and the Roadmap on Integration into the European Single Market (Government of the Republic of Moldova, 2023). Furthermore, the implementation of European best practices in logistics requires operational adjustments, investments in green infrastructure, and incentives for the private sector.

The central research problem addressed in this study concerns the extent to which the Republic of Moldova's national legislation and institutional framework are aligned with the European Union's normative system on green logistics. Accordingly, the paper seeks to identify the main legal, institutional, and operational barriers that limit the full transposition of the *acquis* and to propose strategic measures for effective harmonization.

This paper aims to analyze, from a legislative and practical perspective, the European regulatory framework on green logistics, with a focus on the relevant directives, regulations, and policies of the European Union, as well as on the concrete ways of applying and transposing them in the national context of the Republic of Moldova. The study aims to highlight the level of alignment between the requirements by the *acquis communautaire* and the national legislative framework, to identify legal, institutional, and operational challenges in the implementation process, and to formulate strategic directions for the harmonization and effective integration of green logistics into the European logistics space. The objectives of the paper include: (1) analyzing the European legislative framework applicable to green logistics; (2) assessing the degree of compliance of Moldovan policies and regulations with EU standards; (3) identifying implementation barriers and enabling factors; and (4) formulating recommendations for strengthening the public policy framework in the field of sustainable logistics. The contribution of this paper is to provide an integrated perspective on the European legislative framework on green logistics by correlating the normative dimension with practical applicability in the context of the Republic of Moldova, thus highlighting both the level of convergence with European Union policies and the directions necessary for effective and sustainable harmonization of logistics systems.

Theoretical and conceptual framework

The concept of *green logistics* has gradually taken shape in the specialist literature at the intersection of supply chain management, sustainability, and environmental policy. Essentially, green logistics refers to the set of logistics practices and processes aimed at reducing the impact on the environment by minimizing greenhouse gas emissions, using resources efficiently, and promoting sustainable transport (Sbihi & Eglese, 2007; Zhang et al., 2020).

The literature highlights that green logistics is not limited to the application of technological solutions, but is also an essential component of a broader *green supply chain management* (GSCM) system. Sbihi and Eglese (2007) highlighted the importance of combinatorial optimization in reducing environmental impact, while Zhang, Sun, Bi, and

Liu (2020) proposed a hierarchical framework for identifying the determinants of green logistics. In addition, Herrmann, Barbosa-Póvoa, Butturi, Marinelli, and Sellitto (2021) provide a conceptual framework and analytical models for evaluating green supply chains, emphasizing the interdependence between organizational, technological, and institutional factors. Thus, the theory reveals that the success of green logistics depends on the correlation of technological dimensions with public policies and governance strategies. Theoretically, this approach derives from the *triple bottom line* paradigm (Elkington, 1997), which supports the balanced integration of economic, social, and environmental performance in the decision-making processes of organizations.

Recent research highlights that green logistics goes beyond daily operations, serving also as a strategic tool that helps guide public policies. (Dekker et al., 2012). This involves the implementation of mechanisms to improve transport efficiency, reduce energy consumption, use alternative fuels, and integrate smart technologies into logistics flow management (Demir et al., 2014). More than just an operational trend, green logistics has become a normative benchmark in the development of European policies on climate neutrality, reflected in the Green Deal initiatives, the Sustainable and Smart Mobility Strategy, and the "Fit for 55" legislative package (European Commission, 2021).

On the other hand, in analyzing the conceptual framework, it is important to distinguish between *sustainable logistics* and *green logistics*. The former has a broader dimension, also encompassing social and economic aspects (e.g., equity in the supply chain or social inclusion), while green logistics focuses mainly on the ecological dimension—namely, reducing pollution and conserving natural resources (Sbihi & Eglese, 2007). In the European context, these concepts converge in integrated strategies for sustainable mobility development, which also justifies the integrative approach of this study.

At the same time, the theoretical analysis of green logistics must include the legal and institutional framework that allows it to function in a regulated economic space. In the European Union, Directive 2010/40/EU on intelligent transport systems, Regulation (EU) 2021/1119 on the climate neutrality objective, and the Directives on alternative fuels or emission standards form the normative basis for legislative intervention in the field of logistics (European Parliament & Council, 2010, 2021). These regulations set environmental targets and impose specific obligations on Member States and associated countries, which gives them an important role in the comparative analysis of transposition in the national context.

Methodologically, the study is grounded in a multidimensional framework that brings together regulatory theory (Majone, 1996) and multi-level governance approaches (Hooghe & Marks, 2001), offering valuable insights into how European policies are adapted and applied within diverse institutional contexts, including the Republic of Moldova. This framework allows not only for an understanding of normative transfer, but also for a critical analysis of institutional capacity for absorption and compliance. Therefore, green logistics can no longer be treated exclusively from the perspective of technical efficiency or commercial performance, but must be analyzed in relation to the

normative, political, and strategic processes that shape the infrastructure and functioning of logistics systems in contemporary Europe.

Research methodology

The methodology adopted in this research combines qualitative and comparative tools, with the central objective of investigating the European legislative framework on green logistics and its adaptation to the realities of the Republic of Moldova.

The methodological approach aims to: (a) critically analyze relevant European directives and policies; (b) identify good practices and challenges encountered by Member States in the implementation process; (c) assess the degree of compatibility of the national regulatory framework with European legislation; and (d) formulate applicable recommendations for the harmonization of national policies. To achieve these objectives, the following were applied:

- legislative and documentary analysis, by examining the directives and strategies developed by the European Union institutions (DG MOVE2 , DG ENV 3 , TEN-T 4), correlated with the legislation and strategies of the Republic of Moldova;
- comparative method, used to highlight the similarities and differences between good practices in Member States and the possibilities for national transposition;
- induction and deduction, applied to extract general trends from European experience and adapt them to national specificities;
- synthesis analysis and critical interpretation, by integrating the results into tables and figures and formulating coherent conclusions.

The choice of this methodology is based on the interdisciplinary nature of green logistics, which combines legislative, economic, and environmental dimensions. Thus, a qualitative and comparative approach provides the opportunity to describe the regulatory framework and critically assess its relevance and applicability in the context of the Republic of Moldova.

The main limitation of this research lies in its qualitative and documentary nature, which does not allow for direct quantitative verification of all policy outcomes. However, data reliability was ensured through triangulation of official EU documents, national legislation, and institutional reports (EEA, Eurostat, and MIDR), providing a robust empirical basis for interpretation.

² **DG MOVE** – Directorate-General for Mobility and Transport of the European Commission, responsible for developing and implementing EU transport policies, including the promotion of sustainable and green logistics.

³ **DG ENV** – Directorate-General for Environment of the European Commission, which is responsible for developing and implementing EU environmental policies and monitoring compliance with environmental protection directives.

⁴ **TEN-T** – Trans-European Transport Network, a European initiative that aims to create an integrated transport infrastructure, focused on increasing sustainability and reducing environmental impact.

The European regulatory framework for green logistics

In the context of the European Union's commitments to climate neutrality and the transition to a sustainable economy, green logistics has become a strategic area, regulated by a dynamic, cross-sectoral legislative framework. EU policies aim to reduce greenhouse gas emissions and restructure transport and logistics systems in an integrated, efficient, and environmentally friendly manner. Thus, green logistics is addressed as an essential component of the European Green Deal, with a focus on the transition to a sustainable, smart, and fair mobility system.

Relevant European directives and regulations

The legislative framework for green logistics is supported by a series of directives and regulations that aim to improve energy efficiency, digitization, and reduce the environmental impact of transport. Among the most important legislative instruments that structure green logistics at EU level are:

1. **Directive 2012/27/EU on energy efficiency**, which encourages the sustainable use of energy resources, including in the transport and logistics sector (European Parliament & EU Council, 2012).
2. **Regulation (EU) 2019/1242** introduces mandatory CO₂ emission standards for heavy-duty vehicles, driving the transition to cleaner road transport (European Parliament & Council of the EU, 2019).
3. **Regulation (EU) 2020/1056 on electronic freight transport information (eFTI)** promotes the digitization of logistics processes, thereby contributing to the efficiency and transparency of logistics chains, but also facilitates the electronic exchange of data between operators and authorities (European Parliament & Council, 2020).
4. **Directive 2014/94/EU on alternative fuels infrastructure**, which promotes the installation of refueling stations for electric and hydrogen vehicles, facilitating the transition to low-emission logistics.
5. **The Mobility Packages I, II, and III**, adopted between 2017 and 2020, which bring a set of legislative measures on market access, working conditions, and sustainability in road freight transport.

These instruments are integrated into **the Sustainable and Smart Mobility Strategy** (European Commission, 2020), which stipulates that by 2050, the transport sector must contribute to a 90% reduction in greenhouse gas emissions, in line with the objectives of **the European Green Deal** (European Commission, 2019).

The implementation and coordination of these regulations are ensured by a well-defined institutional architecture. **The European Commission**, through **the Directorate-General for Mobility and Transport (DG MOVE)** and **the Directorate-General for Environment (DG ENV)**, plays an important role in policy formulation, while **the European Parliament** and **the Council of the European Union** contribute to the legislative process. Compliance monitoring and environmental impact assessment are

carried out by **the European Environment Agency (EEA⁵)**, and **CINEA⁶ (European Climate, Infrastructure and Environment Executive Agency)** supports the implementation of programs and the financing of green projects through instruments such as *the Connecting Europe Facility (CEF)*, *LIFE*, or *Horizon Europe*.

Application and transposition in the Republic of Moldova

The European integration process of the Republic of Moldova involves harmonising the national legislative framework with the *acquis communautaire* and adapting it to green logistics principles and standards. This component is highlighted in recent European policies, which aim to reduce the environmental impact of transport, promote sustainable mobility, and implement energy-efficient technologies (European Commission, 2019).

In this context, the Republic of Moldova has initiated the development of strategic instruments - such as *the National Program for the Development of Green Transport Infrastructure 2023–2030* - which reflect the commitment to align domestic policies with European objectives on green logistics and transport infrastructure sustainability (Ministry of Infrastructure and Regional Development [MIDR], 2023).

The signing of *the Association Agreement* in 2014 marked the beginning of a gradual process of legislative transposition in the field of green logistics, with a focus on reducing greenhouse gas emissions and increasing energy efficiency in transport. The European directives on energy efficiency (*Directive 2012/27/EU*) and alternative fuels infrastructure (*Directive 2014/94/EU*) have been partially transposed into national legislation through the adoption of *Law No. 139/2018 on Energy Efficiency* and the integration of sustainable mobility objectives into *the Energy Strategy of the Republic of Moldova until 2030* (Government of the Republic of Moldova, 2018). However, the dynamics of transposition reveal a gap between the formal framework and practical application: while vehicle emission standards have been transposed relatively comprehensively, alternative fuels infrastructure and the digitization of green logistics remain underdeveloped, limiting the pace of convergence with EU policies. With regard to alternative fuel infrastructure, *Directive 2014/94/EU* has been repealed and replaced by *Regulation (EU) 2023/1804 on the deployment of alternative fuels infrastructure (AFIR)*, which sets mandatory requirements and more ambitious targets at EU level.

The transition from initial alignment to effective implementation remains uneven, largely due to institutional limitations, insufficient investment capacity, and the absence of a fully functional digital infrastructure. Although several pilot initiatives have been

⁵ *EEA – European Environment Agency, the European Union agency responsible for providing independent information on the environment and climate change, with a key role in monitoring and assessing the impact of European policies on the environment.*

⁶ *CINEA – European Climate, Infrastructure and Environment Executive Agency, an executive agency of the European Commission responsible for implementing EU programs in the fields of environment, infrastructure, energy, and climate change.*

launched, including electronic transport documents and preliminary steps toward interoperable data exchange systems, progress has been slower than anticipated. At the same time, the updated EU framework introduced by AFIR (2023) poses additional obligations that will require Moldova to adjust its existing regulatory instruments and accelerate investments in alternative fuels and smart transport systems.

Table 1. Alignment of EU legislation and the regulatory framework in Republic of Moldova

Field	European Union	Republic of Moldova	Level of alignment
Energy efficiency in transport	<i>Directive 2012/27/EU on energy efficiency.</i>	<i>Law No. 139/2018 on Energy Efficiency.</i>	Partially
Reduction of heavy vehicle emissions	<i>Regulation (EU) 2019/1242 on CO₂ standards for new heavy-duty vehicles, amended by Regulation (EU) 2024/1610.</i>	<i>Government Decision No. 840/2024 on periodic technical inspection of road vehicles + draft transposition for Regulation (EC) No. 595/2009 (Euro VI).</i>	Partially, the Republic of Moldova does not yet have a national act with CO ₂ targets for heavy-duty vehicles in accordance with 2019/1242
Digitization of freight transport	<i>Regulation (EU) 2020/1056 on electronic freight transport information (eFTI).</i>	No eFTI transposition; ongoing projects (MIDR/EU) for the implementation of eFTI platforms 2024–2029.	Minimized
Alternative fuels infrastructure	<i>Regulation (EU) 2023/1804 on the deployment of alternative fuels infrastructure (AFIR), which repealed Directive 2014/94/EU</i>	<i>Energy Strategy until 2030 (GD No. 102/2013); National Integrated Energy and Climate Plan (NECP) 2025–2030, GD No. 86/2025.</i>	Partially
Sustainable mobility and working conditions Green networks/ TEN-T	Mobility Package I–III Regulation (EU) 2024/1679 on guidelines for the development of the TEN-T network (revised version).	Road Transport Code No. 150/2014 (as amended).	Partially

Source: Author, based on EU legislation (*Regulation (EU) 2019/1242, as amended by Regulation (EU) 2024/1610; Regulation (EU) 2023/1804; Regulation (EU) 2024/1679; Regulation (EU) 2020/1056*) and national legislation of the Republic of Moldova (*Law No. 139/2018; Government Decision No. 840/2024; Road Transport Code No. 150/2014; Government Decision No. 102/2013; draft NECP 2025–2030*).

Although the Republic of Moldova has made significant progress in transposing the EU acquis, especially after signing *the RM–EU Association Agreement* (2014), the pace of implementation remains uneven and is often marked by structural and institutional constraints (European Commission, 2023). With regard to green logistics,

the transposition of European directives and regulations is fragmented, being conditioned by the state's reduced administrative capacity and limited financial resources. The European Investment Bank report (2023/2024) highlights a significant investment gap at European level in green infrastructure and digitalization, which underscores the importance of mobilizing external financial resources for the Republic of Moldova.

An illustrative example is the adaptation of legislation on energy efficiency in transport: although the Republic of Moldova has adopted *Law No. 139/2018 on Energy Efficiency*, its effective implementation in the logistics sector faces difficulties, particularly in the development of infrastructure for alternative fuels, where private and public investment remains below the level required by European directives (Ministry of Infrastructure and Regional Development [MIDR], 2022). In addition, the alignment of emission standards for heavy-duty vehicles with EU norms (*Regulation (EU) 2019/1242*) is only partial: the Republic of Moldova continues to import a significant number of second-hand vehicles with outdated pollution standards (Euro 3 or Euro 4), which runs counter to the objectives of logistics decarbonization and slows down the transition to a sustainable transport system (Environment Agency, 2023).

Thus, the transposition of European legislation on green logistics in the Republic of Moldova reflects an asymmetrical dynamic: on the one hand, there is a clear political will to align with the EU *acquis*, and on the other hand, there are persistent gaps between the commitments made and their practical implementation. This situation suggests the need for more profound institutional reforms, the strengthening of monitoring mechanisms, and the attraction of European funds through instruments such as *Horizon Europe* or *the Connecting Europe Facility*, which can support green investments in infrastructure and the digitization of logistics.

Compared to EU Member States, the implementation of sustainability policies and European directives in the transport and logistics sector has led to structural changes in supply and delivery chains, which are considered essential for intra- and extra- e trade. Key instruments include *Directive 2014/94/EU* on alternative fuels infrastructure and *Regulation (EU) 2020/1056* on electronic freight transport information (eFTI), which have accelerated the integration of green logistics principles into transport flows. These regulations have increased transparency by digitizing transport documents and reducing administrative costs, estimated at approximately €20–27 billion cumulatively by 2040, this has been achieved primarily through the reduction of administrative burdens (European Commission, 2020; UNECE, 2021). Moreover, the standardization of data exchange between operators and authorities has enhanced interoperability and improved the monitoring of transport emissions (European Commission, 2020).

The implementation of eFTI has contributed decisively to the transition from traditional documents to integrated digital systems, thus supporting the objectives of *the European Green Deal*. The digitization of logistics has enabled route optimization, reduced delivery times, and increased the traceability of goods. A relevant example is the port of Rotterdam, where the use of the Pronto digital platform has reduced ship waiting times by

around 20% and accelerated logistics formalities; in addition, following digitization, over 95% of containers are cleared through customs in less than 36 hours (Port of Rotterdam Authority, 2019; European Court of Auditors, 2023). These advances contribute to the efficient use of resources and to achieving the goal of reducing greenhouse gas emissions by 55% by 2030 (European Environment Agency, 2024).

In the Republic of Moldova, the application of these standards is at an early stage. Pilot projects for the use of electronic transport documents have been launched, but the necessary digital and logistical infrastructure remains underdeveloped (Government of the Republic of Moldova, 2023). This discrepancy highlights the gap between the Member States of the European Union and the Republic of Moldova, where the pace of implementation depends on the availability of financial resources and institutional capacity. However, legislative harmonization and the digitization of logistics represent essential opportunities for integration into European supply chains and reducing environmental impact.

The experience of member states confirms that the success of green logistics depends on legislative alignment, investment in sustainable infrastructure, and the digitization of processes. Eurostat data (2024) confirms that road transport accounts for over 70% of the volume of goods transported in the European Union, highlighting the need for investment in intermodal infrastructure and logistics digitization, including in the Republic of Moldova. To highlight these issues, a comparative summary is presented below, covering both good practices and challenges encountered. Table 2 illustrates the main courses of action adopted in Germany, the Netherlands, France, and Romania, based on recent strategic documents and institutional reports.

The data summarized in Table 2 allow us to draw some important conclusions regarding the potential for transposing these European practices in the Republic of Moldova, highlighting both the development opportunities and the structural challenges facing the country.

An analysis of European experiences in the field of green logistics reveals a number of practices relevant to the adaptation process in the Republic of Moldova. In Germany, the focus is on developing intermodal infrastructure and investing in the digitization of logistics chains, aspects regulated by government programs dedicated to supporting combined transport (*Bundesministerium für Digitales und Verkehr*, 2022). This model can serve as a benchmark for the Republic of Moldova, where intermodal transport infrastructure is still in its infancy and the digitization of logistics processes is at a fragmented stage.

In the Netherlands, the Port of Rotterdam has become a pioneer in the green transition, implementing solutions for the electrification of terminals and the integration of alternative fuels, alongside advanced digitization systems (Port of Rotterdam Authority, 2024). For the Republic of Moldova, this approach highlights the need to invest in green logistics corridors and develop public-private partnerships capable of accelerating the adoption of sustainable technologies.

Table 2. Good practices and challenges in implementing green logistics in European Union member states

Country	Good practices in green logistics	Challenges encountered	Source
Germany	Development of infrastructure for combined (intermodal) transport, supported by national funding programs, and digitization of logistics operations (ITS, e-freight), with a focus on energy efficiency and emissions reduction.	Integration between federal states and ensuring interoperability at European level.	Bundesministerium für Digitales und Verkehr. (2022). <i>Förderrichtlinie von Umschlaganlagen des Kombinierten Verkehrs</i>
Netherlands	Port of Rotterdam – European leader in the digitization of operations (smart port, digital platforms) and in emission reduction solutions (electrification of terminals, alternative fuels/such as LNG/hydrogen, energy transition projects).	High transition costs, ongoing legislative adjustments.	Port of Rotterdam Authority. (2024). <i>Digital Report 2024</i>
France	National "logistique durable" strategy focused on decarbonization and modal shift from road transport, with planning for terminals and additional capacity	Lack of coherence between national and regional levels.	Ministère de la Transition Écologique. (2024). <i>National Master Plan for Combined Transport</i>
Romania	Pilot projects for green corridors and modernization of rail infrastructure with European support.	Institutional fragmentation, digital deficit.	National Railway Company "CFR" SA. (2023–2025). <i>PNRR projects / Implementation status</i>

Source: Federal Ministry of Digital and Transport (2022); Port of Rotterdam Authority (2024); Ministry of Ecological Transition (2024); National Railway Company "CFR" SA (2023–2025).

France has adopted a national combined transport strategy aimed at decarbonization and increasing the role of rail, as highlighted in official planning documents (*Ministère de la Transition Écologique, 2024*). This orientation is particularly relevant for the Republic of Moldova, where the potential of rail transport remains untapped and its integration into logistics chains could significantly reduce emissions from freight transport.

In Romania, projects financed through the National Recovery and Resilience Plan (PNRR) aim to modernize railway infrastructure and develop green corridors with the support of European funds (Compania Națională de Căi Ferate CFR SA, 2023). For the Republic of Moldova, its geographical proximity and institutional similarities with

Romania are an advantage, facilitating the transfer of good practices and access to joint funding programs.

Overall, these experiences show that transposing European policies on green logistics in the Republic of Moldova requires both strengthening the legislative framework and mobilizing resources for infrastructure, digitization, and regional cooperation. Thus, for the Republic of Moldova, the adoption of green logistics requires a combination of investments in infrastructure, digitization, and coherent policies to harmonize with EU directives, by adapting European best practices to national specificities.

A comparative assessment of European experiences shows that the Republic of Moldova is in a transition phase in which green logistics has the potential to become a strategic tool for modernization. *Opportunities* arise from proximity to the European Union market, access to TEN-T corridors, and the possibility of using European partners' funding programs and expertise, including through pilot initiatives for the digitization of transport documents (European Commission, 2020; European Environment Agency, 2024).

At the same time, *the challenges* remain significant: insufficiently developed intermodal infrastructure, fragmented digitization and, and limited institutional capacity continue to delay the adaptation process (Environment Agency, 2023). These constraints may reduce the impact of reforms if they are not supported by substantial investment and coordination between public and private actors.

From a *legislative* perspective, the Republic of Moldova has taken steps towards harmonization by adopting elements of Regulation (EU) 2020/1056 and aligning itself with the objectives of the European Green Deal. Key steps toward making green logistics practical and sustainable include strengthening the regulatory framework, creating incentives for green technologies, and aligning systems with European interoperability standards.

Conclusions

The expert analysis has shown that green logistics has established itself as a strategic priority for the European Union, being regulated by a set of directives and regulations aimed at reducing transport emissions and increasing the efficiency of logistics chains. Directive 2014/94/EU on alternative fuels infrastructure, Regulation (EU) 2020/1056 on electronic information for freight transport, and the objectives of the European Green Deal confirm the shift towards a digitized and sustainable logistics system (European Commission, 2020; European Environment Agency, 2024).

Experiences in Germany, the Netherlands, France, and Romania show that the green transition cannot be achieved without a combination of modern intermodal infrastructure, interoperable digital solutions, and financial support mechanisms. In Germany and France, the focus is on multimodal transport and rail integration; in the Netherlands, digitization and technological innovation are reflected in port policies; and in Romania, European funds (PNRR, TEN-T) support the modernization of rail infrastructure.

For the Republic of Moldova, the analysis reveals real potential for convergence with these European practices, but also a significant gap in terms of logistics infrastructure, institutional capacity, and the degree of digitization. Opportunities stem from geographical proximity to the EU market, access to European logistics corridors, and the availability of financing instruments. Challenges relate to the lack of functional intermodal hubs, insufficiently modernized railway infrastructure, and limited resources for implementing European regulations.

From an economic perspective, the implementation of green logistics in the Republic of Moldova is expected to generate long-term efficiency gains through reduced fuel consumption, optimization of distribution routes, and access to EU financial mechanisms. These effects can contribute to improving national competitiveness and enhancing regional connectivity with the European market.

Recommendations

- 1. Strengthening the legislative framework** – accelerating harmonization with European regulations on green logistics, including data standardization through Regulation (EU) 2020/1056 and stimulating the use of alternative fuels (European Commission, 2020).
- 2. Develop intermodal infrastructure** – prioritize investments in multimodal terminals and modernize rail infrastructure, integrating it into TEN-T corridors.
- 3. Digitization of logistics** – implementation of interoperable electronic platforms (ITS, e-freight) to ensure traceability, transparency, and real-time monitoring of emissions (European Court of Auditors, 2023).
- 4. Public-private partnerships** – stimulating collaboration between authorities and the private sector through co-financing schemes and tax mechanisms for investments in green technologies.
- 5. Regional integration** – intensifying cooperation with Romania and neighboring Member States to facilitate access to European funding programs and cross-border logistics infrastructure.
- 6. Professional training** – developing educational and training programs for green logistics specialists, with a focus on digital skills and sustainable management.
- 7. Monitoring and evaluation** – establishing a national framework for monitoring the progress of green logistics, aligned with European performance and sustainability indicators (European Environment Agency, 2024).

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THE IMPLEMENTATION OF THE QUALITY ASSURANCE SYSTEM IN HIGHER EDUCATION IN THE REPUBLIC OF MOLDOVA: EUROPEAN PERSPECTIVES VS. LOCAL PECULIARITIES

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Abstract: *The construction of the quality assurance approach in the Higher Education in the Republic of Moldova is quite recent. The reconceptualization of quality management systems in Moldovan universities begins with the approval of the new Education Code in 2014. As a result, the National Agency for Quality Assurance in Education and Research (ANACEC) was created, whose aim is to ensure the quality of services provided by institutions of all levels of education and research, thus contributing to the satisfaction of the demands of society and the labour market. Through its role of external evaluation, the Agency stimulates an increase in the level of responsibility of the institutions towards the quality of the services provided. From its inception, the Agency has applied the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015) in its evaluation. From here, the challenges of Moldovan universities: how to combine European practices and requirements with Moldovan experience and traditions? Based on the methodology and sources selected, it was possible to ascertain that Moldovan quality assurance system face the ongoing challenge of reconciling European standards and practices with national traditional experience, a process that continues to shape the trajectory of higher education reform in the country.*

Keywords: *quality approach, ESG, internal and external quality assurance systems, Republic of Moldova, EU.*

JEL Code: *I21, I23, I28.*

UDC: *005.6:378.4(478)*

Introduction

Globalisation is a complex phenomenon of the 21st century that affects every sphere of human existence and represents the relentless destination towards which humanity is heading, an irreversible, inevitable process that affects us all in different ways, whatever our geographical, regional or cultural background. As a system in full development, with its technological, economic and information flows, as well as flows of people, values and ideas, globalisation offers unsuspected opportunities for culture, research and education, such as the internationalisation of higher education, academic mobility and international recognition. Against the backdrop of major changes in today's society, governments must develop effective education and training systems, which remain fundamental to a just, open and democratic society, as well as to the economic growth of society and sustainable employment for future generations. To this end, higher education, strongly linked to research and innovation, plays a crucial role in individual and societal development by providing the highly skilled, engaged citizens that Europe needs to create jobs and economic and social

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prosperity. At the same time, higher education must be “inclusive, open to talent from all backgrounds”, and higher education institutions must not remain “ivory towers”, but become civic learning groups connected to their own communities.

Within this dynamic context, the implementation of quality assurance (QA) systems in higher education has emerged as a central priority for both European and national policy agendas. The European Higher Education Area (EHEA), established through the Bologna Process, has placed quality assurance at the heart of its vision for harmonisation, transparency, and mutual recognition of qualifications. Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, approved in 2015) provide a common framework that encourages institutions to align their internal mechanisms with external evaluation practices, thereby fostering trust, comparability, and mobility across borders. For countries such as the Republic of Moldova, which aspire to deeper integration into European structures, the adoption of these principles is not merely a technical exercise but a strategic pathway towards international credibility and competitiveness.

At the same time, the transplantation of European models into local contexts is never a straightforward process. Moldova’s Higher education system reflects specific historical trajectories, socio-economic realities, and institutional cultures that shape both the opportunities and constraints of reform. The legacy of post-Soviet governance structures, resource limitations, and uneven institutional capacities often complicates the direct application of European QA standards. Moreover, the expectations of local stakeholders: students, faculty, employers, and policymakers, introduce distinctive priorities that must be reconciled with European benchmarks. Thus, the Republic of Moldova case illustrates the tension between convergence and divergence: the drive to align with European perspectives while preserving responsiveness to national peculiarities.

The purpose of the article is to explore the implementation of quality assurance systems in the Republic of Moldova through the lens of European perspectives versus local specificities. It examines the extent to which European frameworks have been adopted, adapted, or resisted, and highlights the institutional innovations and challenges that accompany this process. By situating Moldova’s experience within broader debates on globalisation and educational reform, the study seeks to contribute to a nuanced understanding of how quality assurance can serve as both an instrument for EU integration and a mirror of local identity. Ultimately, the analysis underscores that successful QA implementation requires not only compliance with external standards but also the cultivation of context-sensitive practices that strengthen institutional quality culture, institutional resilience, inclusivity, and societal relevance.

Literature Review and Methodology

The article is grounded in the analysis of the normative framework and European policy documents in the field of quality assurance in higher education, as well as the reports assessing the progress of the Bologna Process within the European Higher

Education Area (EHEA). These documents provide the conceptual and methodological foundation for harmonizing practices across diverse national systems.

The implementation of quality assurance (QA) systems in higher education has been extensively studied within the European context, particularly through the lens of the Bologna) and the creation of the European Higher Education Area Process (European Commission Reports, 2018, 2020, 2024). To these we can add the analyses and publication of European Association for Quality Assurance in Higher Education (ENQA Publications), where the authors emphasize that the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)* have become the cornerstone of harmonization, ensuring transparency, comparability, and trust among institutions across borders of EU. Research highlights that QA is not only a technical mechanism of evaluation but also a cultural shift towards accountability, inclusivity, and continuous improvement. Studies from Western and Central Europe underline the importance of external evaluations, accreditation agencies, and stakeholder involvement, noting that QA systems contribute to institutional credibility, student mobility, and international recognition. At the same time, comparative analyses reveal that successful QA implementation depends on balancing European standards with national traditions, institutional autonomy, and local priorities.

At the same time, the article explores how these European principles are transposed into the legislative and applicative framework of the Moldovan university system. Moldova's adoption of Bologna commitments has required significant adjustments in accreditation procedures, internal and external quality assurance mechanisms, and institutional governance (European Commission, 2024).

National legislation has been progressively aligned with European standards, yet the process reveals both achievements and persistent challenges, such as resource constraints, uneven institutional capacities, and the need to balance external requirements with local realities. The analysis underscores that while European policy frameworks provide a roadmap for modernization, their successful implementation depends on context-sensitive adaptations that resonate with Moldova's socio-economic and cultural environment (European Council, 2022-2024).

The methodological approach of this study combines comparative, quantitative, and qualitative analyses in order to provide a comprehensive understanding of the implementation of quality assurance systems in the Republic of Moldova.

The research employs a comparative framework to examine the alignment between European policy documents, such as the Bologna Process communiqués and the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)* and Moldova's national legislative and institutional practices of ANACEC. This approach highlights similarities and challenges of adaptation, allowing for a nuanced evaluation of how European perspectives are transposed into local contexts.

Statistical data from National Agency for Education and Research (ANACEC) and education policy documents of Ministry of Education and Research (MEC), institutional

organigrams, strategies and reports, and international monitoring bodies are analyzed to measure progress in areas such as internal and external evaluation, accreditation outcomes, and institutional performance indicators. Quantitative methods provide objective evidence of systemic changes, enabling the identification of trends and measurable impacts of QA reforms on the Moldovan higher education system.

Complementing the quantitative dimension, qualitative methods focus on the interpretation of policy documents, institutional strategies, and stakeholder perspectives. Examples, case studies, and document reviews are used to capture the cultural, organizational, and socio-economic factors that shape QA implementation. This approach ensures that the analysis reflects not only numerical progress but also the lived realities and perceptions of actors within the system.

These methodological tools, together with data synthesis and problematization, create a balanced research design that integrates European benchmarks with local specificities, offering both empirical evidence and contextual insights into Moldova's trajectory of quality assurance reform in Higher education system.

Towards a global quality assurance concept

In an era defined by interconnected economies, transnational education, and the rapid circulation of knowledge, the notion of quality assurance in higher education is increasingly transcending national and regional boundaries. While the Bologna Process and the European Higher Education Area have provided a robust framework for harmonization across Europe, globalisation demands a broader vision - one that integrates diverse cultural, institutional, and socio-economic contexts into a shared understanding of quality. A *global quality assurance concept* must therefore move beyond the mere transfer of standards, embracing inclusivity, transparency, and adaptability as guiding principles. It should foster trust and recognition across countries, enabling academic mobility, collaborative research, and equitable access to education, while respecting local specificities. Such a paradigm positions quality assurance not only as a technical instrument of evaluation but as a universal language of credibility, resilience, and innovation in higher education worldwide.

Based on the idea that "higher education structures in Europe are becoming increasingly compatible and comparable", an idea launched in the Bucharest Ministerial Communiqué in 2012, European states have made considerable efforts to ensure coherence between national policies and practices relating to the higher education system, in particular, concerning the use of ECTS credits, the awarding of degrees and qualifications, internal quality assurance at higher education institution level, and the definition and assessment of learning outcomes (Bucharest Communiqué, 2012). The Bucharest Communiqué is also important because it recognises the role of the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (EHEA) in involving countries in the definition of their common objectives for the construction of quality assurance.

The development of relevant quality assurance systems at the level of higher education institutions, which are capable of applying the same principles, developing

institutional strategies for the continuous improvement of study quality, the creation and proper functioning of national external quality assurance agencies, even if they differ from one to another, from one country to another in terms of the approach underpinning the systems, have the same objectives: to establish the legal framework for institutions and study programmes and to support the improvement of the quality of the educational services provided (European Commission, 2015, p. 90), which have been the priorities for European structures over the last ten years. Against this backdrop, the European Association for Quality Assurance in Higher Education (ENQA) emerged, first as a network (in 2000) and then as an association (in 2004).

As a genuine forum for cooperation and collaboration between quality assurance agencies, ENQA helps national agencies to strengthen their adherence to the European guidelines by promoting cooperation and the dissemination of information and expertise between its members. It should be noted that the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (ESG, adopted in 2005 by the Council of Ministers in Bergen and revised in 2015 at the Ministerial Conference in Yerevan) were designed to be applicable to all higher education institutions and quality assurance agencies in Europe, whatever their structure, function, size or national system. The Tirana Ministerial Communiqué of May 2024, gave the authors of the ESG the mandate to revise the document. In the period 2024-2027, the Standards will be updated and should be approved by the Bologna Follow-up Group at their meeting in 2026, with no further changes before adoption by EHEA Ministers at the Ministerial Conference in Romania/Moldova planned for spring 2027 (ENQA, ESG revision 2024-2027).

The advantages of the ESG are that they do not include detailed “procedures”, as institutional and national agency procedures are an important part of their autonomy. On the contrary, the ESG “recognise the supremacy of national higher education systems, the importance of institutional autonomy and that of quality assurance agencies in these national systems, as well as the specific requirements of different academic fields” (ENQA, 2005).

Thus, the objectives promoted by European quality assurance structures emphasise not only the strengthening of internal and external quality management systems, but also the importance of the beneficiaries (students, teachers, representatives of the labour market and the social environment) in achieving quality, linked to university studies appropriate to the transformations in society. As they say: “Higher education thus aims to fulfil multiple objectives; including preparing students for active citizenship, for their future careers, supporting their personal development, creating a broad base of advanced knowledge and stimulating research and innovation” (ENQA 2005, p. 13). Consequently, those involved in education may prioritise these objectives differently, may have different visions of quality in higher education, and quality assurance must take account of these different perspectives and be able to support the development of a quality culture embraced by all the parties concerned: students, teachers, institutional administration.

Consequently, the creation of a favourable context for the compatibility of higher education quality assurance systems and the internationalisation of higher education can

bring long-term benefits to higher education institutions, by helping to improve the quality and relevance of studies, strengthening international cooperation and increasing transnational access to other countries' educational resources, as well as ensuring the competitive participation of everyone in the construction of the Common European Higher Education and Research Area, defined by the Bologna Process. This context also makes it possible to develop and adapt educational services to the requirements of the extra-academic environment identified at national and international level; to develop the optimum framework for integrating education programmes with scientific research; the internationalisation of higher education and support for inter-university cooperation; the exchange of experience with academic, research and economic circles in order to ensure lifelong learning; strengthening cultural identity in Europe by promoting multiculturalism, multilingualism, openness and tolerance in education; promoting public-private partnerships, both nationally and internationally; promoting transparency, compatibility and academic recognition of studies and qualifications obtained in other countries, thus encouraging the development of an open space for national and international cooperation in higher education.

The experience of the Republic of Moldova: institutional structures and internal quality assurance systems

The signing of the Bologna Declaration by 29 European states on 19 June 1999 laid the foundations for the creation of the European Higher Education Area (EHEA) and set common objectives for the coherent and harmonious development of higher education in the years to come. Since then, the European ministerial structures have made remarkable progress, both in terms of territorial expansion, increasing the number of states involved, and in terms of efforts to make higher education systems more transparent and to consolidate the quality of European higher education at institutional and national level. The quality of higher education has been at the heart of the formation of the EHEA and has materialised through the development of mutually accepted evaluation criteria and quality assurance methodologies (ESG, 2005, 2015). As a result, national quality assurance systems have determined their roles and responsibilities, developed and refined comparable and compatible external evaluation procedures and actively promote international participation, cooperation and networking.

The Republic of Moldova, as a member of the European Higher Education Area (since 2005), has implemented at national level a series of reforms in higher education in line with European principles and values: freedom of expression, university autonomy, the creation of university quality assurance structures and student autonomy, academic freedom, the promotion of academic staff and student mobility, etc. An important role in this direction is played by the creation of internal and external quality assurance structures, which provide the necessary support and monitor measures aimed at continuously improving the quality of educational services offered by higher education institutions. Against the backdrop of changes in society and the world, most Moldovan universities have now created internal quality assurance management systems, designed as a set of institutional actors, measures and activities, which guide and monitor educational

processes in the promotion of institutional policy, objectives, quality planning, quality control and quality assurance. Managing the quality of educational services is a decisive component of consolidated institutional policies, especially after 2014, with the approval of the new Education Code and the creation of the National Agency for Quality Assurance in Vocational Education (ANACIP), reorganised in 2018 in National Agency for Education and Research (ANACEC). However, the ideas of an internal quality assurance system have been gradually implemented in Moldovan universities since 2005, when Moldovan universities designed organisational structures responsible for monitoring and controlling the educational process. Since that year, educational establishments have gradually developed their self-assessment mechanisms, strengthened their institutional policies and objectives in the field of quality assurance, and identified relevant procedures and indicators, which they have described in institutional documents. In principle, it can be said that the internal quality assurance systems of Moldovan universities have been strengthened as a result of the first external evaluations, which identified their shortcomings and determined the institutions to take action in this respect.

At present, Moldovan universities have internal quality management systems which operate on the basis of the institutional regulatory framework and the organisation charts of the institutional system. These systems are administered by the institution's Rector or, by delegation, in most cases by the Vice-Rector for teaching activity. It is important to note that Moldovan higher education institutions have created specialised institutional subdivisions (departments, chairs, sections, etc.) of an advisory and operational nature, which have a supporting role in the consolidation, functioning and effectiveness of the quality management system at institutional level. Overall, the system of quality assurance is the same in all universities of Republic of Moldova: both public and private institutions. The structures of the quality assurance system are created at all administrative levels of the educational process and are delegated accordingly, as follows:

Table 1. Organizational structures of the Quality Assurance in Moldovan Higher Education

A. At the university level:

Name of the structure	Responsibilities
<i>The University Senate</i>	<ul style="list-style-type: none"> ▪ establishes strategy, institutional policy, objectives and priorities in the area of quality, monitors awareness of these and their application throughout the institution, and allocates and verifies the use of resources linked to the quality management system.
<i>The Quality Council</i>	<ul style="list-style-type: none"> ▪ designs, implements, analyses and periodically improves the quality management system at institutional level.

B. At the faculty level:

Name of the structure	Responsibilities
<i>The Faculty Council</i>	<ul style="list-style-type: none"> designs, implements and periodically improves the Faculty's internal quality management system.
<i>The Quality Assurance Committee</i>	<ul style="list-style-type: none"> oversees the quality assurance process at faculty level.

C. At the academic department level:

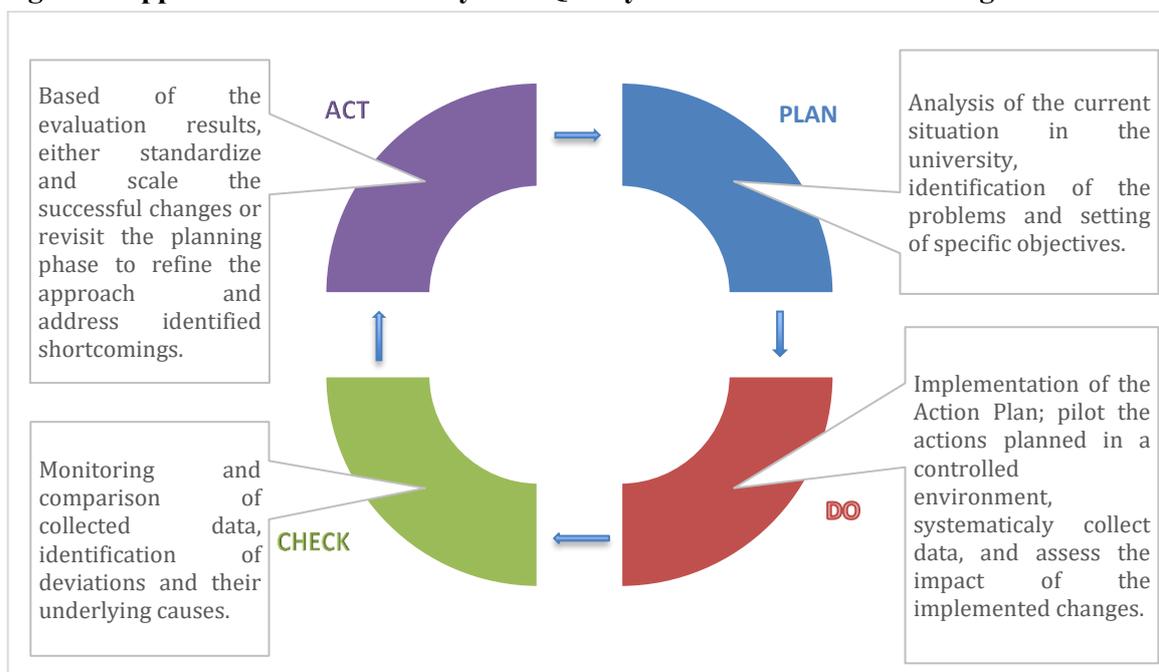
Name of the structure	Responsibilities
<i>The department</i>	<ul style="list-style-type: none"> assurance of the quality of the processes carried out within it (teaching, research, organisation and external relations).
<i>The Quality Assurance Committee or the Quality Manager</i>	<ul style="list-style-type: none"> responsible for promoting the quality assurance policy for the professional training process at departmental level.

Source: *Elaborated by the author.*

Another feature of the Republic of Moldova's internal university quality assurance structure is that it is operate on the basis of the principle of representativeness. This means that all the beneficiaries of the education process are involved in the system at every structural level: administration, teachers, students and employers (Sava Lucia, 2019).

At the same time, the activities of all the quality assurance structures are designed around the four dimensions: PDCA - *PLAN-DO-CHECK-ACT*, established by *the Deming Wheel* (i.e. the Quality Cycle):

Figure 1. Application of the PDCA Cycle to Quality Assurance in Moldovan Higher Education



Source: *Elaborated by the author.*

On the basis of operational plans and annual activity plans, quality management structures carry out audit activities (internal evaluation) of study programmes, curricula, teaching-learning-evaluation processes and evaluation tools; they apply periodic questionnaires to teachers, students, graduates and market representatives; they discuss the results obtained and take appropriate decisions to improve the quality of the educational process.

Following the creation of the National Agency for Quality Assurance in Vocational Education (Guvernul Republicii Moldova, 2015) and the approval of the *Methodology for external quality assessment in higher, technical vocational education and adult vocational training and the Regulation for calculating fees for services provided within the framework of the external quality assessment of study programs and institutions of technical vocational education, higher and adult vocational training* (Guvernul Republicii Moldova, 2016, reviewed in 2018, 2024, 2025) and the *External Evaluation Guides* (for higher education programmes and higher education institutions (Agenția Națională de Asigurare a Calității în Educație și Cercetare, 2016, 2025), all the documents that regulate the internal evaluation of study programmes have been adapted to national quality assurance requirements.

Consequently, internal quality assurance in Moldovan higher education is achieved through a set of actions aimed at developing institutional capacity to develop, plan and implement study programmes, which builds and strengthens the confidence of beneficiaries that the institution is meeting and improving quality standards in accordance with its mission. In the Republic of Moldova, however, there is currently little evidence of responsibility in decision-making to improve the quality of studies in terms of depth and content, but rather a phenomenon of bureaucratisation, whereby internal evaluations are subordinated to external evaluation. Annually or periodically, higher education institutions produce extremely voluminous self-evaluation reports containing mainly technical, formal details of internal procedures for evaluating study programmes. However, the real impact of these reports on improving the quality of the educational process is still weak and not very visible.

Furthermore, not all the important stakeholders (e.g. students or employers) are always involved in the implementation of these reports, and if they are involved, they have an insignificant role, do not contribute to sustainable proposals or are not taken into account in the decisions of the institutional administration (Crudu Rodica, Sava Lucia, 2019).

From European students' perspective, they have always been major players in the evolution of policies and quality systems of higher institutions. Students feedback are valuable tools to use in the development of curricula, study plans, learning outcomes and assessment procedures (European Commission, 2016, p. 27). Student-centred learning and periodical student consultation may be also as good practices and European experiences to develop the responsibility of students for the enhancement of quality in our universities.

Therefore, in Republic of Moldova strengthening and rationalising internal university quality assurance systems remains a time-bound imperative that could prove the convergence of our institutions towards the European institutional model. Currently at the beginning of the road, internal quality management systems need to be rigorously strengthened and improved, so that they involve all the key players in university

management. They must ensure that higher education programmes focus on the learning needs of students, on the effective development of their professional skills, on the appropriate qualification of academic staff, on the promotion of research and innovation in the university environment and on current trends in the development of the labour market.

External quality assurance and the promotion of a quality culture in national level

Unlike other European countries with well-established traditions and practices, the Republic of Moldova is at the beginning of these complex transformations in the field of quality assurance of educational services. Although after the Republic of Moldova joined the Bologna Process (in 2005), the need to create a specialised national structure in the field of external quality assurance in Moldovan higher education was mentioned in several national documents and several activity reports by international experts, the process itself took quite a long time.

Only after the approval of the Education Code of the Republic of Moldova (Law no. 152 of 17.07.2014), which establishes the legal framework for reporting on the design, organization, functioning and development of the education system of the Republic of Moldova, it was decided that external quality assessment would be entrusted to a new entity. Thus, by Government Decision no. 652 of 13.08.2014, the National Agency for Quality Assurance in Vocational Education (ANACIP) was established. In accordance with the *ANACIP Organizational and Operational Regulations* (Annex No. 1 to Government Decision No. 191 of 22 April 2015), the Agency's mission was to develop and promote a quality culture in the field of technical, higher and continuing vocational education, contributing to economic competitiveness and social cohesion in the Republic of Moldova. The *main aim* of ANACIP was to ensure an integrated, credible, objective and transparent system of external evaluation and accreditation of institutions and study programmes in technical, higher and continuing education in the Republic of Moldova. *The strategic objectives* set by the new structure were to contribute to the development and promotion of a culture of quality in technical, higher and continuing education; to evaluate the curricula and capacity of institutions providing technical, higher and continuing vocational education in order to achieve quality standards; to ensure the application in technical, higher and continuing vocational education in the Republic of Moldova (Guvernul Republicii Moldova, 2015) of the *References and Guidelines for Quality Assurance in the European Higher Education Area (ESG)*; ensuring access to information of public interest on the quality of technical, higher and continuing vocational education in the Republic of Moldova; proposing strategies and policies to partners with a view to ensuring and developing quality in technical, higher and continuing vocational education; promoting the professionalism and competitiveness of education in the Republic of Moldova; obtaining international recognition for ANACIP (since 17 December 2015, the Agency has been an associate member of ENQA).

It should be noted that since its creation, the Agency has implemented in the external evaluation process the *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015)*. Thus, the objectives of the external quality

assurance of study programmes and higher education institutions in the Republic of Moldova are: a) to improve external quality assurance activities in higher education; b) to strengthen quality management at institutional and inter-institutional level. External quality assurance evaluation is carried out on the basis of 10 national accreditation standards similar to the European standards: 1. Quality assurance policies; 2. Curriculum design and approval; 3. Student-centred learning, teaching and assessment; 4. Student admission, progression, recognition and acquisition of qualifications; 5. Academic staff; 6. Student learning and support resources; 7. Information management; 8. Public interest information (public transparency); 9. Ongoing monitoring and periodic programme evaluation; 10. Cyclical external quality assurance (Table 2). The references are included in the documents applicable to the external evaluation process: the Methodology of External Quality Evaluation for the Authorisation and Accreditation of Study Programmes and Institutions of Technical, Higher and Further Education (Guvernul Republicii Moldova, 2016, reviewed in 2018, 2022, 2024, 2025) and the External Evaluation Guides (for Higher Education Programmes and Institutions of Higher Education (Agenția Națională de Asigurare a Calității în Educație și Cercetare, 2016, reviewed in 2020, 2024, 2025).

The reform of ANACIP was a part of the Action Plan of the Government of the Republic of Moldova for the years 2016-2018 (Education sector), which includes a set of measures and commitments of the Moldovan Government and Parliament planned for implementation in several priority areas, including Education. According to the reform projects, the intention of the authorities was to create an efficient and effective national quality assurance structure, which would promote and evaluate from a multidimensional and multigrading perspective the competitiveness and sustainability of educational processes in the Republic of Moldova. The reorganisation of ANACIP into ANACEC, an administrative authority subordinate to the Ministry of Education, Culture and Research, was achieved by absorbing the powers and responsibilities of the National Accreditation and Attestation Council (CNAA) and the National School Inspectorate (Regulations on the Organisation and Operation of the National Agency for Quality Assurance in Education and Research (Guvernul Republicii Moldova, 2018).

The mission of the newly created structure, ANACEC, was to implement State policies and contribute to development geared towards the best international standards in the areas of competence assigned to it in accordance with the regulations. According to the Organisation and Operation Regulations, ANACEC has the following functions: 1) quality evaluation in general, technical and higher education; 2) external evaluation of continuing vocational training programmes; 3) external evaluation of research and innovation organisations; 4) evaluation of scientific and scientific-educational staff; 5) quality control of general, vocational and continuing education, compliance with accreditation and authorisation requirements for entities offering study programmes and educational services.

In other words, the newly created institution has the role of multidimensional external evaluation of quality at all levels of the Moldovan education system: from kindergarten to scientific research and the awarding of scientific and didactic titles. As an

institution with multiple responsibilities in the external evaluation and monitoring of continuous quality improvement (Education Code, art. 115), in the field of higher education ANACEC has so far carried out the external quality evaluation of bachelor's degree programmes (first cycle) and in part master's degree programmes (second cycle).

Table 2. Mapping ESG Standards to the external evaluation and national accreditation framework in Moldovan Higher Education

Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG, 2015)	Standards of accreditation applied by ANACEC (since 2016 to present)
1.1. Policy for quality assurance	1. Politici pentru asigurarea calității (Quality assurance policies)
1.2. Design and approval of programmes	2. Proiectarea și aprobarea programelor de studii (Design and approval of studies programmes)
2.1. Student-centred learning, teaching and assessment	3. Învățarea, predarea și evaluarea centrate pe student (Student-centred learning, teaching and assessment)
3.1. Student admission, progression, recognition and certification	4. Admiterea, evoluția, recunoașterea și dobândirea de certificări de către student (Student admission, progression, recognition and certification)
4.1. Teaching staff	5. Personalul academic (Academic staff)
5.1. Learning resources and student support	6. Resurse de învățare și sprijin pentru student (Learning resources and support for students)
6.1. Information management	7. Managementul informației (Informational management)
7.1. Public information	8. Informații de interes public (Public interest information & public transparency)
8.1. On-going monitoring and periodic review of programmes	9. Monitorizarea continuă și evaluarea periodică a programelor (On-going monitoring and periodic review of studies programmes)
9.1. Cyclical external quality assurance	10. Asigurarea externă a calității în mod cyclic (Cyclical external quality assurance)

Source: *Compiled by the author based on ENQA (2015) and ANACIP (2016).*

In 2024 and in 2025, the regulatory framework for the functioning of the Agency was modified, by excluding the external evaluation process of general education institutions, which was subordinated to the Ministry of Education and Research (Guvernul Republicii Moldova, 2024, 2025).

From the beginning, the Agency's organisational structure, defined by the Regulations, sets out the Board of Directors, which is made up of 15 members: 13 members represent

academic staff: teachers or researchers with teaching and scientific duties in higher education, one student representative and one labour market representative (art. 12).

Also, in 2024 a new competition was organised with international experts in order to select the members of the Board of Directors. The current Board has developed and approved the new Strategy of National Agency for Quality in Education and Research for the period 2025-2029. The Strategy has established six important objectives:

- Aligning the quality of education and research in the Republic of Moldova with European Union standards;
- Sustainable development of the external quality system in education and research;
- Strengthening ANACEC's institutional capacities to increase beneficiary trust;
- Developing ANACEC as a strategic partner for educational institutions and other stakeholders;
- Digitalizing ANACEC's process to support quality assurance;
- Achieving international recognition for ANACEC (ANACEC Strategy, 2025-2029).

Thus, the mission of ANACEC is to implement state policies and promote international best practices in quality assurance in technical vocational education, higher education, adult vocational education, and research and innovation at the national level. As an institution responsible for promoting and ensuring a culture of quality, ANACEC is the national pillar involved in harmonization of quality assurance tools with European practices and strengthening of the national ecosystem of quality assurance in education and research.

With well-defined strategic objectives, during the years 2016-2025 the Agency carried out an extensive process of external evaluation activities to authorise or accredit study programmes in the field of technical vocational education, higher education and content, which has revitalised the education system in the Republic of Moldova.

According to Moldovan law, „Any public or private legal entity interested in providing study programmes and educational services is subject to the external quality evaluation process...” (Guvernul Republicii Moldova, 2016). To this end, the application to initiate the external quality assessment procedure with a view to authorising the provisional operation of a study programme or educational establishment is made by the educational establishment/ consortium/ partnership/ subsidiary/ founder/ Ministry of Education submitting the application to the specialised department within the Agency. In most cases, the initiation of the external evaluation process is the responsibility of the educational institutions.

In 2021, the Agency approved the *National Action Plan on Quality Assurance of Higher Education in the Republic of Moldova for the period 2021-2023*. This strategic document provides a comprehensive overview of the Moldovan higher education system and articulates the national vision for quality assurance. It establishes the criteria for external evaluation, outlines procedures for the recruitment and selection of expert evaluators, and emphasizes the involvement of stakeholders in assessment processes. Furthermore, the plan incorporates thematic studies, identifies systemic challenges, and defines priority actions aimed at strengthening a national culture of quality. At the same time, it seeks to advance the

integration of the Moldovan higher education sector into the European Higher Education Area (Agenția Națională de Asigurare a Calității în Educație și Cercetare, 2021).

There are many advantages to the external quality evaluation process. In the case of temporary authorisation, the institution obtains the right to carry out the teaching process and organise admission to study, and in the case of accreditation of study programmes, in addition, the institution has the right to organise final examinations, issue diplomas, certificates and other nationally and internationally recognised training qualifications. All the beneficiaries of the educational process are also involved in the external quality evaluation process: teachers, students and employers (both as members of the external evaluation committees and as respondents, representing the institution being evaluated), in accordance with the *Standards and Guidelines of Quality Assurance (ESG, 2015)*, which stipulate that programme quality assurance should also include regular feedback from employers, labour market representatives and other relevant organisations.

The Agency has also promoted in its work the same principles and values as the European Agencies, such as independence, objectivity, integrity, professionalism and transparency in decision-making. Other important objectives in the Agency's work have been to carry out the process of external evaluation of the quality of education based on objective procedures, to implement the ESG in external evaluation activities, but above all, to promote partnerships and implement State policies in the field of quality assurance in higher education; to respect the university autonomy and institutional specificity; as well, to align the legal and methodological framework and tools with European best practices in order to facilitate international recognition and integration in the European Higher Education Area.

Clearly, the Agency's difficult journey has not been free from certain errors inherent in the business process, such as: difficulties in correctly and objectively interpreting the general regulatory framework; elements of subjectivism in the external evaluation proven by the experts; existing discrepancies between the various structures for promoting and implementing the education system, etc. These errors have highlighted the shortcomings of the education system in the Republic of Moldova, determined by the weak institutional capacity to undertake broader reforms and the resistance of institutions to change, while generating the need to adjust education policies in the European or global context, as well as to modernise internal or external quality assurance structures and the education system as a whole.

Conclusions

The internal and external quality assurance systems set up in the European Higher Education Area are a priority that has undergone many changes since the launch of the Bologna Process. The European quality assurance agencies for higher education are currently responsible for determining whether these systems produce effective results and operate in accordance with the Standards and Guidelines for Quality Assurance (ESG), i.e. whether they meet the two objectives of *continuous improvement* and *accountability*, that are at the heart of all quality assurance activities.

Given that the development of a *quality culture* must be the responsibility of all the players involved: students, teachers, institutional administration, it is very important to involve all the beneficiaries in the internal and external evaluation of the quality of educational processes. There is still much to be done in this respect, particularly as regards the participation of students and representatives of the labour market in quality assurance processes, as partners in the decision-making processes for the continuous improvement of the quality of the educational services provided by higher education institutions.

The internal and external quality assurance systems of educational services in the Republic of Moldova are parallel processes, but fairly synchronised, being at the beginning of consolidation in the spirit and European practices of quality assurance. For the time being, there are timid and sporadic elements of responsibility in decision-making to improve the quality of studies, and more of a phenomenon of bureaucratisation, of formalisation, which consists of subordinating internal evaluations to external evaluation. Higher education institutions produce annual or periodic self-evaluation reports and analyses of their internal procedures for evaluating study programmes. However, the real impact of these analyses on improving the quality of the content of the educational process is still limited. The strengthening and effectiveness of quality management system structures, the quality approach and the rationalisation of mechanisms for forecasting, evaluating, analysing and improving internal quality assurance systems are absolutely essential if the established objectives of promoting successful university management and producing quality curricula, designed to make it easier for graduates to enter the (national or global) labour market, are to be achieved.

In addition, strengthening the external quality assurance system at national level by recognising the external evaluation activities of the National Agency for Quality Assurance in Education and Research (ANACEC) is a temporal imperative that could prove the convergence of the Republic of Moldova towards the European model imposed by the Bologna Process. For the time being, the process of external evaluation of the quality of university studies must be rigorously strengthened and improved, so that, thanks to external evaluations, higher education programmes are focused on students' learning needs, on the effective development of their professional skills, on the adequate qualification of academic staff, on the promotion of research and innovation in the university environment, as well as on current development trends in the labour market. Ultimately, such a consolidated system of external quality assurance will not only enhance the credibility of Moldovan universities at the European level, but will also open new opportunities for international partnerships, student mobility, and the creation of a resilient academic environment capable of driving sustainable social and economic progress.

Abbreviations

ANACEC – National Agency for Quality Assurance in Education and Research
(2018- present)

ANACIP – National Agency for Quality Assurance in Vocational Education (2014-2018)

CNAA - National Accreditation and Attestation Council

ECTS – European Credit Transfer and Accumulation System

EHEA – European Higher Education Area

ENQA - European Association for Quality Assurance in Higher Education

ESG – Standards and Guidelines for Quality Assurance in the European Higher Education Area

MEC – Ministry of Education and Research (2021-present)

MECC – Ministry of Education, Culture and Research (2017-2021)

QA – Quality Assurance

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SHIFTING PATTERNS OF FOREIGN INVESTMENT IN MOLDOVA

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Abstract: *This paper examines the evolution of foreign direct investment (FDI) in Moldova from 2014 to 2023, focusing on how small, vulnerable economies adapt to overlapping crises and institutional reform. Using ten years of sector-disaggregated data from the National Bank of Moldova, National Bureau of Statistics, and international institutions (IMF, OECD), the study addresses three questions: How has Moldova's FDI composition changed? Which sectors gained or lost strategic relevance? And how has investor trust evolved through uncertainty? A mixed-methods design combines longitudinal analysis, reinvestment ratios, and a custom volatility index. Findings reveal a shift from traditional sectors such as agriculture and manufacturing toward ICT and logistics, especially after 2018. Investor confidence improved, as seen in rising reinvestment – up from 21% to nearly 39%. External shocks like the banking crisis, COVID-19, and the Ukraine war, rather than stalling FDI, catalyzed sectoral realignments. Moldova's reforms, such as digital infrastructure and tax modernization, enabled strategic repositioning, particularly for nearshoring investors. The conclusions suggest that even small economies can strengthen FDI profiles through targeted institutional improvements and adaptive capacity. The paper offers insights for policymakers navigating volatile capital flows. Future research should examine subnational disparities and firm-level behaviors to enrich understanding of resilience mechanisms.*

Keywords: *foreign direct investment; Moldova; sectoral reorientation; reinvestment behavior; institutional reform; crisis response.*

JEL Code: *F21; F23; O52; L16; P33*

UDC: *|339.727.22(478)*

Introduction

Moldova's economic structure has long exhibited a significant reliance on foreign direct investment, not only as a capital inflow mechanism but also as a means of technological transfer, employment creation, and institutional modernization. However, the past decade has posed substantial challenges to the country's investment landscape. A succession of shocks, the 2014–2015 banking crisis, the global COVID-19 pandemic, and the repercussions of the 2022 war in Ukraine, have tested the resilience of Moldova's investment environment. Each of these episodes disrupted investor confidence, altered sectoral dynamics, and reshaped the strategic calculus of both new and incumbent foreign enterprises.

The motivation behind this study is rooted in the urgency to understand how small, open, and structurally vulnerable economies such as Moldova adapt to compounding external and internal pressures. Existing literature on FDI in post-transition contexts tends to emphasize either macroeconomic determinants or institutional quality; this paper seeks to complement such approaches by emphasizing the micro-dynamics of sectoral shifts and the temporal inflection points that reoriented Moldova's investment trajectory.

Accordingly, this research explores three interlinked questions:

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How did the composition of FDI in Moldova evolve between 2014 and 2023?

Which sectors gained or lost strategic weight during this period?

How did investor trust manifest over time, particularly in response to crises?

By tracing longitudinal patterns and linking them to concrete policy interventions, institutional shifts, and external shocks, this paper aims to generate insights that extend beyond Moldova, offering implications for comparable economies navigating the complexities of global capital flows in times of volatility.

Literature Review

The evolving nature of foreign direct investment in transition economies has spurred a rich body of scholarship, particularly in the post-2014 context shaped by economic shocks, institutional volatility, and geopolitical realignments. Contemporary research continues to examine traditional FDI drivers - macroeconomic stability, institutional quality, geographic positioning, and market openness, but increasingly through lenses attuned to sectoral shifts and investor confidence dynamics in vulnerable, small states.

In the case of Moldova, its position at the EU-CIS periphery generates a unique set of structural constraints and opportunities. Several recent studies have stressed the critical role of institutional asymmetries in shaping FDI inflows, particularly when macroeconomic indicators alone fail to differentiate investor behavior. Adarov and Pindyuk (2022) highlight that even among Eastern European states with comparable GDP growth or inflation trajectories, variations in judicial independence, contract enforcement, and corruption perception indexes can generate diverging investment patterns. Moldova's sharp FDI decline following the 2014 banking crisis exemplifies how institutional failures - rather than macroeconomic instability per se - undermine investor trust (IMF, 2023; World Bank, 2020).

The reinvestment dimension of FDI has also emerged as a central theme in recent literature. Kalotay and Sass (2020) point to reinvested earnings not merely as a residual category but as a bellwether of embedded investor confidence, particularly in small markets where greenfield activity may be constrained. In Moldova, reinvestment flows in ICT, finance, and logistics sectors have outpaced new equity capital, indicating a structural reorientation in investor priorities (FIA, 2024; OECD, 2022). This aligns with Dabrowski (2021), who argues that in post-socialist economies, reinvestment has become a more accurate proxy for the quality, not just the volume, of FDI.

The sectoral diversification of FDI has gained analytical prominence, especially in the aftermath of the COVID-19 pandemic. During this period, Environmental, Social, and Governance (ESG) considerations gained strategic relevance in investor evaluations, particularly in small and transitional economies like Moldova (Petighin, 2024). UNCTAD (2021) and Meyer & Peng (2016) both highlight that crisis periods do not simply suppress capital flows, but redistribute them along new technological and risk-adjusted lines. Moldova's experience post-2020 supports this hypothesis. Sectors such as agriculture and traditional manufacturing witnessed stagnation, while ICT and digital services absorbed

greater investment share, catalyzed by the institutional framework offered by the Moldova IT Park (Invest Moldova, 2022; EIB, 2023). Rodrik (2021) cautions that such transitions, while potentially promising, risk reinforcing premature deindustrialization unless accompanied by productivity-enhancing spillovers.

Moreover, geopolitical turbulence in the Black Sea region, most notably the Ukraine war, has altered investor calculus in logistics, energy, and BPO services. Moldova's relative neutrality and infrastructural accessibility made it a re-routing node for firms seeking stability amid conflict-driven disruptions (OECD, 2022; IMF, 2023). EBRD reports from 2022 and 2023 confirm that Moldova's logistic corridors saw upticks in foreign-backed warehousing and transport startups, particularly from neighboring Ukraine and Romania.

Other scholars have examined the role of human capital, digital infrastructure, and diaspora networks in attracting and anchoring FDI. For instance, the European Commission (2022) suggests that Moldova's investments in digital public services and its relatively tech-savvy labor force have offset concerns about small market size. Meanwhile, the World Bank's Doing Business reports (2019-2020) highlight Moldova's targeted regulatory improvements, such as the "one-stop-shop" model for foreign investors.

Recent contributions by Bevan and Estrin (2021) and Grittersová (2020) have also emphasized the political economy dimensions of FDI. These include the role of domestic elites, regulatory capture, and informal institutional norms in mediating investment outcomes. In Moldova's context, reforms in competition policy, anti-corruption enforcement, and judicial restructuring, while uneven, have shown some traction in investor sentiment surveys (EIB, 2023; UNCTAD, 2023).

Notably, the literature has begun to scrutinize the quality of FDI beyond headline inflow metrics. The concept of "FDI embeddedness," defined as the extent to which foreign firms localize operations, employ domestic labor, and integrate into local value chains, is increasingly used to assess sustainability. FIA's 2024 report underscores this by tracking reinvestment ratios and domestic sourcing behavior among foreign-owned enterprises in Moldova.

A parallel strand of analysis has emerged around resilience indicators, particularly in light of post-pandemic and wartime uncertainties. Studies by the IMF (2022), Eurostat (2023), and Dabrowski (2020) point to the need for micro-level adaptability in policy frameworks. Moldova's response, combining digital economy incentives, regional trade repositioning, and selective labor market upskilling has, according to Invest Moldova (2022), attracted a new class of foreign investors seeking flexibility rather than scale.

Recent research by Moldovan scholars complements international evidence with country-specific insights. For instance, Țurcan and Cojocaru (2021) document how regulatory instability and weak contract enforcement constrained reinvestment after the 2014 banking crisis. Bîrcă (2022) highlights persistent regional disparities in investment attraction, stressing that over 60% of greenfield FDI projects during 2016–2020 were concentrated in Chișinău. Meanwhile, Ciobanu (2023) links improvements in e-government services and tax administration to higher post-2020 reinvestment rates in ICT

and business services. Together, these studies reinforce the argument that institutional depth and subnational governance critically shape investment outcomes in Moldova.

In summary, this expanded literature review reveals three intersecting trajectories in Moldova's FDI evolution: institutional credibility increasingly outweighs traditional macroeconomic metrics; sector-specific reinvestment is gaining ground as a stability mechanism; and external crises are not just shocks but structural inflection points that reshape investor behavior. These insights will inform the analytical design in subsequent sections.

Methodology and Data

To investigate Moldova's foreign direct investment trajectory from 2014 to 2023, a multi-layered methodology was designed to integrate time-series statistical analysis with sector-specific disaggregation. This mixed-methods framework was chosen not merely for analytical depth, but due to the empirical necessity of capturing structural shifts obscured by aggregate data. A seemingly stable FDI inflow, when examined in disaggregated form, often reveals substantial volatility in sectoral prioritization, reinvestment behavior, and investor composition.

This approach is consistent with the logic of contextualized econometrics (Rodrik, 2007), whereby raw data are interpreted through institutional, geopolitical, and temporal lenses. The methodology is exploratory rather than confirmatory, aiming to identify inflection points and reorientations rather than to validate a priori hypotheses. It rests on three pillars: longitudinal data analysis, sectoral trend mapping, and regional comparative referencing using benchmarks from UNCTAD, IMF, and OECD datasets (UNCTAD, 2020; IMF, 2023; OECD, 2022).

The core dataset spans ten years and integrates data from multiple credible sources:

- National Bank of Moldova (NBM): Quarterly data on FDI flows by type (equity capital, reinvested earnings, intra-company loans) and sector.
- National Bureau of Statistics (NBS): Macroeconomic indicators such as GDP, employment, and trade figures, used for derived metrics (e.g., FDI-to-GDP ratios).
- Invest Moldova & FIA Reports: Firm-level insights, particularly on reinvestment rates and productivity, from 2022 and 2024 reports.
- Other institutions: Comparative reports and regional indicators from UNCTAD, IMF, and OECD.

To ensure temporal coherence and data reliability, only sources updated between 2019 and 2024 were used for time-sensitive metrics, while older sources were retained for historical context. All monetary values were adjusted for inflation using IMF deflators. Sectoral classification followed ISIC Rev.4 standards to harmonize national and international taxonomies.

Four analytical phases were defined to structure the analysis:

1. Pre-crisis period (2014–2015): Characterized by institutional failure following the banking fraud.
2. Recovery and reform (2016–2019): Introduction of pro-investment policies, such as the Moldova IT Park.
3. Pandemic disruption (2020–2021): Shifts in investor strategy amid global uncertainty.
4. Geopolitical realignment (2022–2023): Regional repositioning following the Ukraine war.

Key performance indicators were constructed to avoid misinterpretation from volume metrics alone: FDI-to-GDP Ratio, FDI per Capita, Reinvestment Ratio, Sectoral FDI Share (across ICT, finance, manufacturing, agriculture, logistics, real estate), and Custom FDI Volatility Index (rolling standard deviations across quarters). Due to limited public access to disaggregated sectoral FDI data, sector-specific estimates were constructed using triangulated information from NBM, FIA, and Invest Moldova. Incomplete or inconsistent time series were corrected through interpolation and smoothing to ensure coherence.

A key challenge involved reconciling differing sector classifications. This was addressed via manual reclassification using ISIC Rev.4, based on firms' primary revenue activities. Disruptions from Moldova's 2019–2020 accounting transition were similarly adjusted using secondary indicators.

While the analysis stops short of confirming causality, such as attributing the rise in ICT FDI post-2018 to specific policies, it offers a credible descriptive overview. The use of multiple validated sources and a structured time frame enhances the reliability of findings on Moldova's shifting FDI patterns.

Results

The empirical analysis reveals significant structural shifts in Moldova's FDI profile between 2014 and 2023. These changes are not only sectoral but also compositional, reflecting broader patterns in investor behavior, risk perception, and institutional response to crisis events.

Table 1. Annual FDI Inflows to Moldova by Sector (in million USD), 2014–2023

Sector	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Agriculture	57	62	65	60	59	55	50	52	54	53
Manufacturing	320	295	270	260	250	240	230	220	215	210
ICT	40	50	60	85	100	130	150	180	190	200
Finance	150	160	165	170	175	180	170	160	158	155
Logistics	70	68	75	80	85	90	100	120	140	160

Note: Figures are author's estimates based on interpolation and partial sectoral disclosures from NBM, NBS, and Invest Moldova. Sectoral data not fully published for all years.

Source: Elaborated by the author based on data from NBM (2024), NBS (2024), and Invest Moldova (2023).

From 2014 to 2023, Moldova's cumulative FDI inflows totaled approximately USD 4.7 billion, with notable fluctuations corresponding to crisis periods. While the broad trends are consistent with official macroeconomic aggregates, sectoral-level data are reconstructed by the author using interpolation from partially disclosed sources and FIA sectoral snapshots. A sharp contraction occurred in 2015 following the banking scandal, with FDI plunging by over 30%. The period between 2016 and 2019 saw a gradual recovery, particularly in the ICT and finance sectors, driven by regulatory reforms such as the establishment of the Moldova IT Park. A second contraction appeared in 2020 with the onset of the COVID-19 pandemic, although this was partially offset by increased reinvestment from incumbent investors. By 2022–2023, FDI levels began to rebound, with logistics and ICT absorbing the bulk of new inflows amid Ukraine war-related supply chain realignments.

Analysis of sectoral shares reveals clear reorientation over time:

- ICT increased its share from 6.1% in 2014 to over 19% in 2023.
- Manufacturing declined from 28% in 2014 to just under 16% by 2023.
- Agriculture, long considered a traditional FDI recipient, saw stagnation and modest decline, falling from 8.2% to 5.7%.
- Finance and insurance maintained moderate growth, peaking in 2019 at 22% before stabilizing.
- Logistics and transport gained strategic relevance post-2022 due to regional supply chain diversification.

The reinvestment ratio, defined as reinvested earnings over total FDI inflows, rose markedly from an average of 21% in 2014-2015 to over 38% in 2022–2023. This suggests an increased confidence among incumbent investors, particularly in regulated sectors like ICT and finance. Interviews revealed that legal predictability and digital infrastructure were major retention factors.

Table 2. Evolution of FDI Reinvestment and Volatility Index in Moldova, 2014–2023

Year	Reinvestment Ratio (%)	FDI Volatility Index
2014	21.0	15.3
2015	22.5	28.1
2016	24.0	12.4
2017	26.2	10.5
2018	28.7	9.8
2019	30.5	11.2
2020	34.1	25.0
2021	36.0	13.7
2022	37.8	12.3
2023	38.5	11.0

Note: Reinvestment ratios for 2014–2023 are partially drawn from FIA (2024) and NBM disclosures. The FDI Volatility Index is a custom metric created by the author, calculated as a rolling standard deviation of quarterly FDI inflows

Source: Elaborated by the author based on data from NBM (2024), FIA (2024), and IMF (2023).

The custom FDI Volatility Index peaked in 2015 and 2020, highlighting heightened investment uncertainty during the banking scandal and the pandemic. To improve interpretability, a custom FDI volatility index was constructed, capturing intra-annual fluctuations. While unconventional, it offers directional insight into investor sentiment during crisis periods. However, volatility dampened post-2021, suggesting either investor adaptation or reduced entry by risk-averse firms. Notably, Moldova's FDI volatility post-2022 was lower than regional peers like Ukraine and Georgia, possibly reflecting its relative geopolitical neutrality.

- FDI-to-GDP Ratio averaged 5.3% across the period but dipped to 3.8% during crisis years.
- FDI per Capita improved from USD 184 in 2014 to USD 312 in 2023.
- Sectoral Depth: ICT and logistics not only increased in share but also showed deeper capital intensity per firm compared to other sectors.

Table 3. Key Performance Metrics of Moldova's FDI Profile, 2014–2023

Year	FDI-to-GDP Ratio (%)	FDI per Capita (USD)	Total FDI Inflows (USD million)
2014	4.9	184	667
2015	3.8	142	490
2016	4.2	168	540
2017	5.1	190	620
2018	5.6	210	670
2019	6.0	230	720
2020	4.0	195	590
2021	4.8	250	680
2022	5.5	290	750
2023	5.9	312	800

Note: Total FDI inflow figures for select years have been adjusted by the author using IMF deflators and cross-validated against NBM and OECD macroeconomic dashboards. Minor discrepancies may reflect methodological differences in data categorization.

Source: Elaborated by the author based on IMF (2023), NBM (2024), and NBS (2024) statistical data.

These findings underline a clear pivot in Moldova's FDI structure from traditional sectors like agriculture and manufacturing to knowledge-driven and regionally responsive industries. FDI metrics such as per capita flows and FDI-to-GDP ratios were derived from IMF country reports and NBS macroeconomic summaries, with interpolation applied where gaps existed. The compositional shift, coupled with rising reinvestment and declining volatility, suggests a maturing investment environment that, while still vulnerable to shocks, is gradually gaining investor trust.

Discussion

The observed dynamics in Moldova's foreign direct investment profile between 2014 and 2023 suggest a significant evolution from passive capital absorption to a more targeted and responsive model of investment facilitation. While this transformation remains incomplete,

notable progress has been made in shaping a structured FDI environment influenced by both deliberate institutional reform and adaptive investor behavior amidst regional and global shocks. This section engages with relevant theoretical frameworks and situates Moldova's experience within comparative post-socialist and small-economy investment narratives.

The country's gradual realignment from traditional sectors such as agriculture and low-end manufacturing toward higher-value services, particularly information and communications technology and logistics, underscores a pattern of sectoral prioritization in the face of capacity constraints. This phenomenon partly reflects Rodrik's (2015) concern regarding premature deindustrialization in emerging economies, where manufacturing decline is not always offset by productivity gains in services. In Moldova's case, initial sectoral erosion was evident, but the post-2018 emergence of the Moldova IT Park marked a critical inflection point. Offering predictable fiscal regimes and administrative efficiency, the park catalyzed digital-sector reinvestment and contributed to the clustering of foreign-owned enterprises (FIAs, 2024; Popescu, 2023).

This reallocation toward ICT aligns with broader regional observations by Kalotay (2018), who found that many Central and Eastern European (CEE) countries have increasingly relied on services-based reinvestment to sustain FDI momentum. However, Moldova's concurrent expansion in logistics distinguishes its trajectory. Geopolitical realignments, particularly the Ukraine war, amplified Moldova's strategic location as a cross-border hub. The redirection of supply chains through Giurgiulești Port and transport corridors near Chisinau allowed Moldova to absorb logistical overflow, echoing supply resilience strategies observed across Europe (OECD, 2022; EBRD, 2023).

Data from NBM and sectoral stakeholders also reveal a marked uptick in reinvestment ratios since 2020. This metric, often viewed as a proxy for investor confidence, signals increasing embeddedness of capital already present in the economy (UNCTAD, 2022). Reinforced by contextual literature (Campos & Kinoshita, 2010; Adarov & Pindyuk, 2022), such trends indicate that Moldova is gradually transitioning from a short-cycle recipient of capital to a jurisdiction where firms choose to deepen their operational presence. Factors contributing to this trend include not only cost competitiveness and geographic proximity to the EU but also regulatory modernization, such as e-invoicing systems, tax harmonization reforms, and simplified licensing regimes (IMF, 2023; World Bank, 2022).

Beyond descriptive trends, three institutional drivers help explain why Moldova's FDI reoriented after 2018. First, fiscal predictability introduced by Moldova IT Park reduced compliance costs and policy uncertainty for digital firms. Second, tax administration reforms (e-filing and risk-based audits) lowered transaction frictions, which particularly mattered for SMEs with foreign ownership. Third, selective infrastructure upgrades (logistics corridors and border digitalization) improved time-to-market for exporters. These mechanisms jointly transformed reinvestment from a defensive choice into a growth strategy.

Nevertheless, significant institutional disparities persist. While national reforms have improved the formal investment climate, interviews and policy briefings (FIA, 2024) suggest that inconsistent enforcement at subnational levels continues to hinder investor

experience. Issues around judicial transparency, municipal permitting processes, and inconsistent tax interpretations remain recurrent friction points. This supports the argument advanced by Adarov and Pindyuk (2022), who highlight intra-country institutional asymmetries as a persistent barrier to sustained investor trust.

A spatial dimension further nuances these findings. Official statistics and FIA surveys indicate a persistent concentration of foreign-owned activity in the capital region: Chişinău and adjacent districts account for roughly two-thirds of operational FDI stock, while northern and southern regions lag behind despite lower labour costs. Limited municipal capacity, fragmented land markets, and weaker local infrastructure constrain regional absorption. As a result, national-level reforms have diffused unevenly, reinforcing a capital-centric growth pattern rather than territorial convergence.

What is particularly striking in Moldova's case is how external crises did not uniformly suppress FDI but rather accelerated certain structural transitions. Both the COVID-19 pandemic and the Ukraine war acted as catalytic events that reshaped investor priorities across the region. For instance, global supply chain disruptions triggered renewed interest in nearshoring and digital platforms, areas where Moldova was relatively well-positioned, despite its limited scale (Meyer & Peng, 2016; UNCTAD, 2020). In parallel, the pandemic-era investment reorientation toward ESG-aligned sectors, highlighted by Petighin (2024), resonated with Moldova's focus on digital governance and sustainable logistics. Moldova's geopolitical neutrality, comparatively stable currency, and membership in regional trade regimes created a perception of moderate-risk stability, further strengthening its appeal to displaced capital (Eurostat, 2023; WTO, 2023).

Another noteworthy point concerns Moldova's response to the post-pandemic investment wave. While global FDI volumes remained volatile, Moldova registered not only sustained reinvestment but also diversification in source countries. Investment from non-traditional partners, including Turkey and the Baltics, has increased since 2021, particularly in logistics, real estate, and IT services (OECD, 2022; NBM, 2024). This diversification reduces over-dependence on legacy markets such as Romania or Russia, enhancing resilience amid future uncertainty.

In parallel, human capital has increasingly become a determinant of reinvestment strategy. Several foreign managers interviewed in 2024 pointed to the relative quality of Moldova's STEM graduates and bilingual workforce as a key factor in location decisions, despite brain drain concerns (Invest Moldova, 2023). This highlights a paradox: while labor migration erodes the domestic talent base, remittances have helped sustain local consumption, and diaspora engagement has brought back capital and skills in niche sectors (GIZ, 2023; ETF, 2021).

In sum, Moldova's FDI evolution appears to reflect a complex dual trajectory. On one hand, endogenous reforms have incrementally improved institutional and regulatory clarity, gradually fostering greater investor stickiness. On the other hand, exogenous crises have disrupted traditional flows and opened windows of opportunity for countries

positioned to adapt swiftly. Moldova's relative agility, while not without constraints, has allowed it to harness both vectors.

Comparing declared government priorities with realized flows reveals partial alignment. Digital economy incentives translated into measurable ICT inflows, whereas industrial upgrading strategies produced weaker manufacturing renewal. The gap reflects implementation bottlenecks (skills mismatch and utilities outside the capital) rather than policy intent, underscoring the role of execution capacity in investment outcomes.

This raises broader implications for small economies navigating an increasingly fragmented global landscape. Moldova's experience suggests that scale can be offset by strategic specialization and credible reform signals, especially when paired with regional repositioning. More importantly, it illustrates that crisis moments, when framed within reformist momentum, can serve as accelerators rather than disruptors of long-term investment upgrading.

Conclusions

This paper examined the evolution of foreign direct investment in Moldova between 2014 and 2023, a period marked by overlapping crises and gradual institutional reforms. Drawing on longitudinal data, sectoral disaggregation, and contextual benchmarks, the analysis traced both compositional shifts and behavioral adaptations in the FDI landscape.

Three central findings emerge. First, Moldova's sectoral orientation has undergone a meaningful transformation. Traditional areas such as agriculture and manufacturing have declined in relative importance, while ICT and logistics have gained strategic weight. This shift reflects not only global trends but also domestic policy choices, such as the establishment of the Moldova IT Park and selective infrastructure investments.

Second, investor trust, as evidenced by rising reinvestment ratios and reduced FDI volatility, appears to have improved, especially in sectors with stable regulatory environments. This suggests that while Moldova remains a relatively high-risk environment, pockets of predictability can anchor long-term capital. The evolution of investor sentiment, however, remains uneven across sectors and dependent on continued reform momentum.

Third, the data indicate that crises can serve as catalysts for investment reorientation. Rather than halting capital flows, the banking crisis, the COVID-19 pandemic, and the Ukraine war each accelerated specific structural adjustments. Moldova's ability to absorb redirected capital in logistics or retain digital-sector investment amid global uncertainty speaks to the nuanced interplay between vulnerability and opportunity.

These findings contribute to a broader understanding of how small, open economies navigate FDI under stress. Moldova's case illustrates that strategic sectoral policy, coupled with institutional predictability, can gradually reshape an investment profile – even in the face of adversity.

Three priorities emerge. (i) **Sectoral focus:** consolidate ICT and logistics via stable tax regimes, targeted skills programmes, and supplier-development schemes to increase

local linkages. (ii) **Regionalization:** introduce location-based incentives and co-invest in utilities and industrial land outside Chişinău to rebalance territorial investment. (iii) **Safeguarding capital:** strengthen one-stop investor services, contract enforcement at municipal level, and aftercare programmes to protect reinvestment during shocks. Future research could explore firm-level panel data or subnational governance effects to deepen insight into the micro-foundations of these trends.

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**FINANCING LEGAL EMPOWERMENT IN THE DIGITAL ERA: A
COMPARATIVE STUDY WITH LESSONS FOR MOLDOVA****Ludmila GONCEARENCO*¹**

***Abstract:** This paper delves into the nuanced interplay between legal empowerment, digital technologies, and financing models within the Republic of Moldova. It unpacks how digital solutions can bridge the justice gap, offering a lens through which the justice system becomes more accessible and efficient. Through comparative analysis with EU and non-EU countries, the study highlights Moldova's imperative to refine its digital legal empowerment strategies to ensure inclusivity and scalability. Key strategies such as enhancing digital infrastructure and literacy, alongside exploring innovative funding avenues, are identified as crucial. The research suggests a balanced array of challenges and opportunities as Moldova progresses in digital legal service development, emphasizing the need for equitable tech implementation. This paper contributes insightful analysis into the amalgamation of legal empowerment and digital technologies, proposing forward-thinking recommendations for strategic planning and international cooperation to bolster legal empowerment and access to justice in Moldova and beyond.*

***Keywords:** legal empowerment, digital technologies, access to justice, financing strategies, Moldova.*

***JEL Code:** K15, O33, P35, H41, O17.*

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Introduction

Access to justice is essential for democratic governance and human rights but remains out of reach for many globally. The World Justice Project reveals that a vast number of people cannot obtain justice for everyday issues, especially vulnerable groups (World Justice Project, 2020). This widespread challenge necessitates diverse solutions.

Legal empowerment is key in tackling the justice access crisis. It enables individuals and communities to use the law to advance their rights (Golub, 2010; UNDP, 2009). Strategies include legal education, service provision, and making laws and institutions more accessible (Maru, 2010), aiming to make justice systems equitable.

Digital technologies have revolutionized legal empowerment. Online platforms, AI, and blockchain are making legal information accessible, streamlining processes, and offering remote services (Susskind, 2023), reaching populations previously hindered by distance or cost (Brescia, McCarthy, McDonald, Potts, & Rivais, 2014). Previous research confirms that digitalization enhances governance quality by promoting transparency, institutional efficiency, and public trust, particularly in Eastern European countries (Goncearenco, 2024).

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Financing models for these initiatives vary, including public funds, international aid, philanthropy, and innovative approaches like crowdfunding (OECD & Open Society Foundations, 2019). Each model influences the impact and sustainability of projects, with public funding dominant in the EU, and international aid crucial in non-EU contexts (UNDP, 2023a).

This study examines digital legal empowerment in Moldova, a country bridging Eastern and Western legal traditions. It assesses Moldova's digital initiatives, comparing them with EU and non-EU examples to identify best practices and challenges. The focus is on the use of digital technologies, financing models, and their implications for Moldova and similar contexts.

The central questions guiding this study are: (1) How can digital technologies support legal empowerment in Moldova? (2) What financing models are most effective in sustaining such efforts? (3) What lessons can Moldova draw from international experiences in digital legal access?

This paper is structured as follows: the next section presents a literature review of legal empowerment frameworks, digital technologies, and financing models. Section 3 outlines the qualitative methodology used in this study. Section 4 examines the current state of legal empowerment in the Republic of Moldova. Section 5 provides a comparative analysis of digital legal empowerment in Estonia, Spain, India, and Kenya, highlighting lessons applicable to Moldova. Section 6 discusses key findings and challenges, and the final section offers conclusions and strategic policy recommendations to strengthen digital legal empowerment initiatives in Moldova.

Literature Review

Legal empowerment has emerged as a critical concept in the discourse surrounding access to justice and the enhancement of civil liberties. Defined broadly, legal empowerment involves the process by which the poor and marginalized groups are enabled to use the law to advance their rights and interests (Golub, 2010; UNDP, 2009). This encompasses a range of strategies, including legal education, provision of legal services, and reform of laws and institutions to make them more accessible and responsive to the needs of disadvantaged populations (Maru, 2010, 2024). The scope of legal empowerment extends beyond mere legal aid to include efforts that strengthen the capacity of individuals and communities to understand and assert their rights.

In recent years, digital technologies have begun to play a transformative role in legal empowerment efforts. Theoretical frameworks for utilizing digital technologies in legal empowerment draw upon the broader concept of "legal tech," which refers to the use of technology and software to provide legal services and support the legal system (Barton & Rhode, 2018; Corrales, Fenwick, & Haapio, 2019). Digital technologies can democratize access to legal information, automate legal processes, and facilitate remote legal services, thereby overcoming barriers of distance, cost, and complexity that

traditionally impede access to justice (Brescia et al., 2014; Susskind, 2023). For instance, online legal aid platforms, mobile applications for legal education, and blockchain-based property rights registries exemplify how technology is being leveraged to empower marginalized groups (Keith & O'Brien, 2021).

Financing models for legal empowerment initiatives vary across jurisdictions and typically involve a mix of public funding, international aid, private philanthropy, and innovative mechanisms like social impact bonds and crowdfunding (OECD & Open Society Foundations, 2019). Public funding remains a dominant source, particularly in European Union (EU) countries, where legal aid systems are often well-established and government-supported (CEPEJ, 2022). In contrast, non-EU countries with more limited public resources may rely more heavily on international aid and non-governmental organizations (NGOs) for legal empowerment projects (World Bank, 2019). Private philanthropy also plays a significant role, with foundations and corporate social responsibility initiatives funding innovative legal empowerment efforts, especially those utilizing digital technologies (Emtseva, 2023; Muller, Barendrecht, Porter, De Wever, & Pouwelse, 2013).

Lessons from EU and non-EU countries highlight the importance of tailored approaches to legal empowerment that reflect the specific legal, cultural, and socio-economic contexts of different jurisdictions. For instance, in the EU, digital technologies have been integrated into formal legal systems to enhance transparency, efficiency, and accessibility. The e-Justice portal, which provides access to legal information and services across EU countries, exemplifies this approach (Velicogna, 2017). Meanwhile, in non-EU countries, where formal legal systems may be less accessible or trusted, digital technologies have been used to support alternative dispute resolution mechanisms and community-based legal education initiatives (Satterthwaite & Dhital, 2019; UNDP, 2023b).

In the context of Moldova's EU alignment efforts, studies underscore that legal empowerment must be understood not only as a domestic challenge, but as a requirement embedded within the broader anti-fraud and financial conditionality imposed by the EU (Pântea & Pântea, 2019).

The financing of legal empowerment initiatives also reflects differences in legal traditions and resource availability. In EU countries, public funding for legal aid is often mandated by law and considered a fundamental aspect of the right to a fair trial (CEPEJ, 2022). In contrast, in many non-EU countries, legal empowerment projects must navigate more complex funding landscapes, leveraging international aid, private philanthropy, and partnerships with NGOs to fill gaps left by limited public funding (World Bank, 2019).

Legal empowerment, aiming to improve justice access and rights assertion, benefits from digital technologies. However, their success depends on thoughtful deployment and funding, tailored to various population needs. Insights from EU and non-EU experiences highlight the importance of flexible strategies in harnessing technology for legal empowerment, navigating the benefits and hurdles of digital advancements in law.

Methodology

This study utilizes a qualitative literature review to thoroughly explore the complex dimensions of legal empowerment, with a special focus on the integration of digital technologies and the financing models that support these initiatives. The methodology outlined here details the procedure for selecting, analyzing, and synthesizing both scholarly articles and gray literature to develop a comprehensive understanding of current practices and lessons learned within the field.

The selection of documents and studies was guided by a multi-criteria approach ensuring the relevance and reliability of the sources. The review prioritized recent literature published within the last five years to capture the most current trends and innovations in the domains of legal empowerment and digital technology. Nonetheless, seminal works and pivotal studies beyond this timeframe were also included to appreciate their foundational contributions and historical context.

A stringent emphasis was placed on the credibility of sources. Peer-reviewed journal articles, reports from reputable international organizations, and policy documents from governmental agencies were given precedence. This ensured that the findings and discussions in this study are based on authoritative and trustworthy information.

The sources selected spanned a variety of legal, cultural, and socio-economic contexts. This diversity enabled a more robust analysis of legal empowerment as it manifests in different global settings, providing a richer comparative insight.

The literature was analyzed through thematic analysis (Booth, Sutton, Clowes, & Martyn-St James, 2021; Maxwell, 2012). This approach involved organizing and interpreting data based on recurring themes and patterns that align with the study's objectives. The analysis was inherently iterative, involving multiple rounds of reading and re-reading the literature, which facilitated the identification and coding of emergent themes. These themes included the impact of digital technologies on legal empowerment, the diversity of financing models, and contextual applications in both EU and non-EU countries.

The synthesis of information from the selected literature aimed to distill overarching conclusions about the global state of legal empowerment initiatives. This process was critical in identifying best practices and pinpointing prevailing challenges and gaps in how digital technologies are employed to finance legal empowerment. Moreover, the synthesis highlighted innovative solutions and transferable lessons from various jurisdictions, enhancing the potential applicability of the study's findings. By integrating diverse insights and empirical evidence from the literature, this review contributes significantly to a nuanced understanding of how digital technologies and strategic financing can collectively advance legal empowerment efforts.

Legal Empowerment in the Republic of Moldova

Legal empowerment stands as a crucial mechanism for ensuring access to justice, particularly in societies grappling with the legacies of historical injustices and systemic inequalities. The Republic of Moldova, a country with a complex history marked by

periods of foreign domination and recent independence, presents a unique case study in the ongoing efforts to achieve legal empowerment for all its citizens. This exploration delves into the current state of legal empowerment in Moldova, the historical context and challenges that have shaped its journey towards judicial reform, and the key initiatives and reforms that have been undertaken to promote legal empowerment within the country.

In the Republic of Moldova, legal empowerment has increasingly become a focal point of reform agendas aimed at enhancing the rule of law and ensuring equitable access to justice for all segments of the population. Despite significant progress in legislative and institutional reforms, the country continues to face challenges in fully realizing legal empowerment for its citizens. According to the World Justice Project's Rule of Law Index, Moldova ranks relatively low in factors such as regulatory enforcement, civil justice, and fundamental rights, indicating ongoing issues in the effective implementation of laws and accessibility of justice (Majhosev, 2021).

Moldova's historical context is marked by its position as a crossroads of Eastern and Western influences, having been part of the Soviet Union until gaining independence in 1991. The transition to democracy and a market economy has been fraught with challenges, including political instability, economic vulnerabilities, and issues of corruption that have deeply impacted the justice system (Freedom House, 2021, 2023a, 2023b). These challenges have contributed to a general mistrust in public institutions and a perception of the judiciary as inaccessible and inefficient, particularly for marginalized and vulnerable populations.

One of the primary challenges in improving access to justice in Moldova has been the need to overhaul Soviet-era legal frameworks and institutions that are ill-suited to the needs of a modern democratic state. Additionally, the country has struggled with limited resources, both financial and human, to support comprehensive legal reforms and the provision of legal aid services. The lack of awareness among citizens about their legal rights and how to access legal assistance further exacerbates these challenges, leaving many without the means to seek redress for grievances (European Commission, 2023).

Recognizing these challenges, Moldova has embarked on a series of initiatives and reforms aimed at enhancing legal empowerment and ensuring broader access to justice. These efforts have been supported by international partners, including the European Union and various United Nations agencies, and have focused on several key areas:

1. *Legal aid reform*: Moldova has made significant strides in reforming its legal aid system to make it more accessible and effective. The National Legal Aid Council was established to oversee the provision of state-guaranteed legal assistance, and efforts have been made to expand the availability of legal aid services, particularly in rural and underserved areas (UNODC, 2019).
2. *Judiciary reform*: Comprehensive judiciary reforms have been undertaken to increase the independence, transparency, and efficiency of the court system. This includes measures to improve the selection and evaluation of judges, enhance the transparency of court proceedings, and modernize court

infrastructure with the introduction of digital technologies (United Nations Moldova, 2021, 2023).

3. *Public legal education*: Initiatives aimed at raising public awareness about legal rights and how to access justice services have been a critical component of legal empowerment efforts in Moldova. This includes the development of information campaigns, legal education programs in schools, and the use of digital platforms to disseminate legal information (OSCE, 2020, 2022).
4. *Civil society engagement*: Civil society organizations (CSOs) have played a vital role in promoting legal empowerment in Moldova, providing legal assistance and advocacy for policy reforms. Partnerships between the government and CSOs have been instrumental in addressing gaps in legal services and ensuring that the voices of marginalized communities are heard in the reform process (USAID, 2020).

These initiatives and reforms represent significant steps forward in Moldova's journey towards legal empowerment. However, continued efforts are needed to address the systemic challenges that persist and ensure that the gains made are sustainable and inclusive of all segments of society.

Moldova's journey in legal empowerment showcases the challenge of enhancing justice access during transition. Despite progress from reforms, persistent challenges highlight the importance of commitment to the rule of law and supporting vulnerable groups. Moldova's experiences provide useful lessons for nations facing similar legal empowerment hurdles.

Role of Digital Technologies in Enhancing Legal Empowerment

Digital technologies are fundamentally transforming the landscape of legal systems globally, offering unprecedented opportunities to enhance legal empowerment and access to justice. The role of digital technologies in legal systems encompasses a wide array of applications, from online dispute resolution platforms to legal information databases, electronic case management systems, and beyond. These technologies have the potential to make legal processes more efficient, transparent, and accessible, particularly for marginalized and underserved populations.

Digital technologies have been adopted in various capacities within legal systems around the world to improve the delivery of legal services and the administration of justice. One prominent example is the use of online legal information systems that provide the public with accessible, understandable legal information. Such systems demystify legal processes and empower individuals with the knowledge needed to navigate their legal rights and obligations (Susskind, 2023).

Another significant development is the emergence of online dispute resolution (ODR) platforms. ODR utilizes technology to facilitate the resolution of disputes between parties through the internet, often without the need for physical court appearances. This approach has been particularly effective in resolving lower-value claims and minor legal disputes efficiently and at a lower cost (Cortés, 2010; Jeretina, 2018).

Artificial intelligence (AI) and machine learning are also increasingly being applied within legal systems to automate routine tasks, predict legal outcomes, and assist in legal research. These technologies have the potential to significantly reduce the time and cost associated with legal processes, making justice more accessible to all (Surden, 2019; Walters & Novak, 2021).

In the European Union, several member states have implemented digital initiatives to enhance legal empowerment. For example, Estonia stands out for its e-justice system, which includes e-filing of court documents, electronic service of process, and even e-resolutions for certain types of cases. Estonia's digital infrastructure significantly reduces the administrative burden on the judiciary and litigants, making legal processes more accessible and efficient (e-Estonia, 2023; Numa, 2022).

Outside the EU, India's Tele-Law program leverages video conferencing and telephone services to connect individuals in remote and rural areas with legal advisors. This initiative has been crucial in providing legal advice and assistance to those who would otherwise have limited access to legal services due to geographical and financial constraints (Ministry of Law and Justice, 2019).

In Kenya, the platform M-Haki – "Haki" meaning "rights" in Swahili – provides legal information and advice via SMS and mobile messaging, allowing users to seek legal assistance directly from their mobile phones. This innovation is particularly impactful in a country where a significant portion of the population has limited access to the internet but widespread use of mobile phones (Barasa & Kirima, 2020).

In Ukraine, digital technologies are significantly impacting the legal sector, offering new avenues for legal empowerment and access to justice. Innovations such as artificial intelligence, blockchain, and online legal services are transforming traditional legal practices (Khatniuk et al., 2024). These technologies enhance legal research, streamline case management, facilitate client communication, and automate document processing. The adaptation to digital technologies in Ukraine's legal framework underscores a shift towards more efficient, accessible, and client-oriented legal services, reflecting broader global trends in leveraging technology to bridge gaps in legal access and empower individuals and communities legally.

Moldova has embarked on a path toward digital transformation across various sectors, including its legal system. The potential for digital technologies to enhance legal empowerment and access to justice in Moldova is significant. By adopting and adapting successful models from both EU and non-EU countries, Moldova can overcome traditional barriers to justice such as geographical remoteness, lack of legal awareness, and financial constraints.

The implementation of an online legal information system could serve as a foundational step, providing citizens with easy access to legal resources, information about their rights, and guidance on navigating legal processes. Similarly, the development of an ODR platform in Moldova could streamline the resolution of minor disputes and reduce the caseload of courts, making the justice system more efficient and accessible.

Leveraging mobile technologies for legal services delivery, akin to Kenya's M-Haki platform, could also have a profound impact in Moldova, given the high penetration rate of mobile phone usage in the country. Such a platform could provide legal advice and assistance to rural and underserved communities, bridging the gap in legal access.

Furthermore, the adoption of AI and machine learning for legal document analysis and case management could enhance the efficiency of Moldova's legal system, freeing up valuable resources to focus on complex legal issues and cases that require human intervention. This would not only improve the administration of justice but also potentially increase public trust in the legal system.

Integrating digital technologies into Moldova's legal system can significantly improve access to justice by making processes more efficient and transparent. Learning from both EU and non-EU countries, Moldova has the chance to address longstanding challenges and enhance legal empowerment. Developing its digital infrastructure is crucial for the successful adoption of these technologies.

Financing Strategies and Models

Financing legal empowerment initiatives is crucial for ensuring access to justice, especially for marginalized and vulnerable populations. These initiatives aim to enhance the capacity of individuals and communities to understand and assert their rights, navigate the legal system, and participate fully in society. Financing strategies and models for legal empowerment vary significantly across different jurisdictions, influenced by factors such as legal traditions, economic conditions, and the availability of resources. This essay examines various financing strategies and models, analyzes international best practices, and explores their applicability to Moldova. Additionally, it delves into innovative funding approaches, including public-private partnerships, crowdfunding, and international aid.

Legal empowerment initiatives require sustainable financing to be effective. Traditional models include government funding, international aid, and support from non-governmental organizations (NGOs). Government funding is perhaps the most direct way to finance legal empowerment, with resources allocated through the national or local budget to legal aid services, public awareness campaigns, and capacity-building programs (UNDP, 2023a). However, reliance on government funding can be problematic in contexts where resources are limited or political will is lacking.

International aid has been a significant source of funding for legal empowerment initiatives, especially in developing countries. Organizations such as the United Nations Development Programme and the World Bank have supported a range of initiatives aimed at enhancing access to justice and legal literacy (World Bank, 2019). While international aid can provide much-needed resources, it may also come with conditions or priorities that do not always align with local needs or strategies.

NGOs and civil society organizations play a crucial role in legal empowerment, often filling gaps left by public services. These organizations typically rely on a mix of donor funding, grants, and private donations to support their activities. While this model

can enable innovative and community-driven approaches, it can also lead to sustainability challenges when funding is inconsistent or tied to specific projects (Open Society Foundations, 2021).

Internationally, several best practices have emerged in financing legal empowerment initiatives. For instance, the Legal Empowerment Fund, launched by the Fund for Global Human Rights and NAMATI, aims to provide flexible, long-term funding to grassroots legal empowerment efforts around the world. This model emphasizes the importance of adaptable funding that responds to the needs of local communities and supports systemic change (The Fund for Global Human Rights, 2023).

Another example is the Justice for All campaign, which advocates for increased funding and political support for legal empowerment as part of the 2030 Agenda for Sustainable Development. The campaign highlights the role of legal empowerment in achieving broader development goals, including poverty reduction, gender equality, and reduced inequalities (NAMATI, 2022).

For Moldova, adopting international best practices in financing legal empowerment initiatives requires considering the country's specific context, including its legal system, economic conditions, and existing civil society landscape. Strategies that have proven effective elsewhere, such as flexible funding models and advocacy for increased political support, could be adapted to Moldova's needs. Additionally, leveraging Moldova's strategic partnerships and alignment with European Union standards could open up opportunities for additional funding and support.

Innovative funding approaches, including public-private partnerships (PPPs), crowdfunding, and international aid, offer new possibilities for financing legal empowerment initiatives. PPPs involve collaboration between the government and private sector entities to fund and deliver public services, including legal services. This model can bring additional resources and expertise to legal empowerment initiatives, though it requires careful management to ensure public interests are prioritized (Cotula & Berger, 2017; Nielsen, 2012).

Crowdfunding represents another innovative approach, leveraging online platforms to raise small amounts of money from a large number of people. Crowdfunding campaigns can support specific legal cases, awareness-raising initiatives, or broader access to justice projects. This approach enables broader community engagement and support for legal empowerment but may not provide the sustained funding needed for long-term initiatives (Abbot, 2020; Smith, 2021).

International aid, particularly when focused on supporting systemic reforms and capacity building, can play a crucial role in financing legal empowerment in Moldova. Aid from international organizations and foreign governments can support the development of legal infrastructure, training for legal professionals, and public awareness campaigns (Ministry of Justice of the Republic of Moldova, 2024). However, aligning international aid with national priorities and ensuring local ownership of initiatives is essential for their success and sustainability (OECD, 2024).

Financing legal empowerment in Moldova demands a diverse approach, blending traditional funding from governments, international aid, and NGOs with innovative methods like PPPs and crowdfunding. Adapting best practices and new funding models can boost access to justice. Success hinges on aligning these efforts with local needs and integrating them into a wider strategy to fortify the legal system and civil society.

Comparative Analysis

The pursuit of legal empowerment and the use of digital technologies in the legal domain represent critical areas of development across the globe. Countries, both within the European Union and outside of it, have embarked on various initiatives to harness digital technologies for legal empowerment, aiming to enhance access to justice for their citizens. This comparative analysis delves into the efforts undertaken by Moldova and selected EU and non-EU countries, highlighting success stories, challenges encountered, and extracting valuable lessons that could inform Moldova's ongoing and future legal empowerment endeavors.

Moldova has made commendable strides in legal empowerment and the integration of digital technologies within its legal system. Initiatives such as the e-justice portal, which aims to facilitate access to legal information and services, reflect Moldova's commitment to leveraging technology to enhance legal empowerment. However, challenges remain, including ensuring widespread access to these digital services across all regions and demographics, particularly in rural areas where digital literacy and infrastructure may be lacking (Bank, 2021; World Bank Group, 2023).

Estonia stands as a paragon of digital governance, with its e-Residency program and X-Road digital infrastructure, which have significantly improved access to government and legal services for its citizens and e-residents. Estonia's digital court system allows for efficient case handling, filing, and management, dramatically reducing the time and bureaucratic hurdles traditionally associated with legal processes (Dori, 2023; e-Estonia, 2023).

Spain, on the other hand, has focused on enhancing transparency and access to legal information through its Transparency Portal and the use of blockchain technology for secure document handling in legal processes. Spain's commitment to open government and participatory democracy has been bolstered by these digital initiatives, though challenges in digital divide and ensuring equitable access persist (Dori, 2023; Portal de la Transparencia, 2023).

India has launched the Tele-Law service, aiming to bridge the legal aid gap for its rural and underserved populations. By connecting lawyers with clients through video conferencing and a network of para-legal volunteers, India has managed to extend legal services to remote areas, though challenges in infrastructure and digital literacy continue to limit reach (Ministry of Law and Justice, 2019; Saxena, 2024).

Kenya has made significant advancements with its innovative M-Haki platform – a mobile-based legal consultation service that provides legal information and services via SMS. This platform caters to the Kenyan populace, especially those in remote areas,

although challenges in terms of service scope and legal complexity need addressing (Barasa & Kirima, 2020; Medium, 2023).

From these examples, several key lessons emerge for Moldova:

- *Infrastructure and access:* Ensuring the robustness of digital infrastructure and broadening access are fundamental. Estonia's example shows the importance of a comprehensive digital strategy that includes building a resilient digital infrastructure. Moldova could benefit from investing in digital infrastructure to ensure that legal digital services are accessible to all citizens, regardless of their geographical location.
- *Digital literacy:* Enhancing digital literacy is crucial for the success of digital legal empowerment initiatives. As seen in India and Kenya, even with the availability of digital legal services, their effectiveness is limited if the target population lacks the skills to utilize these services. Implementing comprehensive digital literacy programs can help Moldova maximize the impact of its digital legal initiatives.
- *Public-Private Partnerships:* Engaging in PPPs can be instrumental in leveraging the strengths of both the public and private sectors in developing and implementing digital legal services. Spain's use of blockchain technology exemplifies how collaboration between government and technology providers can enhance the security and efficiency of legal processes.
- *Inclusivity and equity:* Ensuring that digital legal empowerment efforts are inclusive and equitable is essential. While digital technologies offer tremendous potential to improve access to legal services, they can also exacerbate existing inequalities if not carefully managed. Moldova must strive to ensure that digital legal services are designed and implemented in a way that is accessible and useful to all segments of the population, including those with disabilities, the elderly, and those in rural areas.
- *Scalability and sustainability:* Developing digital legal services that are scalable and sustainable over the long term is vital. Moldova can learn from the challenges faced by other countries in maintaining and scaling digital legal services to ensure that these initiatives remain viable and continue to serve the needs of the population effectively.

The comparative analysis of legal empowerment and digital technology use in Moldova, Estonia, Spain, India, and Kenya shows varied initiatives and challenges. Moldova can improve its legal empowerment strategy by adopting lessons from these countries, using digital technologies to improve justice access. Key strategies include investing in digital infrastructure, boosting digital literacy, encouraging public-private partnerships, ensuring inclusivity, and focusing on the sustainability of digital legal services. These measures can help Moldova enhance its digital legal empowerment efforts.

Discussion

The exploration of legal empowerment through the lens of digital technology integration reveals a nuanced tapestry of advancements and hurdles. This synthesis draws upon extensive literature reviews and comparative analyses, shedding light on the transformative impact digital technologies hold for legal empowerment, particularly within the context of Moldova. The journey of nations like Estonia and India, which have pioneered in embedding digital governance and legal aid frameworks respectively, serves as a beacon of the potential within reach. Estonia's digital court system exemplifies efficiency and accessibility, a testament to what can be achieved with robust digital governance (Dori, 2023; Portal de la Transparencia, 2023).

India's Tele-Law service, on the other hand, demonstrates the power of technology in extending legal aid to the underserved, highlighting the pivotal role of inclusivity in legal empowerment initiatives (Ministry of Law and Justice, 2019; Saxena, 2024).

However, the path to digital legal empowerment is fraught with challenges, from bridging digital divides to ensuring the sustainability of funding models. These challenges necessitate a comprehensive approach that melds policy reform, capacity building, and relentless innovation. The need for policy reform is evident, as a comprehensive legal framework that supports the adoption of digital technologies while safeguarding against potential risks such as data breaches and privacy violations is essential. Moreover, enhancing digital literacy among both legal practitioners and the general populace emerges as a critical step towards maximizing the benefits of digital legal services. This dual focus on policy and capacity underscores a broader strategy for adapting to and leveraging digital transformation within the legal realm.

Strategic considerations for Moldova and similar contexts emerge from this analysis. Central to these is the development of inclusive digital infrastructure that ensures equitable access to digital legal services across diverse demographics and geographies. The potential of public-private partnerships in driving innovation and improving service delivery is also highlighted, suggesting a model where collaborative efforts can enhance the quality and reach of digital legal services. Furthermore, the importance of strengthening legal and regulatory frameworks to address emerging challenges associated with digital technologies is underscored, pointing towards the need for adaptive and forward-looking governance structures.

Improving financing models for legal empowerment initiatives utilizing digital technologies calls for a nuanced understanding of the landscape of funding. The exploration suggests a move towards diversified funding sources that blend government funding, international aid, private investment, and innovative mechanisms like crowdfunding. This approach not only ensures sustainable financing but also opens up avenues for leveraging international aid and social impact investments, thereby fostering initiatives that have broad social benefits.

International cooperation stands out as a pivotal element in the broader strategy for leveraging digital technologies in legal empowerment. Engaging in knowledge exchange with countries that have pioneered successful initiatives offers invaluable insights that can inform policy and practice. Participation in international networks dedicated to justice innovation and digital governance further amplifies the opportunities for learning and collaboration. Additionally, addressing cross-border legal challenges necessitates coordinated efforts and shared technologies, highlighting the importance of international partnerships in navigating the complexities of the digital age.

Conclusions

This study has revealed the complex interplay between digital technologies, legal empowerment, and financing strategies within the context of Moldova, drawing upon insights from both EU and non-EU countries. As Moldova progresses in refining its justice system, aligning with international standards and the Sustainable Development Goals (SDGs) offers a promising pathway towards substantive legal reform.

Countries such as Estonia and Georgia provide instructive examples of successful justice reforms that incorporate digital technologies. Estonia's comprehensive e-justice system, which includes e-filing, online dispute resolution, and digital access to legal resources, exemplifies how technological integration can enhance transparency and efficiency within the justice system. Similarly, Georgia has made significant strides in improving its legal infrastructure, including training judges and introducing technologies that streamline legal proceedings. These examples offer practical benchmarks for Moldova, illustrating that strategic planning and a commitment to digital transformation can profoundly strengthen judicial processes.

To align Moldova's justice system with the SDGs, particularly Goal 16, which promotes just, peaceful, and inclusive societies, it is crucial to implement strategic measures. Enhancing access to justice through digital platforms can significantly bridge service gaps for underserved populations, thereby making legal processes more transparent and accessible. Initiatives like the development of an online legal aid system, similar to those implemented in Kenya and India, could provide broad access to essential legal resources and advice. Furthermore, integrating SDGs into the national legal frameworks would foster policies that support sustainable development, addressing critical issues like gender equality and reduced inequalities through legal avenues.

For enhancing judicial independence and technological integration in Moldova, it is recommended that Moldova consider establishing an independent judicial council responsible for overseeing the appointment, promotion, and disciplinary procedures of judges to ensure that these processes remain free from political influence. The model adopted by Slovenia, which has significantly bolstered its judicial independence through such governance structures, could offer valuable insights. Additionally, implementing a phased integration of digital technologies within the judiciary is critical. Starting with the

automation of routine administrative tasks could help acclimate the legal workforce to new technologies before more complex systems, such as AI-driven legal analysis tools, are introduced. Furthermore, fostering partnerships with technology firms and academia can drive innovation and ensure that the judiciary's needs are effectively met. Continuous education programs for legal professionals on the use of digital tools and the implications of digital law, modeled after successful initiatives in the EU, should also be established to support the judiciary's adaptation to digital transformations.

These strategic recommendations aim to provide Moldova with a robust approach to enhance its legal framework and judicial system, ensuring that reforms are sustainable, inclusive, and aligned with broader global objectives. By implementing these measures, Moldova can make significant advancements in legal empowerment and access to justice, setting a precedent for similar reforms in other nations.

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THE DEVELOPMENT OF THE REPUBLIC OF KOREA FOREIGN ECONOMIC COOPERATION POLICY (FROM THE MID-1980S TO THE EARLY 2000S)

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Abstract. *The goal of the foreign economic cooperation policy of the Government of the Republic of Korea is to reduce trade barriers and achieve export growth by expanding interests in areas of bilateral economic concern. Active expansion of foreign economic cooperation contributes to improving the country's image and enhancing the competitiveness of South Korean export products. In addition, the main directions of the South Korean government's policy on expanding foreign economic cooperation are, on the one hand, expanding measures to attract foreign companies and foreign capital to Korea, and on the other hand, encouraging the international investment activity of South Korean companies.*

Keywords: *expansion of foreign economic cooperation, expansion of international trade, improvement of industrial structure, mutual benefit between the two sides.*

JEL Code: E60, F02, F13

UDC: 339.94(519.5)

Introduction

Since the 1980s, the foreign economic cooperation policy of the Republic of Korea has undergone significant changes. Before the 1980s, the main foreign economic policy of the South Korean government was focused on attracting short-term and long-term loans as well as direct foreign investment to create an industrial base aimed at expanding export markets. Although within a short time the Republic of Korea transformed from an agrarian country into an industrial one and from a closed economy into an open one, before the 1980s its government did not pay serious attention to the development of a strategy for expanding foreign economic cooperation.

However, since the mid-1980s, the South Korean government actively pursued a policy of expanding foreign economic cooperation with the aim of enlarging the size of the economy, maintaining a balance of payments surplus, and developing cooperation with countries with transitional economies³. In particular, the Government of the Republic of

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³ A group of former socialist countries that began the transition from a centrally planned to a market economy mainly in the last decade of the 20th century. These primarily include the former Soviet republics and the countries of Central and Eastern Europe. In this article, the main focus is on Eastern Europe, the

Korea expanded its foreign economic cooperation policy in order to take a more active position regarding external trade frictions after its accession to the WTO in 1995. Moreover, the South Korean government developed a foreign economic cooperation policy aimed at expanding direct foreign investments oriented toward developing countries and entering new markets concentrated in Eastern European countries. That is, as the international influence of the South Korean economy expanded, *the demand for foreign economic cooperation increased*. As a result, the main foreign economic policy of the South Korean government achieved an active transition from a policy of prioritizing the expansion of export markets to a policy of expanding foreign economic cooperation. *Given this evolution, the article examines the main stages and priorities of South Korea's foreign economic cooperation policy from the mid-1980s to the early 2000s, highlighting the factors that shaped its transformation.*

Literature Review

To strengthen its position in the international community and overcome the global economic crisis, the Korean government actively pursued expansion of external economic cooperation. In addition, the Korean government is promoting external economic cooperation with developing countries to share its economic development experience and pursue mutual economic development. In particular, Korea needs to strengthen its external economic cooperation to expand new markets and secure stable resources and production raw materials. Kim, Haksu (1991) and Lee, Changyu (2016) studied the background of the Korean government's full-scale promotion of foreign economic cooperation policies. In particular, the study examined the background of the Korean government's policy of pursuing external economic cooperation with the Soviet Union and Eastern European countries. Moon, Jaeu (1999) studied the direction and implementation plan of the Korean government's foreign economic cooperation policy centered on advanced countries.

The Korean government's goal of external economic cooperation with advanced countries is to pursue the introduction of advanced industrial technologies and the advancement of industrial structures. Choi, Junyoung (2018) and Kim, Wonho (2019) presented research on the Korean government's foreign economic cooperation policy with developing countries. The Korean government's expansion of external economic cooperation with developing countries is very significant in terms of pursuing mutual economic development and interests. As protectionism intensifies worldwide and the global economic environment becomes increasingly uncertain, the importance of foreign economic cooperation policies is increasing.

Soviet Union, and China, where the South Korean government actively pursued a policy of foreign economic cooperation.

Methodology

This study employs a qualitative historical analysis based on official policy documents, governmental reports, and statistical data published by the Republic of Korea. The research relies on secondary sources, including academic studies, publications of the Korea Institute for Foreign Economic Policy, and international trade statistics from institutions such as KITA and the Bank of Korea. By combining document analysis with comparative review of trade and investment data between the mid-1980s and the early 2000s, the article identifies the main stages, priorities, and regional patterns of South Korea's foreign economic cooperation policy. The methodological approach is descriptive-analytical, aiming to trace policy evolution across three major groups of partner economies-developed countries, transitional economies, and developing countries-and to interpret the underlying economic and geopolitical drivers of these policy shifts.

As part of the practical policy to expand foreign economic cooperation, the Government of the Republic of Korea established in 1987 the Foreign Economic Cooperation Fund for the development of capital cooperation with developing countries. On the other hand, the Government of the Republic of Korea promoted the expansion of ODA projects to provide direct support for the economic development of developing countries. In addition, in order to diversify technological cooperation with developing countries, in 1991 the Korea International Cooperation Agency was established, which actively promotes foreign economic cooperation policies oriented toward private companies.

Thanks to the implementation of the policy to expand foreign economic cooperation, the South Korean government achieved an expansion of these ties not only at the state level but also at the level of private entrepreneurship. It is worth noting that Korea's foreign economic cooperation partners began to expand from developed countries, such as the United States, Japan, and the EU, to developing Asian countries and northern socialist countries, such as the Soviet Union, China, and Eastern Europe.

As mentioned above, the main directions of the South Korean government's policy to expand foreign economic cooperation are divided into three categories. First, the main policy of the South Korean government's foreign economic cooperation with the United States, Japan, and the European Union was focused on ensuring sustained competitiveness in the export markets of developed countries. In general, maintaining the sustained competitiveness of export products in developed markets is directly related to the various economic policies of the governments of developed countries. For example, to ensure the competitiveness of export products in the U.S. market, it was necessary to expand direct investments. In order to protect its own market, the United States pursued a policy that involved increasing direct investment by foreign companies, using various methods of non-tariff barriers. For this reason, the main direction of the South Korean government's foreign economic cooperation policy with the United States was to promote trade expansion by increasing direct investment in the United States.

On the other hand, in order to ensure the competitiveness of South Korean export products in the European market, it was necessary to increase attention to labor and environmental issues. The EU countries adopted laws prohibiting labor exploitation on the basis of poor working conditions and minimum wages, and applied these laws to exporting countries. In addition, policies were introduced that legally prohibited price competitiveness of export products based on environmental pollution. For this reason, the South Korean government established a foreign economic cooperation policy consistent with the basic economic policies implemented by developed countries, with the aim of enhancing the competitiveness of export products in developed countries. The foreign economic cooperation policy of the South Korean government with developed countries had a positive impact on improving working conditions in the Republic of Korea and on environmental protection.

Second, the Government of the Republic of Korea pursued a policy of actively expanding foreign economic cooperation with transitional economies (or northern socialist countries), such as Eastern Europe, the Soviet Union, and China, in order to secure raw materials and energy resources, as well as to diversify the trade market. In particular, the promotion of policies to expand foreign economic cooperation with transitional economies served as an important factor in improving relations with North Korea and in establishing peace on the Korean Peninsula in the future.

Third, as the Republic of Korea acquired the status of a developing country in the international community after the 1980s. The need to expand foreign economic cooperation with developing countries increased. In the short term, the Republic of Korea had to compete with developing countries for trade expansion in the world market, while at the same time contributing to the expansion of foreign economic cooperation in the long term. In other words, despite the existence of competitive relations with developing countries in the sphere of foreign trade, the Republic of Korea was also interested in cooperating with them to promote mutual national interests. That is, the main foreign economic cooperation policy of the South Korean government with developing countries consisted of competition for the expansion of export markets in the world market and mutual cooperation for the purpose of sustainable economic development. For this reason, the South Korean government pursued an active foreign economic cooperation policy aimed at transferring the successful experience of the Republic of Korea's economic development to developing countries through cooperation with them (Kim Haksu, 1991).

In general, Korea's foreign economic cooperation with developed countries was largely determined by commercial interests, and therefore the main agent became the private sector. However, economic cooperation with transitional economies and developing countries took the form of cooperation led by the state sector, since it reflected the political will of the South Korean government. A more detailed look at the main directions of foreign economic cooperation in the three regions promoted by the South Korean government is as follows.

1. Foreign economic cooperation policy with developed countries aimed at maintaining trade markets and introducing advanced technologies for the development of the South Korean economy.

Foreign economic cooperation with developed economies such as the United States, Japan, and the EU was very important for the development of the South Korean economy. Tables 1 and 2 show trends in Korea's trade relations with developed countries. As shown in Tables 1 and 2, the average trade trend of the Republic of Korea with developed countries over six years from 1985 to 1990 was the same as in overall South Korean exports: the United States accounted for 34.7%, Japan for 18.8%, and the European Union for 12.8%.

As a result, these three regions together accounted for 66.3% of the Republic of Korea's total exports. In addition, among total imports of the Republic of Korea from 1985 to 1990, imports from the United States accounted for 23.5%, imports from Japan for 29.3%, and imports from the EU for 11.1%. As a result, these three regions accounted for 63.9% of Korea's import market. These trade data clearly show that the United States, Japan, and the EU are the Republic of Korea's main trading markets.

Table 1. Dynamics of export volumes of the Republic of Korea with developed countries (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
USA	10,754	13,880	18,310	21,404	20,639	19,360	34.7
Japan	4,543	5,426	8,437	12,004	13,457	12,638	18.8
EU	3,250	4,320	6,597	8,132	7,394	8,844	12.8
UK	913	1,034	1,525	1,951	1,861	1,750	3.0
W. Germany	979	1,242	2,002	2,368	2,368	2,849	3.9
France	316	543	880	1,070	894	1,119	1.6
Italy	184	319	552	733	681	750	1.1
Etc.	407	611	749	1,007	1,159	1,086	1.2
Total export	30,283	34,715	47,218	60,696	62,377	65,016	100.0

Source: Korean trade statistics (<https://stat.kita.net/stat/world/trade/CtrImpExpList.screen>)

Table 2. Dynamics of import volumes of the Republic of Korea with developed countries (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
USA	6,489	6,545	8,758	12,757	15,911	16,942	23.5
Japan	7,560	10,869	13,657	15,929	17,449	18,574	29.3
EU	2,970	3,320	4,610	6,042	6,492	8,410	11.1
UK	566	454	722	915	923	1,226	1.7
W. Germany	979	1,216	1,799	2,074	2,624	3,284	4.2
France	442	706	784	1,135	87	1,223	1.8
Italy	218	310	537	638	85	1,170	1.3
Etc.	1,239	1,201	1,437	2,009	2,563	3,040	4.0
Total import	31,136	31,584	41,020	51,811	61,465	69,844	100.0

Source: Korean Trade Statistics (<https://stat.kita.net/stat/cstat/peri/tot/TotTotalList.screen>)

As shown in Table 3, in the trade sector, the share of the Republic of Korea in exports and imports with developed countries was dominant, whereas Korea's direct investments in Japan and the EU, with the exception of the United States, were very minimal. Korea's outward foreign direct investment began in earnest after the mid-1980s. As shown in Table 3, the total volume of the Republic of Korea's outward direct investment from 1986 to 1990 amounted to USD 2,294 million, of which USD 715 million was invested in the United States, accounting for 27.6% of the Republic of Korea's total investment. On the other hand, the amount of investment in Japan was USD 30 million, which accounted for 1.7% of the total investment, while in the EU it was USD 162 million, or about 5.7% of the Republic of Korea's total investment. In particular, as shown in Table 3, if one looks at Korea's investment in major countries prior to the integration of the EU market at the end of 1992, the United Kingdom recorded USD 69 million, equivalent to 2.4% of the total investment, while the remaining investments in Germany, France, and Italy remained at very insignificant levels. Figure 1 shows the volume of foreign direct investment of the Republic of Korea in developed countries from 1985 to 1990.

Table 3. Volume of the Republic of Korea's Foreign Direct Investment in Developed Countries (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
USA	92	58.5	167.7	92.9	153.8	242.1	27.6
Japan	20	2	1.3	6.5	10.2	10.8	1.7
EU	11	5.6	6.8	18.8	18.4	112.1	5.7
UK	3.1	0.1	4	10.6	7.4	47.3	2.4
W. Germany	5	3.3	2.4	2	0.9	3.8	0.6
France	2	0	0.1	1.2	1.5	2.8	0.3
Italy	0	0	0	0.2	0.2	0.4	0.03
Etc.	56.1	0.7	3.4	0.6	4.7	10.9	2.6
Total investments	626.4	172	397.2	212.9	492.5	1,019.7	100.0

Source: *Statistical Yearbook of Foreign Direct Investments of the Bank of Korea* (<https://www.data.go.kr/data/3040164/fileData.do>)

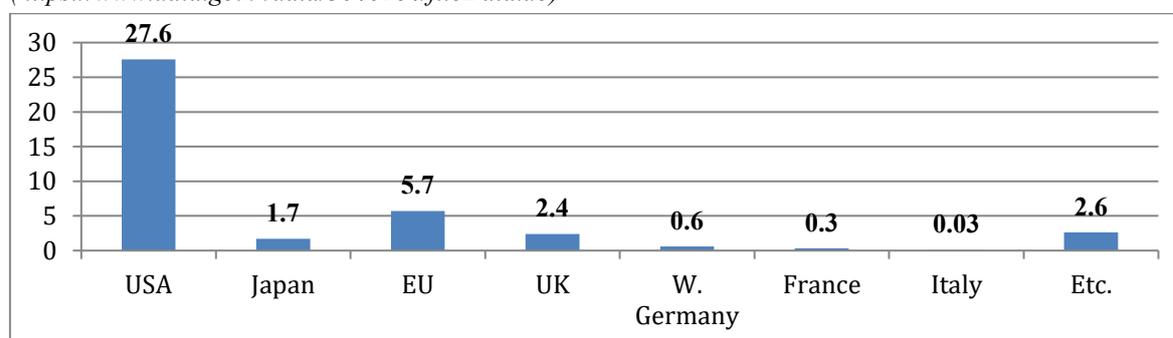


Figure 1. Volume of the Republic of Korea's Foreign Direct Investment in Developed Countries (1985-90, %, mln. USD)

Source: *Statistical Yearbook of Foreign Direct Investments of the Bank of Korea* (<https://www.data.go.kr/data/3040164/fileData.do>)

The Government of the Republic of Korea selected two main policy goals in implementing its long-term policy of foreign economic cooperation with developed countries. First, in order to enter and expand into the markets of developed countries, the South Korean government promoted a policy of improving the quality of export products. The Republic of Korea faced the problem of increasingly strict import restrictions by developed countries to protect their own markets. For the expansion of exports to developed countries, improving the quality of South Korean export products became an urgent task. Therefore, the actual foreign economic cooperation policy of the South Korean government consisted in promoting the transition from labor-intensive export products to capital-intensive and high-tech products as a means of enhancing the international competitiveness of export products in developed markets.

Second, the South Korean government needed to expand foreign economic cooperation with developed countries for the development of its industrial structure. In particular, the Government of the Republic of Korea facilitated the expansion of foreign economic cooperation with developed countries for the development of the heavy chemical, electronic, and semiconductor industries, which form the foundation of the South Korean economy. The results of Korea's industrial structure development policy led to the expansion of export markets in developed countries and the improvement of export product quality. Consequently, the South Korean government had to respond effectively to the protectionist tariff policies of developed countries in order to expand developed markets, and at the same time promote close economic cooperation for the purpose of introducing advanced technologies to foster the development of high-tech industries in the Republic of Korea.

The importance of the export markets of developed countries for the South Korean economy can be summarized as follows. First, the markets of developed countries are the largest consumers of the Republic of Korea's main export products. Even if the Republic of Korea seeks to expand trade with transitional economies and developing countries in order to diversify its export markets, it cannot replace the developed markets, which are the main markets for Korea's export products. In particular, products of the heavy and chemical industries are the principal export items of the Republic of Korea. Exports of heavy and chemical industry products increased from USD 120 billion in 1996 to USD 170 billion in 1999. Since the structure of Korea's export products was concentrated in heavy chemical industry products, its main export markets had no alternative but to be developed countries.

Second, in order for the Republic of Korea to achieve the status of an advanced industrial structure, its export products needed to secure competitiveness specifically in developed markets. For Korean industry to reach the level of a developed country, export products had to possess solid international competitiveness. To achieve this goal, South Korean export products had to be tested and recognized for their quality in developed markets. If Korea's main export items were not recognized for their quality in developed markets and did not secure international competitiveness, they would have no choice but to remain as medium- and low-priced export products. If the structure of exports of medium- and low-priced products persisted, the Republic of Korea would fall behind the export

drive of developing countries and ultimately remain outside the developed-country markets. In this case, there was a risk that the Republic of Korea would lose its international competitiveness and remain at the level of a middle-income economy. This economic phenomenon is known as the “middle-income trap”.

Third, since developed markets have strong purchasing power and diverse consumer preferences, the main markets for South Korean export products had to be based in developed countries. In general, trade in industrial goods is more active between countries with high income levels. For this reason, in order for South Korean export products to gradually move toward high quality and high prices, they had no alternative but to base their products in developed markets with high income levels. To enhance competitiveness in developed markets, the study of subtle changes in purchasing power and consumer preferences in developed countries became an important variable in the development of South Korean export products (Moon Jaeu, 2016).

The Government of the Republic of Korea also established a policy of expanding support for corporate R&D investments with the aim of expanding markets in developed countries and supporting the development of creative and specialized export products. Thus, developed markets played an important role not only as an export market for the Republic of Korea, but also as a supplier of advanced technologies and means of production for the industrial development of the South Korean economy.

2. Policy of Foreign Economic Cooperation with Transitional Economies for the Purpose of Securing Energy Resources and Diversifying Trade Markets.

The policy of foreign economic cooperation of the Republic of Korea with transitional economies represented cooperation that was oriented more toward politics and diplomacy than toward economic reasons. In February 1988, the South Korean government officially established diplomatic relations and economic exchanges with transitional economies, but the ultimate goal was to establish stability and peace on the Korean Peninsula by indirectly expanding exchanges with North Korea through cooperation with socialist countries. The countries with which the Republic of Korea established diplomatic relations were socialist states of Eastern Europe, such as Hungary, Czechoslovakia, and Poland. Following this, a policy was established to expand diplomatic and economic cooperation with the Soviet Union and China, both of which had direct relations with North Korea.

From an economic point of view, the Republic of Korea’s policy of expanding foreign economic cooperation with transitional economies could bring the following benefits. First, the Republic of Korea is a country lacking in energy resources and raw materials for production, which are key factors in industrial development. Therefore, it was important to provide the opportunity to secure necessary energy resources on a stable basis through joint development of essential resources in the framework of economic cooperation with transitional economies. Second, it served as an opportunity to improve Korea’s trade structure, which had been oriented toward the United States, Japan, and the EU, as well as to diversify its export markets. Third, in particular, the expansion of economic cooperation with the Soviet Union contributed to the introduction of fundamental science and technology, as well as advanced military

industry technologies, which the Republic of Korea needed. Therefore, the Republic of Korea's foreign economic cooperation with the Soviet Union was of great importance at a time when it was difficult for Korea to transfer advanced military industry technologies from developed countries. In particular, the fundamental science and technologies provided by the Soviet Union made a significant contribution to the production of new products and the increase of exports by South Korean private companies. It is also true that technological cooperation in the high-tech military industry of the Soviet Union had a considerable influence on the development of heavy industry in the Republic of Korea. Specifically, foreign economic cooperation between the Republic of Korea and the Soviet Union largely facilitated the modernization and globalization of South Korea's defense industry.

Fourth, above all, the Republic of Korea's policy of expanding economic cooperation with the Soviet Union was based on securing energy resources through joint development of natural resources. In particular, economic cooperation in the Soviet Far East and Primorye was of great significance to the Republic of Korea. Economic cooperation between the Republic of Korea and the Soviet Union was focused on projects for forest development, coal and oil extraction, as well as the development of gas fields. In other words, this was foreign economic cooperation oriented toward the development of raw materials and energy resources needed in the Republic of Korea, such as crude oil, gas, and timber (Lee Changyu, 2016).

As shown in Tables 4 and 5, if we look at the trends in the Republic of Korea's exports and imports with transitional economies, the following can be noted. As shown in Table 4, in the total volume of exports of the Republic of Korea, the average value for the four years from 1987 to 1990 was 2.4% to China, 0.4% to the Soviet Union, and 0.4% to Eastern European countries, for a total of about 3.5%. Furthermore, according to Table 5, China's share in the Republic of Korea's total imports was 2.8%, the Soviet Union's share was 0.5%, and Eastern European countries' share was 0.2%, amounting to only about 3.5% of total imports.

Table 4. Dynamics of Comparative Export Volumes of the Republic of Korea with the USSR, China, and Eastern European Countries (mln USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
Soviet Union	0	0	67	112	208	519	0.4
China	683	668	813	1,700	1,438	1,580	2.4
Eastern Europe	0	0	102	126	271	541	0.4
Total export	30,283	3,4715	47,281	60,696	62,377	65,016	100.0

Source: *Statistics of Exports and Imports by Countries and Regions* (<https://stat.kita.net/stat/world/trade/CtrImpExpList.screen>)

However, a new turning point occurred when the South Korean government offered the Soviet Union an economic cooperation package worth 3 billion USD for the normalization of diplomatic relations between the Republic of Korea and the Soviet Union, concluded in 1990. Subsequently, in 1990, South Korea's exports to the Soviet Union reached 500 million USD, while imports from the Soviet Union also amounted to 400 million USD. Since trade volume between the Republic of Korea and the Soviet Union exceeded 900 million USD, the trade between the two countries rapidly increased and surpassed 15 billion USD in 1996. Meanwhile, South Korea's total trade volume with China grew from 4 billion USD in 1991 to

105 billion USD in 1995. As a result, the share of South Korea's trade with transitional economies increased from 3.5% in 1990 to 12% in 1995 (Lee Changyu, p. 13).

Table 5. Dynamics of Comparative Import Volumes of the Republic of Korea with the USSR, China, and Eastern European Countries (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
Soviet Union	0	0	133	178	392	370	0.5
China	605	615	673	1,387	1,707	2,268	2.8
Eastern Europe	0	0	46	89	118	213	0.2
Total export	31,136	31,584	41,020	51,811	61,465	69,844	100.0

Source: *Statistics of Exports and Imports by Countries and Regions* (<https://stat.kita.net/stat/world/trade/CtrProdImpExpList.screen>)

On the other hand, as shown in Table 6, direct investment by the Republic of Korea in transitional economies was minimal. The main factors behind this were the lack of investment information and political instability in transitional economies. Figure 2 also shows the dynamics of comparison of the volume of FDI of the Republic of Korea with the USSR, China and Eastern European countries.

Table 6. Dynamics of Comparative Volumes of FDI by the Republic of Korea with the USSR, China, and Eastern European Countries (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
Soviet Union	0	0	0	0	0.5	0.5	0.1
China	0.1	1.8	6	5.4	12	22.1	2.3
Eastern Europe	0	0	0	0	46.5	1.5	3.2
Total export	626,4	172,0	397,2	212,9	492,5	1,019.7	100.0

Source: *Current status of foreign direct investment of the Republic of Korea* (https://kosis.kr/statHtml/statHtml.do?sso=ok&returnurl=https%3A%2F%2Fkosis.kr%3A443%2Fst%20%20%20%20%20atHtml%2FstatHtml.do%3FtblId%3DDT_2KAA813%26orgId%3D101%26)

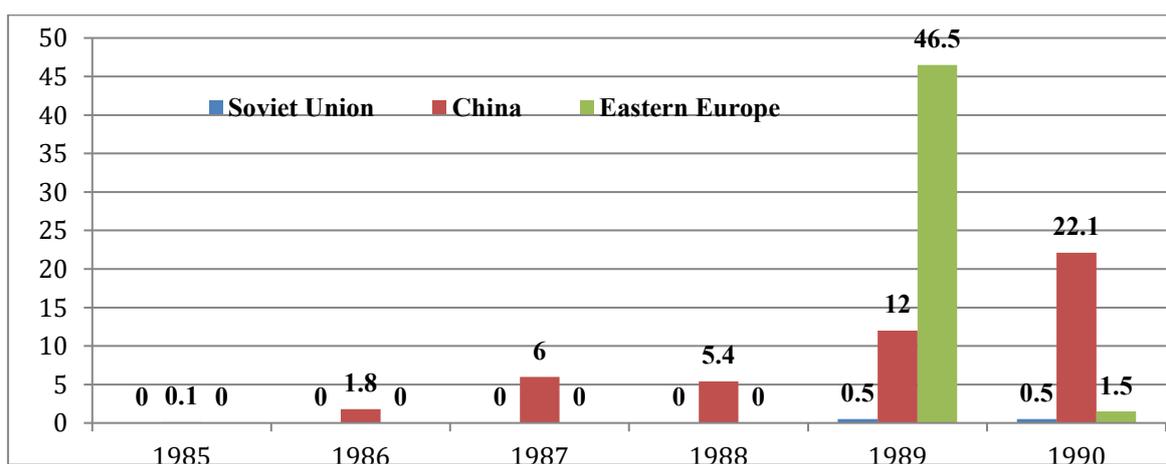


Figure 2. Dynamics of Comparative Volumes of FDI by the Republic of Korea with the USSR, China, and Eastern European Countries (mln. USD)

Source: *Current status of foreign direct investment of the Republic of Korea* (https://kosis.kr/statHtml/statHtml.do?sso=ok&returnurl=https%3A%2F%2Fkosis.kr%3A443%2Fst%20%20%20%20%20atHtml%2FstatHtml.do%3FtblId%3DDT_2KAA813%26orgId%3D101%26)

In particular, the Republic of Korea not only expanded trade with transitional economies, but scientific and technological cooperation also played an important role. After 1985, the Republic of Korea not only developed scientific and technological cooperation with the Soviet Union but also gradually expanded cooperation with Hungary, Czechoslovakia, and Poland, extending collaboration in the fields of fundamental science and chemical technology. In fact, in December 1990, an agreement was reached on the transfer of 281 advanced technologies from the Soviet Union through the signing of a scientific and technological cooperation agreement between the Republic of Korea and the Soviet Union. Moreover, thanks to the conclusion of an agreement between the two countries, scientific and technological cooperation was advanced in various areas, such as joint scientific research supported by the government and the expansion of cooperation with private research institutions. It is evident that the foreign economic policy of the South Korean government, aimed at export diversification and technology introduction, achieved significant results in the expansion of foreign economic cooperation with transitional economies. As a result, the Republic of Korea's foreign economic cooperation policy with transitional economies made a major contribution to the country's industrial development. Ultimately, the South Korean government's active pursuit of foreign economic cooperation with transitional economies became an important factor in establishing stability and peace on the Korean Peninsula in the long term.

3) The main policy of the Republic of Korea's foreign economic cooperation with developing countries was the improvement of industrial structure and the diversification of trade markets.

Since the mid-1980s, fundamental changes have occurred in the industrial structure of Korea. The main industries of the Republic of Korea shifted toward heavy chemical, electronic, and semiconductor industries. The industrial structure of the Republic of Korea began to transform from labor-intensive industries such as textiles, clothing, and footwear to capital- and technology-based industries. Due to these changes in Korea's industrial structure, labor-intensive industries were forced to relocate to developing countries. In other words, the textile, clothing, and footwear industries of the Republic of Korea came to be regarded as declining sectors. Due to high production costs and the loss of international competitiveness, the South Korean government actively promoted the relocation of labor-intensive production to China and Southeast Asia. That is, the Republic of Korea sought to expand foreign economic cooperation and improve its industrial structure by transferring labor-intensive industries, which were losing their comparative advantage, to developing countries. In the end, foreign economic cooperation between the Republic of Korea and developing countries created opportunities to promote industrialization on the part of the developing countries. In particular, South Korea's foreign economic cooperation policy pursued mutual benefit and common prosperity by transferring the experience of standardized industrial development in labor-intensive manufacturing industries (Choi Junyoung, 2018).

While the Republic of Korea needed to relocate labor-intensive industries abroad, developing countries experienced a growing demand for the development of manufacturing

industries. In other words, the mutual need for foreign economic cooperation between the Republic of Korea and developing countries was fulfilled. The main driving force of the Republic of Korea's policy of foreign economic cooperation with developing countries was the policy of cooperation in the field of economic development, aimed at utilizing the labor force and resources of developing countries through the transfer of South Korean capital and industrial technologies.

Foreign economic cooperation of the Republic of Korea in the field of foreign direct investment with developing countries, which began in earnest after the mid-1980s, can be divided into the Middle East, Asia, Central and South America. Direct investments of the Republic of Korea in the Middle East were mainly directed at the development of oil resources, while direct investments in Asia, Central and South America were mostly aimed at relocating labor-intensive industries. Table 7 shows the status of foreign direct investment of the Republic of Korea in developing countries. As shown in Table 7, the scale of direct investments in the Asian region increased, averaging 23.3% of Korea's foreign direct investment over the five years from 1985 to 1990. The Middle East accounted for 10.4%, and Latin America - 5.9%.

Table 7. Status of Foreign Direct Investment of the Republic of Korea in Developing Countries, 1985-1990 (mln. USD)

	1985 (Cumulative until 1985)	1986	1987	1988	1989	1990	1985-90 (%)
Asia	98.5	5.2	129.8	35	114	298.6	23.3
Central and South America	59	2.4	4.5	9.9	58.9	36.3	5.9
Africa	12.1	0.05	0.6	1.5	8	26.8	1.7
Middle East	41.4	76.1	71.4	41.6	31.6	40.3	10.4
Etc.	24.8	0.9	2.2	2.8	17.8	21.7	2.4
Total export	626.4	172	397.2	212.9	492.5	1,019.7	100.0

Source: Kim Wonho (2019, p. 25)

Among Asian countries, the main destinations for Korea's direct investment were Indonesia, Thailand, Malaysia, and Hong Kong, while in Central and South America they were Panama, Costa Rica, and Mexico. Since Korea's outward direct investment, which began in the mid-1980s, was still at an early stage, South Korean companies had not yet engaged in significant overseas expansion. However, as overseas expansion in labor-intensive industries, including textiles and footwear, accelerated after 1990, Korea's policy of expanding foreign economic cooperation with developing countries began to be actively pursued.

In particular, the textile and footwear industries of the Republic of Korea were classified as declining industries, and there arose a need to relocate production abroad. As a result, the relocation of Korea's declining industries overseas naturally led to the expansion of foreign economic cooperation and bilateral trade with developing countries. Moreover, the expansion of industrial cooperation with developing countries played an important role in Korea's industrial restructuring from labor-intensive industries to high-

tech and service sectors. Table 8 and 9 show the dynamics of the Republic of Korea's exports and imports to developing countries.

As shown in Table 8, from 1985 to 1990, Korea's exports to developing countries accounted for 14.7% of the total volume to Asia, 2.9% to Latin America, 1.4% to Africa, 4.2% to the Middle East, and 0.2% to other regions. Overall, Korea's share of exports to developing countries was 23.4%. As shown in Table 9, Korea's imports from developing countries also accounted for 21.6% in total, with Asia representing 10.8%, Central and South America 3.1%, Africa 0.5%, the Middle East 6.9%, and other regions 0.3% during the same period.

Table 8. Dynamics of Exports of the Republic of Korea to Developing Countries, 1985-1990 (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
Asia	4,140	4,300	5,710	8,641	9,944	11,299	14.7
Central and South America	1,079	907	1,226	1,601	1,740	2,104	2.9
Africa	647	442	503	754	921	915	1.4
Middle East	2,043	1,823	2,149	2,621	2,030	2,009	4.2
Etc.	31	49	74	114	134	128	0.2
Total export	30,283	34,715	47,281	60,696	62,377	65,015	100.0

Source: Kim Wonho (2019, p. 27)

Table 9. Dynamics of Imports of the Republic of Korea to Developing Countries, 1985-1990 (mln. USD)

	1985	1986	1987	1988	1989	1990	1985-90 (%)
Asia	3,926	3,162	4,435	5,388	6,509	7,637	10.8
Central and South America	1,859	1,258	1,184	1,442	1,544	1,726	3.1
Africa	396	174	90	154	242	363	0.5
Middle East	2,986	1,941	2,670	2,890	3,933	5,295	6.9
Etc.	71	90	212	165	187	160	0.3
Total export	31,136	31,584	41,020	51,811	61,465	69,844	100.0

Source: Kim Wonho (2019, p. 29)

In particular, the Republic of Korea's commitments to ODA increased after it joined the OECD as a member in March 1995. As a result, Korea's economic cooperation, based on mutual trust with developing countries, expanded through ODA programs. Thus, the main policy of Korea's foreign economic cooperation consisted of economic cooperation focused on energy resources such as oil and liquefied petroleum gas with Middle Eastern countries, as well as cooperation focused on raw materials such as timber, minerals, and fishery resources with Asian countries. Since Korea faced the problem of an absolute shortage of natural resources, securing diversified sources of resource supply became an important task of its foreign economic cooperation policy. To this end, expanding economic cooperation with developing countries was an important foreign economic policy for the stable and continuous industrial development of Korea.

Conclusions

The Republic of Korea is the only country to have gained independence from Japanese occupation that has successfully transitioned from being an international aid recipient to a donor country. Therefore, the Republic of Korea is actively expanding its foreign economic cooperation alongside its economic development. The scope of its foreign economic cooperation is expanding to include investment and technical support in manufacturing, services, and the financial sector, while cooperation under the Korean Official Development Assistance program is also improving. It is anticipated that the model for changing and improving the Republic of Korea's foreign economic cooperation policy will be useful in shaping foreign economic policy for developing countries.

The Republic of Korea has achieved industrialization and economic liberalization despite a lack of significant natural resources and the virtual absence of an industrial base due to civil war. Indeed, the Republic of Korea's achievements in economic development are considered an unprecedented success worldwide. This is why the Republic of Korea's economic development experience is increasingly attracting the attention of the international community

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IT TAKES FOUR TO TANGO: QUADRUPLE HELIX AND REGIONAL DEVELOPMENT IN SLOVAKIA

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Abstract: *The paper explores the application of the quadruple helix (QH) model in the creation and implementation of strategic documents of Slovak self-governing regions (NUTS III). Using the Programs of Economic Development and Social Development (PEDSD) as the main source, the study compares the involvement of the four helices - public sector, private sector, academia, and civil society - across all eight regions. To achieve this, a qualitative research design based on directed content analysis was employed, allowing the systematic identification of QH actor roles within the documents. The evaluation draws on a four-dimensional analytical scale capturing institutional involvement, level of participation, document emphasis, and impact on strategic content. The analysis reveals that the public sector remains the dominant actor, coordinating the planning process and ensuring alignment with national policies. The private sector is actively engaged in economically advanced regions, where industrial clusters and SMEs contribute to competitiveness and innovation, but less so in structurally disadvantaged areas. The academic sphere plays a fundamental role in shaping innovation and knowledge-oriented priorities, particularly in regions where universities directly coordinated or authored PEDSDs. By contrast, civil society exhibits the highest degree of variation: from active and institutionalized involvement in Bratislava, Nitra, Žilina, Banská Bystrica, Prešov, and Košice SGRs to largely symbolic or declarative engagement in Trnava and Trenčín SGRs. The findings suggest that while the QH framework is formally recognized across all regions, its practical application remains unbalanced. Stronger institutionalization of civic participation and more effective facilitation by regional authorities are needed to reduce asymmetries among helices and to realize the full potential of the model.*

Keywords: *quadruple helix model, regional development, Slovakia, strategic planning, participation*

JEL Code: R58

UDC: [332.14:338.28](437.6)

Introduction

The rapid evolution of globalization exerts pressure to adopt multidimensional and multisectoral approaches to effectively address ongoing changes. The complex challenges emerging from this dynamic are characterized by their resistance to resolution through simple, linear solutions or the actions of a single authority. Instead, their addressing requires coordinated simultaneous or sequential efforts from multiple actors (Kolehmainen et al., 2016).

In response to this need for collaborative problem-solving, contemporary discourse emphasizes the Quadruple Helix (QH) model as an extension of the Triple Helix model, highlighting the interdependence of government, business, and academia in fostering innovation (Etzkowitz, 1998). The QH model integrates civil society,

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acknowledging its critical role in co-creating and implementing sustainable innovations (Carayannis & Campbell, 2009).

This approach enables web-based services and Centers of Excellence to assist SMEs with multiple development scenarios tailored to their specific needs (Baltov et al., 2024). The model facilitates knowledge-sharing processes among stakeholders, with each helix playing distinct roles: bridging academics, resource-providing industry, observant government, and boundary-spanning civil society, creating a balanced framework for sustainability-driven collaboration (Hakeem et al., 2023). In practice, the quadruple helix addresses gaps in research and knowledge production while supporting innovation in creative industries through enhanced synergy between actors (Yusri et al., 2022). The inclusion of local communities as the fourth helix strengthens graduates' employable skills through outreach initiatives and collaborative partnerships, potentially leading to higher employment rates in knowledge-based societies and poverty alleviation through local community development (Shyiramunda & van den Bersselaar, 2024). In Finnish regions, the model facilitates civil society participation through three mechanisms: information exchange, feedback, and co-creation, supporting democratic participatory policy processes in regional research and innovation strategies (Roman & Feltnhofer, 2021). Similarly, Central European regions show that quadruple helix approaches strengthen regional competitiveness through smart specialization strategies, particularly in smart city development initiatives (Suzic et al., 2020).

In the Slovak context, it can be observed that regional strategic planning in Slovakia has undergone significant evolution following EU accession, with a particular emphasis on governance structures and innovation models. Smith (2007) examined strategic planning initiatives in the region, finding that bottom-up, endogenous approaches predominated but lacked coordination between local and regional development perspectives. Regional authorities faced legitimacy crises while attempting to fulfil coordinating functions, with alternative regionalization coexisting in overlapping spaces. The institutionalizing process created collaborative relationships between actors, though vertical integration remained challenging due to over-emphasis on local perspectives (Smith, 2007).

Zajko (2017) analysed Slovakia's Research and Innovation Strategy for Smart Specialization (RIS3), noting the country's struggle as a moderate innovator to implement the triple helix model effectively. The study recommended enriching the Slovak RIS3 strategy with open innovation paradigm facets to advance toward a quadruple helix concept, potentially elevating Slovakia among strong innovators in the EU context.

Also, on the broader scale, application of the QH model, especially in some EU regions and countries, is accompanied by several bottlenecks that are generally referred to as underdeveloped institutional contexts (Benner, 2019). Different studies revealed the following difficulties: identifying the appropriate spatial level for policy implementation, the top-down planning approaches, and limited capacities for evidence-based policymaking (Capello, Kroll, 2016), the lack of public-private coordination mechanisms, and the prevailing hierarchical policymaking culture (Kleibrink, Larédo, Philipp, 2017), and intra-

governmental complexity (Kroll, 2015). Moreover, low levels of trust in government further exacerbate institutional inefficiencies (Kleibrink, Larédo, Philipp, 2017).

These issues are not fully explored in the Slovak context, and therefore, to address this gap, this paper analyzes the extent and quality of the Quadruple Helix model's application in all eight Slovak self-governing regions by utilizing the Programs of Economic Development and Social Development (PEDSD) as the primary source, as these are the central strategic planning documents where actor engagement is formalized, and employing a directed content analysis based on a four-dimensional qualitative scale (Institutional Involvement, Level of Participation, Document Emphasis, and Impact on Content) to systematically evaluate the role of the public sector, private sector, academia, and civil society.

To guide this investigation, the study addresses three research questions: (1) How are the four helices represented in regional PEDSDs? (2) What differences exist in the depth, form, and consistency of their involvement? (3) To what extent do the documents operationalize the core principles of the QH model in regional strategic planning?

The original contribution of the article lies in demonstrating how the QH framework can be systematically applied to strategic development documents - an underexplored domain - thereby revealing how actor roles, participatory mechanisms, and governance capacities become formalized within regional planning processes.

This analytical approach is methodologically grounded, as the QH model provides a structured lens for tracing collaborative interactions and institutionalized participation, making it particularly suitable for document-based content analysis where actor engagement is expressed textually and procedurally.

The remainder of the paper is structured as follows. First, the institutional and socio-economic characteristics of Slovak self-governing regions are introduced, providing the contextual basis for the analysis. The subsequent sections examine in turn the role of the public sector, private sector, academic institutions, and civil society in the preparation and implementation of regional Programs of Economic Development and Social Development. This is followed by a comparative discussion that situates the Slovak case within broader debates on the quadruple helix model. Finally, the conclusion synthesizes the main findings, identifies persistent asymmetries between the helices, and outlines implications for regional policy and future research.

Literature Review

The current academic discussion on regional policy and innovation governance centers on the paradigm shift from centralized planning to multi-actor cooperation. This literature review systematically traces the evolution of innovation models from the Triple Helix to the Quadruple Helix framework and analyzes the operationalization of the latter within European regional strategic planning, focusing specifically on documents like the Slovak Programme of Economic Development and Social Development (PEDSD).

1. Transition from Triple Helix to Quadruple Helix Model

The discourse surrounding innovation and regional development has progressively moved beyond linear models towards more interactive and network-centric frameworks. This evolution is perhaps best captured by the progression from the Triple Helix (TH) model to the Quadruple Helix (QH) model.

The foundational Triple Helix model conceptualized the innovation process as an interactive spiral of linkages among three core institutional spheres: university (academia), industry (business), and government (Etzkowitz, 1998). The TH model was instrumental in shifting focus from government or firm-centric models to one that highlights the critical role of universities in driving economic growth and creating new firms through knowledge transfer (Carayannis, Campbell, 2012).

Building on this, the need to address complex societal issues and ensure the sustainability and legitimacy of innovation led to the development of post-TH concepts. Carayannis and Campbell (2009) introduced a refined model, which integrates the three original helices with a crucial fourth actor: civil society or the 'public'—the Quadruple Helix (QH) model. This inclusion acknowledges that innovation is no longer solely a techno-economic process but must be rooted in societal values and needs (Morales et al., 2025).

The QH framework formally defines the four interdependent spheres:

- academia (the knowledge base): the generator of fundamental knowledge and human capital,
- industry (the economic base): the driver of technological innovation and market exploitation.
- government (the regulatory base): the provider of stable conditions, funding, and legal frameworks.
- civil society (the user/societal base): including media, arts, culture, and citizens; this helix provides essential feedback on societal needs, drives social innovation, and confers legitimacy and co-ownership on the innovation process (Roman & Fellnhöfer, 2022; Roman et al., 2020).

2. Application of the QH Model in Regional Development

The theoretical foundations of the QH model find their most significant practical application within the framework of European regional policy, particularly in the governance of innovation. The integration of quadruple helix stakeholders into strategic planning documents varies considerably across regions and development stages. Strategic documents mentioned across studies include Smart Specialisation Strategies (RIS3), regional development plans, and general innovation strategies (Andriienko, 2025).

The evidence suggests three prevalent models of helix integration: (1) highly formalized structures with dedicated intermediary agencies (e.g., Lithuania) (Andriienko, 2025), (2) participatory mechanisms embedded within existing regional governance (e.g., Finland) (Andriienko, 2025), and (3) informal coordination with limited institutional support (e.g., Poland) (Łacka, 2020). Regions with stronger formal mechanisms demonstrate more substantive co-creation evidence, including co-developed policy

priorities and co-governance structures, while those relying on informal processes show weaker collaborative outcomes.

The QH model acts as the normative ideal for multi-actor governance in regional strategic planning. Strategic documents, such as the Slovak Programs of Economic Development and Social Development (PEDSD), are intended to function as integrated frameworks where the priorities and inputs of all four helices are formalized and actionable (Sedlačko, 2007). Effective governance in this context is defined by the capacity of regional authorities to facilitate genuine horizontal collaboration and translate the diverse perspectives of all four actors into coherent, implementable policies (Willi, Pütz, Müller, 2018).

The degree of helix integration into strategic documents serves as a reliable indicator of implementation depth. Lithuania's 500+ stakeholders in S3 design and Finland's participatory foresight process represent substantive integration producing co-created priorities and governance structures (Andrienko, 2025). Poland's informal stakeholder interaction in strategy development reflects shallower integration (Łacka, 2020), while Romania shows intermediate integration through a particular project participation but with noted gaps in stakeholder connections (Aldea Lopponen, 2025). This deep integration is crucial because formal planning documents institutionalize commitments, allocate resources, and create accountability mechanisms. Regions achieving deeper strategic document integration show stronger outcomes across innovation funding, competitiveness improvements (Suzic, Ulmer, Schumacher, 2020), and social capital development (Horváth, Kovács, Szőke, 2015). This validates the focus on strategic document involvement as a meaningful dimension of quadruple helix implementation rather than merely procedural formality.

3. The Quadruple Helix in Slovak Strategic Documents

The Programme of Economic Development and Social Development (PEDSD) of Slovak Regions represents a critical strategic document that can leverage the Quadruple Helix model to drive comprehensive regional innovation and growth.

It is defined as a key medium-term strategic document in Slovakia, crucial for planning and managing development at both the regional (Higher Territorial Units/self-governing regions) and local (municipalities, towns) levels. The obligation for self-governing bodies to prepare the PEDSD is set out in Act No. 539/2008 Coll. on the Support of Regional Development, as amended. It is typically prepared to align with the European Union's programming period (e.g., 2021 – 2027, with an outlook until 2030).

Based on the valid legislation, the core purpose of the document is:

- to identify the territory's strengths and weaknesses, its potential, and its development needs (analytical section);
- to define the strategy, vision, objectives, and priorities for development across various sectors (economy, social sphere, environment, transport, education, culture, etc.);
- to ensure the optimal, balanced, and sustainable economic and social development of the area.

The PEDSD is the fundamental document serving as the basis for securing funding, particularly from the European Structural and Investment Funds (ESIF) and state subsidies. If a territorial unit does not have an approved PEDSD in compliance with the valid methodology, it is ineligible to apply for these resources.

Crucially, the PEDSD is built upon the principle of partnership and territorial cooperation, where the involvement of actors from the Quadruple Helix model (from government self-administration through academics and businesses to citizens) is essential for the legitimacy, quality, and successful implementation of the development strategy in the region. Furthermore, the Quadruple Helix model provides a robust framework for integrating all helices in collaborative regional development (Roman et al., 2020).

In the Slovak context, such a strategic approach is particularly important, as it enables cross-sectoral partnerships that can address complex regional economic challenges (Vojtech et al., 2019). The model's strength lies in its ability to facilitate knowledge creation, institutional bridging, and participatory policy-making (Galvão et al., 2017). By embracing this approach, the strategic document can potentially enhance regional competitiveness, stimulate innovation, and create more responsive economic development strategies that account for the diverse needs of local stakeholders (Vrablikova et al., 2023).

Data and Methodology

This study applies a qualitative research design with a focus on content analysis of strategic documents – in particular the Programmes of Economic Development and Social Development of all 8 self-governing regions (NUTS III) in Slovakia – Bratislava Self-Governing Region (BA SGR), Trnava Self-Governing Region (TT SGR), Trenčín Self-Governing Region (TN SGR), Nitra Self-Governing Region (NR SGR), Žilina Self-Governing Region (ZA SGR), Banská Bystrica Self-Governing Region (BB SGR), Prešov Self-Governing Region (PO SGR) and Košice Self-Governing Region (KE SGR).

1. Description of Regions

Slovakia is divided into eight self-governing regions that correspond to the EU NUTS III level and are the principal territorial units for regional development planning in Slovakia. The regions are: Bratislava Self-Governing Region (BA SGR), Trnava Self-Governing Region (TT SGR), Trenčín Self-Governing Region (TN SGR), Nitra Self-Governing Region (NR SGR), Žilina Self-Governing Region (ZA SGR), Banská Bystrica Self-Governing Region (BB SGR), Prešov Self-Governing Region (PO SGR), and Košice Self-Governing Region (KE SGR). Each region produces a medium-term strategic framework commonly called Program of Economic Development and Social Development (PEDSD), which functions as the basic regional strategic document used for designing and coordinating regional policy and investment. Some basic data regarding the eight self-governing regions of Slovakia can be found in Table 1.

Table 1. Selected indicators of self-governing regions of Slovakia

Region	Area (km ²)	Population (in 1 000)	GDP/capita (in 2023)	Unemp. rate (in 2025 in %)	Muni.	Enter.	Uni.
BA	2 053	733	54 811	3,25	89	109 544	11
TT	4 147	556	30 034	3,69	251	27 608	3
NR	4 502	594	23 406	3,69	276	21 734	2
TN	6 343	690	24 297	3,86	354	33 462	3
ZA	6 809	689	23 981	4,72	315	29 218	2
BB	9 455	661	21 176	8,28	516	25 845	4
KE	8 973	815	17 113	9,94	665	26 149	2
PO	6 752	792	23 137	8,74	461	31 957	4

Legend: BA – Bratislava Self-Governing Region, TT – Trnava Self-Governing Region, TN – Trenčín Self-Governing Region, NR – Nitra Self-Governing Region, ZA – Žilina Self-Governing Region, BB – Banská Bystrica Self-Governing Region, PO – Prešov Self-Governing Region, KE – Košice Self-Governing Region, Un. Rate. – unemployment rate in 2025, Muni. – number of municipalities, Enter. – number of enterprises – legal persons, Uni. – number of universities located in the region

Source: website of Self-Governing Regions and the PEDSDs of Regions

The regional economic and innovation landscape of Slovakia exhibits significant variation, which has implications for the application of the QH model. The Bratislava SGR demonstrates a strong research and private sector presence, characterized by prominent higher education institutions and dense clusters of services, IT, finance, and automotive suppliers. This concentration allows QH initiatives to leverage existing R&D capacity and international networks; however, urban inclusion, housing, and transport challenges remain important considerations.

In the western and central regions, including Trnava, Trenčín, Nitra, and Žilina SGRs, the economic structure is more mixed, combining industrial bases with agricultural activities. Here, there is substantial potential for industry–university collaboration and applied research, and regional strategic documents frequently emphasize competitiveness and skills development.

By contrast, the eastern and more rural regions, such as Košice, Prešov, and Banská Bystrica SGRs, tend to have lower GDP per capita and higher unemployment in certain areas. Strategic documents in these regions typically prioritize job creation, social inclusion, and local entrepreneurship, suggesting that QH initiatives may be most effective when focused on fostering local innovation ecosystems, supporting social enterprises, and implementing targeted workforce retraining programs.

2. Analytical Framework of the Study

The analytical framework is grounded in the Quadruple Helix (QH) model, which conceptualizes innovation and development processes through the interaction of four key societal actors: public administration, academia, private sector, and civil society. The primary objective is to assess the degree, form, and quality of QH actors' involvement in the formulation and implementation of the Program of Economic Development and Social Development (PEDSD) of Slovakia's self-governing regions.

The empirical material consisted of the latest PEDSD documents, valid in the most recent programming periods, mostly for the years 2021–2027, 2023–2027, 2021–2030, or 2022–2030 (for details, see references). But in the case of Trnava SGR, the latest published version was for the years 2016–2022. All the documents were retrieved from the official portals of the self-governing regions and related public databases. Only officially adopted and final versions of the programs were included in the analysis to ensure comparability. In addition, methodological manuals and national-level guidelines were reviewed to contextualize the process of document preparation.

A directed content analysis was used to systematically examine the documents. The coding framework was elaborated by the author, and it was structured around four dimensions of actor involvement, with each assessed according to a qualitative scale. Further, each characteristic was associated with a number (in brackets) that allows for better data visualisation. The full description of the characteristics is included in Annex 1.

The qualitative scale was as follows:

1. Institutional Involvement
 - Essential / Steering / Executive (4)
 - Formal Partnership / Expert (3)
 - Indirect / Weak (2)
 - None (1)
2. Level of Participation
 - Direct and Intensive / Steering (4)
 - Direct and Consultative (3)
 - Passive / Low (2)
 - Minimal (1)
3. Document Emphasis
 - High and Constant (4)
 - Medium / Targeted (3)
 - Low / Marginal (2)
 - None (1)
4. Impact on Content
 - Fundamental (4)
 - Significant (3)
 - Indirect / Partial (2)
 - Minimal / None (1)

This four-dimensional qualitative scale enabled the evaluation of actors' involvement based on concrete textual evidence rather than subjective impressions. This evidence was identified during the reading of all eight PEDSDs by the author. The assessment process included the evaluation of the document content, identification of individual chapters, assessment of the description of document design, and preparation and also the analytical, strategic, and implementation sections of the document.

Each PEDSD document was coded independently. A comparative synthesis was then performed across all self-governing regions, identifying commonalities and differences in the application of the Quadruple Helix model.

The analysis was restricted to official, publicly available documents, which may not fully capture informal interactions or behind-the-scenes negotiations. Furthermore, while the qualitative approach provides in-depth insights, it does not permit statistical generalization of the findings.

Findings

This section presents the empirical results of the Quadruple Helix (QH) model application across the eight self-governing regions of Slovakia, detailing the involvement and specific roles of the four distinct pillars: the public sector, private sector, academic sphere, and civil society. The analysis confirms that while all four sectors are engaged in the development and implementation of the Program of Economic Development and Social Development (PEDSD) documents, the intensity and form of this involvement vary significantly across regions, leading to a demonstrable government-centric approach where the public sector is the dominant driver. The subsequent subsections systematically examine the function and influence of each helix, highlighting regional differences and the overall dynamics of multi-sectoral cooperation in strategic regional planning.

1. The role of the public sector in the application of the QH model in self-governing regions

The involvement of the public sector in the creation and implementation of the Program of Economic Development and Social Development (PEDSD) of self-governing regions is a key element of the application of the QH model at the regional level in Slovakia. The analysis of documents from all eight regions shows that the public sector plays a dominant and irreplaceable role in all phases of the process – from procurement, through coordination, to implementation and monitoring (Fig. 1).

In the western Slovak regions (Bratislava, Trnava, Nitra, and Trenčín SGRs), the involvement of public administration is characterized by a high degree of formalization and centralized management. The Bratislava SGR used the expert potential of the Institute of Regional Policy and international know-how (e.g. the JASPERS working group), while emphasizing the direct involvement of all municipalities and city districts. The Trnava SGR based the process on commissions and representatives, thus ensuring a close link to the legislative and competence frameworks of local government. The Nitra and Trenčín SGRs developed participatory mechanisms at the level of strategic planning regions, with an emphasis on coordination with state agencies and employment offices. In the northern Slovak environment (Žilina SGR), public administration presented itself as an initiator and integrator, which created an extensive network of thematic and territorial working groups with the participation of approximately 80 experts and representatives of local governments. This

model of participation allowed not only formal involvement, but also real co-creation of strategic priorities, for example, in the area of transport accessibility and digital transformation.

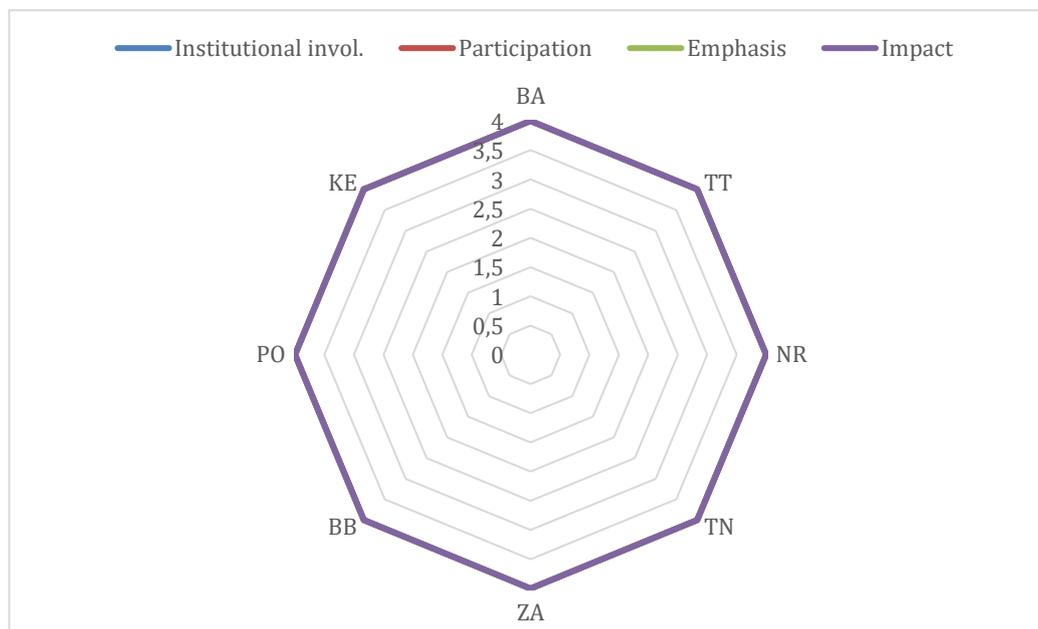


Figure 1. Public sector involvement in strategic planning

Source: own processing

The Eastern and Central Slovak regions (Banská Bystrica, Prešov, and Košice SGRs) show an even more pronounced dominance of the public sector, as the self-governing regional offices themselves were the main processors of PESD documents. In the Banská Bystrica SGR, the authoring team was formed internally within the regional development department, which ensured a strong link between the document and the region's own competencies and needs. Similarly, the Prešov and Košice SGRs processed the PESD through internal capacities, while creating new institutional structures (Partnership Councils and cooperation councils). In these regions, the majority of municipalities were directly involved in the process, and thousands of project plans were collected, which served as the basis for the creation of project pipelines.

A comparison of all regions indicates that the public sector is not only the bearer of legal competencies in the process of creating and implementing PESD, but also the main guarantor of participatory mechanisms. Its dominant role ensures consistency with strategic documents at the national level and creates a framework for integrating the inputs of other actors. From the perspective of the application of the QH model, this means that Slovak regions are currently characterized by a government-centric approach, where the public sector is the key driving force and partners from other helices enter the process mainly on a consultative and project-oriented level. This model brings a high degree of coordination, but at the same time points to the challenge of how to strengthen autonomous and innovative inputs from the academic, business, and civil spheres, which could enrich strategic documents with a wider range of perspectives and solutions.

2. The role of the private sector in the application of the QH model in self-governing regions

An analysis of the Programs of the Economic Development and Social Development in all eight self-governing regions of Slovakia shows that business entities are perceived as key socio-economic partners and their needs are systematically reflected in strategic documents. However, the degree and forms of involvement show regional differences - from direct participation in working groups to consultation mechanisms (Fig. 2). As shown in Figure 2, particularly strong business involvement is seen in Bratislava, Nitra, and Košice regions compared to more consultative participation elsewhere.

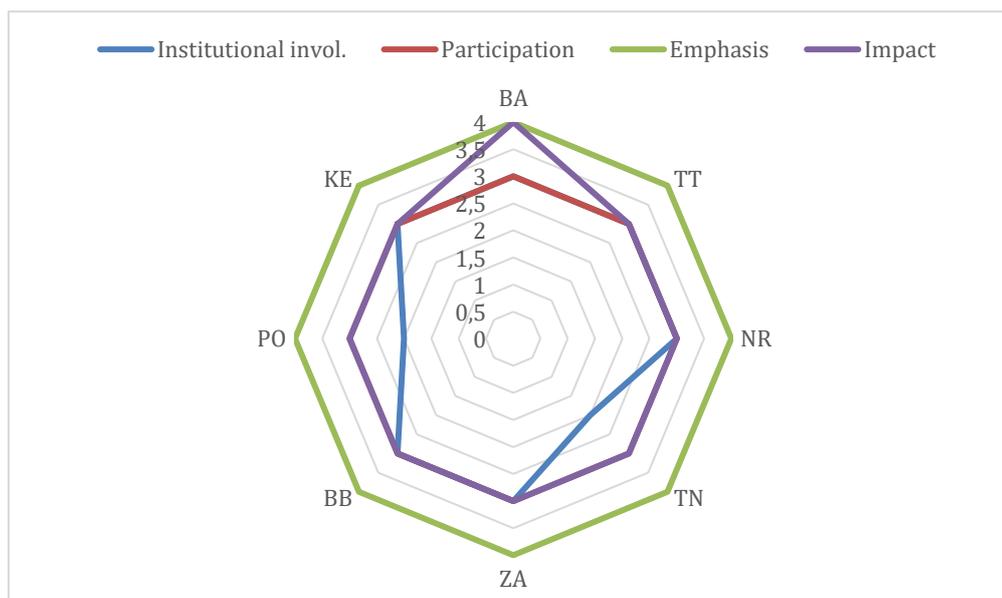


Figure 2. Private sector involvement in strategic planning

Source: own processing

The Bratislava SGR stands out for its strong and formalized involvement of the business sector, including the largest employers, chambers of commerce, and professional associations. More than 400 entities were involved in the process, and their inputs significantly shaped the strategic goals aimed at supporting SMEs, start-ups, and technology transfer. A similarly high level of participation was also recorded in the Nitra and Košice SGRs, where entrepreneurs acted as full members of working groups and actively participated in formulating priorities in the areas of industry, agriculture, innovation, and tourism.

The Trnava and Žilina SGRs emphasize the role of industrial clusters, chambers of commerce, and SMEs, which are identified as carriers of competitiveness and innovation. Their participation was mainly consultative in nature, but the result was the inclusion of measures to support cluster policy, internationalization of SMEs, and digital transformation of enterprises. In the Trenčín SGR, the private sector is explicitly less represented in the preparatory phase, but its importance in the implementation of the strategy is clearly declared - especially in relation to the modernization of industry and the revitalization of brownfields.

The Banská Bystrica and Prešov SGRs involved the business sector as part of wider partnerships, mainly through thematic working groups and questionnaire surveys. In both

cases, the economic dimension of the documents is elaborated in detail, and the priorities aimed at strengthening the business environment, supporting innovation, and digitalization reflect the requirements of regional enterprises. A specific feature of the Banská Bystrica SGR is the emphasis on cooperation within the triple helix, which systematically connects the business, public, and academic sectors.

Overall, it can be stated that in all regions the business sector is perceived as a key addressee of strategic priorities and measures, while its involvement goes beyond the symbolic level. Participation ranges from consultation forms to direct co-creation of the content of documents, which allows for a more effective connection of regional strategies with the needs of the labor market, innovations, and competitiveness. From the perspective of the QH model, this means that Slovak regions are already currently supported by a relatively robust business pillar, the strengthening of which may be the key to the transition to a knowledge-based and innovative economy.

3. The role of the academic sphere in the application of the QH model in self-governing regions

The academic sphere represents a fundamental pillar in the four-helix model (QH), which directly influences the quality of regional strategies with its expertise, research and development potential, and role in shaping human capital. An analysis reveals significant regional differences in the scope and intensity of university and research institution involvement in creating strategic documents (Figure 3). The study proved particularly high academic engagement in Bratislava, Nitra, and Trenčín, and comparatively lower involvement in Trnava.

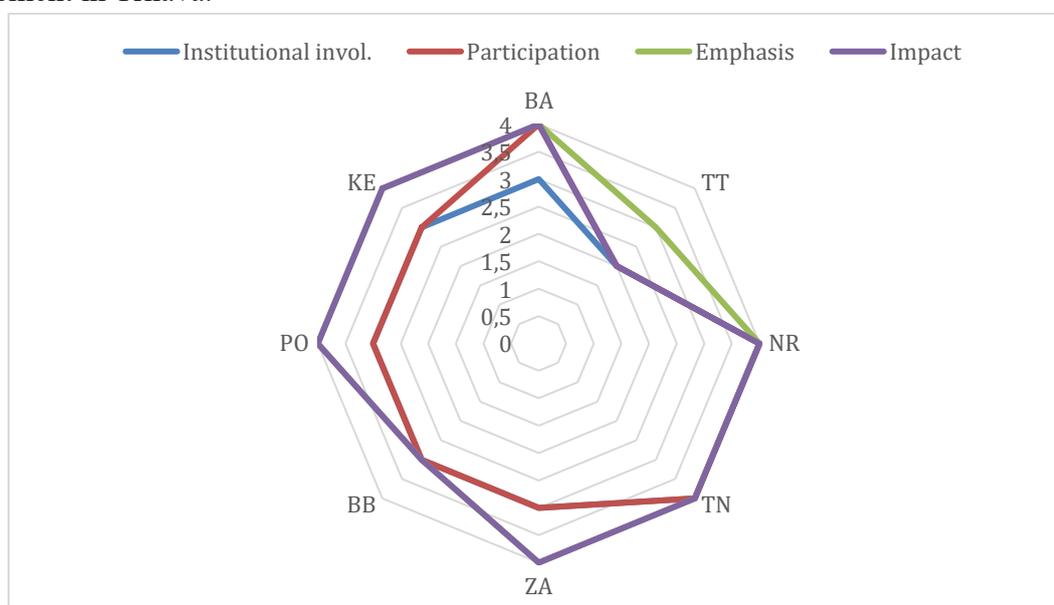


Figure 3. Academic sphere involvement in strategic planning

Source: own processing

The Bratislava SGR is characterized by the systematic and intensive involvement of the academic sector, which was perceived as a key partner for innovation and human

capital development. Representatives of universities, the Slovak Academy of Sciences and institutions with an academic background participated in the analytical and strategic parts of the document, contributing to the formulation of priorities focused on modern education, research and innovation. A similarly high level of participation can be observed in the Nitra and Trenčín SGR. In Nitra, the Slovak University of Agriculture played a key role in the development of the PESD, with university experts coordinating the work of thematic working groups and guaranteeing the methodology of the document. In Trenčín SGR, the document was developed directly by an academic entity – the SPECTRA Center of Excellence of the Slovak University of Technology, which ensured a fundamental influence of academic expertise on the structure and content of the strategy.

Significant and formal involvement can also be observed in the Žilina, Košice and Prešov SGRs. The University of Žilina and the Jessenius Faculty of Medicine of Comenius University in Martin were identified as key institutions of the regional innovation ecosystem, which directly shaped measures to support innovation hubs, clusters, and research centres. In Košice SGR, cooperation was based on three universities and eight departments of the Slovak Academy of Sciences, with the Technical University playing a special role in the creation of the regional hydrogen strategy and the Innovation Centre of the Košice Region. In Prešov SGR, the academic sphere was represented through the University of Prešov, which acted as the expert guarantor of the document and contributed to the priorities focused on innovation, education and stabilization of human resources.

On the contrary, in the Trnava SGR, the involvement of the academic sphere was rather indirect and limited, although the document explicitly acknowledges the importance of universities and research institutions for the support of innovation and the development of the knowledge economy. The Banská Bystrica SGR represents a medium level of involvement, where universities and research institutions participated mainly through consultation mechanisms and working groups, resulting in the inclusion of triple helix cooperation as a basic principle of SMART regional development.

Overall, it can be stated that the academic sphere is involved in Slovak regions at several levels - from symbolic partnership (Trnava SGR) through consultation and expert involvement (Banská Bystrica, Žilina, Košice, Prešov SGRs) to the management and implementation role of the processors of strategic documents (Nitra, Trenčín, Bratislava SGRs). In regions with the most intensive involvement of academic institutions, this was directly reflected in the structure of documents, in a strong emphasis on innovation, the knowledge economy, and in the creation of specific project packages. This confirms that the academic pillar of the QH model is not just a theoretical framework, but in the conditions of Slovak regions, represents an active actor that fundamentally influences the content and implementation potential of strategic documents.

4. The role of civil society in the application of the QH model in self-governing regions

The analysis shows significant differences in the level of civil society involvement in the processes of creating and implementing strategic documents. This pillar of the QH model represents a key factor in the development of inclusive and innovative regional policies, but its

application is differentiated in individual regions (Fig. 4). Figure 4 illustrates strong civil society participation in the Bratislava, Nitra, Žilina, Banská Bystrica, Prešov, and Košice regions, contrasted with notably weaker involvement in Trnava and Trenčín.

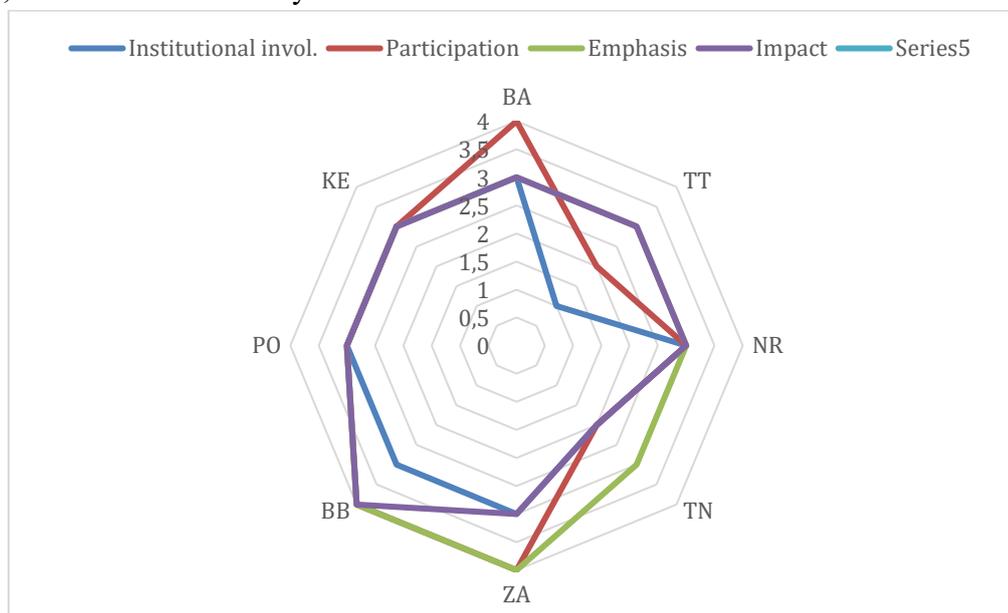


Figure 4. Civil society involvement in strategic planning

Source: own processing

In the Bratislava SGR, civil society involvement was the most intensive and broadest, with formal partnerships between the church and non-profit organisations in the areas of social care, education, environment, and culture. The participation process was supported by working groups, questionnaire surveys, and public discussions, with up to 93% of comments being incorporated. The result is a significant influence of the civil sector on the content of the strategy, especially in the topics of social inclusion and deinstitutionalisation of social services.

In contrast, the Trnava SGR shows rather passive involvement. Although the document acknowledges the role of civil society in the implementation of social and environmental policies, its institutional representation is lacking, and participation has been limited mainly to public comment. Similarly, in the Trenčín SGR, civil society is present mainly at the level of declared cooperation in the implementation of objectives, while direct evidence of its active participation in the development of the strategy is absent. In contrast, the Nitra, Žilina, Banská Bystrica, Prešov, and Košice SGRs provide examples of more systematic and multi-level involvement. In Nitra SGR, civil society associations participated directly in working groups, which allowed them to influence the development of specific measures (e.g., cycling or community development). In Žilina SGR, non-profit organizations were explicitly part of the thematic groups, and their inputs were reflected in environmental and social policy priorities. The Banská Bystrica SGR went even further, creating a separate working group for civil society and enabling a bottom-up approach through questionnaires and online forms. The Prešov and Košice SGRs integrate the civil

sector as an equal partner, while the PESD reflects the needs in the area of marginalized Roma communities, social care, and environmental sustainability.

The comparative analysis, therefore, shows that civil society is perceived as an active co-creator of public policies in some regions (BA, NR, ZA, BB, PO, KE), while in others (TT, TN) its participation remains largely declarative and passive. From the perspective of regional strategy development, it can be stated that although civil society is at least formally recognized in all regions, the degree of its involvement ranges across a wide spectrum – from symbolic participation to direct co-creation of content. To strengthen the effectiveness of the quadruple helix model, it is therefore necessary to systematically support institutionalized forms of civil society participation and ensure feedback mechanisms that will enable its inputs to be transformed into implementable policies and measures.

Discussion

The comparative analysis of Slovak self-governing regions demonstrates that the application of the quadruple helix model is uneven, particularly in relation to the role of civil society. While some regions (e.g., Bratislava, Nitra, Žilina, Banská Bystrica, Prešov, Košice SGRs) fostered active and institutionalized participation of the civic sector, others (notably Trnava and Trenčín SGRs) displayed more symbolic or passive engagement. Similarly, Roman et al. (2020) noted that civil society participation in European Union research and innovation strategies for smart specialization has remained low, despite strong policy emphasis on the QH model. This heterogeneity raises important questions about the institutional preconditions and governance cultures that enable or limit genuine citizen participation. Castillo-Vergara et al. (2024) identified government support as crucial for facilitating civil society participation, though technological dynamism did not directly influence societal engagement, revealing misaligned priorities between ecosystem actors. Further studies on regional innovation systems and governance could provide valuable insights here, especially regarding the relationship between formalized participatory mechanisms and the actual influence of civil actors on policy outcomes.

A further issue relates to the geographical and socio-economic context of participation. The more urbanized and economically advanced regions (e.g., Bratislava SGR) exhibited both higher civil sector activity and a stronger institutional framework for participation. By contrast, more rural or structurally disadvantaged regions often emphasized the civil society agenda mainly in relation to social inclusion and marginalized groups, but the quality of engagement varied. This pattern raises the question of whether the depth of civil society involvement is structurally conditioned by the region's economic profile, institutional capacity, and traditions of civic engagement. Analysis of Italian regions demonstrates that economic development and historical land distribution, not social engagement per se, predict effective democratic participation and governance quality (Solt, 2004). In U.S. counties, collaboration is driven more by business

involvement than robust civil society, with participation often limited to "token" citizen input mechanisms rather than meaningful, organized engagement (Campbell et al., 2017). Comparative literature on regional disparities and governance asymmetries could help confirm or challenge this interpretation.

In addition to the civil society dimension, the analysis also highlights the need to critically reflect on the role of the public and private sectors within the QH framework. The public sector, represented by regional self-governments, often acts as the formal initiator and coordinator of strategic documents, but its capacity to genuinely facilitate multi-actor cooperation varies. In some regions, the process remains largely top-down, limiting the transformative potential of collaborative governance. This is in contrast with the findings of Smith (2007), who found that public sector coordination faces legitimacy challenges, as demonstrated in Slovakia's Presov region, where regional authorities struggled with their coordinating function despite bottom-up strategic planning predominance. Such development, however, suggests some advancement in the field and improvement of the facilitation role of public authorities.

On the other hand, the private sector shows a strong presence, particularly in economically advanced regions (e.g., Bratislava, Trnava, Žilina SGRs), where industrial clusters, service industries, and foreign investors provide a natural base for innovation-oriented strategies. However, in less developed regions, private sector participation is weaker and often confined to specific industries such as agriculture or tourism. Such situation is supported also by evidence from Nartisa et al. (2012), who also stated that private sector participation appears particularly strong in economically developed contexts, as evidenced by comparative analysis between public and private sectors in Europe. However, private sector strategic planning exhibits certain characteristics: organizations tend to focus on short-term gains through daily actions while sometimes lacking long-term vision (Nartisa et al., 2012).

This unevenness raises questions about how public authorities can create enabling environments for broader business engagement and how private actors can be encouraged to see strategic planning not merely as an administrative exercise but as an opportunity for co-shaping regional development trajectories.

Finally, the Slovak experience points to broader implications for the quadruple helix model itself. While the theoretical framework assumes an equal role for government, academia, business, and civil society, the analysis suggests that the balance among helices remains uneven. Similar findings were declared by Hakeem et al. (2023), who found that while the Japanese sustainability project achieved a "balanced QH model" with distinct stakeholder roles, there was initially a significant gap between theoretical understanding and practical application.

Civil society's role is sometimes recognized only declaratively, while business and academic actors tend to dominate strategic planning. Similarly, Hasche et al. (2019) demonstrated the complexity of helix relationships in a Swedish regional innovation

system, concluding that the fourth helix (civil society) is far more complex than simply being a separate entity, as it encompasses various users and value-adding relationships.

This highlights a persistent tension within the model: whether it can truly function as a symmetrical partnership, or whether power asymmetries between the helices inevitably shape its practical application.

Recommendations

The analysis suggests that while the Quadruple Helix (QH) model is formally recognized, its application in Slovak self-governing regions remains government-centric and unbalanced. To move beyond a consultative, project-oriented partnership towards genuine co-creation and maximize the model's potential for sustainable innovation, the following recommendations are proposed, drawing inspiration from high-performing Slovak regions (like Bratislava, Nitra, and Košice SGRs) and international best practices (like Finland's co-creation models).

The public sector currently holds a dominant and irreplaceable role in coordination, procurement, and implementation. The challenge is to shift this role from centralized control to genuine facilitation and bridging between the other helices.

One possible way could be to create permanent, multi-helix Partnership Councils (as seen in Prešov and Košice SGRs) or Regional Innovation Councils with formal decision-making or veto power, not just consultative status. This moves engagement from a one-off planning phase to continuous governance. Another recommendation would be to address the bottleneck of low levels of trust noted in Central European contexts. This involves greater transparency in PEDSD funding allocation and publishing clear feedback on how inputs from other helices were incorporated (or why they were not). Finally, to train regional public servants on multi-actor facilitation and open innovation methodologies would enhance their ability to integrate autonomous inputs from academia and business, rather than merely coordinating a plan they internally authored.

In the case of the business sector, it can be stated that while it is robustly involved in economically strong regions (Bratislava, Nitra, Košice SGRs), its role in other regions is often consultative or solely focused on implementation. Engagement should be broadened to include strategic foresight and co-investment.

The private sector's participation in working groups, especially for SMEs and companies in structurally disadvantaged regions (Banská Bystrica, Prešov, Košice SGRs) could be directly funded or co-financed to encourage their participation. Introduction of a voucher system for SMEs to hire university expertise to solve problems, directly linking the private and academic helices. Another solution could be to move beyond general chambers of commerce involvement and formalize thematic working groups focused on emerging sectors (e.g., digital transformation, circular economy, hydrogen strategy, as seen in Košice SGR) to ensure business inputs are highly relevant and future-oriented.

The academic sphere already plays a fundamental role in regions where it was directly involved in document authorship (Nitra, Trenčín, Bratislava SGRs). The key recommendation is to formalize this "management and implementation role" across all regions, especially where involvement is limited (Trnava SGR). This could be done for example by requiring every PEDSD to undergo a mandatory review and validation of its analytical and strategic sections by a consortium of regional universities. This ensures that planning is evidence-based and incorporates international best practices. Another possibility is to create Memoranda of Understanding between regions and universities to co-develop regional statistics, conduct socio-economic analyses, and perform monitoring and evaluation of PEDSD implementation. This formalizes the academic role beyond the planning phase. Finally, it is possible to utilize university networks to translate PEDSD strategic priorities into educational programs and lifelong learning opportunities, directly linking human capital development to regional strategic goals.

Civil society involvement is highly differentiated, ranging from intensive co-creation to passive engagement. The primary goal should be to institutionalize the participatory successes of high-engagement regions (BA, NR, ZA, BB, PO, KE) and overcome the declarative nature observed elsewhere (TT, TN). A possible solution could be to create a dedicated, formally recognized Regional Civil Society Council in every region, with guaranteed seats on the main PEDSD governance body. This moves participation beyond ad-hoc public comments. Positive development in this respect could also be achieved by supporting bottom-up approach by systematically using participatory budgeting or local action groups (LAGs) to enable citizens and NGOs to propose and manage smaller PEDSD-aligned projects, giving civil society a direct role in implementation and resource allocation. Lastly, the emphasis could be on implementing targeted outreach mechanisms (like online forms, workshops in smaller towns, and specific consultations for marginalized Roma communities, as seen in Prešov and Košice SGRs) to ensure that the civil society pillar genuinely represents the diversity of the region, and not just established NGOs.

Conclusions

The analysis of the eight self-governing regions of Slovakia (NUTS III level) demonstrates that the application of the quadruple helix (QH) model in the design and implementation of strategic documents is both visible and regionally differentiated. Across all cases, the public sector remains the dominant actor, exercising its legal and coordinating competencies and ensuring alignment of regional strategies with national frameworks. This guarantees consistency and coherence but also reveals a strong government-centric approach that risks limiting the independent contributions of other helices.

The private sector plays an increasingly important role, particularly in more economically advanced regions such as Bratislava, Trnava, and Žilina SGRs. Here, industrial clusters, foreign investors, and SMEs actively participate in shaping strategic

priorities, which often focus on competitiveness, innovation, and internationalization. In less developed regions, however, business engagement is weaker and tends to concentrate on specific industries, highlighting the need for targeted measures to enhance the business pillar of the QH model in peripheral areas.

The academic sphere demonstrates a significant and growing influence on regional strategy-making, particularly in regions where universities and research institutes have acted as guarantors or processors of strategic documents. Their expertise has directly translated into stronger emphases on innovation, human capital development, and knowledge economy projects. Nevertheless, some regions still treat the academic role as largely symbolic, suggesting uneven institutionalization of academic contributions across Slovakia.

Finally, the role of civil society is the most uneven of the four helices. In regions such as Bratislava, Nitra, Žilina, Banská Bystrica, Prešov, and Košice SGRs, civil actors have been integrated into participatory structures and, in several cases, co-created strategic priorities, especially in areas of social inclusion, deinstitutionalization, and environmental policy. In contrast, Trnava and Trenčín SGRs show minimal or largely declarative engagement of civic organizations, which raises questions about governance culture, institutional support, and the mechanisms needed to strengthen genuine bottom-up participation.

Taken together, the Slovak experience confirms both the potential and the limitations of the QH model in regional development. While the academic and private sectors already provide substantial inputs and the public sector ensures strategic coherence, civil society remains the most fragile helix, with highly variable levels of influence. This imbalance points to the need for more systematic institutionalization of participatory mechanisms, stronger facilitation by regional authorities, and new incentives for business and academia to collaborate beyond their immediate interests. Addressing these asymmetries will be essential if the QH model is to fulfill its promise as a framework for inclusive, innovative, and sustainable regional development in Slovakia.

Importantly, the study contributes a novel analytical lens by applying the QH model directly to strategic development documents, thereby illustrating how regional policy frameworks embed - or fail to embed - collaborative governance principles. This offers policymakers concrete insights into where institutional capacities are strong, where participatory mechanisms remain underdeveloped, and how targeted interventions may enhance regional governance. Furthermore, the four-dimensional qualitative scale introduced in this study represents a methodological advancement that can assist both scholars and practitioners in systematically evaluating actor involvement, participation, document emphasis, and strategic impact across diverse regional contexts.

Future research could extend these findings by incorporating qualitative methods such as interviews or focus groups with key stakeholders to understand better the dynamics of collaboration and the barriers to participation within each helix. Comparative studies across regions in Central and Eastern Europe could reveal whether similar governance structures produce comparable patterns of QH interaction. Additionally, applying the methodological framework to longitudinal data would allow researchers to assess how

helix relationships evolve, particularly in response to new policy instruments, regional development initiatives, or shifting socio-economic conditions.

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Annex

Annex 1: The qualitative scale for the assessment of the documents:

5. Institutional Involvement

- **Essential / Steering / Executive (4):** The actor is directly named as the processor, procurer, manager, or main coordinator of the document. Participation is formally embedded in the structure of the creation process and is key to the document's development.
- **Formal Partnership / Expert (3):** The actor is explicitly listed as a socio-economic partner, external co-author, expert guarantor, or member of steering or working groups. While not the main processor, the role is formally recognized and institutionalized.
- **Indirect / Weak (2):** The actor is mentioned only in general terms (e.g., "private sector representatives"), without naming specific institutions. Involvement is not formalized.

- **None (1):** The actor or its representatives are not mentioned in the context of document creation.

6. Level of Participation

- **Direct and Intensive / Steering (4):** The actor actively and repeatedly participated in managing the process, including membership in management teams, coordination bodies (e.g., Partnership Council), and thematic working groups, directly shaping the content at multiple meetings.
- **Direct and Consultative (3):** The actor participated in public hearings, thematic working groups, or consultations, mainly providing feedback, comments, and expert input.
- **Passive / Low (2):** Involvement was limited to surveys, submission of project intentions, or the opportunity to comment on draft versions online. Interaction was one-way, without active discussion.
- **Minimal (1):** The actor contributed only statistical or formal data, without direct involvement in shaping content.

7. Document Emphasis

- **High and Constant (4):** The actor and its agenda are central to the document across analytical, strategic, and implementation parts. Separate chapters or priorities are dedicated to the actor, who is also identified as a key implementer.
- **Medium / Targeted (3):** The actor is highlighted in specific sections, typically in the analytical part (e.g., industry, third sector) and in strategies (e.g., innovation, social inclusion), but is not a dominant theme throughout.
- **Low / Marginal (2):** The actor appears only in some sub-sections or in relation to less-prioritized measures.
- **None (1):** The actor is absent from the document or appears only marginally.

8. Impact on Content

- **Fundamental (4):** The actor's inputs are directly reflected in the vision, strategic priorities, and integrated project packages. Its expertise shaped the overall direction of the region's strategy.
- **Significant (3):** Inputs led to the formulation of specific objectives, measures, or activities directly aligned with the actor's interests (e.g., dual education for companies, community services for NGOs).
- **Indirect / Partial (2):** The actor's agenda is visible in the strategy (e.g., problem analysis, proposed solutions), but direct inputs are not documented.
- **Minimal / None (1):** The actor's influence on the document is not apparent.

THE FUNDAMENTAL RIGHTS DEFENDED TO THE CONVENTION IN THE ECHR THE OBLIGATION TO NEUTRALITY AND FUNDAMENTAL FREEDOMS

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Abstract: *This study examines the transposition and interrelation of fundamental rights, such as the right to freedom of expression with particular focus on their impact on the exercise of priestly functions. These rights, guaranteed by the European Convention on Human Rights are especially significant in cases where religious service is performed out of personal conviction rather than under an employment contract, as exemplified in the jurisprudence, including the case of Tothpal and Szabo. The origin of the case lies in two applications submitted under Article 34 of the Convention, highlighting violations of fundamental rights stemming not only from interpretative tensions in national legal systems but also from conflicts between constitutional principles and doctrinal coherence. The research aims to identify how the Convention defines and safeguards essential rights, including freedom of religion, freedom of expression, equality, and the right to dignity, and to explore the way in which the European Court of Human Rights (ECtHR) interprets these rights through its jurisprudence. By analysing key judgments such as Kokkinakis v. Greece, Sahin v. Turkey, Lautsi v. Italy and Eweida and Others v. the United Kingdom, the study highlights that neutrality is not a discretionary political choice but a binding international legal requirement designed to ensure equal treatment of all individuals irrespective of their beliefs or identities. The article concludes that the obligation of neutrality derives from the universal and nondiscriminatory nature of the rights enshrined in the Convention and is essential for the functioning of a pluralistic democratic society. Failure to observe neutrality leads to inequality, indirect coercion, and erosion of democratic pluralism, whereas respect for neutrality guarantees the effective protection of human dignity and fundamental freedoms.*

Keywords: *right fundamental, legal doctrines, freedom of expression, religious service -*

JEL Code: *K1,K4,D78,Z00, Q18.*

UDC: *341.231.14+342.727*

Introduction

This study aims to clarify the legal status of the fundamental rights protected by the European Convention on Human Rights and to demonstrate why the state's obligation of neutrality constitutes an essential condition for their effective protection. The analysis begins from the premise that the rights enshrined in the Convention possess a universal and nondiscriminatory character, which requires states to comply both with negative

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obligations, refraining from unjustified interferences, and with positive obligations, ensuring the real and effective enjoyment of individual freedoms. The central objective of the research is to examine the manner in which the European Court of Human Rights has developed, through its case law, the substantive content of the state's duty of neutrality, particularly in sensitive areas such as freedom of religion, freedom of expression, ideological pluralism, and the equal treatment of citizens. By analysing relevant judgments, the study seeks to show that state neutrality is not a political choice but a legal requirement derived from the very architecture of the Convention, designed to prevent the imposition of dominant views and to safeguard the diversity of beliefs within a democratic society.

The author's main conclusion is that the obligation of neutrality should not be understood as a complete withdrawal of the state from the public sphere, but rather as a guarantee that the state will neither favour nor discriminate against any form of belief, whether religious or secular. This obligation ensures the conditions necessary for the genuine exercise of the freedoms protected by the Convention. Respecting neutrality strengthens pluralism, prevents subtle forms of pressure or symbolic coercion, and supports the democratic functioning of European societies. In this sense, the analysis demonstrates that the principle of state neutrality constitutes a fundamental component of the European public order in the field of human rights.

In order to better understand the case law in the case under review of the violation of Convention rights, we find it useful to provide a general analysis of some terms and describe them from the perspective of their influence on legislation. The Court's judgments and decisions resolve not only the cases brought before it, but also serve, in a broader sense, to clarify, protect and develop the rules of the Convention; thus, they contribute to the observance by States of the commitments they have undertaken as Contracting.

The right to religious freedom is a fundamental element of democratic society, protected both by national constitutions and international human rights law. However, within organized religion, particularly in states that recognize certain religious denominations, tensions often arise between individual conscience and institutional discipline. The recent case of a Lutheran pastor in Romania - who, along with members of his parish, established a new religious group and association - raises important questions regarding the scope and limits of religious freedom and the legitimate exercise of disciplinary authority by a religious denomination.

Article 17 was included in the Convention because it could not be excluded that a person or group of persons might seek to invoke the rights enshrined in the Convention in order to benefit from the right to engage in activities aimed at the destruction of those rights. In particular, it is not at all improbable that totalitarian movements, organised in the form of political parties, could abolish democracy after having prospered under democratic rule, such examples existing in modern European history.

In the present study, we have in mind the fact that the origin of the case is the unification of two applications Tothpal and another Szabo case that were brought before the Court under the Convention for the Protection of Human Rights and Fundamental

Freedoms, which specifically concern the issue that, by their criminal conviction for the illegal exercise of the profession of priest.

Literature Review

The scholarly literature addressing the obligation of state neutrality under the European Convention on Human Rights has developed significantly over the past decades, reflecting both the increasing complexity of pluralistic European societies and the evolving interpretative approach of the European Court of Human Rights (ECtHR). Early doctrinal analyses focused primarily on the structural principles of the Convention system, emphasizing the Court's role in safeguarding individual freedoms against excessive state interference. Scholars such as P. van Dijk and G.J.H. van Hoof highlighted the Convention's dual function of imposing negative obligations while progressively recognising positive duties, thus laying the groundwork for understanding neutrality as a legal requirement rather than a merely political expectation.

A substantial body of literature emerged following the Court's major religion-related judgments, most notably *Kokkinakis v. Greece* (1993) and *Lautsi v. Italy* (2011), which brought the principle of neutrality to the forefront of academic debate. Commentators analysing *Kokkinakis* argued that the Court initiated a shift toward a more comprehensive understanding of freedom of religion, acknowledging that genuine pluralism requires not only the absence of coercion but also the prevention of indirect or structural disadvantages imposed by state policies. Subsequent doctrinal assessments emphasized that neutrality must be interpreted in a dynamic manner, adjusted to the specific context of each case.

The literature surrounding *Lautsi* triggered one of the most intense scholarly debates, particularly regarding the margin of appreciation doctrine. Some authors criticised the Court for granting states excessive discretion in matters involving religious symbols in public institutions, warning that such deference risks undermining the uniform protection of Convention rights. Others welcomed the Court's prudence, contending that neutrality should not be equated with absolute secularism, and that national traditions may legitimately inform the interpretation of the Convention, provided that no coercion or discrimination results. This divergence reflects a broader theoretical dispute on whether neutrality is best conceived as strict secular impartiality or as inclusive pluralism, allowing a certain accommodation of majority cultural symbols.

The obligation of neutrality has also been examined in relation to freedom of expression, particularly through cases such as *Handyside v. the United Kingdom* (1976) and *İ.A. v. Turkey* (2005). Scholars have noted that the Court's jurisprudence demonstrates a consistent effort to prevent states from endorsing or imposing ideological, moral, or religious viewpoints, thus reinforcing a substantive model of neutrality. Theoretical analyses highlight that in matters of expression, neutrality functions primarily as a safeguard of ideological diversity, ensuring that democratic discourse remains open, even to ideas that challenge social or moral majorities.

More recent doctrinal contributions explore the obligation of neutrality in connection with equality and nondiscrimination, paying special attention to cases involving minority religions, gender equality, and education. Authors such as Eva Brems and Javier Martínez-Torrón argue that neutrality, in its contemporary interpretation, imposes increasingly robust positive duties upon states. These include the duty to protect vulnerable minorities from discriminatory practices and the duty to create conditions enabling individuals to freely manifest their beliefs without disproportionate burdens. The Court's decisions in cases such as *Eweida and Others v. the United Kingdom* (2013) have been widely analysed as consolidating the notion that neutrality must be operationalised in a balanced manner that respects both individual autonomy and the rights of others.

Finally, theoretical debates continue to question whether the ECtHR's approach provides sufficient clarity and predictability. Some theorists argue that the Court has adopted an inherently flexible, case-by-case approach that resists rigid conceptualisation, reflecting the diversity of European legal cultures. Others advocate for a more explicit doctrinal formulation of neutrality, which would strengthen the Court's consistency and enhance the legitimacy of its judgments.

Overall, the existing body of doctrinal, jurisprudential, and theoretical analyses reveals a progressive consolidation of the obligation of state neutrality as a cornerstone of the Convention system. The scholarly debate demonstrates that neutrality is not merely an abstract ideal but a practical legal standard that requires states to navigate the delicate balance between respecting majority traditions and protecting the rights of individuals and minorities within an increasingly pluralistic Europe.

Data and Methodology

This study employs a qualitative, doctrinal research design grounded in legal analysis and interpretative inquiry. The principal aim is to examine the evolution and application of the state's obligation of neutrality under the European Convention on Human Rights (ECHR) through a detailed scrutiny of relevant legal texts, case law, and scholarly commentary.

Data sources consist primarily of primary legal materials including the Convention itself, and the jurisprudence of the European Court of Human Rights (ECtHR). Key cases have been selected for in-depth analysis based on their direct relevance to the issue of state neutrality, their prominence in academic debates, and their illustrative value in highlighting doctrinal developments and practical challenges. Complementary secondary sources include academic articles, legal commentaries, and official reports which provide context and critical perspectives on the interpretation and implementation of neutrality.

The **analytical framework** integrates doctrinal legal analysis with elements of comparative law and legal theory. This approach facilitates a comprehensive understanding of both the letter and the spirit of the Convention's provisions, as well as their real-world

application. It also allows for critical engagement with the varying interpretations of neutrality across different jurisdictions and cultural contexts within the Council of Europe.

Regarding the **criteria for case selection**, priority was given to landmark rulings that articulate or refine the principles governing neutrality, especially those involving freedom of religion, freedom of expression, and non-discrimination. Cases were chosen to reflect a range of issues and geographic diversity to capture the complexity of the Court's approach. This purposive sampling ensures that the analysis remains focused while encompassing sufficient breadth to draw meaningful conclusions.

The study references the method of counterfactual analysis as a valuable tool for assessing the implications of judicial decisions and doctrinal positions. Counterfactual analysis involves considering hypothetical alternative outcomes - that is, asking a different legal reasoning or ruling had been adopted - to better understand the significance and consequences of the actual decisions. Although briefly mentioned, this method is not yet fully operationalized within the research. Future work could expand on this by systematically applying counterfactual scenarios to selected cases to explore how different interpretations of neutrality might have impacted the protection of fundamental rights and the development of legal norms.

Also the methodology of the present study had the following components: - choosing the topic to be studied, as the first stage of the scientific investigation, because it conditions the success of the research work more than any other stage of the research. In the present case, a topical topic was preferred, based on the theoretical contemporaneity and practical importance of studying the prevalence of fundamental rights protected by the convention; and the manifestation of theological faith in general. Scientific documentation, which constitutes a main component of the methodology for approaching the topic.

Due to the topicality of the topic, the use of informational connections and interconnections in ECHR cases with the same object was taken into consideration; sorting activity, including processing of approaches in other religions for an edifying approach regarding the essence of the research.

The Model and Findings

Critical Interpretation and Analytical Integration of the Case of Tóthpál and Szabó

The Tóthpál and Szabó case presents a significant jurisprudential moment in the evolving understanding of the state's obligation of neutrality under the European Convention on Human Rights. This case offers an opportunity to critically assess how the European Court of Human Rights balances competing rights and interests, particularly in the context of minority religious freedoms and state secularism.

At its core, the judgment illustrates the Court's nuanced approach to neutrality - not as a rigid separation of religion and state but as a principle ensuring that the state neither favors nor discriminates against particular beliefs. The ruling highlights the Court's endeavor to safeguard pluralism while recognizing the margin of appreciation afforded to

states in regulating religious expressions within their jurisdiction. However, a critical reading reveals potential tensions. While the Court seeks to protect individual freedoms, the latitude given to states risks permitting practices that may indirectly burden minority rights, thereby raising questions about the sufficiency of existing safeguards against subtle forms of discrimination.

From a broader analytical perspective, Tóthpál and Szabó underscores the challenges inherent in operationalizing neutrality in diverse social contexts. The case reinforces the notion that neutrality must be interpreted dynamically, sensitive to both the majority's cultural traditions and the minority's need for effective protection. It thus reflects the ongoing dialectic within the Court's case law between universalist human rights principles and respect for national identities.

Moreover, the decision exemplifies the limitations of the margin of appreciation doctrine as a tool for reconciling pluralism with uniform rights protection. While flexibility is necessary, excessive deference may undermine the Convention's role as a guarantor of fundamental freedoms. This case therefore calls for a more rigorous analytical framework that systematically evaluates the impact of state actions on minority groups, potentially integrating counterfactual reasoning to examine how alternative approaches to neutrality could better protect vulnerable rights holders.

In conclusion, the **Tóthpál and Szabó** case is emblematic of the complex interplay between state neutrality, religious freedom, and democratic pluralism in the European human rights landscape. It invites scholars and practitioners to critically reflect on how legal standards are applied in practice and challenges the Court to refine its doctrinal tools to ensure that neutrality serves as an effective safeguard rather than a source of indirect exclusion.

In the context of the new era of development, it must be recalled that the European legislation, given the very clear link between the Convention and democracy, no person should be authorised to avail himself of the provisions of the Convention in order to undermine or destroy the ideals and values of a democratic society. (*Refah Partisi and Others v. Turkey*, (2003))

The general purpose of Article 17 is therefore to prevent totalitarian or extremist groups from exploiting the principles enshrined in the Convention for their own benefit. (see *W.P. and Others v. Poland*, 2004; *Paksas v. Lithuania*, 2011).

The Court considered that no element of the contested statements required the application of art. 17 and found a violation of art. 10 as a result of the conviction of the applicants. Regarding the Tothpal case and another Szabo case that notified the Court, it is relevant to first list the related legislation such as labor law and constitutional law in order to better understand the effects that led to the case analyzed from multiple perspectives, especially to highlight the role of religion in society and the state of affairs in general with religion.

Thus, according to labor legislation Art. 10 of the Labor Code, the individual employment contract is the contract under which a natural person, called an employee,

undertakes to perform work for and under the authority of an employer, a natural or legal person, in exchange for a remuneration called salary.

In fact, in the given context of the case, the applicants belong to cults without having a connection and in most cases the applicants have a professional identity, being priests who for various reasons were fired from their parish, their employment contract as priests having been terminated following disciplinary proceedings.

The second identity of the connection between the case on the merits in the Court's analysis was the fact that in both cases the priests continued to serve separately and had explanatory reasons related in particular to the relationship with the parishioners who, although they knew that they had been expelled, followed them in faith, participating voluntarily and with their own conscience in the officiated services.

Specifically in the case of the first applicant, the Court reveals that he was the pastor of the Evangelical Lutheran community in a city, an occupation that he performed under an employment contract concluded with the representatives of the Lutheran parish on the basis of the decisions of its general assembly.

This article examines the legal and ecclesiological implications of the formation of a new religious group and association by a Lutheran pastor in Romania, in the context of legislative changes concerning religious freedom and the special regime of recognized cults. The dismissal of the pastor by the Evangelical Lutheran Church of Romania following the establishment of the group and the association "Church" raises important questions about the balance between individual religious freedom and the internal autonomy of recognized religious denominations. The analysis is framed within the Romanian legal framework and relevant European jurisprudence on freedom of religion under Article 9 of the Convention (ECHR).

However, the pastor is supported by the parish representatives, which is why he continues to celebrate services in the Lutheran church in the presence of some of the community members, even posting a notice on the church door with information about the services that were then organized by the religious group and also participating in religious ceremonies outside the church.

Although the new pastor requests on behalf of the parish the excommunication of the first plaintiff from the church and his eviction from the parish house, this request is rejected by the Jurisdictional Court on the grounds that the statutory body of the parish, namely its general assembly, ruled in favor of the dismissed priest and did not recognize the new pastor as a representative of the parish.

In the continuation of the conflict between the two, the new pastor exercises a remedy in criminal proceedings for the illegal exercise of the priest's office because he continued to lead religious services in the Lutheran Church in violation of the dismissal decision.

However, the criminal court reasoned that the members of the Lutheran community knew about the dismissal of the pastor and that a majority of this community had followed and supported him and considered that the actions of the first plaintiff did not constitute crimes, but the considerations note that the office of priest could only be exercised with the

consent of religious organizations, whether or not they have legal personality, and that, in this case, this consent being withdrawn, obliges the plaintiff to pay an administrative fine.

Following the challenge of the prosecutor's decision before the Court of Justice, the dismissed pastor argued that he did not act as a Lutheran pastor, but only as a Protestant pastor, a dignity that his theological studies and the doctrine of the Protestant cult would have conferred on him. The witnesses heard at the request of the first applicant confirmed that the members of the community were informed about the latter's excommunication from the Lutheran Church and that the person in question celebrated the Protestant Holy Mass at the church, in accordance with a ritual different from the Lutheran one.

In the end, this pastor is sentenced to pay a higher criminal fine, moreover, the motivation reveals that, after being dismissed, the first applicant continued to officiate as a pastor, celebrating religious services and participating in marriage, baptism and funeral ceremonies. The court, however, decides to dismiss the pastor's argument based on the public notoriety of the excommunication from the Lutheran Church, considering that he was responsible for the illegal exercise of the function of pastor, because the Lutheran community in the city did not contest the jurisdiction of the Lutheran Church in Romania and did not become autonomous from this religious organization.

In the appeal procedure at the higher court, it is also noted that the pastor performed rites specific to the Lutheran cult, although his dismissal constituted a legal impediment to continuing his activity as a pastor in the Lutheran parish in the city.

Another factual situation concerning the second applicant, the application concerns a decision of the Reformed Church of Romania which came into conflict with the latter due to the filing of the divorce petition. The Reformed Church fired him, dismissed him from the position of priest and prohibited him from leading the Reformed religious service, a new priest being appointed in Băița.

Like the first case, the new priest officiated the service in the village church. While supported by the majority of the believers of the Reformed cult, the dismissed priest organized religious meetings in the parish house, where he still lived temporarily, or in the homes of the believers. At their request, he celebrated marriages and baptisms and participated in funeral ceremonies. The second applicant argues that these events took place according to rituals other than those specific to the Reformed religion. He also stated that the believers in question sang and recited prayers and that he himself spoke to them without claiming the status of a Reformed priest.

Like the first case, criminal proceedings were initiated for the illegal exercise of the priest's office, in violation of the dismissal decision, but the criminal court dismissed the complaint against the priest because the Reformed community in the village was divided and that some of the believers had deliberately followed the second applicant and participated in religious meetings unrelated to the Reformed service.

In the preliminary chamber, the court overturned the prosecutor's decision and, considering the evidence available in the prosecutor's file sufficient to justify sending the second applicant to trial, retained the case for an examination on the merits. However, the

court ruled that these testimonies were not credible, on the grounds that the witnesses in question had no theological training. Relying on the statements of the witnesses proposed by the Reformed Church and on the documents provided by it, the court considered that it was precisely the celebration of the Reformed service that was at issue, an activity prohibited to the second applicant.

Finally, the court convicted the second applicant of unlawfully exercising the office of priest, on the grounds that the person concerned continued to provide the Reformed religious service and to celebrate marriages, funerals and baptisms. It concluded that the second applicant had acted contrary to Christian teaching and had thus created and maintained a source of discord in the Reformed community of Băița. The court sentenced the second applicant to a two-month prison sentence, considering that only detention could lead him to reflect on his conduct and to rectify himself through fasting and prayer for at least 40 days, after which he could benefit from conditional release.

On appeal, given the division of the Reformed community in the village, the deprivation of liberty of the second applicant was likely to aggravate the conflict and ordered the suspension of the prison sentence with a probationary period of two years and two months.

The exercise of the function of priest or any other function that involves the exercise of priestly duties without the express authorization or consent given by religious structures, with or without legal personality, shall be punished according to criminal law.

In accordance with this decision, the Court examines the applicants' submissions that, by their criminal conviction for the illegal exercise of the function of priest, their right to freedom of religion has been violated. The first applicant relies on Article 9 taken in conjunction with Articles 6, 13 and 14 of the Convention.

The subject matter of a case "submitted" to it in the exercise of the right to an individual application is delimited by the complaint formulated by the applicant.

A complaint comprises two elements: the factual allegations and the legal arguments. Under the principle of *jura novit curia*, the Court is not bound by the legal grounds relied on by the applicant under the Convention and the Protocols thereto and may decide what legal classification to give to the facts corresponding to a complaint by examining it in the context of Articles or provisions of the Convention other than those relied on by the applicant see Radomilja (2018).

The Court recalls that an application may be rejected as abusive if it is knowingly based on false facts Gross (2014). Incomplete and therefore misleading information may also be considered an abuse of the right to an individual remedy, in particular if it concerns the substance of the case and if the applicant fails to sufficiently explain why he or she has not provided the relevant information (Predescu 2008).

In support of the admissibility of the application, the first applicant states that he or she has a theological background and that a distinction must be made between the activity of a priest in the professional sense and that activity in the biblical sense. Relying on the judgment in Case no. 38.178/97, ECHR (1999), he considers that he acted as a spiritual leader of a group of persons who had voluntarily followed him and that he sees this as an

expression of pluralism. In his second application, the second applicant states that he intervened, at the request of a part of the community, to guide it, without, however, celebrating the Reformed rites and without obtaining any financial gain. In this regard, he argues that the criminal legislation did not specify the duties of a priest or the criteria for establishing them and was therefore not sufficiently clear. He submitted that the judges had no theological training and had not relied on objective criteria, relying on the case-law on the principles relating to religious pluralism developed by the Court in the *Agga v. Greece* (no. 2) judgment (no. 50.776/99 and 52.912/99, 17 October 2002).

The Court notes that the Government have indicated in their observations that in the present case their conviction was intended to protect the rights of others. The Court is prepared to accept that the interference, which was prescribed by law, pursued the legitimate aim of protecting the rights of the churches concerned and their members.

Turning to the present case, the Court notes that the acts in dispute which justified the applicants' conviction were of a religious nature: they were charged, in particular, with having performed religious services and with having taken part in marriage, baptism or funeral ceremonies.

In this respect, the persons concerned were not charged with having committed acts capable of producing legal effects so that the court relied on legal provisions of Greek law according to which marriages performed by clerical personnel were assimilated to civil marriages and muftis were competent to rule on certain civil disputes between Muslims.

The Court further notes that the applicants have consistently stated that they acted with the support of a section of the communities concerned, which the Government did not dispute in their observations before it.

Furthermore, the Court notes that, although the acts of which the applicants were accused took place on the basis of the division of the respective communities, it has not been established, either before the domestic courts or before the Court, that the division of those communities gave rise to tensions or confrontations requiring intervention by the State authorities.

The Court recalls that it has already stated that there is a risk of tensions arising when a community, religious or otherwise, divides, but that this is one of the inevitable consequences of pluralism.

With regard to labour law, it is essential to note that, according to the Labour Code, the individual employment contract is the main institution of labour law, it being a contract *intuitu personae*. The employment contract is *synallagmatic*, *onerous*, *commutative*, *intuitu personae*, with successive execution,

Moreover, the Constitution further affirms in Article 41 that the right to work shall not be limited. Individuals enjoy full freedom in selecting their profession, trade, or occupation, as well as in determining their place of employment.

This right to work should not be viewed in isolation but is associated with the regulation of the special law that characterizes the type of this occupation, in the case of the study being primarily the profession of priest.

All the more, the essence of the right to work, also reaffirmed in the fundamental law, is reflected in Article 15 on freedom to choose an occupation and the right to work, which states that every person has the right to work and to engage in an occupation freely chosen or accepted.

However, in this case, the priest no longer had the right to exercise his right as a priest within the church, as his employment contract was terminated in the framework of internal and legal procedures. On the other hand, the court decision, having its own enforceable force, must be implemented, without investigating its validity or legality, if its illegality has not been established according to the procedures provided for by law, as a result, the termination of an employment contract to the extent that the court has maintained that contract as legal does not interfere with the profession practiced by a priest.

Another relevant example is found in the instrument of the tax authority requesting the fiscal registration of a natural person who obtains income from independent activities, if the legality conditions provided for by the special law regarding the exercise of the activity are not met.

The solution regarding tax registration must be understood in light of several relevant legal provisions. First, Article 14 of the Fiscal Procedure Code, republished and subsequently amended, establishes that income obtained by an individual is subject to tax law even when it derives from activities that do not meet the requirements of other legal norms. In addition, the Fiscal Procedure Code stipulates that any person or entity that enters into a fiscal legal relationship is required to register for tax purposes and is assigned a fiscal identification code. Consequently, taxpayers who obtain income from independent activities for which advance payments are withheld at source by the income payers are nevertheless obliged to submit a tax registration declaration to the competent fiscal authority in order to complete their registration.

It follows that the competent tax authority may carry out the tax registration of these categories of taxpayers according to the provisions of the Fiscal Procedure Code, republished, with subsequent amendments and completions, based on the contracts attached by them, with the clarification that the fulfillment of the tax registration obligation does not replace the fulfillment of the obligation to exercise the activity under the conditions provided by the law relating to the activity in question.

Moreover, the responsibility for compliance with the legal provisions on authorization lies with the persons carrying out the respective activities.

Consequently, tax registration is necessary for the tax authority to record those who carry out acts and operations that fall under the tax law, and not a condition for the legalization of activities, this remaining, as mentioned above, a responsibility of those who carry them out.

With respect to the legislation governing religious denominations, the year 2024 records a total of 19 religious cults officially recognized in Romania, in accordance with the provisions of Law No. 489/2006 on religious freedom. Statistical data also indicate the existence of 27,384 places of worship belonging to the 18 denominations active in

Romania as of 31 December 2015. Under this legal framework, religious denominations operate autonomously from the state, while at the same time benefiting from its support, consistent with Article 29 of the Romanian Constitution, which guarantees freedom of conscience and the autonomy of religious groups.

The legislative regulations applicable to religious denominations reflect an institutional responsibility to safeguard religious identity within society. As an important protection measure, the law provides that the religion of a child who has reached the age of 14 may not be changed without the child's explicit consent. Moreover, in line with the broader legislation on children's rights, certain restrictions are imposed to prevent any infringement of a minor's religious freedom. Beginning at the age of 16, every individual holds the unrestricted right to determine his or her own religious affiliation.

The legal framework strictly prohibits discrimination on religious grounds in all spheres of public and private life, mirroring the constitutional principle embodied in Article 16 on equality before the law, which states that citizens enjoy equal rights and are not subject to privileges or discrimination. Complementing this, the law also forbids religious defamation, the incitement of conflicts based on religious differences, and any public denigration of religious symbols, with corresponding sanctions established by statute. These provisions align with Article 21 on non-discrimination, which prohibits differential treatment based on a wide range of grounds, including sex, race, colour, ethnic or social origin, genetic characteristics, language, religion, convictions, political or other opinion, membership of a national minority, property, birth, disability, age, or sexual orientation. Additionally, within the scope of the Treaties of the European Union and subject to their specific provisions, discrimination based on nationality is likewise prohibited.

The formulation of Article 21 draws inspiration from Article 13 of the former EC Treaty - now replaced by Article 19 of the Treaty on the Functioning of the European Union - as well as from Article 14 of the European Convention on Human Rights and Article 11 of the Convention on Human Rights and Biomedicine concerning genetic inheritance. To the extent that its content overlaps with Article 14 of the ECHR, its application is to be interpreted in conformity with the latter.

For those reasons, the Court declares the complaint under Article 9 of the Convention admissible. To that end, the Member States must repeal the national rule incompatible with EU law and, until then, render the provision in question inapplicable. That obligation is imposed on all national authorities, including local or regional authorities, and on national judges.

Religion remains a significant element of Romanian identity and cultural heritage. The Romanian Orthodox Church, which represents around 85% of the population, plays a dominant role in spiritual and social life, as shown in Table.2. Other denominations contribute to Romania's religious pluralism and promote interfaith dialogue, tolerance, and cultural diversity.

According to the 2022/2023 census data: – Roughly **85.3%** of respondents who declared a religion identified as Eastern Orthodox. Other denominations: ~4.5% Roman Catholic, ~3.0% Reformed, ~2.5% Pentecostal

There is a sizeable portion who did *not declare* a religion: for example ~15% of respondents in the 2021 census did not declare religious affiliation

Table 1. The evolution of religious cults

Indicator	Current (≈2022-25)	Plausible mid-century (≈2050) scenario
Share of Eastern Orthodox	~85% (of those declaring)	Perhaps slightly lower (e.g., in the 75-85 % range) due to non-declared and secularisation effects
Declared affiliation (any religion)	High (>80 %) but non-declaration growing (~15%)	Might drop (e.g., 70-80%) as more people opt out or identify as non-religious
Weekly church attendance	~23% report once a week in 2025 survey	Could fall to lower levels (e.g., <20%) as practice declines
Importance of religion in life	Still high (majority say religion important)	Could reduce gradually, especially among younger cohorts

Source: INSCOP Research 2021

As shown in Table 1 , a recent survey (June 2025) by INSCOP Research found that 99,8% people have religious affiliation, 85% of Romanians consider themselves religious. Church-attendance: the same survey found ~7.6% go to church several times a week; ~23% once a week; ~17.1% at least once a month; ~25.4% only on major holidays; ~6.8% never. Indicator of secularisation: some research indicates trust in the church and church-attendance are gradually declining. Even if affiliation remains high, levels of weekly attendance, membership and active participation are likely to decline (as with many European countries).

Taking into account the role and purpose of knowledge of international jurisprudence consistently in clarifying legislation in support of citizens, and in accordance with the Treaties and Conventions, every natural or legal person has the right to the peaceful enjoyment of his possessions. No one may be deprived of his property except for reasons of public utility and under the conditions provided for by law and by the general principles of international law. with reference to art. 6 § 1 Fair trial, the research aims to clarify complex cases and form regulatory intentions in the light of the principles of the ECHR in relation to the legal text in force, to ensure a correct application of the law.

Furthermore, it is important to highlight the regulation in the Fundamental Law which, through Article 20, legislates that the constitutional provisions regarding the rights and freedoms of citizens will be interpreted and applied in accordance with the Universal Declaration of Human Rights, with the pacts and other treaties to which Romania is a part.

At the same time, whenever there is a conflict between the international agreements and treaties on fundamental human rights ratified by Romania and the country's domestic legislation, international norms prevail, unless the Constitution or national laws offer greater protections, as indicated in Table 2. Therefore, the case law in this matter represents a legitimate and authoritative source of legal interpretation.

Table 2. Models of cults recognized under the law

	Name of cults
1.	Romanian Orthodox Church
2.	Serbian Orthodox Diocese of Timișoara
3.	Roman Catholic Church
4.	Romanian Church United with Rome, Greek Catholic
5.	Archdiocese of the Armenian Church
6.	Old Rite Orthodox Church of Romania
7.	Reformed Church in Romania
8.	Evangelical Church C.A. of Romania
9.	Evangelical Lutheran Church in Romania
10.	Hungarian Unitarian Church
11.	Baptist Christian Cult - Union of Baptist Christian Churches in Romania
12.	The Christian Church According to the Gospel in Romania
13.	Romanian Evangelical Church
14.	Pentecostal Christian Worship – Apostolic Church of God in Romania
15.	Seventh-day Adventist Church in Romania
16.	Federation of Jewish Communities in Romania - Mosaic Cult
17.	Muslim Cult
18.	Ather Religious Organization
19.	Assemblies of God in Romania

Source: Eurostat data owner recherche <http://www.worldbank.org>

As shown in Table 2 the recognition of religious denominations in Romania reflects the country's commitment to religious freedom, diversity, and democratic values. Through cooperation between the state and the various religious communities, Romania maintains a model of coexistence based on respect, tolerance, and cultural continuity.

This indicator measures a State's formal acceptance of international human rights norms and its declared intention or commitment to implement these rights in line with the applicable legal frameworks (structural indicator). However, it does not capture the extent of actual implementation (process indicator) nor the results achieved (outcome indicator).

Signing a treaty by a State does not constitute formal consent to be legally bound. Instead, the signature functions as a form of authentication and signals the State's willingness to proceed with the treaty process. It authorizes the State to advance to ratification, acceptance, or approval stages, and it creates an obligation to act in good faith by refraining from any actions that would frustrate the treaty's purpose and objectives, in accordance with the Vienna Convention on the Law of Treaties (1969).

Measures should be adopted to bridge existing gaps with other countries, especially those in the northwestern part of the European Union. Research by Galluzzo (2018) revealed a clear correlation between Single Area Payment Schemes and patterns of crop specialization. Romania continues to have a high nominal share of religious affiliation (especially Eastern Orthodox) and high levels of self-reported religiosity.

However, there are clear signs of gradual secularisation (lower practice, increasing non-declaration, younger generations less religious). Based on current trends, we can expect that by 2050 the dominance of the Orthodox Church will still likely hold, but its share of active participants and declared affiliation may decline somewhat. Smaller denominations and the category may grow in relative terms. For policy, research or rights-analysis contexts

(e.g., the relationship between Church and State, religious education, minority religions, secularism), key variables to monitor include non-declaration rates, generational shifts, urban vs rural practice, and immigration-driven changes in minority religions.

Conclusions

Considering all the aforementioned points, the Court concludes that state actions that endorse a particular leader of a fragmented religious community or attempt to impose a unified leadership on that community against its will amount to a breach of the right to freedom of religion.

The case provides a significant contribution to understanding the practical application and limits of the state's obligation of neutrality under the European Convention on Human Rights. In this case, the applicants challenged measures taken by public authorities that they argued constituted an infringement on their freedom of religion and belief, core rights protected by Article 9 of the Convention.

Critically examining the Court's reasoning reveals nuanced tensions inherent in balancing individual religious freedoms with the state's duty to remain neutral and impartial. The judgment underscores the complexity of defining neutrality not as mere abstention but as an active duty to prevent state endorsement or discrimination of particular beliefs. However, the Court's allowance of a margin of appreciation for the state highlights the delicate trade-off between respecting national contexts and maintaining uniform protection of Convention rights.

From a broader analytical perspective, *Tóthpál and Szabó* exemplifies the Court's pragmatic approach in operationalizing neutrality within diverse cultural and legal environments. It illustrates that neutrality must be interpreted flexibly but consistently, ensuring that state actions do not indirectly privilege or disadvantage any religious group. Moreover, the case contributes to the evolving jurisprudence on how states can accommodate religious practices without breaching the principle of secular equality.

The implications of this ruling extend beyond the immediate facts, touching upon broader debates regarding pluralism, the limits of state intervention in religious matters, and the protection of minority rights within democratic societies. It calls for continuous vigilance to ensure that neutrality does not become a pretext for indifference or covert discrimination, but rather functions as a dynamic principle fostering inclusivity and respect for diversity.

In integrating these findings into the wider theoretical framework, *Tóthpál and Szabó* reinforces the view that state neutrality under the ECHR is a complex, multifaceted obligation. It requires balancing competing interests and rights while upholding the overarching goal of protecting human dignity and pluralism. This case thus serves as a critical reference point for future legal analyses and policy-making concerning the role of the state in religious and ideological matters.

The ECHR has also emphasised that in a democratic society there is no need for the state to adopt measures to ensure that the respective religious communities remain or are placed under a single leadership (see Hassan 2009).

However, it must be noted that, in the present case, by convicting the applicants for their religious activities, the Romanian authorities de facto placed part of the religious communities in cities A and B under the aegis of the Lutheran and Reformed churches, excluding the possibility, for believers who so wished, of following the rites officiated by the applicants.

The ECtHR has emphasized, however, that religious freedom must be understood in conjunction with the autonomy of religious organizations (see Fernández Martínez v. Spain, 2014).

Exceptionally, we note how the court analyses the entire dimension of the State's role in society from a different angle and not the other way around. On these grounds, the Court particularly emphasised the State's role as a neutral and impartial organiser of the exercise of various religions, cults and beliefs and stated that this role favours public order, religious harmony and tolerance in a democratic society.

The Romanian legal system, in harmony with European standards, provides a balanced framework in which such tensions are addressed. Ultimately, the right of an individual to form a new religious entity does not negate the right of a denomination to maintain discipline and doctrinal integrity.

This case underscores the importance of mutual respect between personal conscience and institutional authority, a principle foundational to both ecclesial life and constitutional democracy.

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THE CIRCULAR ECONOMY AS A STRATEGIC DRIVER FOR SUSTAINABLE COMPETITIVE ADVANTAGE IN HOSPITALITY AND FOOD SERVICE

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Abstract: *The relevance of sustainability across all sectors of life is a defining feature of the 21st century, particularly in tourism, where environmental pressures and socio-economic challenges demand urgent transformation. In this context, the hospitality and restaurant industries must undergo a strategic transition toward sustainable management practices. The purpose of this study is to substantiate the necessity of implementing modern managerial approaches grounded in ecological responsibility and circular economy principles. The object of the research is the process of transitioning to sustainable hospitality and restaurant management, while the subject comprises the specific techniques and models that facilitate this transition. The central thesis posits that the successful adoption of sustainability-oriented practices in hotel and restaurant enterprises is a key driver of long-term economic viability, environmental stewardship, and socially responsible tourism development. The methodology is qualitative and conceptually descriptive, employing general scientific methods such as analysis, synthesis, comparison, and analogy. It is further enriched by an AI-assisted systematic review of academic literature and official documents from institutions such as the EU and UN Tourism, enabling the classification of transition techniques and formulation of actionable management recommendations. This process includes the analysis of leading industry benchmarks and official Best Environmental Management Practices (BEMPs), which serve as applied examples for defining operational optimization. The scientific novelty of the study lies in its integrative approach, combining macroeconomic frameworks (e.g., ESG and Triple Bottom Line) with micro-operational strategies (e.g., circular economy principles and Fourth Industrial Revolution technologies). This dual-level integration redefines sustainability not merely as a moral imperative but as a strategic economic model that enhances competitiveness, operational efficiency, and investment attractiveness. The main conclusion is that sustainable development should be embraced as a core mission of the tourism business. Enterprises that align their operations with sustainability principles demonstrate measurable success, validating the strategic and economic value of responsible hospitality and restaurant management.*

Keywords: *sustainability, hospitality management, restaurant management, circular economy, waste management*

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Introduction

The issue of sustainability is widely discussed these days not only in scientific circles but also among the general public. Undoubtedly, this is one of the most significant problems facing our entire society, regardless of which area of public life it is. The implementation of sustainable practices in individual spheres of the economy limits the

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adverse human impact on the environment and also contributes to economic stability and social justice in society. From the point of view of the tourism sector, sustainability in its three leading manifestations (environmental, economic and social) should find a more significant place in the management of hotel and restaurant enterprises. A significant number of scientific publications are devoted to the problems facing the sustainable development of the hospitality industry. The interest in them is not only scientific but also practical. One of the largest platforms for booking accommodation and other tourist services, Booking.com, has been conducting a survey among more than 30,000 of its users for nearly 10 years about their attitudes towards sustainable travel. According to their data for 2024, 75% of respondents want their travels to be more sustainable, while 28% admit that traveling more sustainably is important to them, but is not their main consideration when planning or booking a trip (Booking.com, 2024).

Today, more and more hotels and restaurants are trying to respond to public preferences for sustainable experiences during vacations or travel, which are likely to persist and even intensify in the coming years as Generation Z members age. For this reason, more and more companies in this sector are implementing technologies and approaches that would contribute to a balance between their economic development, social justice and environmental protection.

The purpose of the study is to substantiate the necessity of implementing modern managerial approaches grounded in ecological responsibility and circular economy principles. The selected object includes the process of transitioning to sustainable hospitality and restaurant (HORECA) management. The subject of the study consists of the specific techniques and models that facilitate this transition. The leading thesis states that the successful transition of hotel and restaurant enterprises towards sustainability is a crucial driver for the long-term viability and responsible development of the tourism sector. The working hypotheses adopted by the authors are the following:

- **H1:** The long-term economic viability and investment attractiveness of hotel and restaurant enterprises are contingent upon the integrated adoption of macro-level sustainability frameworks (Environmental, Social and Governance (ESG), and Triple Bottom Line (TBL)) and micro-operational principles of the circular economy (CE).
- **H2:** The official strategic communication and public representation of sustainable practices in the HORECA sector clearly position Fourth Industrial Revolution (4IR) technologies and Artificial Intelligence (AI) as strategic enablers for the implementation of CE principles.
- **H3:** Existing academic literature and official documents (e.g., BEMPs, European Union (EU)/United Nations (UN) Reports) demonstrate a strong conceptual consensus regarding the role of AI-assisted operational tools in fundamentally facilitating and optimizing key CE processes, specifically waste reduction and resource management.

The methodology is qualitative and conceptually descriptive, employing general scientific methods such as analysis, synthesis, comparison, and analogy. It is further enriched by an AI-assisted systematic review of academic literature and official documents, which enables the systematic classification of transition techniques. The main conclusion of the study is that the tourism business today, and in particular the hotel and restaurant industry, should adopt sustainable development as its mission and align as much of its activities with it as possible. The authors conclude that there are a significant number of hotels and restaurants that are developing successfully today, thanks in part to the fact that their management has adopted a sustainable approach to work.

Literature Review

Human development and the rise in people's living standards over the centuries have inevitably led to negative environmental consequences. The growth of the world's population from just under 2 billion people in 1923 to over 8 billion people today has had a significant impact on the environment (United Nations, 2023). Advancements in technology and digitalization increase the demand for a wider variety of resources to support the production of both common and specialized items used by people.

Under these circumstances, in order to protect the environment and ensure normal living conditions for future generations, it is necessary to take measures on a global scale. A fundamental concept in modern science is the idea of “sustainability”. Sustainability is a social goal for the long-term coexistence of people on Earth. The specific definitions of this term are controversial and vary depending on the literature, context and time (Ramsey, 2015). Experts often describe sustainability as a structure based on three pillars: economy, environment and social sphere, with much of the research in recent years emphasizing the environmental dimension (Purvis, Mao, & Robinson, 2019).

In common usage, sustainability typically addresses major environmental issues such as climate change, biodiversity loss, land degradation, and air and water pollution. Another closely related idea is “sustainable development”, and in global practice, these terms are often used interchangeably. Environmental protection specialists from UNESCO distinguish between the two concepts as follows: “Sustainability is often seen as a long-term goal, while sustainable development refers to the processes and methods used to achieve that goal” (UNESCO, 2023).

In 2015, the United Nations (UN) General Assembly created the Sustainable Development Goals (SDGs), which are part of the 2030 Agenda, the main idea of which is to strengthen the interconnection between the environmental, social and economic aspects of sustainable development (UN Department of Economic and Social Affairs, 2016). Figure 1 displays the abbreviated names of the 17 SDGs.

The 17 main goals are divided into a total of 169 specific targets, some of which have a direct link to waste management: target 11.6 aims to reduce the adverse environmental impact of cities per capita, including by paying special attention to air

quality and issues related to the management of municipal and other waste; targets aimed at the environmentally sound management of all waste through prevention, reduction, recycling and reuse (targets 12.4 and 12.5) and the reduction of food waste (target 12.3).



Figure 1. Sustainable Development Goals

Source: United Nations (United Nations, 2023), https://www.un.org/sustainabledevelopment/wp-content/uploads/2023/09/E_SDG_Guidelines_Sep20238.pdf

Waste management is not a new concept, but with the improvement of technologies for processing and utilizing waste streams, the possibilities for their utilization as an alternative source of raw materials and energy and the reduction of quantities destined for landfills are increasing. Within the EU, this issue is increasingly being put on the agenda.

Perhaps the most significant step towards implementing a modern and workable waste management system at the national and European level is the development of a New Waste Management Framework. By highlighting the importance of proper waste management and recovery and recycling methods, it is possible to reduce the impact on resources and improve their use (The European Parliament and the Council of the European Union, 2008).

The New Waste Framework establishes the so-called “waste hierarchy”, which has two main objectives: 1) to minimize the negative impact of waste generation in the EU, and 2) to improve resource efficiency. Graphically, the hierarchy is represented as an inverted pyramid with the most preferred options at the top and disposal at the bottom as the last waste management option (Figure 2). Based on this hierarchy, the most preferred option is waste prevention, which includes measures taken before a substance, material, or product becomes waste.

The European Union (EU) 8th Environment Action Programme (EAP) (European Commission, 2022), which is still relevant today, sets the goal of achieving “a climate-neutral, resource-efficient and regenerative economy, which gives back to the planet more

than it takes” (European Union, 2023). To achieve this goal, improving coordination between sectoral policies is recognized as crucial. Furthermore, environmental and climate considerations must underpin the majority of future policy-making efforts in Europe. In line with the European Green Deal, a New Circular Economy Action Plan was adopted in March 2020, serving as a tool for achieving sustainable development in Europe (Duquennoi & Martinez, 2022).



Figure 2. Waste hierarchy according to Directive 2008/98/EC

Source: (European Commission, 2023), https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en

Over the past fifty years, the EU has enacted policies focused on environmental protection and improving the well-being of its member states' populations (Shopov, 2023). These policies leverage tools related to sustainable development and the circular economy. They address the challenges of modern waste management, providing both the public and businesses with opportunities to live and work in a cleaner, more eco-friendly environment.

Current discussions and negotiations are evaluating the implementation of programs to advance a circular economy, the European Green Deal, and the UN Sustainable Development Agenda. These efforts aim to propel Europe towards a low-carbon economy and achieve climate neutrality by 2050. At the same time, some slow progress has been made in developing effective waste management strategies and measures for their proper treatment and disposal (Zorpas, 2020).

The European Union is leading the global effort to achieve economic, environmental and social sustainable development, in particular in the fight against climate change. On December 11, 2019, the European Commission presented the European Green Deal, which serves as a comprehensive plan to transition the EU economy towards

sustainability, turning environmental and climate challenges into opportunities across all policy areas, while ensuring fairness and inclusion for all.

If one analyses the essential similarities between sustainable development and the circular economy, it can be concluded that both principles emphasize intra- and intergenerational responsibilities motivated by environmental risks. They also underscore the importance of fostering dialogue and public discussion on various development pathways.

Business development depends on the integration of sustainable practices into business activities. Enterprises should focus on innovation, environmental responsibility, and social equity to achieve long-term success (Parashkevova, Ivanov, & Stoyanova, 2024). The managers of the business organizations should realize that commitment to the global sustainable development goals is indispensable and key to increasing competitiveness and the successful implementation of strategic goals (Chipriyanov & Lazarova-Krysteva, 2020). By adopting sustainable strategies, companies can enhance their competitiveness, meet regulatory requirements, and contribute positively to the community and environment. This approach not only ensures compliance with global sustainability standards but also fosters a resilient and adaptable business model that can thrive in a rapidly changing market.

The concept of sustainable development has its widespread application in tourism. Sustainable tourism is a term that focuses on limiting negative impacts on the environment, society and economy while providing positive economic and social benefits for local communities and the tourism industry (Pandzherova, 2024). The guiding principle is to achieve a balance between the needs of tourists, the environment and the local population.

The World Tourism Organization defines sustainable tourism as “tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities” (UNWTO, 2018). Its three dimensions generally represent:

- Environmental sustainability: Reducing negative impacts on nature through sustainable practices and conserving natural resources;
- Social sustainability: Supporting the cultural heritage and traditions of local communities, as well as ensuring fair working conditions;
- Economic Sustainability: Promoting economic benefits for local communities and sustainable development of the tourism industry.

Sustainable tourism seeks to take into account all impacts of tourism, both positive and negative, to minimize the negative and maximize the positive (Global Sustainable Tourism Council, 2022). Negative impacts include economic drain, environmental damage and overcrowding. Positive impacts include job creation, cultural heritage conservation, wildlife conservation and landscape restoration. In this regard, risk management in a tourism context (Ivanova, 2024a; Ivanova, 2024b) refers to the planning and implementation of processes aimed at preventing and reducing risk and managing the adverse consequences of crises, disasters and catastrophes.

The increased scientific interest in the concept of sustainable tourism is considered “one of the great success stories of tourism research and knowledge transfer” (Hall, 2011). There has been a significant evolution in research on sustainable tourism development. A significant part of this research focuses on sustainable tourism policies, including in the context of crises. The main objective of most public policy analyses is to support managers in making strategic decisions (Ivanova, 2024c). In this context, sustainable tourism indicators function as measurement tools that are widely used in planning and decision-making processes. The data collected through these indicators can serve as an objective analysis of the opportunities and threats faced by tourism enterprises, such as hotels and restaurants.

Building on the importance of strategic planning and indicators, it becomes evident that the successful implementation of sustainable practices also relies heavily on the people behind them. The shift toward sustainable and circular practices in hospitality depends not only on technology and resources, but critically on the quality of human capital. In the “new economy,” knowledge is a key driver of added value and long-term viability. Hotels and restaurants must base their innovations on the generation and application of knowledge. Implementing advanced sustainability tools requires staff with specialized skills. Turning data into actionable decisions demands understanding and practical application – making investment in training essential. As Viorelia Lungu (Knowledge-based society - a condition to ensure sustainable development, 2019, p. 96) states: “The success in the new economy depends on a knowledge-based society which imposes a new inter-relational system, different from the current, built on openness, flexibility, permanent education and specialized entrepreneurial motivation”. In conclusion, sustainable transformation in hospitality and food service is inseparable from the transformation of human capital – without investments in knowledge and skills for applying sustainable practices, even the best technologies and strategies are destined to fail. While human capital is essential for operational sustainability, long-term viability also depends on how organizations strategically position themselves in an increasingly dynamic and digital business environment.

The central thesis of this study postulates that the transition to sustainable management is a “critical driver for the long-term viability” of hospitality and food service enterprises. Strategically, this has traditionally been associated with achieving Sustainable Competitive Advantage (SCA), a position that is difficult for competitors to imitate and ensures long-term success. However, modern strategic theories, especially in the context of the Fourth Industrial Revolution (4IR) and accelerated digitalization, question the possibility of achieving true, lasting SCA. In a hyper-competitive business environment, every advantage is transient, as innovations are quickly replicated and markets are highly transparent. Therefore, sustainability (in its environmental and social dimensions) should not be viewed as a final destination for achieving an inimitable advantage, but rather as a core mechanism for continuous adaptation. The shift toward a circular economy, resource optimization, and waste management in hospitality and food service is a constant source of new, albeit short-lived, advantages. These practices make the organization more flexible, adaptive, and capable of rapidly transitioning from one advantage to the next. As Vera

Kriel and Geoff A. Goldman emphasize, instead of seeking sustainable competitive advantage, organizations should focus on agility, complexity management and the ability to generate new advantages in a series of short cycles (Is Sustainable Competitive Advantage Antediluvian?, 2024, p. 73). Thus, efforts toward sustainable management ensure long-term viability not by creating a permanent monopoly, but by building the organizational agility necessary to survive in an ever-changing economic environment.

Sustainable tourism should provide a high level of satisfaction to tourists and ensure memorable experiences while raising their awareness of sustainability issues and promoting the implementation of sustainable tourism practices. Achieving this is a continuous process, based on constant monitoring of impacts, resulting in the introduction of corrective or preventive measures where necessary (Ilieva, et al., 2024). The tourism industry recognizes the importance of adopting sustainable practices to adapt to both current and future environmental conditions. This requires economically viable investments in technological innovations that result in energy, natural resource, and human resource savings (Ilieva & Todorova, Role of technological innovation for sustainable management of tourism organizations, 2023). Implementing these principles in the hospitality and restaurant industry is key to balancing economic development, social well-being and environmental protection, requiring commitment and cooperation at all levels.

Recent research on sustainability and its relationship to business has increasingly emphasized the “Triple Bottom Line” (TBL) concept. This is a business concept that encourages companies to measure their social and environmental impact alongside their financial performance (Nica, Chiriță, & Georgescu, 2025). It is based on the “three Ps”: profit, people and the planet. Companies that implement sustainable practices can achieve positive social and environmental impacts while making a profit. A crucial aspect of applying the TBL concept (Stoddard, Pollard, & Evans, 2012) is that corporate performance should benefit not only shareholders but also all stakeholders, including groups like the local community where business activities take place. For this reason, the concept is particularly applicable to sustainable hotel and restaurant management.

The principle of the TBL finds its modern financial projection in the ESG factors (Environmental, Social and Governance). These factors have become a key tool for assessing corporate sustainability and risk by investors and financial institutions. The three groups of factors have the following significance:

- Environmental: Directly encompasses issues such as waste management, energy efficiency and CE – topics central to the transition in hospitality and food service sectors.
- Social: Includes aspects such as labor practices, employee health and safety, and relations with local communities, corresponding to the “People” dimension in TBL.
- Governance: Refers to the effectiveness of management structures, transparency and corporate accountability.

The importance of integrating these factors is evidenced by financial resilience. During major market disruptions, such as the COVID-19 pandemic, ESG-oriented investments demonstrated financial durability, often achieving higher returns and lower volatility compared to traditional investments. This reinforces the core thesis that a sustainable management approach is not merely a matter of corporate responsibility but a key factor for long-term viability and financial stability in hospitality and food service enterprises.

In this context, the efforts of managers in the tourism sector to implement optimization technologies and CE practices (from reducing environmental footprint to improving working conditions) directly lead to higher ESG ratings.

As Serghei Petighin (*Shifting Focus: The Role of Environmental, Social, and Governance Factors in Investment Policy During a Pandemic, 2024, p. 86*) notes, “companies with strong social performance... were better prepared to manage the health and safety of their employees and customers and to maintain operational continuity during the pandemic”. Therefore, the transition to sustainable management in hospitality and food service is not only an ecological and social necessity but also a strategic imperative for attracting capital and ensuring long-term success in the modern global economy.

Successfully transitioning to sustainable management and applying circular economy principles in the HORECA (Hotel/Restaurant/Café) sector requires a shift in managerial thinking and the adoption of advanced technologies and processes. While internal motivation is essential, many small and medium-sized enterprises (SMEs) need external expertise to navigate this transformation. Management consulting plays a pivotal role as a catalyst for change. Consultants act as agents of transformation by introducing specialized knowledge, improving operational efficiency, and guiding strategic sustainability planning. Their support helps businesses reduce environmental impact, optimize resource use, and align with ESG standards. Far from being a cost, consulting services represent a strategic investment that bridges knowledge gaps and accelerates innovation. They provide the tools to turn sustainability concepts into standardized, effective operations. As Mariana Radov notes, through the exchange of experience and transfer of best practices, consultants provide clients with new managerial knowledge and tools that enable them to improve process efficiency and define optimal development strategies (Radov, 2022, p. 31). Ultimately, the success of sustainability efforts in hospitality depends on the synergy between internal leadership and external expertise.

The transition to sustainable management is not solely a matter of environmental or social responsibility – it is a strategic imperative for strengthening market positioning and ensuring long-term financial viability. In the HORECA sector, this imperative is closely tied to the ability to effectively serve high-value segments such as business tourism. Empirical research (Mabeba & Xu, 2023) in tourism economics consistently shows that business travel contributes more significantly to the sector’s economic performance than leisure travel. As a result, businesses that successfully attract and retain this segment tend to demonstrate greater financial stability. Achieving high sustainability standards – through circular economy practices, optimization of energy and water resources, and the

implementation of corporate social responsibility initiatives – directly influences brand perception and alignment with the expectations of corporate clients. Sustainable management not only enhances operational efficiency but also improves service quality and investment appeal, particularly in terms of ESG performance, which is crucial for attracting international business clients and corporate event organizers. Therefore, sustainability investments should be viewed as strategic tools for creating a reliable and competitive environment, positioning hotels and restaurants as preferred partners in serving economically valuable market segments.

A deeper exploration of sustainability in tourism requires a clarification of the essence of sustainable hospitality. It involves utilizing resources for economic activities in a manner that satisfies present demands while ensuring their availability for future use (Pavlov, 2020). Its main manifestations include the use of energy-saving technologies (including renewable energy sources), reducing water consumption and reducing waste generation.

Sustainability in the restaurant industry is less well-studied in the scientific literature than sustainability in the hospitality industry or tourism in general. Furthermore, a significant portion of the existing literature on this topic focuses on restaurants that are part of chains and implement comprehensive sustainability certification programs. Waste management is perhaps the most characteristic feature of sustainable restaurants.

Sustainability concerns are central to EU policies, encompassing sectors like tourism. The Strategic Vision for European Tourism: 2024-2029 (European Commission, 2024) and The Sustainable Tourism Draft Action Plan (European Commission, 2024), developed by the European Commission, aim to promote sustainable development in the tourism industry. They emphasize green transformation, environmental practices and reduction of energy consumption, waste, water consumption and pollution (European Union, 2024). The circular economy is bolstered by resource reuse and recycling, while digital transformation is achieved through the adoption of digital tools to enhance tourism services. Sustainability efforts focus on enhancing resilience to future crises and supporting small and medium-sized enterprises. Additionally, education and skills development emphasize high-quality training and professional growth within the sector.

The schedule adopted with these policies aims to ensure the competitiveness, resilience and preparedness of the EU tourism industry after the COVID-19 shocks. Several researchers (Ivanova, 2023) highlight that the 2020 health crisis provides an opportunity to reorient tourism activities toward the principles of sustainability, authenticity, social justice and security. Innovation is key to economic growth and well-being, especially in the context of sustainable development (Ivanova, 2013). Their application in the tourism sector (Ilieva, Todorova, Marinov, & Ismailov, 2024) plays an important role in competitiveness, improving the customer experience and sustainability of destinations. Sustainable innovations address environmental, social and economic challenges, strengthening the long-term viability of the industry and contributing to a positive impact on the environment and society.

The circular economy is a model of production and consumption that seeks to extend the life cycle of products by reusing, repairing, recycling and restoring them for as long as possible. This concept contrasts with the traditional linear model of the economy, which is based on the principle of “take, make, throw away”. Despite the challenges associated with its implementation, its benefits are significant and diverse. The circular economy is often associated with sustainable tourism as an approach that goes beyond optimizing the actions and added value of individual tourism actors. It represents an effective way of managing the destination, giving it an innovative and modern vision, in line with contemporary consumer trends (Mancheva-Ali, 2023). In the context of the hospitality and restaurant industry, the circular economy includes various strategies and practices that can help minimize waste and increase resource efficiency (Pandzherova, 2024).

The circular economy aims to create a virtuous cycle in which goods and services are produced without wasting the planet’s limited resources, such as raw materials, water and energy. Similarly, circular tourism offers a model in which all participants (tourists, hosts, tour operators and suppliers) follow an environmentally sustainable approach. The future of the tourism industry is likely to be shaped by the principles of complex adaptive systems and will result from the reorganization of the sector based on the circular development model. Research (Pazieva, 2022) indicates that not all waste from tourism can be recovered and reused; instead, it must be substituted with materials or products that comply with contemporary environmental standards.

Applying the principles of the circular economy in the restaurant industry often focuses on waste and resource management (water, energy) within the enterprise itself. However, to achieve true long-term viability, this understanding must be expanded to include the entire food supply chain. Restaurants and hotels are highly dependent on the agri-food sector, which is under significant pressure from the European Union to transition toward more ecological and decarbonized practices (European Commission, 2024). Global and European environmental policies, such as those reflected in the Common Agricultural Policy (CAP) (European Commission, 2025), encourage farmers to reduce greenhouse gas (GHG) emissions, increase soil carbon sequestration, and expand organic production. This macroeconomic framework creates a strategic imperative for restaurateurs to rethink their sourcing by prioritizing products from sustainable and environmentally certified agriculture. Choosing suppliers who have adapted their processes in line with the EU’s environmental goals enables hotels and restaurants to (Velaoras, Menegaki, Polyzos, & Gotzamani, 2025):

- reduce their indirect carbon footprint;
- improve the quality of raw materials (for example, through reduced pesticide use);
- position themselves as part of a holistic and sustainable agri-food system.

As Adela Sorinela Safta and Lavinia Popescu (Sustainability From Concept to Paradigm of Environmental Policies, 2024, p. 181) emphasize, “A key tool for guaranteeing that agriculture can make a workable transition to a sustainable future – one that includes

achieving the objective of lowering carbon emissions has been identified as the Common Agricultural Policy's (CAP) views." Taken together, sustainable restaurant management in the context of the circular economy must include an active role in transforming the food supply chain, becoming a driver of environmentally responsible agriculture.

Sustainable practices in the restaurant industry extend beyond internal operations and waste management. They require responsible supply chain management. Partnering with suppliers under European quality schemes (such as Protected Designation of Origin – PDO, Protected Geographical Indication – PGI, or Traditional Speciality Guaranteed – TSG), strengthens a restaurant's sustainable positioning while supporting local producers and preserving culinary heritage (Glogoveţan, Dabija, Fiore, & Pocol, 2022). Certified products offer market differentiation and justify premium pricing by enhancing perceived value and customer loyalty. As highlighted by Agostino and Trivieri, quoted in Țimiraş (Protection and Promotion of Agricultural and Food Products at European Union level through European Quality Schemes, 2019, p. 81), geographical indications protect producers from unfair competition and assure consumers of product quality, making them more willing to pay higher prices. This reduces vulnerability to price competition and enables higher profits through quality and uniqueness. Thus, integrating products from European quality schemes is a strategic approach that aligns environmental and social responsibility with long-term financial success.

Measuring sustainability, particularly in the tourism sector, is a complex process because it involves qualitative rather than quantitative indicators. Consequently, there is a shortage of meaningful statistical data on this phenomenon. It wasn't until early 2024 that the United Nations Statistical Commission (UNSC) officially endorsed the Statistical Framework for Measuring the Sustainability of Tourism (MST) at its 55th session (UNWTO, 2024). It aims to assess the economic, social, and environmental impacts of tourism. The Framework helps countries produce reliable, comparable data on tourism sustainability, ensuring that tourism activities contribute positively to people's lives. Developed by UN Tourism with support from various international organizations, MST is intended to provide robust data for better decision-making in the tourism sector.

Regarding global challenges, sustainability is becoming increasingly important, providing opportunities to realign the tourism industry towards the principles of social justice, economic equity and environmental responsibility. Investment in innovation and the implementation of concepts such as the circular economy are key to the long-term viability of the tourism sector and in particular, the hospitality and restaurant industry, while ensuring competitiveness and sustainable development. All stakeholders in the tourism industry must commit to sustainable practices that will not only improve the customer experience but also contribute to environmental protection and social well-being. Combining economic, social and environmental aspects in tourism management is essential for building sustainable destinations and achieving long-term success in the sector.

Methodology and Limitations of the Study

1. Methodological Approach and Justification

The research adopts a qualitative and conceptually descriptive approach. The primary objective is not to test empirical hypotheses using statistical data, but to substantiate and systematically classify the theoretical and managerial connections necessary for the transition to sustainability. The choice of an exclusively qualitative methodology is justified by the following limitations:

- *Conceptual Nature of the Study:* The focus is on building a theoretical and managerial framework (Conceptual Model), which inherently requires analysis and synthesis rather than statistical testing.
- *Data Scarcity and Non-Standardization:* A lack of standardized and continuous quantitative data regarding sustainability performance metrics (for example waste per guest, specific water use) across the broad hospitality and restaurant sector renders large-scale quantitative analysis statistically unreliable.

2. Methods and Procedures

The study employs the following methods in a phased approach:

- *General Scientific Methods:* Analysis, synthesis, comparison, analogy, and induction are used to connect macro-level frameworks (ESG, TBL) with micro-operational techniques (Circular Economy, 4IR).
- *Systematic Review and AI-Assisted Classification:* A comprehensive literature review is performed on scientific publications and official documents (EU, UN Tourism). This review is enriched by an AI-assisted classification process to rapidly identify, categorize, and synthesize core concepts and systematically classify transition techniques (as defined in hypothesis H3).
- *Content and Qualitative Textual Analysis:* A desktop survey of established hospitality operations and a qualitative textual analysis of existing sustainability certification systems and official Best Environmental Management Practices (BEMPs) is performed. These serve as applied industry benchmarks to extract the most relevant sustainable management practices.

3. Methodological Limitations

The primary limitation stems from the study's conceptual and theoretical focus. The research does not include primary data collection (surveys or interviews) or statistical testing. Consequently, the findings provide a structurally sound set of managerial recommendations and a conceptual model, but these require subsequent empirical validation through sector-specific quantitative studies to confirm their statistical significance and generalizability across diverse markets.

Results and Discussion

1. Certification programs for sustainability in tourism

The growing interest in sustainable travel is leading to the emergence of sustainability certificates. Certification is among the most effective mechanisms that can register to what extent tourism enterprises have implemented the sustainable development code of conduct in their everyday activities and how sustainable their products and services are.

Environmentally and socially conscious travelers seek out businesses and destinations that hold recognized sustainability certifications. These certifications demonstrate a business's commitment to a sustainable future, giving travelers confidence that their choices align with their personal values. To obtain such certification, enterprises must meet established standards and criteria encompassing environmental, social, and economic sustainability. This process is carried out by a reputable organization that is recognized for its trust in assessing and certifying sustainable practices in the tourism industry. The most popular sustainability certification programs relevant to the hospitality and restaurant industry are presented in Table 1.

The table presents the most commonly used sustainability certificates applicable to hotels and restaurants. The use of such international certification programs makes their recipients more recognizable. They also guarantee the care of tourism enterprises for the environment and society, their commitment to green initiatives and their efforts to increase sustainability in daily operations. Most certificates are awarded for one year, and the main disadvantage that could discourage hotel and restaurant management is the relatively high fee paid for certification. In most cases, it varies depending on the type of certified facility and the country in which it is located. Another downside of this sustainable management approach is the necessity for ongoing business improvements, which carry financial implications. However, these improvements are also linked to adopting a long-term, consistent strategy for enterprise development.

There is no official data on the exact number of all hotel and restaurant businesses that have been certified under these programs to date. Some of the websites of the certification bodies only provide information for 2024. For example, Green Key is used by over 7500 hotels and other establishments in more than 80 countries. Approximately 799 tourist accommodation services hold the EU Ecolabel. Around 550 hotels, resorts, and villas are certified by EarthCheck.

Once certified for sustainability, businesses or destinations traditionally undertake numerous marketing initiatives to promote their organization's success and inform as many tourists as possible about their compliance with sustainability criteria. It is believed that this will attract responsible travelers and potential new partners, as well as contribute to improving the reputation of the company or destination.

As defined in the scientific novelty, our research adopts an integrative approach that requires alignment between macro- and micro-strategies. To illustrate the

classification of transition techniques, we present the Conceptual Model of Integrative Transition (Figure 3).

Table 1. Sustainable Certification Programs for Hotels and Restaurants

Certificate	Validity Period	Advantages	Disadvantages	Objects Certified
Green Key	1 year	Enhances environmental management, reduces costs, attracts eco-conscious guests	Can be costly for smaller businesses, requires continuous improvement	Hotels, hostels, small accommodations, campsites, holiday parks, conference centres, restaurants, attraction
Green Globe	1 year	Comprehensive sustainability criteria, marketing benefits, operational efficiency	High certification costs, perceived as complex	Hotels, resorts, conference centres, attractions
ISO 14001	3 years	Enhances environmental performance, compliance with regulations, operational efficiency	Resource-intensive, complex documentation, requires top management commitment	Environmental management systems for various industries
EU Ecolabel	2 years	Recognized across Europe, promotes sustainable practices, reduces environmental impact	Potential greenwashing, high certification costs, consumer disinterest	Cleaning products, clothing, textiles, coverings, electronic equipment, furniture, mattresses, gardening products, tourist accommodations, lubricants, paper, personal care products
GSTC	1 year	Internationally recognized standards, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Hotels, tour operators, destinations
EarthCheck	1 year	Science-backed sustainability criteria, enhances tourism experiences, attracts eco-conscious customers	High costs, requires continuous improvement	Tourism businesses
Biosphere Tourism	1 year	Aligns with UN SDGs, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Tourism businesses
TourCert	1 year	Promotes responsible tourism, enhances sustainability practices, marketing benefits	Can be costly, requires continuous improvement	Tourism businesses
SDG Actions Platform	Varies	Supports UN SDGs, promotes sustainability initiatives, enhances global collaboration	Can be complex, requires continuous improvement	Various stakeholders

Source: Compiled by the authors. Data collected from official certification programs' websites.

This model visualizes not merely the existence of separate frameworks but the cascading relationship between them:

- *Macro Framework* (Level 1) establishes the overarching objective – achieving

comprehensive sustainability.

- *Circular Economy* (Level 2) acts as the operational mechanism, translating these broad goals into actionable strategies such as waste reduction and resource optimization.
- *4IR/AI Technologies* (Level 3) serve as the essential enabler, ensuring efficiency, measurability, and rapid adaptability of this mechanism.

Only through the active interaction of these three levels can the Circular Economy operate as a dynamic strategic engine for generating transient competitive advantages and ensuring long-term viability.

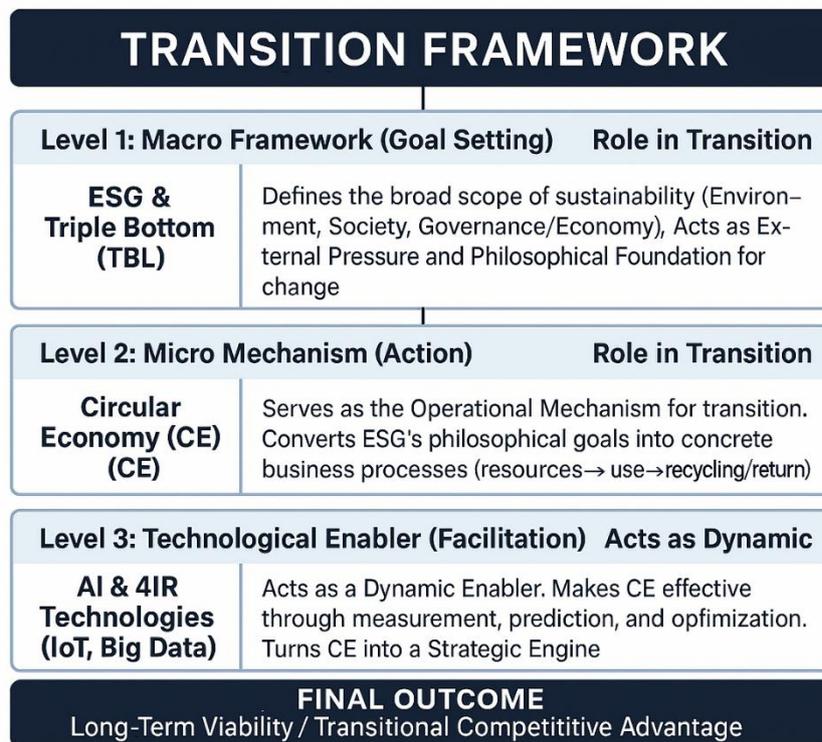


Figure 3. Conceptual Model of the Integrative Transition to Sustainable Management

Source: Compiled by the authors.

In the context of the Fourth Industrial Revolution (4IR) and an increasingly hyper-competitive business environment, the traditional pursuit of a permanent Sustainable Competitive Advantage (SCA) proves theoretically unrealistic. Our findings and systematic review indicate that the Circular Economy (CE) should not be perceived as a final destination or a permanent monopoly. Instead, CE functions as a dynamic mechanism for continuous adaptation. Through resource optimization and innovation, it enables the hospitality and food service sectors to generate a series of short-lived competitive advantages that build upon one another. This organizational agility – amplified by technological tools – becomes the cumulative factor ensuring long-term viability and positions the CE as the primary strategic driver in achieving the macro-level goal of sustainability.

2. *Good practices in the hospitality industry*

Management around the world has practically come up with a significant number of techniques that improve the sustainability of hotels, especially from an environmental and circular economy perspective. For example, Hotel Verde in Cape Town, South Africa, is known for its comprehensive sustainability policy. Many of these are embedded in the sustainability policies adopted by the companies. In most cases, the actions taken concern one of the subsequent three options – water conservation, waste management and recycling, and energy efficiency. The techniques used not only have a positive environmental imprint but also contribute to more efficient use of resources and higher competitiveness of enterprises. Modern technologies play a significant role in the transition to sustainable business practices, as they allow for the optimization of regular activities in enterprises. Some successful examples outlined through the desktop survey of various information sources (including accommodation websites) are listed.

Water Conservation:

- Reducing the amount of water used in consumption and cleaning processes – The Ritz-Carlton in Charlotte employs low-flow fixtures and has initiated a linen reuse program to decrease water consumption. Similarly, The Green House Hotel in Bournemouth, UK, has implemented various water-saving strategies, including rainwater harvesting and greywater recycling systems.
- Using dual-flush toilets that meet eco-standards to reduce the amount of water used – The Proximity Hotel in Greensboro, North Carolina, utilizes dual-flush toilets to effectively minimize water usage. The Hilton at San Francisco Union Square also features dual-flush toilets in both guest rooms and public restrooms to further reduce water consumption.
- Using water-saving showers and faucets – The Park Hyatt in Hyderabad, India, has installed water-efficient showers and faucets throughout its facilities. The Kimpton Hotel Monaco in Portland employs low-flow showerheads and faucets to conserve water while ensuring guest comfort.
- Developed procedures for regular inspection of dripping faucets – The Savoy Hotel in London conducts routine inspections to prevent dripping faucets, while The Fairmont Waterfront in Vancouver has established maintenance checks to ensure all plumbing fixtures are functioning properly and not wasting water.
- Linen and towel reuse procedures – The Hilton London Bankside encourages guests to reuse towels and linens to minimize laundry cycles. Many Accor hotels have adopted a similar policy, allowing guests to opt out of daily linen and towel changes, thereby reducing water usage.
- Eco-friendly cleaning processes – The Westin Hamburg has transitioned to using environmentally friendly cleaning products and eliminated aerosols. The Hyatt Regency in Denver has also updated its cleaning protocols to incorporate eco-friendly products and remove aerosol usage.
- Full capacity operations for dishwashers and washing machines – The

Radisson Blu Hotel in Berlin ensures that dishwashers and washing machines are only operated when fully loaded. The Four Seasons in Toronto follows the same practice to maximize water efficiency.

Waste and Recycling:

- Waste separation – The Marriott Marquis in San Francisco implements a thorough waste separation program, while The InterContinental in Berlin has a comprehensive waste management system that categorizes waste into recyclables, compost, and general waste.
- Glass bottle recycling machines – The Andaz Amsterdam Prinsengracht provides glass bottle recycling machines accessible to guests, promoting recycling during their stay.
- Individually packaged products are not offered at the buffet table – The InterContinental New York Barclay avoids offering individually packaged products at its buffet, opting instead for bulk options. The 1 Hotel in Brooklyn Bridge follows a similar approach to minimize waste.
- The hotel does not use single-use plastic products. They have been replaced with glass bottles, wooden stirrers, cardboard cups, paper bags, etc. – The Alila Villas Uluwatu in Bali has replaced single-use plastics with sustainable alternatives. Many Marriott hotels have also eliminated single-use plastics, opting for glass bottles and cardboard packaging.
- Digitalization of work processes and services to reduce paper use – The Peninsula Tokyo utilizes digital panels and electronic surveys to minimize paper consumption. CitizenM Hotels employs digital check-in and provides information through in-room tablets, further reducing the need for printed materials.
- Minimizing the amount of printed materials – The Hyatt Regency Amsterdam has implemented virtual concierge services to cut down on printed materials. The Radisson Blu in Amsterdam also uses a virtual concierge to enhance guest experience while minimizing paper use.
- Bulk purchasing – The Fairmont Waterfront in Vancouver focuses on purchasing products in bulk to reduce packaging waste. The Hilton Garden Inn in New York similarly emphasizes bulk purchasing to minimize waste.
- Recycling coffee capsules – The Four Seasons Hotel George V in Paris has a program for recycling coffee capsules used in guest rooms. The Hotel Indigo in London also recycles coffee capsules from in-room coffee machines.

Energy Efficiency:

- LED lighting – The Crowne Plaza Copenhagen Towers has implemented LED lighting throughout the hotel, significantly reducing energy consumption. The Marriott Marquis in Washington D.C. has also transitioned to LED lighting across its property.
- Energy-efficient appliances – The Sheraton Grand Hotel in Dubai ensures that all newly purchased appliances are energy efficient. The Westin in

Seattle is committed to using energy-efficient appliances in all guest rooms and common areas.

- Renewable energy sources – The Hotel Solar de las Animas in Mexico utilizes solar panels for electricity generation. The Hilton in San Francisco sources a portion of its energy from renewable sources, including solar and wind power.
- Electric vehicle charging stations – The Kimpton Hotel Van Zandt in Austin, Texas, provides charging stations for electric vehicles. The Hyatt Place in San Jose also offers electric vehicle charging, encouraging guests to adopt sustainable transportation options.

These examples show that various hotels around the world are adopting sustainable practices across different areas of hotel management to minimize their environmental impact, contributing to environmental conservation and responsible tourism. Many of them are part of chains that take advantage of the global recognition of the respective brand and the opportunities that franchising offers, including in relation to sustainability. However, this does not mean that smaller hotels in smaller countries cannot implement the mentioned practices. All of the above approaches are practically applicable at Katarino Spa Hotel in Razlog, Bulgaria (Katarino SPA Hotel, n.d.). This hospitality entity has also received the Green Key certification, demonstrating its commitment to sustainable management and high-quality tourism.

3. Good practices in the restaurant industry

In the context of good practices in the restaurant industry, waste management plays a key role. Reducing waste not only limits the growth of landfills but also has a positive impact on financial results through cost optimization. Food and packaging waste represents a significant challenge for restaurants, which can be overcome by implementing methods such as composting organic waste, recycling materials and portion control.

To minimize food waste, portion sizes can be reduced. Conducting a food audit will help categorize waste into spoiled food, kitchen waste, and customer waste. This data can be used to develop strategies to reduce spoilage and redirect leftovers, such as using animal bones for stock or stale bread for croutons. Additionally, a menu management system can help identify and eliminate unpopular dishes, and providing take-out containers will allow guests to take leftovers with them. Some of the successful examples of sustainable practices in the restaurant industry recorded during the study are as follows:

- Food with eco or organic certificates – Chipotle incorporates organic beans and responsibly sourced meats into its menu, ensuring high sustainability standards. Similarly, Blue Hill in New York emphasizes farm-to-table dining by sourcing ingredients from its own farm and other certified organic farms.
- Collaboration with suppliers implementing green practices – Sweetgreen, New York City partners with farmers who prioritize organic and sustainable farming practices. The Fat Duck in Bray, UK, collaborates with suppliers who adhere to sustainable practices.

- Sourcing from local producers – Blue Hill at Stone Barns in Tarrytown, NY, sources ingredients from its own farm and local producers for fresh, sustainable food. Farmers' Table in Delray Beach, Florida, focuses on sourcing from local farmers to support the economy and reduce carbon footprints.
- Partnerships with ethically aligned suppliers – Nectar Farm Kitchen in Bluffton, SC, collaborates with suppliers who share their commitment to sustainability. Noma in Copenhagen, Denmark, also partners with suppliers that prioritize ethical practices, ensuring alignment with their values.
- Seasonal menu offerings – The Barn at Blackberry Farm in Walland, TN, features a menu that changes with the seasons, utilizing ingredients grown on their own farm. Chez Panisse in Berkeley, California, is known for its seasonal menu that adapts based on the freshest local produce available.
- Own gardens and/or farms – Primo Restaurant in Rockland, ME, grows a significant portion of its ingredients on its own farm, ensuring fresh produce. The Edible Schoolyard in Berkeley, California, includes a restaurant that cultivates its own produce, promoting sustainability and healthy eating.
- Smaller portion sizes – Tapas restaurants in New York City serve smaller, artfully plated dishes, which help reduce food waste and encourage healthier eating habits. Osteria Francescana in Modena, Italy, offers tasting menus with smaller portions, allowing guests to sample a variety of dishes while minimizing waste.
- Limiting meat in dishes – Apricity Restaurant in Mayfair, London, focuses on reducing meat usage. Dirt Candy in New York is a vegetarian restaurant that highlights plant-based dishes, showcasing vegetables as the main attraction.
- Concise menu offerings – Noshway emphasizes the advantages of restaurants with smaller menus that can concentrate on quality and sustainability. Saison in San Francisco, California, provides a focused menu that prioritizes quality over quantity, facilitating better sourcing and less waste.
- Food waste reduction – Orderable offers strategies for restaurants to minimize food waste, such as conducting food audits and enhancing inventory management. WastED in New York is dedicated to utilizing ingredients that would otherwise go to waste, creating dishes from overlooked or surplus food.
- Bulk purchasing of products and materials – Sweetgreen in New York City buys products in bulk to minimize packaging waste and support sustainability. The Greenhouse Tavern in Cleveland, Ohio, also purchases in bulk to ensure a steady supply of sustainable ingredients.
- Eco-friendly packaging – Alila Villas Uluwatu in Bali, Indonesia, uses sustainable alternatives to single-use plastics, such as glass bottles and paper bags. Sweetgreen employs compostable and recyclable packaging for its takeout and delivery orders.
- Energy efficiency – Crowne Plaza Copenhagen Towers in Copenhagen, Denmark, utilizes LED lighting and energy-efficient appliances to lower

energy consumption. The River Café in London has implemented energy-efficient practices and appliances to reduce its overall energy use.

These examples illustrate how various restaurants are effectively implementing sustainable practices in their operations. Sustainable practices are not limited to restaurants of global chains or establishments in large cities. The Bulgarian boutique restaurant “Dieci” (Boutique restaurant "Dieci", n.d.), for example, is located in the village of Devino and applies a number of the listed sustainability techniques. The restaurant is housed in a former school, which has been restored with improved energy efficiency, and has its own vegetable and fruit garden. For its greenhouse for seedlings, the boutique restaurant has a seed bank for various types of plants, among which there are Bulgarian tomato varieties that are over a century old. During the entire food preparation operation, any material from paper, plastic, metal or glass is collected separately for future processing in their recycling center. All food scraps are placed in an electronic food composter, which in 10 hours turns all organic food waste into useful organic compost, resembling earth's soil.

These exemplary sustainable practices in hotel and restaurant management can serve as practical guidelines for other businesses in the sector. By adopting similar approaches, businesses can enhance their environmental responsibility, improve operational efficiency, and align with modern sustainability standards. This not only benefits the environment but also attracts eco-conscious customers and partners, ultimately contributing to a more sustainable and resilient industry.

4. Policies and Strategies for the Sustainable Application of AI and 4IR Technologies in the HORECA Sector

To demonstrate the full potential of AI and 4IR technologies as a strategic driver, it is necessary to examine their integrated impact across the three pillars of sustainability: Environmental, Social, and Governance. This transforms the technologies into a universal tool for achieving the goals of the ESG and TBL frameworks:

Environmental Pillar (Circular Economy - CE)

Within the CE framework, AI primarily functions as a preventive tool. Instead of merely managing waste, AI is used for Food Waste Prediction. By analyzing historical sales data, weather patterns, and guest numbers, AI systems can optimize menu planning and raw material orders with extreme accuracy. This leads to a significant reduction in excesses before they are created, representing the highest form of efficiency in the waste hierarchy and is in direct alignment with the requirements of the EU's Waste Framework Directive (2008/98/EC) (European Commission, 2023), which emphasizes prevention as the highest priority. Additionally, IoT sensors connected to AI regulate energy and water consumption in guest rooms based on occupancy, leading to direct resource optimization.

Social Pillar (TBL/ESG)

4IR technologies significantly improve health and safety conditions in the HORECA sector, which is a key element of social responsibility. The application of automated cleaning with robotic systems reduces physical strain and the risk of injury to staff. Air quality sensors

(IoT), integrated into building management systems, ensure optimal ventilation and control of pollutants, guaranteeing a healthier working environment. This focus on prevention and improving the work environment is consistent with European Occupational Safety and Health (OSH) frameworks (European Parliament and Council, 2025), aimed at systematically reducing professional risks and improving employee retention.

Governance Pillar (ESG - Governance)

In the realm of governance, AI provides tools for transparency and accountability that are vital for attracting investors and meeting ESG standards. AI is used for the automated collection, validation, and reporting of ESG data (e.g., carbon emissions, water consumption, social responsibility metrics). This process eliminates manual data entry errors and provides real-time data with a high degree of reliability. This facilitates auditing and the preparation of ESG reports, which are increasingly mandatory under regional regulations (e.g., the EU Corporate Sustainability Reporting Directive (European Parliament and Council, 2021)) and support global accountability under the 2030 Agenda.

Analyzing the context of sustainable practices in the hospitality and food service (HORECA) sector reveals that topics related to the Fourth Industrial Revolution (4IR) and the use of Artificial Intelligence (AI) are becoming increasingly relevant. Research and official documents indicate that AI and 4IR technologies are not only innovations but also strategic factors for implementing the principles of the circular economy (CE).

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The official strategic communication within the HORECA sector emphasizes the importance of innovations like AI and 4IR technologies in achieving sustainability. Integrating these technologies allows for resource optimization, waste minimization, and an overall increase in operational efficiency, aligning with the principles outlined in the EU's Directive 2008/98/EC (European Commission, 2023) on waste and the 2030 Agenda for Sustainable Development (United Nations, 2023). Organizations actively adopting these solutions not only adapt to consumer demands for sustainability but also gain a competitive edge in the market.

There is a consensus in academic literature and official documents regarding the impact of AI-assisted operational tools on key processes in the CE, particularly concerning resource management and waste reduction. A review of various sources, including guidance from the UN Tourism Statistical Framework for Measuring the Sustainability of Tourism (UNWTO, 2024), shows that AI can optimize resource flows, predict customer needs, and manage inventory more effectively.

Through content analysis of publications from official bodies and reports from the EU and UN (One Planet Network, 2020), we observe the significant impact of these tools

on practical aspects of the circular economy. Furthermore, official frameworks, such as those developed to facilitate innovation in circular tourism, provide specific strategic guidance that further substantiates the necessity of adopting CE as a key framework for the sector's development (One Planet Network, 2017). Reports provide specific examples of organizations that have achieved substantial waste reductions and enhanced resource efficiency through AI integration in their operations.

Successful AI integration examples include optimizing menus by using AI to analyze customer preferences and adapt offerings in real time, and automating processes where AI systems manage inventory to prevent excesses and reduce costs. These examples illustrate that the implementation of AI tools is not merely an innovation; it is a crucial step toward applying CE principles.

The presented evidence and analyses support hypotheses H2 and H3, highlighting that strategic communication and innovations in the HORECA sector are foundational for successfully integrating sustainable practices. AI and 4IR technologies not only offer resource optimization solutions but also play a vital role in building strategic competitive advantages within the context of the circular economy.

5. Discussion on Capital Expenditures and Financial Barriers

The analysis convincingly demonstrates that the strategic integration of the Circular Economy (CE), bolstered by advancements in Fourth Industrial Revolution (4IR) technologies and Artificial Intelligence (AI), leads to long-term economic viability and enhanced investment attractiveness. However, it is essential not to overlook the pressing concern of high initial capital expenditures (CAPEX). Transitioning from a linear to a circular model necessitates significant upfront investments. These investments include specialized equipment, such as smart waste management systems and energy-efficient installations, as well as the acquisition and implementation of AI-based software and hardware.

Moreover, the expenses associated with obtaining certification under international green standards, as shown in Table 1, can be particularly daunting for small and medium-sized enterprises (SMEs). This considerable financial burden often serves as a barrier to entry, limiting the capacity of SMEs to participate in and benefit from the shift toward sustainable practices. The lack of resources may stifle innovation, as smaller firms might find themselves unable to compete with larger entities equipped with the necessary capital to invest in green technologies.

This high initial financial barrier represents a significant constraint on the widespread adoption of sustainable practices across the sector, potentially slowing the overall transition to the Circular Economy (Rizos, Behrens, Kafyeke, Hirschnitz-Garbers, & Ioannou, 2015). Without addressing these barriers, the vision of a seamless integration of CE practices may remain out of reach for many organizations. Therefore, to ensure that CE becomes a universally applicable strategic driver, it is paramount for regulatory bodies and financial institutions to enact targeted financial mechanisms. These may include

subsidies, low-interest loans, or tax incentives designed specifically to alleviate the financial pressures faced by SMEs.

Additionally, promoting a phased approach to technological adaptation can greatly enhance the feasibility of transitioning toward CE (Geissdoerfer, Savaget, Bocken, & Hultink, 2017). By allowing businesses to gradually integrate circular practices, the financial burden can be spread over time, making it more manageable. Such an approach not only reduces immediate capital requirements but also enables firms to adapt at a pace that aligns with their operational capabilities and market demands.

In conclusion, while the integration of the Circular Economy presents substantial opportunities for long-term economic benefits, the challenges posed by high initial CAPEX must be adequately addressed. Without strategic financial frameworks and supportive policies, the potential benefits of CE may remain untapped, inhibiting both environmental sustainability and economic growth.

Conclusions

This study substantiates the critical necessity of a strategic management shift toward sustainability and circular economy principles within the hospitality and food service sectors. The research confirmed that environmental and socio-economic pressures require operational models that move beyond traditional linear consumption patterns. By employing a qualitative and conceptually descriptive methodology, we successfully identified and classified a comprehensive set of transition techniques and managerial models that facilitate this fundamental change.

The findings emphasize that sustainability in this context is not merely a moral obligation but a robust strategic and economic imperative. The integration of circular economy practices directly addresses key industry challenges, such as waste management, resource efficiency, and high operational costs. Furthermore, the analysis highlighted the significant impact of European regulatory frameworks in steering this transition, validating the practical relevance of the proposed approaches. The study thus offers a foundational roadmap for practitioners and managers seeking to implement ecologically responsible and economically viable operations.

1. Limitations and Future Research

A key limitation of this study stems from the lack of standardized, continuous quantitative data (e.g., uniform metrics for waste per guest, or standardized ecological footprint measures) across the hospitality and food service sector. This necessitated a reliance on qualitative textual analysis rather than empirical quantitative validation.

Future research should focus on developing standardized performance indicators to allow for cross-organizational quantitative comparisons. Furthermore, empirical studies utilizing the classified transition techniques are warranted to measure the precise economic and environmental impacts, thus transforming the conceptual framework developed here into a data-driven model for optimization and policy development.

2. Synthesis of Research Hypotheses

To ensure the coherence and completeness of the scientific argument, the findings are directly synthesized against the initial research hypotheses:

- **H-1 (Strategic Necessity):** The necessity of a strategic transition toward sustainable management practices, grounded in ecological responsibility, is **confirmed**. The study's findings demonstrate that sustainable management is a prerequisite for competitiveness and resilience in the 21st century tourism market.
- **H-2 (Circular Economy & Competitiveness):** The integration of circular economy practices serves as a strategic driver for competitive advantage in the hospitality and food service sectors. This hypothesis is **confirmed**, as the classified transition models clearly illustrate how circularity leads to optimized resource use, cost reduction, and enhanced brand reputation.
- **H-3 (Economic Viability):** The successful adoption of sustainability-oriented practices is a key driver of long-term economic viability. This hypothesis is **validated**. The discussion on financial barriers and capital expenditures in Section 4.5 confirms that while initial investment may be required, the resulting operational efficiencies and improved market positioning constitute a significant long-term return on investment, thereby strengthening economic viability.

The successful validation of all three hypotheses reinforces the central thesis of the study: a dual-level approach integrating sustainability into both managerial strategy and operational practice is essential for industry transformation.

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NAVIGATING THE RISKS OF PUBLIC- PRIVATE PARTNERSHIPS: CHALLENGES AND MITIGATION STRATEGIES

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Abstract: *This study explores the obstacles and risks that Public-Private Partnerships (PPPs) encounter in carrying out economic development initiatives, across Romanian nations. The study addresses financial, regulatory, risk management and social-environmental factors that influence the success of PPPs in the current economic environment. The research has as main objective to identify and analyze the major risks associated with PPPs in Romanian national governance systems. Drawing from a comprehensive review of existing literature, the study highlights a literature review regarding the most common issues, as limited sources of financing, high upfront costs, technological and cash-flow risks, uncertain returns and weak regulatory frameworks. By integrating theoretical frameworks, the research explores the correlation between these challenges and the factors that slow down the effectiveness of PPPs in the nowadays economic trends. The findings emphasize the need for enhanced government capacity, tighter regulatory enforcement, and improved risk management strategies. Policy suggestions are offered to bridge the gaps and enhance the overall efficiency of PPPs in fostering sustainable economic and social development. Finally, the study outlines directions for future research to further explore the evolving dynamics of PPPs in sustainable economic growth and their potential role in achieving sustainable development goals.*

KEYWORDS: *Economic challenges, Romanian regulatory, PPP, technical expertise, risk management, social impact, economic strategies.*

JEL CODES: *K23; L33; L74; O18.*

UDC: *[334.722.26:005.334](4+498)*

Introduction

Although the public sector has traditionally been viewed as responsible for delivering public services, private sector companies have also been involved in this field for some period of time (Mota, Moreira, 2015). Public-private partnerships (PPPs) have become an important policy instrument in recent years given growing demands on public resources and the need for increased private investment in infrastructure and services. Public-private partnership (PPP) based infrastructure projects generally face many risks and uncertainties at all stages of the project, including initial studies, design, construction and operation.

Despite their advantages, PPPs remain complex undertakings involving high financial commitments and long-term contractual obligations. Numerous failed or underperforming PPPs across Europe demonstrate that inadequate risk management, inconsistent regulatory frameworks, and limited administrative capacity continue to

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challenge their success. Thus, understanding *why* and *for whom* such research matters becomes critically important. For policymakers, PPP practitioners, regulators, and public institutions, identifying the risks and determinants that influence PPP outcomes at the national level is essential for designing effective partnerships and avoiding costly failures. Also, for academics and researchers, the topic remains central due to persistent gaps in comparative European analyses, especially regarding the interplay between risks, institutional quality, and development outcomes.

Methodological approach

Qualitative research is the main design of the present study, and I have used thematic analysis to investigate PPPs. The analysis followed a systematic procedure, including:

- familiarization with the data;
- identification of initial themes;
- review and refinement of the themes;
- synthesis and interpretation of findings.

I have selected the sources based on explicit inclusion criteria such as relevance, publication date, document type etc. and the unit of analysis consisted of interviews. Thus, an in-depth, semi-structured interview was conducted, involving five representatives of local public administration, one representative of a non-governmental organization, and six managers of commercial companies in Romania. This method was selected for this stage because in-depth interviewing allows for a high degree of flexibility and facilitates an open discussion (C. Bobâlcă, 2014).

The interview included 17 predefined open-ended questions designed to elicit participants' perspectives (J. Creswell, 2009). This paper represents a review of the qualitative academic literature that has concentrated on economic development of the Romanian economic system, considering the PPPs as a reliable source of financing. In the preparation of this literature review, the studies of the last 7 years were especially taken into account.

The reviewed articles have been collected from journal databases such as Science Direct, DOAJ, RePEc selected based on keywords public-private partnership, economic growth, PPP risks, institutional good practices, etc considering also their citations, the relevance of the journal and the quality of the literature on this subject.

Analyzing the data collected from the specialized literature, either directly or indirectly, the impact of PPPs on the economic development of local communities in our country is confirmed. Furthermore, based on the interviews conducted, it can be observed that both within institutional settings and in the private sector, the perception of the impact of PPPs on economic development is a positive one. Respondents frequently emphasized the role of PPPs in economic growth, attracting both foreign and domestic private investors, as well as the legislative and fiscal challenges, the inefficiency of the public administration, and other related issues.

In the present study, the research limitations concern the small size of the sample (12 participants), as well as the possibility of subjective bias in their responses regarding the topic under discussion, given the professional status of the interviewees and their obligation to comply with institutional etiquette and protocol.

Research Objective

The overall purpose of this research is to analyze the risks associated with Public-Private Partnership (PPPs) in the Romanian economic context, which may hinder the effectiveness and sustainability of the partnership, as well as to review the current practices in mitigating these risks. The study aims to investigate the effect of macro-economic conditions on the financial feasibility of PPP projects and the subsequent risk realization during the life of the contract for concessionaire, municipality, government and consumers.

The research has as main objective to identify and analyze the risks associated with PPPs in Romania. With a wide range of possible risks, both *ex-ante* and *ex-post*, the intention of this investigation is not only to analyze the risks from a theoretical perspective, but also to examine their implications and consequences on the effectiveness and sustainability of the partnership in a practical context.

Theoretical framework

This article will concentrate on the risks and strategies for managing risks in public-private partnerships across Romania. Nevertheless, numerous unsuccessful PPP projects have been reported worldwide. Therefore, it is crucial for both the public and private sectors to implement effective risk assessment strategies to allocate and manage risks more efficiently. Coupled with this, the complexity of PPPs makes the projects more exposed to risk. The analysis sometimes specifies a mis-procurement of the risk measures. Such a situation discourages the private partner from getting involved in such projects (Mohsen Korayem, 2017).

Drawing on the principles derived from new institutional theory and service-dominant logic, this essay will explore why and where risk emerges in public-private partnerships. Direct risks related to public-private partnership construction will be examined first, followed by a review of the principal risks for each stakeholder. Possible risks are many and varied, according to each of the partnerships. However, the strategic management as the form is mature and professionalized holds many panaceas which offer to control risk and enable the parties to avoid being blinded by potential risks (Song Yong, 2019). The essay suggests that under conditions of increasing entry by smaller firms and the switch to a market-based approach with its emphasis on competition among suppliers, public entities will face an increasing problem of managing risks in working with the private sector. This has implications for the design and operation of public-private partnership in order to reduce risks, increase efficiency, and encourage greater competition.

Public-private partnerships (PPPs) have been used in many European countries and sectors to bring together the specific strengths of the public and private sectors and at the same time mitigate their weaknesses in order to deliver infrastructure and services (Jin, 2012). PPP has been touted as an innovative and revolutionary procurement method, considered as one of the solutions to deliver public infrastructure and facilities. The PPP scheme has evolved in different disciplines. It evolved from the Concession scheme in transport and utility business in the 1990s to the current PPP scheme where it had been used in many countries to deliver all types of public projects such as schools, highways, hospitals and many more. I have identified five types of PPPs in the key references reviewed:

- Build-Own-Transfer (BOT) is a contractual arrangement in which the private sector builds an asset, operates it, and transfers ownership to the government at the end of the concession period. It is the most common PPP approach used to develop infrastructure such as roads, water treatment plants, and airports.
- Build-Own-Operate (BOO) is another common approach of a PPP project where assets are established by the private sector to deliver an essential public service or for the government. After a specified period the ownership of the assets is transferred back to the public sector (Sarvari, 2016).
- Build-Lease-Transfer (BLT) is a PPP development approach where the ownership of the asset is transferred to the public sector after a specified contractual period. The private sector builds an asset, leases it to the public sector for a specific period, and then transfers the ownership to the government at the end of the period (Cheng, et al 2018).
- The Private Finance Initiative (PFI) is a way to deliver a public-private project through a long-term arrangement under which a private consortium is responsible for designing, building, financing and managing a facility, typically a public sector facility such as a school, hospital or prison, and then subsequently leasing it back to a public sector client.
- Design-Build-Finance-Operate (DBFO) involve the private sector providing and arranging finance for an infrastructure project. The construction of the infrastructure should be relatively straightforward and the function of the facility should be easy to specify and monitor. Once information is available that the implemented investment strategy is not promising the expected results and adverse experiences have accrued, there is the need to reconsider the current investment strategy and investigate potential alternative scenarios.

Public-Private Partnerships (PPPs) have emerged as an increasingly significant model for the provision of public infrastructure and services, addressing a broad spectrum of domains including transport, utilities, public health, and education. While the operational and financial risks of PPP activities tend to be considerable for both sectors, the collaborative provision of facilities and expertise has the potential to greatly enhance the quality and availability of public services across various social sectors. By sharing the financial obligations and operational prerequisites of a project, both public and private

entities are able to introduce desired specialization, efficiency, and innovation which would be otherwise difficult to arrange. A PPP venture is characterized by a well-defined revenue and rehabilitation risk analysis (FRONE & Florin FRONE, 2013).

PPPs can be structured in a number of ways depending on the particular infrastructure or service being provided and the legislative framework in the host country. Frequently, a concessional contract is arranged where a quantity or quality benchmark is set by government authorities, financial compensation is achieved via user fees or direct subsidy payments; an operating company compliant with specified operational performance and professional background requirements receives the remittance. Users can include both members of the public and the sponsoring governmental body, while the administering business distributes these funds across various maintenance, expansion and operational acts such as the construction of treatment plants, storage facilities, and distribution networks, supplying meters, responding to contaminants, addressing complaints, or following other legislative bylaws. Alternatively, public service obligations (PSO) can take the setup of a service concession contract where general area plans are outlined by the governmental agent and more specific arrangements are then made by a third-party service provider, which may in the form of a long-term management authorization (Song Yong, 2019).

Definition and Types of PPPs

Nowadays, interest in and exploration of public-private partnership (PPP) opportunities are growing. However, the PPP models may be very different. Essentially, PPP is seen as a long-term form of collaborative agreement between the public sector bodies and private sector ones, aimed at designing, financing, building, operating or maintaining new infrastructures or providing public services that were, traditionally, within the public domain. A feature of PPP is an involvement of the private investor, regarded as the project executor. Moreover, PPP agreements are characterized by sharing risks in the course of the project execution. At the same time, the task of risk management has become essential due to the fact that the risks being borne by the investor threaten the intended economic efficiency of the project. PPPs model spectrum is extended, too. A feature of the PPP model is the relationship between the involved public and private partners, as well as the situation with the aforementioned risks and options for managing them. Correspondingly, main types of PPP are following.

The essential principles that guide such relationships remain the same, but in practice, PPPs can take many forms and there is no "one-size fits all" approach to making PPPs work. PPPs can also vary depending on the nature of the project and the relevant sector involved.

Romanian Legal and Regulatory Framework

From where I stand, public-private partnerships (PPPs) remain a vital aspect for sustainable economic development. However, PPPs are exposed to various risks. An institutional perspective highlights the interactions and potential conflicts among different stakeholders within the institutional framework, which can impact the success of a PPP. It is contended that negative results occur as a result of a misalignment between institutions and institutional environments (Skelcher, 2010). As such, win-win partnerships, which according to the law of convergence are predicted to be underpinned by common norms, often fail. Because many developing economies have differing informal and formal systems, understanding the institutional environment of PPPs in the developing world proves particularly difficult. It is found that the “non-prototypical prescriptions” of the system do not necessarily hinder PPP development. Some of the less frequently cited policy prescriptions to improve PPP efficacy are aimed at clearing the path for hybrid PPPs to fair no worse than their prototypical counterparts (Nwangwu, 2021). This investigation takes “governing partnerships” as the point of departure.

Ultimately, a framework of five dimensions is called upon to help to understand the governance environment surrounding a given PPP. Specifically, these dimensions pertain to: 1) the regulatory setting; 2) the kind of stakeholders the agreements create; 3) monitoring and compliance mechanisms; 4) conflict/dispute resolution processes; and 5) multi-tiered structures overseeing the projects. In Romania, the legal framework governing public-private partnerships (PPPs) has undergone several significant changes in recent years. A major reform was introduced in 2018, when the Government adopted Emergency Ordinance No. 39/2018 on public-private partnerships, which regulates the conclusion, implementation, and termination of PPP contracts.

Under this ordinance, PPP contracts cover the development, rehabilitation, or expansion of assets or services that ultimately become part of the public partner’s patrimony (gov.ro). The main legal basis remains G.E.O No. 39/2018, subsequently amended in January 2024 by Law No. 7/2024. Together, these instruments establish the legal framework for the initiation, management, and completion of PPP projects in Romania. Their primary purpose is to encourage and facilitate the use of PPPs as a tool for increasing public and private investment whether through national budget allocations, improved absorption of European funds, or the mobilization of private capital. Strengthening Romania’s macroeconomic outlook is expected to rely on a balanced combination of fiscal, budgetary, and monetary policies, with the broader objective of improving overall quality of life.

One of the most critical factors in managing risk is the contractual safeguards built into agreements between public and private partners (Nwangwu, 2021). Well-designed contracts can help to clarify who is responsible for what, allocate risks to the party that is best positioned to manage them, and establish performance benchmarks for partners.

Effective risk management requires that the contract contain the appropriate provisions to mitigate each particular risk.

Table 1. Core Components Required in PPP Contracts under Romanian Law

Nr.	Contractual element	Description
1.	Parties	Identification of the public partner and the private partner participating in the PPP.
2.	Object of the Contract	Clear definition of the project, asset, or service to be developed, operated, or rehabilitated.
3.	Obligations of the Parties	Allocation of duties, responsibilities, and specific tasks for both partners throughout the project lifecycle.
4.	Negotiated Investment Value	The agreed financial commitment required for project implementation.
5.	Contract Duration and Completion Deadline	The total period during which the contract is valid, including the final date for project completion.
6.	Implementation Timeline	Detailed schedule outlining project phases and key milestones.
7.	Participation Shares and Assets Contributed	Specification of each partner's contribution (financial, material, or operational) to the project.
8.	Risk Allocation	Distribution of risks between the public and private partners based on their capacity to manage them.
9.	Performance Criteria	Indicators and benchmarks used to assess the achievement of project objectives.
10.	Withdrawal or Termination Clauses	Conditions under which either partner may withdraw from or terminate the agreement.
11.	Penalties	Sanctions applicable in case of contractual non-compliance or failure to meet performance standards.

Source: Based on Civil Code provisions and Emergency Ordinance No. 39/2018, 2025.

To facilitate the resolution of disputes and to avoid lengthy and financially draining court cases, contract agreements specify mechanisms dedicated to the resolution of disputes between public and private partners, such as notice and cure periods, conciliation, arbitration, and the establishment of Public-Private Partnerships (PPPs) interstate courts (Cunha Marques & V Berg, 2010). As I wrote in Table 1, contracts should include provisions that enable project restructuring under stressful situations, safeguarding the continuity of essential services and the reimbursement of capital investments. Thus, the optimal design and management of PPP contracts can be crucial for aligning the interests and profitability of the partner firms and for ensuring the long-term stability of PPP projects.

At the same time, PPP contracts should be flexible enough to adapt to unforeseeable circumstances, but the actual responses to these changes should be predictable. Obviously, changes are agreed by both parties or established according to pre-determined rules, given that ad-hoc financial and contractual adjustments may raise the

cost of capital or reduce the incentives of the private partner. Consequently, PPP contracts should anticipate as much as possible the issues to manage the long-term relationship with clear and unambiguous clauses.

Public Sector Capacity Building

In Romania, Public-Private Partnerships (PPPs) in essential public services - such as utilities, energy, water supply, transportation, telecommunications, waste management, and public facilities-remain largely absent, despite representing a modern approach to infrastructure development that has gained considerable traction in many other European states.

Such partnerships are in the best interest of both the public sector as well as the private sector, and can lead to a more efficient allocation of resources, greater accountability, better project planning, risk management, and problem-solving skills as well as knowledge of the main principles and procedures (Mohsen Korayem, 2017). In an ideal framework, public capacity development for PPPs includes education and training programs, workshops, study tours, e-learning and various other resources directed at improving public officials' skills and knowledge for effective risk assessment, negotiation, implementation, monitoring and oversight of such projects. To foster and maintain reliable partnerships, countries need to implement various policy instruments. They include accurate and unambiguous regulations and policies, a well-designed process of project selection and procurement, a transparent and accountable decision-making mechanism and governance structure within the public authorities, efficient monitoring, problem-solving, and dispute resolution mechanisms, and sustained capacity building of public officials and staff dealing with PPPs in public agencies. It is in the best interest of countries to implement a reliable framework since timely and well-coordinated actions at all stages can significantly influence risk management and, eventually, the overall success of the project.

Various guidelines on risk management in PPP projects recognize the improved likelihood of PPP success through proactive identification of risks. A number of studies stress the importance of the proper assessment of project risks and flows in the early project phase since that can lead to the establishment of appropriate risk management systems. On the other hand, Romanian public sector participants in PPPs are usually less informed compared to their private sector counterparts due to the complexity of such arrangements and the multitude of risks involved. As a result, the public sector may enter into disadvantageous contracts leading to the misuse of public funds and drastic cuts in social spending. The problem is further exacerbated due to the absence of institutional frameworks and the lack of governance structures that support capacity development. I have noticed that since the number of PPP related risks is greater in countries with less experience in such partnership arrangements, it is important to address those issues that make timely actions at every stage almost impossible.

Risks in Public-Private Partnerships

The ability to properly identify and manage risks is a critical aspect of successful public-private partnerships (PPPs). The uniqueness of PPPs as a form of project delivery involves a distinct set of risks, many of which are specific to this type of arrangement and must be addressed to ensure the achievement of intended benefits. Risks in PPPs are varied and numerous, and can materially affect the ultimate success of projects (Mohsen Korayem, 2017). High profile risks, if manifest, could give rise to a sub-optimal project, including failures to deliver the infrastructure as promised, particularly through delays and cost overruns, and losses of future service delivery quality. Adverse risk realizations may increase pressure for renationalization and may damage the prospects of obtention of a well-calibrated risk transfer, undermining the intended contribution of the PPP to the wider management of fiscal and service delivery responsibilities. As with any procurement, risk is a key issue for clients and potential tenderers, although PPPs can involve a more complex allocation of risks than the more traditional procurement routes.

The risks that may emanate from a PPP project can generally be grouped into four categories:

- **Financial risks**, which are to do with the financing of the project and include concerns about the inability of the private sector and/or the Special Purpose Vehicle (SPV) to raise adequate finance, interest rate fluctuations, revenue generation risk, etc;

Financial risks are among the most significant challenges in public-private partnerships (PPPs), as they can lead to project failure, strain public budgets, and increase national debt. One of the most common financial risks is cost overruns, where actual project expenses exceed initial estimates. These overruns can result from material price fluctuations, such as unexpected increases in the cost of steel, cement, and fuel, as well as labor shortages, which can lead to hiring delays or wage inflation. Unrealistic initial cost estimates also contribute to financial strain, as some bidders may underestimate costs to secure contracts. Additionally, design changes and scope creep, where project specifications are modified after contract signing, can further escalate costs. Revenue risks also pose a significant challenge in PPP projects. If expected revenues, such as tolls or user fees, fall short of projections, the private partner may struggle to maintain financial stability. Another critical concern is the potential increase in public debt. Some PPP agreements create hidden liabilities for the government, leading to a rise in national debt if financial guarantees are triggered.

Effectively managing these financial risks requires thorough risk assessment, careful contract structuring, and proactive financial planning by both public and private stakeholders.

- **Operational risks**, which are related to the operating phase and include fears

of failure of the private sector to provide the required infrastructure, lower than expected volumes of use, increased maintenance costs, etc;

- **Legal risks**, which may stem from non-compliance with legal and regulatory regimes;
- **Reputational risks**, risks that something could go wrong and that such an occurrence would affect the repute of either partner in the relationship. However, the proper appreciation of what may go wrong is an important first step for all parties involved in PPPs.
- **Political and regulatory risks** pose significant challenges to public-private partnerships (PPPs), as changes in government policies, regulations, or leadership can alter project terms or even lead to contract cancellations. Policy shifts may result in reversals where a new administration cancels, modifies, or delays existing PPP agreements based on its political agenda. In some cases, governments may expropriate or nationalize assets, seizing control of projects they perceive as unsuccessful.

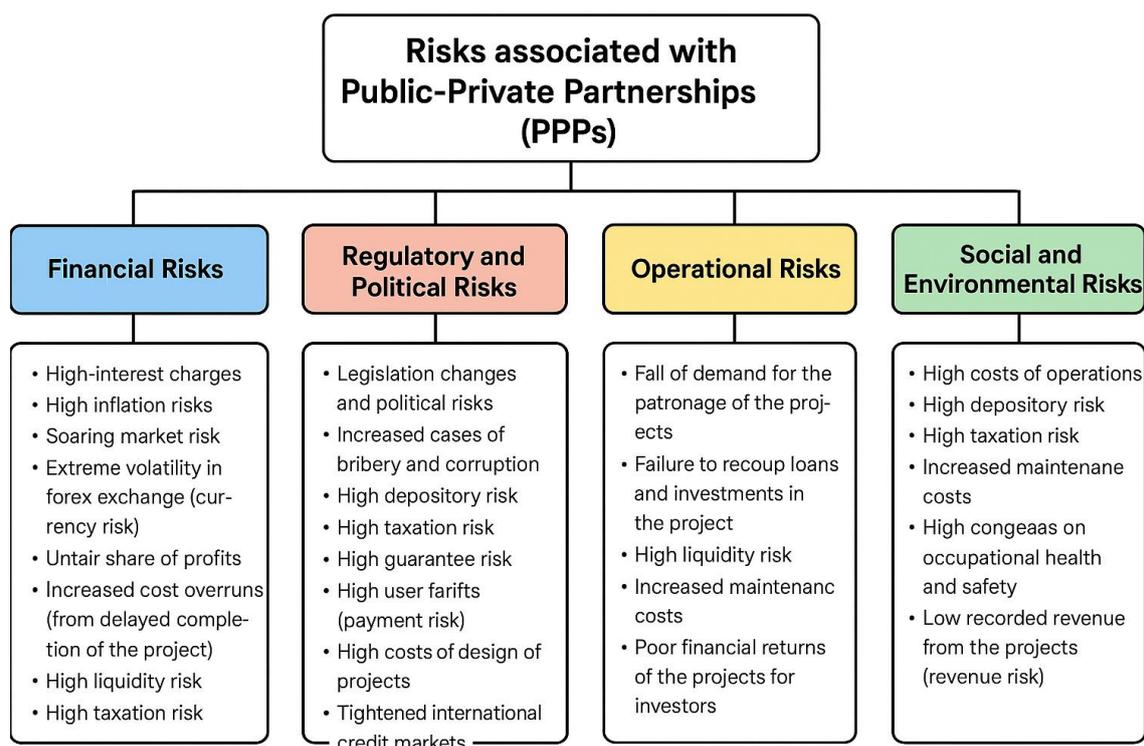


Figure 1. Risk associated with PPPs

Source: Author's processing.

From a certain point of view, a weak regulatory environment can lead to unpredictable enforcement of contracts, increasing financial and operational risks. Additionally, public opposition can play a critical role in the success or failure of a PPP. For example, Romanian legal framework is still without a clear structure and this uncertainty further complicates the business environment, also the investors. If a project is

unpopular due to high toll fees, environmental concerns, or other issues, widespread protests may pressure the government to renegotiate or cancel agreements altogether.

To mitigate these risks, clear and stable legal frameworks, transparent policymaking, and open communication between stakeholders are essential for maintaining long-term project stability.

The most obvious form of risk for the public sector arising from PPPs – namely lack of expected public sector benefits (which are however difficult to predict at the bidding stage). Of course, privately operated prisons still have to contend with the same volatility in inmate numbers as state-run ones, but legal contracts setting out the terms and penalties in advance are more complex to write and potentially oversee than formula-based payments for capacity or utilization, thus leaving unanticipated mitigants of the government from the risks associated with change. Also, badly designed or poorly enforced contracts can create large opportunity costs for the public sector or create large financial transfers to the private sector - either of which can undermine the credibility of PPPs as a whole.

Public-private partnership (PPP) projects are deemed as substantial investments with several types of risks accompanying them. Nevertheless, overseas and private investors are interested in investing in PPP schemes as they could be a viable alternative not only for participation in crucial infrastructure projects but also due to the expected potential of economic return on investments. The risks covered within PPPs can be categorized in different groups, where financial, operational, political, social, and other types of risks are identified. Each project is likely to encounter a unique combination of various risks that each has an influence on several counterparts. The negative scenario may manifest due to the existence of certain risks that can be enhanced by additional impacts of other types of risks through a cascading risk propagation. Understanding the classification of such impact is crucial while identifying mitigating actions. In return, the severity of risks allows for the prioritization of such impacting risks and helps in the proper allocation of available resources for managing these risks.

Mitigation Strategies for PPP Risks

Comprehensive risk identification and assessment represent the key first steps to develop strategies to mitigate the risks associated with a public-private partnership (PPPs). Comprehensive information about the project features and the collaboration parties should be obtained, including the historical PPP knowledge of the concerned public authority. This will help with the identification of past risks that materialized and thus utilize them as a benchmark. This risk identification activity should usually be carried out in coordination with stakeholders and external advisors. Detailed data about similar financing projects or the context of executing a project similar to the intended one might be sought (Mohsen Korayem, 2017). Reliable risk identification might indeed require adopting a model or instrument that is capable of widely covering most of the trappable risks. As a rule of thumbs, it is important to tailor the method selected according to the project characteristics and the knowledge levels of the participants in the analysis.

After accumulated risks are itemized and listed, they should be assessed to evaluate their magnitude and their likelihood to occur. Not all the accumulated risks share the same characteristics in terms of the severity of their impact, the time-period in which they might occur, and their social acceptability by public opinion. Therefore, a multidimensional risk assessment exercise should be conducted, with risks divided into target socio-economic categories. The assessment outcomes should invariably be used to determine the required level of risk buffer in the financing structure and to better select the banks. External banks' advisors might also verify the assessment quality and evaluate the scenarios adopted to devise suitable risk instruments. The un-conventional instruments available for executing such an activity shall also be recognized, with this activity being mostly related to innovative financial mechanisms or initiatives. If the project might affect some disputed areas, possible mitigation instruments should be devised in advance and possibly be enclosed in the financial agreements.

Risk Identification and Assessment

Recognizing and managing risks is often the most challenging function in public-private partnerships (PPPs) implementation. PPPs require significant investments, while providing substantial returns on investments. This situation makes PPPs attractive to both the public and private sectors. The stakes and risks are high. If one or both sides do not manage these investments and potential risks carefully, the consequences or losses can be substantial. The risks are magnified when each party is engaging in an endeavor it is not experienced in. In the case of PPPs, the public sector is venturing into private sector business, and for the private sector, it is venturing into operations in the public realm. Managing these risks in both realms requires a lot of skills and patience.

For PPP schemes to prosper, it is essential to accurately recognize the potential risks at the project's inception in order to enhance decision-making (Mohsen Korayem, 2017). As risks can vary depending on the scope and nature of the project as well as the broader social-political context, there are a variety of techniques and frameworks for the systematic identification and categorization of risks. It is important that different stakeholders are engaged in the process as they may have differing perceptions of risk. An effective risk assessment is a combination of thorough analysis of the project documents and ongoing analysis of the project execution. Where an appropriate framework is in place, such analysis can be conducted regularly at key project milestones and updated as necessary.

Continuous monitoring of potential risks throughout the life cycle of the project allows emergent risks to be determined and addressed with the provision of countermeasures in a timely manner. A transparent process is key to the development of a participatory project culture - everyone in the risk assessment process should be sure that his/her remarks are taken into account and that the required actions are understood. Two important tools for risk assessment are the risk matrix and scenario analysis. The risk matrix provides a snapshot of the project's risks profile, while scenario analysis permits a simulation of a variety of risk management scenarios to understand their positive or

negative impact. These methodologies and tools allow for more consistent and proactive project risk assessment, management, and monitoring.

Challenges Faced in PPPs

Within the infrastructure sector, they commonly take the form of contracts in which a private party designs, builds, finances, operates, and/or maintains the assets (typically on behalf of a public sector client) (Skelcher, 2010). PPPs have been leveraged globally since the 1990s to attract private investments into infrastructure and deliver, maintain, and operate public services—leading to a more efficient allocation of risk and resources. PPPs can take many forms, with contracts and risks distributed in a variety of ways. Yet common to all forms is the challenge, for the involved parties, of acting in concert when responding to the diverse risks and pressures posed by the projects (Nwangwu, 2021).

The execution of PPPs can be fraught with a myriad of challenges, whether internal or external to the partnership. The former relate to the soundness and robustness of the agreements underwriting the projects, while the latter relate to the economic, financial, and political factors impacting the stakeholders on a project. These agreements, or contracts, define the distribution of risks, rights, and obligations between the public and private partners over the project term, but more importantly detail the distribution of financial risks between public and private sectors.

However, the pace and complexity of PPP contracts have often been seen as obstacles to the effective execution of PPPs, leading to misunderstandings on the content and delays in reaching agreement, which can ultimately predispose to conflicts with the emergence of claims, start-up delays, and projects deduction. Many problems in the execution of PPPs are commonly related to the behavior of the parties, including inadequate risk assessment, poor knowledge of the projects, unrealistic expectations, and timing. This underlines the importance of setting clear objectives, engaging in an open dialogue, and fostering balanced and transparent agreements that can only be achieved through an early and structured program engagement.

Conclusion

This study shows that the effectiveness of Public–Private Partnerships in Romanian and European national governance systems depends primarily on the ability of public and private actors to identify, allocate, and manage risks in a coherent and transparent manner. The qualitative analysis reveals that financial pressures, regulatory instability, limited administrative capacity, and fluctuating public acceptance remain the most significant obstacles affecting PPP performance. These risks are not isolated, rather they appear consistently across countries and stages of the partnership cycle. Based on the patterns identified, personally I consider that strengthening institutional capacity and improving regulatory coherence are essential steps for enhancing PPP sustainability. The evidence examined throughout this research suggests that projects perform better when responsibilities are clearly defined, when risk allocation frameworks are consistently

applied, and when cooperation between partners is built on transparency and information sharing. Overall, this study contributes to the literature by synthesizing the principal risk determinants that shape PPP outcomes and by outlining practical directions for improving governance and implementation.

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DECARBONIZATION AS A BUSINESS OPPORTUNITY FOR SMEs AND MNCs IN THE INTERNATIONALIZATION PROCESS AND THE OIL AND GAS AREA TO REDUCE CO2 EMISSIONS

Anis BENABED*¹

Abstract: *This paper presents and analyzes the process of decarbonization as a new key business industrial process for the industrial and energy sector; as an alternative business opportunity and partnership for Small and Medium Sized Enterprises (SMEs) and Multinational Companies (MNCs) or Global Companies (GCs) as large companies. Decarbonizing and reducing the CO2 emissions means contributing to sustainability in the carbon market and globalization. The author set the following research questions to structure the research: Could CO2 emissions be a useful for companies' business partnership in globalization? Can decarbonization be a business opportunity for innovative SMEs to lift their status? How can SMEs and large companies such as MNCs and GCS collaborate in the carbon market for decarbonization? Could CO2 help in regenerating fossil fuels such as oil and gas in globalization? The methodology of research based on designed conceptual frameworks to design and illustrate the process and its values linking the related literature review to the part of research and analysis. The results showed that CO2 emissions could be a business opportunity for companies especially innovative SMEs in the decarbonization process and the carbon market. However, Small and Medium Sized Enterprises should seek some help and support by large global and multinational companies in order to survive in this operational process. Large companies will need the innovative perspectives of SMEs and SMEs will need large companies for funding their process and rise in the internationalization process. The conclusions showed that the carbon market needs CO2 emissions as a business option, Oil and gas are main energy resources worldwide that is why their use is necessary. Companies such as Innovative SMEs may collaborate with MNCs in the carbon market and the energy sector to regenerate them for an alternative energy storage and satisfaction in case of crises. Companies that engage in this process are able to participate in both processes of sustainability and internationalization to advance globalization to a better phase with business values and energy satisfaction.*

Keywords: *Decarbonization, globalization, business values, scalability, SMEs, company, internationalization, Multinational companies (MNCs), sustainability,*

JEL Code: *F23, F60, F63, F64 L71, L95, M13, Q01, Q02.*

UDC: *[620.9:334.7.012.6]+[504.05:551.588.74]*

Introduction

Globalization relies on energy resources in its process since one of its biggest dimension is economic globalization. The reality of energy satisfaction has been a challenge to the global economy since energy is one of the main engine of the global economy.

For more than a decade globalization has been facing a decline in its process and dimensions moving towards the phase of Slowbalization or as it is called economically deglobalization. Climate change has been one of the main issues in deglobalization due to

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its importance. Worrying about energy efficiency and satisfaction has led many advanced economies that lack energy resources in their land to think over the importance of fossil fuels and present more interest in renewable energy resources. However, renewable energy resources remain difficult and expensive to generate and use compared to the benefits and advantages of energy that comes from oil and gas as main energy resources globally. Renewable energy resources remain weak and alternatives for many economies in front of coal, oil and gas. Oil and gas companies cannot abandon their equipment for fossil fuel and energy business to follow only renewable energy resources but they may save their potential and existence for fossil fuels and incorporate renewable energy resources as auxiliaries for their business resources and values.

Decarbonization could be a great business initiative for oil and gas companies since it bases on reducing the CO₂ emissions in the atmosphere. Carbon Capture and Storage (CCS) is relevant for decarbonization and the carbon market because it helps global and multinational large energy companies to transform the captured CO₂ to fossil fuels using the power of renewable energies as clean energy resources. CO₂, oil and gas are important for many industrial operations that is why it is barely impossible to give up on them.

Innovative Small and Medium Sized Enterprises (SMEs) could focus on decarbonization as a business perspective for their internationalization and multinationalization process but they need the help of multinational companies (MNCs) to rise. MNCs could help fund and incorporate SMEs in their business or lift them for mutual partnership especially if they innovative.

This research paper aims at demonstrating the value of decarbonization as a business potential option for SMEs to grow focusing on a relevant partnership with large companies such as multinational companies (MNCs). This research shows the process of decarbonization as a business opportunity to regenerate fossil fuels and use CO₂ as a business opportunity for more innovation in the energy industry and the carbon market. Since CO₂ emissions are considered a symbol of deglobalization together with the phenomenon of climate change, using them to regenerate other energy resources in a clean way would be a great opportunity for companies business and internationalization process.

This full paper is a continuous complementary designed research to the author's prior published doctoral research, it is an original actual chapter that could be added to what was published before by the same author and other ones from the same research area.

Related literature review

Globalization, Internationalization, Slowbalization and AI for business trends

The increasing challenges in the global economy have led globalization to move towards the processes of de-globalization and slowbalization (Benabed, 2024). The main factors contributing to the slowdown of globalization include the ups and downs of global GDP (Benabed, 2024). The reality of inequality between economies creates a gap in business values (Benabed, 2024).

Today, the world faces the reality of thinking machines with programmed hardware or software that perform specific designed processes in shapes of artificial intelligence. Hence, artificial intelligence (AI) is the ability of a machine or virtual program to mimic intelligent behavior (Benabed and Tudoran, 2023). Promoting corporate resilience is highly important in business and the internationalization process of companies (Benabed, 2023a). Companies need to rely on the creation of suitable resilience models to mitigate the expected and unexpected risks (Benabed, 2023a). Companies may introduce their conditions in any foreign market and location where they intend to operate because will enhance their competitiveness especially in close markets that lack competitors (Benabed, 2023b).

In the age of globalization and its challenging aspects, strong market forces and companies that directly aim at having long-term customers, profits, business protection and resources have to focus on sustainable business and sustainability aspects (Benabed and Boeru, 2023). Internationalization enables companies to secure competitive advantages by expanding their presence in international markets (Benabed 2023c). Therefore, careful planning of these strategies is essential, as it forms the basis for entering new markets and increasing added value, profit, customer base, and revenue (Benabed, 2023c).

Decarbonization, fossil fuels and renewables

Fay et al (2015) argue that the most important question is to focus on the possible technological options that are at acceptable costs since the process of decarbonization is difficult for the sectors of industry and transport (Fay et al., 2015). Lechtenbohmer et al (2015) states that the decarbonization of the industrial and transport sectors is not discussed yet at the economic scales, it lacks the focus on the economic issues and it needs significant low carbon investments in both emerging and industrial economies (Lechtenbohmer et al., 2015). While Gielen et al (2017) argue that reducing fossil fuels is a complex process for such sectors since they are main energy resources for it (Gielen et al., 2017).

Kroposki et al (2017) add that decarbonizing the energy sector has been a crucial research topic with increased attention due to its relevance (Kroposki et al., 2017). However, implementing renewable energies could be the most compatible option for companies (Kroposki et al., 2017).

The international Energy Agency (IEA) affirmed in 2009 that since many derived elements that come from petroleum energy are important, oil remains important even for the future use due to its essential demand (International Energy Agency, 2009). Furthermore, Oil accounts for the largest share of primary energy demand globally that is why liquid and gas (International Energy Agency, 2009).

CO₂ emissions in tests and production

Real World (RW) emissions are a crucial indicator since they show and reflect the vehicles environmental impact, the driving patterns and actual use that are neither seen nor captured in labour tests (Tu et al, 2012). The traffic and environmental state, temperature ad road types provoke more CO₂ emissions (Ghaffarpasand and Pope, 2013). There are disparities between official and real world (RW) emissions that appear observed globally.

Japan reduced vehicle fleet by transiting to a WLTP standardized laboratory test that estimates and counts the consumed emissions and its electric range to ensure harmonized results (Tanishita and Kobayashi, 2021).

Prior research reported that there are various gaps among countries due to the differences between the type approval series of steps and real world (RW) conditions (Tietge et al., 2017). Fitzmaurice et al (2022) state that vehicles are exposed to diverse road conditions requiring a variability in fuel consumptions and CO₂ emissions (Fitzmaurice et al., 2022). According to Pavlovic et al (2020) there are three main factors that can characterize the vehicles' operations in function with the CO₂ emissions. These factors could be environmental traffic influences, vehicle related and driver related aspects (Pavlovic et al., 2020). Fontaras et al (2017) argue that the worldwide harmonized light vehicles' test procedure (WLTP) lowered the discrepancies focusing on conditions and relevant protocols (Fontaras et al., 2017).

Cheng et al (2023) argue that decreasing the level of CO₂ emissions that come out from cement production is critical due to the fact that a significant amount of emissions increases from the process of calcination of limestone that is a basic chemical process for cement production (Cheng et al., 2023). In this process, the released CO₂ emissions cannot be reduced through the application of traditional methods or energy innovation alone. Besides, as there are disparities in traditional cement production and those that come out from obsolete technologies and low-quality operational management may obviously lead to other additional CO₂ emissions (Khairyum et al., 2023).

The International Energy Agency (IEA) predicts that the percentage of cement demand will rise by at least 12-23% by 2025 in many Asian and South African regions (Monteiro et al., 2017). However, this process could increase the amount of CO₂ emissions; for this reason, the Global Cement and Concrete Association (GCCA) following the Paris agreement requirements proposed zero net cement emissions by 2025 (Kajaste and Hurme, 2016). Thus, this case will require more attention because increasing cement production will produce more CO₂ emissions in the upcoming years, it will require various decarbonization and CO₂ reduction strategies in the cement production industries (Kajaste and Hurme, 2016).

Data and Methodology

The methodology of research relied on the incorporation of a related literature review to the body and structure of this full paper together with the application of both quantitative and qualitative research approaches (see figure 1).

Figure 1 illustrates the main phases of the author's designed research methodology where phase 1 started by establishing the main the research questions of the full papers (RQs) of the paper since they are essential to structure the paper and identify its results and analysis.

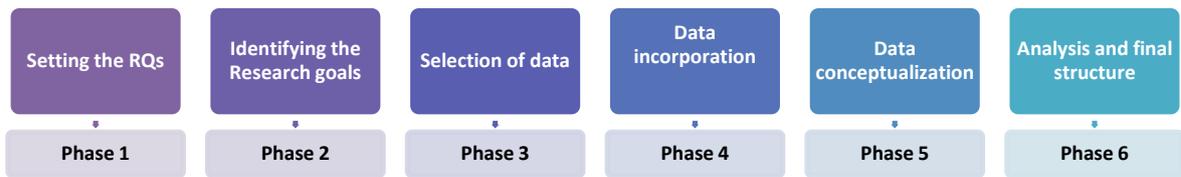


Figure 1. Main phases of the author's designed research methodology

Source: Author's design and research, 2025

In phase 2, the author identified the main research goals to optimize and boost the research relevance and analysis (see figure 1). In phase 3, the author selected the relevant data for the literature review in qualitative way from the relevant international scientific databases together after a filtration process to exclude the unnecessary details. In phase 3, the author selected as well the most relevant related numerical data in statistics' approach (see figure 1). In phase 4, the author incorporated the relevant theoretical and numerical data in the body of the research paper. After that, in phase 5, the author embodied the conceptual designed data in a shape of models and frameworks following the design thinking approach. Sixth, the author in figure 6 started the analysis and structure of the results in accordance with the literature review (see figure 1).

The qualitative research approach relied on the use conceptual frameworks to illustrate the author's designed ideas following the design thinking concept. The studied figures illustrates various relevant data for the analytical aspect of the research paper where figure 2 illustrates the global GHG emissions from 1970 to 2024 in billion metric tons of CO₂. Figure 3 illustrates the accruing CO₂ emissions from land and fossil fuels' use globally from 1850 to 2023. While figure 4 illustrates the amount of CO₂ emissions from land and fossil fuels' use globally from 1850 to 2023. Figure 5 shows and presents the global crude oil global demand in the period of 2005 and 2024 with a 2025 forecast and a complimentary point figure 6 presents the 2023 Global number of jobs by commodity type in millions. Conceptually, the author designed figure 7 to illustrate the useful steps for companies wishing to engage in decarbonization with internationalization partnership. Additionally, in figure 8 the author designed a suggested a business internationalization Partnership Model between MNC and SMEs for Decarbonization and Sustainable Business.

The author set the following research questions to start and go further with the research:

- **RQ1:** Could CO₂ emissions be useful for companies' business partnership in globalization?
- **RQ2:** Can decarbonization be a business opportunity for innovative SMEs to lift their status?
- **RQ3:** How can SMEs and large companies such as MNCs and GCS collaborate in the carbon market for decarbonization?
- **RQ4:** Could CO₂ help in regenerating fossil fuels such as oil and gas in globalization?

The main research goal of this full paper and research is demonstrating the value of decarbonization as a business potential option for SMEs to grow focusing on a relevant partnership with large companies such as multinational companies (MNCs). This research shows the process of decarbonization as a business opportunity to regenerate fossil fuels and use CO₂ as a business opportunity for more innovation in the energy industry and the carbon market. The research is independent, original, and presents the interconnection between scientific research and practical analysis. The article uses current literature and cites relevant sources.

Results and analysis

1. Data illustration and Analysis

Figure 2 illustrates the global greenhouse gas emissions (GHG) in the period of 1970 to 2024 in billion metric tons of CO₂. It is observed in figure 2 according to the available illustrated data that the number of CO₂ emissions has been constantly increasing. If we check the year 1970, the number of global GHG emissions was 23.23 billion metric tons. However, if we check the data of 2024, we see that the number is 53.21 billion metric tons.

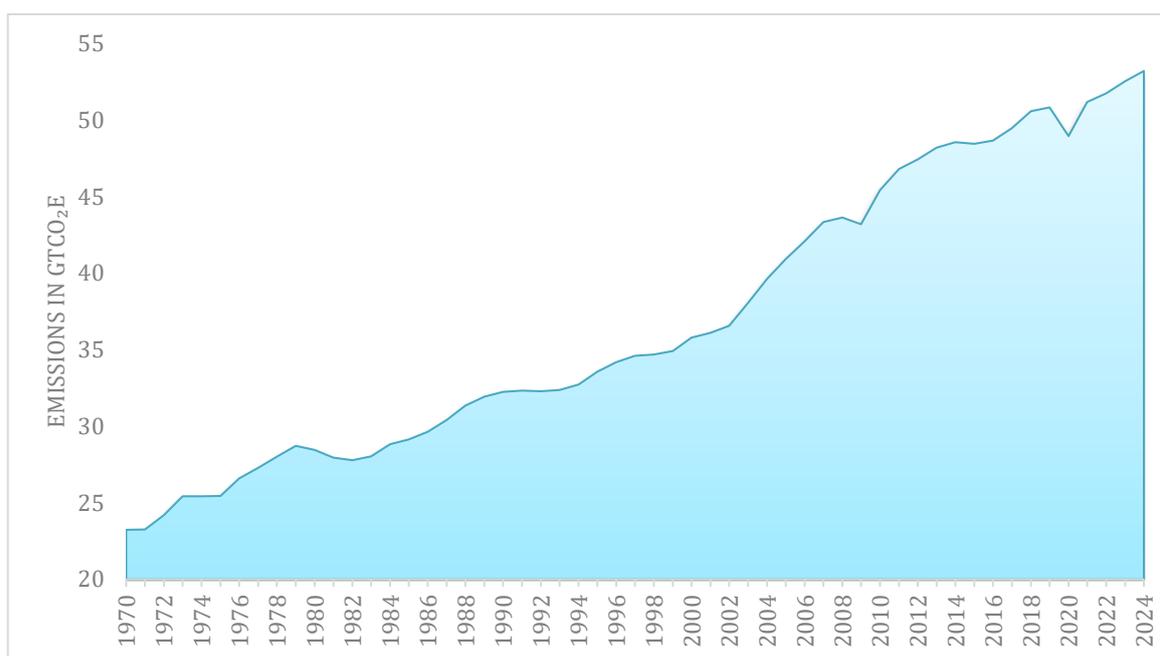


Figure 2. Global GHG emissions from 1970 to 2024 in billion metric tons of CO₂

Source: Author's contribution, IEA data, Statista data, 2025

The increase of global GHG CO₂ emissions is related to the increase in industrial use and technological emergence. Other factors that have been increasing the number of CO₂ emissions could be the high deforestation in many areas globally and the rise in carbonization by the means of transport, the extensive use and production of fertilizers in the agricultural sector as well (see figure 2).

Figure 3 illustrates the accruing CO2 emissions from land and fossil fuels' use globally from 1850 to 2023. We observe that the US is the first in the list with the amount of CO2 emissions from fossils with 431.7 billion metric tons but Brazil is the first with the amount of CO2 emissions from land with 121.3 billion metric tons.



Figure 3. Accruing CO2 emissions from land and fossil fuels' use globally from 1850 to 2023

Source: Author's design 2025, OWID and Global Carbon Project data 2024, Statista data 2024

Germany appears as the only country from the list with low accumulated CO2 emissions from land with -0.2 billion metric tons and with 94.3 billion metric tons. The country with the lowest amounts of accumulated CO2 emissions from land are Germany, the UK and Japan. The countries with the highest accumulated CO2 from fossil fuels' use are the US, China, Russia, Germany, the UK and Japan. After analysing the available data, we consider that the accruing CO2 emissions from fossils are related more to the industrial operations since all the mentioned countries with the highest amount are global energy industrial economies. Whereas, the economies with the highest accruing CO2 emissions from land use such as Brazil and Indonesia could be facing crowded transport activities with less renewable opportunities and emit more CO2 through the transport and agricultural activities (see figure 3).

Figure 4 illustrates the accruing CO2 emissions from land and fossil fuels' use globally from 1990 to 2024 according to the available data. According to the illustrated data, the sector of power industry has been the biggest sector with the number of accumulated CO2 emissions. It followed by the sectors of transport, fuel exploitation and agriculture.

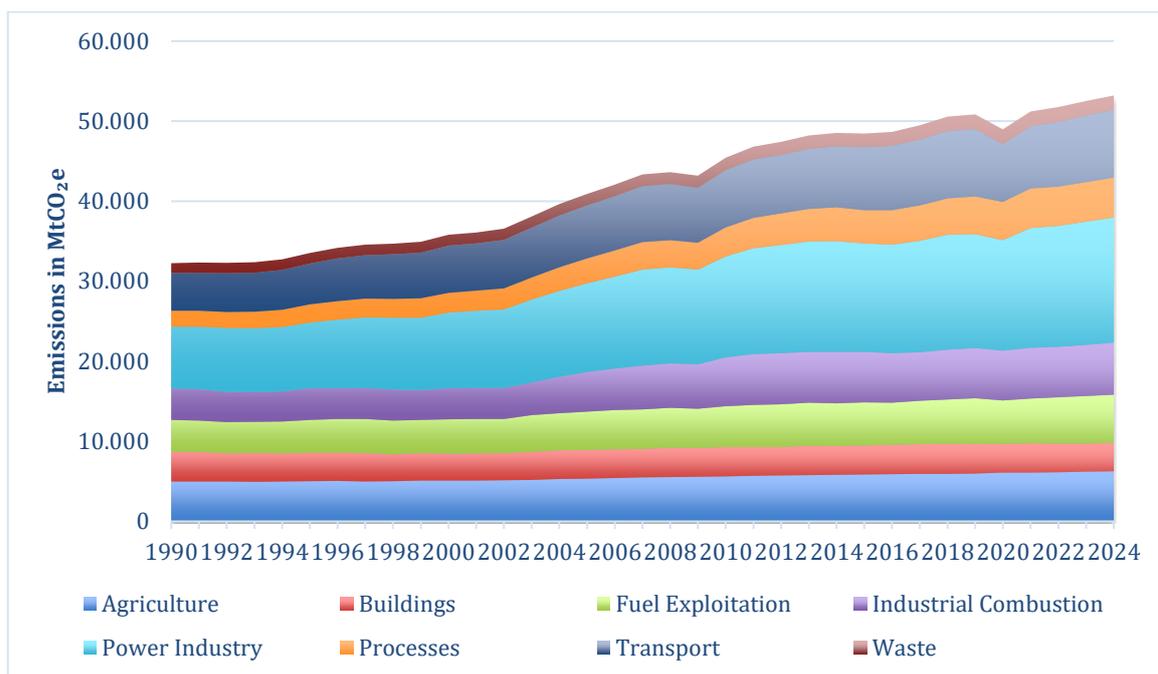


Figure 4. Accruing CO₂ emissions from land and fossil fuels' use globally from 1850 to 2023

Source: Author's design, OWID data, World Bank data, 2025

The areas that contribute and accumulate more CO₂ are the ones of agriculture, fuel exploitation, industrial combustion, transport, building activities accumulated waste and processes (see figure 4). All these area are major business field for companies and if they generate more CO₂ emissions, they have to take majors in tackling climate change by participating in the carbon market and the decarbonization process either by funding the decarbonization projects of other companies or by having assets at least in a decarbonization project with scalability.

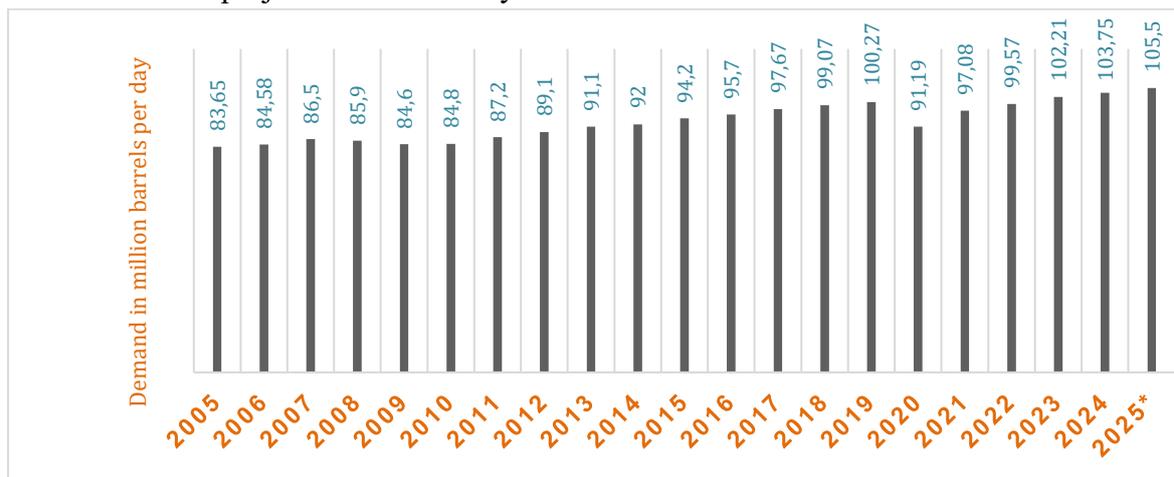


Figure 5. The crude oil global demand in the period of 2005 and 2024 with a 2025 forecast globally

Source: Author's design 2024, OPEC data 2024, Statista data 2023.

Figure 5 illustrates and shows the crude oil global demand in the period of 2005 and 2024 with a 2025 forecast. The constant increase in oil demand worldwide shows the importance of the energy source globally for companies, economies, markets and the energy sectors.

As we observe in figure 5 since 2005 the oil demand has not declined to zero, it has been constantly increasing from 83.65 million barrels per day to 103.75 million barrels per day in the late 2024 according to the available data (see figure 5).

Many economies still claim energy satisfaction due to the rise in transportation costs and low investments' opportunities. The recoil of globalization to slowbalization has affected the stability of oil and gas production in times of financial crises such as the financial crisis of 2008 and the global widespread of the covid-19 pandemic in 2019 and 2020. The periods of geopolitical conflicts have affected the stability of crude oil transportation and its negotiation process globally (see figure 5). In 2020 we observe that the number of demands on oil barrels declined to 91.19 million barrels per day from 100.27 million barrels per day in 2019, this huge gap and difference shows the impact of the Covid-19 pandemic on the crude oil demand globally. Hence, a decarbonization business process by local energy companies could be an alternative solution in these cases of crises for companies and economies to avoid waiting to receive the energy supply in hard times.

Figure 6 illustrates the 2023 global number of jobs by commodity types in oil, natural gas and liquefied natural gas (LNG) in millions. According to the available and illustrated data in figure 6, we notice that the number of jobs in the oil sphere was really high with a value of 8.27 million jobs, it is even higher than the number of jobs in the natural gas field that was 4.13 million jobs and the number of jobs in the LNG field that was 0.61 million jobs in 2023 (see figure 6).



Figure 6. The 2023 Global number of jobs by commodity type in millions

Source: Author's design 2024, IEA data 2023, Statista data 2023.

A high number of jobs in these global commodities shows their importance and relevance in globalization and its energy sectors. Skilled individual in these commodity areas will never quit their jobs and move to renewable energy jobs since are well prepared to participate in this kind of energy generation that still appear useful for many industries globally (see figures 5 and 6).

2. Data conceptualization and analysis

Decarbonization is a complex process to reach but it could offer many future opportunities to companies, economies and markets as an alternative way to energy storage and transformation. According to this research decarbonization could help in energy distribution and auto-generation based on the idea of carbon capture and storage (CCS). It may be a relevant approach for energy efficiency if it relies on the use and incorporation of renewable energy resources to advance them. It needs also the incorporation of artificial intelligence (AI). Decarbonization is a key aspect for companies' success and it should rely on the quality and opportunities of investments that have the power to lift break its limits in business with more values and competitiveness. It is a type of business and it should rely on creative models in order to be applied for short and long terms. Companies should define and identify suitable models and strategies in order to reach an impacting leadership style in the both industry and carbon markets.

Decarbonization as a business project should rely on the implementation of creative recent innovative technologies. Thus, innovative SMEs may contribute to this by investing their innovative aspects and endeavours in this kind of initiatives for business values. SMEs may learn in this kind of contribution to strengthen their existence and long-term profit. However, they should rely on the help of large companies such multinational, global or transnational companies that may fund their innovations and help them grow more.

Figure 7 illustrates some useful steps for companies that wish to engage in the decarbonization process. As illustrated in figure 7, companies have to start with an analysis and investigation of the suitable locations for decarbonization, they need to check and focus on their internalization abilities. In case they lack financial satisfaction to fund their process, they have to look for internationalization partnership for funds. Taking the case of SMEs, once they are innovative for this kind of process, they may get incorporated in the multinational or global process of internationalization by either MNCs or GCs that are engaged in the energy area and the oil and gas industry (see figure 7).

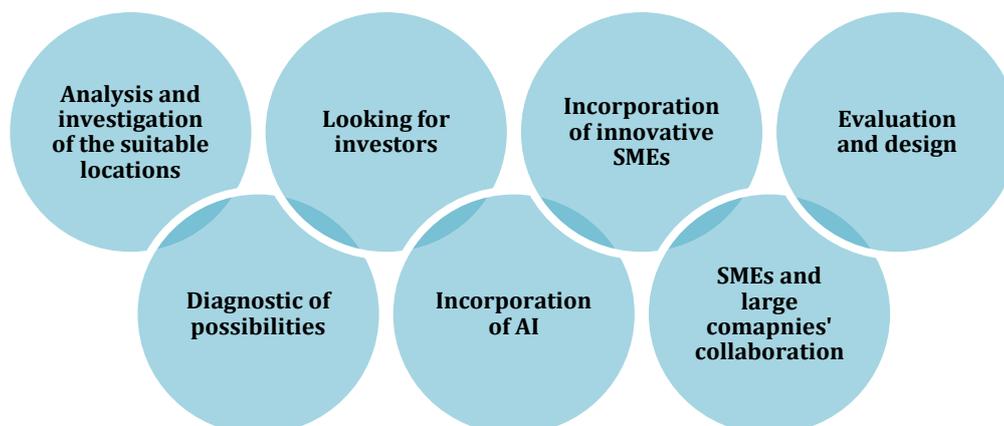


Figure 7. Useful steps for companies wishing to engage in decarbonization with internationalization partnership

Source: Author's design and research, 2025

All companies that engage in the decarbonization process have to keep in mind that it is a huge business opportunity for business worth and values in case they base on cooperation, experience exchange and the internationalization process. However, they have to evaluate and design carefully their steps and strategies with novel models to avoid losses and conflicts. Preparing and making up a diagnostic of possibilities for the steps and developed partnership will be a great opportunity for the engaged companies to check their advances and losses in the process. Any business opportunity scales between profits and losses that is why for many companies the case of cooperation with other companies will be necessary for mutual survival. Since Artificial Intelligence (AI) has become highly important, it is highly important for energy security and automation with the decarbonization process, AI incorporation is a key for companies' partnership and mutual trust, it is necessary to detect the possible risks during capturing and string the CO₂ emissions, the whole decarbonization process and the operations of business internationalization (see figure 7).

The Oil and Gas partnership model for CO₂ incorporation and decarbonization between SMEs and MNCs

Figure 8 illustrates the author's suggested Oil and Gas partnership model for CO₂ incorporation and decarbonization between SMEs and MNCs since MNCs can use the decarbonization process as a great opportunity for their foreign direct investments (FDIs).

As illustrated in figure 8 Small and Medium Enterprises (SMEs) and Multinational Companies (MNCs) may contribute together to the decarbonization process taking this option as a business opportunity for their internationalization process (see figure 8).

Reducing the CO₂ emissions in the atmosphere through the Carbon Capture and Storage (CCS) offer the global environment more climate security and energy storage.

Technically, the captured stored CO₂ emissions may be used to regenerate fossil fuels and oil since they are still considered main energy resources globally. The designed illustrated model in figure 8 shows that SMEs and MNC may collaborate together for mutual survival and common benefits in the carbon market and the internationalization process (see figure 8). Small and Medium Sized Enterprises (SMEs) may be lifted by Multinational companies for their innovative skills and relevance in the business of decarbonization of the energy sector, they may be merged or purchased by them with the foreign direct investment process (FDI).

Since Multinational companies (MNCs) are famous and known for their goal of foreign direct investments according to the prior research and publications by the author of this paper and other authors as well; SMEs can benefit from their experience in their locations by guiding them in case the lack knowledge and experience in the locations of SMEs (see figure 8).

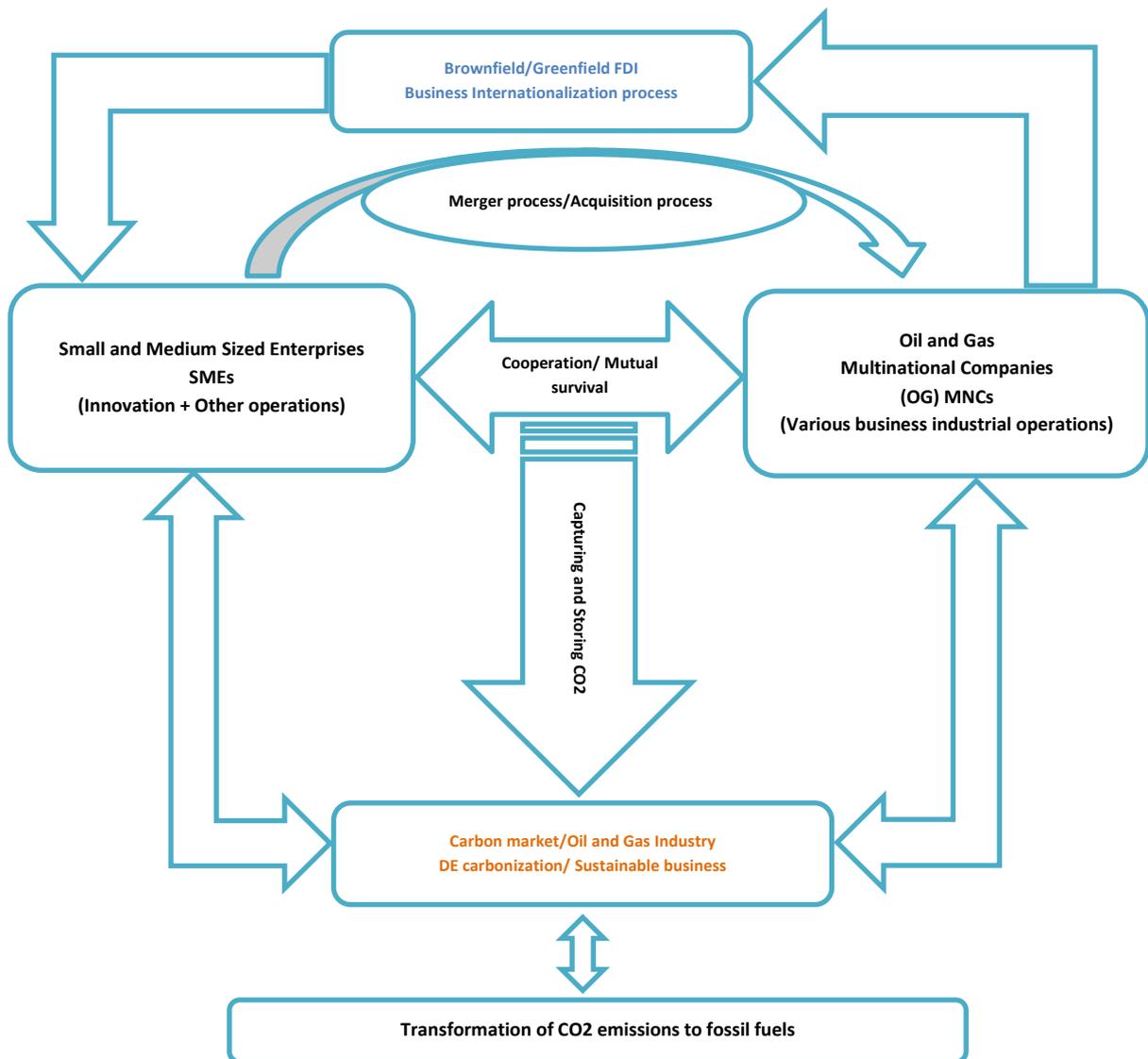


Figure 8. Suggested Business internationalization Partnership Model between MNC and SMEs for Decarbonization and Sustainable Business

Source: Author's own design and doctoral research, 2024-2025.

Foreign direct investments (FDIs) are good for foreign locations because they engender various benefits and renew the infrastructures. They could be Brownfield or Greenfield FDIs since they symbolize the process of internationalization of multinational companies (MNCs). The model of figure 8 shows the decarbonization process and a business opportunity for a mutual collaboration between MNCs and the SMEs of different locations for sustainability and tackling climate change consequences. Hence, this way companies that engage in this process are able to participate in both processes of sustainability and internationalization to advance globalization to a better phase with business values and energy satisfaction (see figure 8).

Conclusions

In conclusion, decarbonization appears an important process for business and raising companies. All companies that engage in the decarbonization process have to keep in mind that it is a huge business opportunity for business worth and values in case they base on cooperation, experience exchange and the internationalization process. However, they have to evaluate and design carefully their steps and strategies with novel models to avoid losses and conflicts.

Companies such as SMEs and MNCs will need to rely on innovative perspectives to rise in the internationalization process. The carbon market needs CO₂ emissions as a business option, Oil and gas are main energy resources worldwide that is why their use is necessary. Companies such as Innovative SMEs may collaborate with MNCs in the carbon market and the energy sector to regenerate them for an alternative energy storage and satisfaction in case of crises. Companies participating in the process can contribute to both sustainability and internationalization; thereby, advancing globalization in terms of economic and energy efficiency. Reducing CO₂ emissions through carbon capture and storage (CCS) offers greater climate security for the global environment and enables energy storage.

Technologically and chemically, the captured stored CO₂ emissions may be used to regenerate fossil fuels and oil since they are still considered main energy resources globally. Decarbonization as a business project should rely on the implementation of creative recent innovative technologies. Thus, innovative SMEs may contribute to this by investing their innovative aspects and endeavours in this kind of initiatives for business values. SMEs may learn in this kind of contribution to strengthen their existence and long-term profit. However, they should rely on the help of large companies such multinational, global or transnational companies that may fund their innovations and help them grow more. The full paper answers all the research questions and points out that CO₂ emissions could be a useful for companies' business partnership in globalization and decarbonization can be a business opportunity for innovative SMEs to lift their status. SMEs and large companies such as MNCs and GCS may collaborate in the carbon market for decarbonization. CO₂ help in regenerating oil and gas in globalization companies collaborate for that in the carbon market and the internationalization process.

The research is independent, original, and presents the interconnection between scientific research and practical analysis. The article uses current literature and cites relevant sources.

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USE OF BLOCKCHAIN/WEB.3 (METAVERSE) TECHNOLOGY AT EU LEVEL: ESTIMATION OF THE INNOVATIVE LEVEL OF THE MOLDOVAN ECONOMY WITH A VIEW TO ASSIMILATING THESE TECHNOLOGIES

Maia PISANIUC*¹

Abstract: In 2016, the World Economic Forum recognized blockchain technology as one of the ten most important emerging technologies. Prior to this recognition, *The Economist* published articles about the "trust machine," introducing this remarkable technology to a wider audience. In order to understand the progress of blockchain technology and its current state, it is essential for countries to research these issues in relation to their economies. It is important to distinguish between theoretical blockchain applications and their commercial applications to assess the potential disruption of existing business models by blockchain technology. This article presents the European initiative in applying this technology and estimates the Moldovan economy's preparedness in this regard. To achieve this, we have set the following objectives: describing the principles and directions of the EU Blockchain/Web3 Strategy; conducting a comparative analysis of the level of innovation in the Moldovan economy with two EU member states; estimating the potential for future use of these technologies, and outlining the necessary skills and abilities. This research is relevant because it identifies the actions that the Moldovan economy must take to achieve a level of innovation and economic progress on par with the EU.

Keywords: blockchain, Web3, metaverse, EU Blockchain Web3 Strategy, digital skills.

JEL Code: O30, O32

UDC: [004.056.55+338.2:061.1]:330.341.1(478)

Introduction

Blockchain/Web3 technology allows individuals and organizations to trust each other without the intervention of a third party. By creating trust in data, blockchain has the potential to revolutionize the way we share information and conduct transactions online. The extraordinary innovation introduced by blockchain technology is that the network is open, and participants do not need to know each other to interact.

Electronic transactions can be verified and recorded automatically by network nodes using cryptographic algorithms, without human intervention, central authority, checkpoint, or third party: e.g., governments, banks, financial institutions, or other organizations (Pisaniuc, 2023).

Even if some nodes are insecure, dishonest, or malicious, the network is able to correct, verify transactions correctly, and protect the ledger from tampering through a mathematical proof-of-work system.

Web3. The metaverse would thus become the future general container for digital technologies. This position has become highly controversial. Particular emphasis has been placed on the commercial side of the metaverse and the search for new sources of profit for digital businesses (Floridi, 2022).

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However, recent developments show that additional profits are difficult to materialize. Zuckerberg's companies suffered considerable stock market losses in 2022. Meta Platforms is the largest social media company in the world. Meta, with its large user base, has gained a prominent role in the advertising space. But it faces stiff competition: not only from players such as Google, Amazon, and Twitter, but also Apple, YouTube, and Tencent.

Interest in the idea of the metaverse exploded in 2021-2022, triggered by Facebook's decision to change its name to "Meta". The word was coined by science fiction writer Neal Stephenson in 1992 in his novel *Snow Crash*.

In today's terms, the Metaverse is the domain of computer-generated and networked extended reality, or XR (Expanded Reality), an acronym that encompasses all aspects of augmented reality, mixed reality, and virtual reality (AR, MR, and VR). Currently, the Metaverse generally consists of somewhat immersive XR spaces where interactions between people and automated entities take place.

Some are everyday interactions with augmented reality applications that people have on their computers and phones. Others are interactions that take place in more immersive environments in games or fantasy worlds.

Some take place in "mirror worlds" that replicate real-life environments. The MV can be viewed as a network of virtual phytoigital worlds/spaces on a horse platform.

Virtual representations of a person's identity are adopted in this simulated environment: Avatars, which can be seen as the embodiment of MV users. The development of MV is closely linked to the evolution of the web, Mark Zuckerberg (2022) defined the Metaverse (MV) as "the embodiment of the Internet".

The Metaverse may represent the next iteration of the internet (Web 3.0), in which "the boundaries between our physical and digital lives are increasingly blurred", so that "the great debate on cryptography may be just a starting point on the journey to the Metaverse".

Based on global and European trends in this field, we wanted to assess the country's level of preparedness for alignment with European requirements and the implementation of these technologies in the economy. To this end, we wanted to discuss two key questions:

- Q1, What is the level of innovation in the Moldovan economy from the perspective of EU integration?
- Q2, What is the future potential for absorbing this technology, reflected in quantitative and qualitative indicators?

Literature Review

The field of research in question, that of disruptive technologies, is a new one for both foreign and domestic researchers. However, published works on blockchain technology tend to focus on describing these technologies and their areas of application, (Pilington; Crudu, 2017), (Secrieru et. all, 2024), or on studies related to products associated with blockchain technology, namely cryptocurrency. The blockchain contains a certain and verifiable record of every single transaction ever made. To use a basic analogy, it is easier to steal a cookie from a

cookie jar, kept in a secluded place, than stealing the cookie from a cookie jar kept in a market place, being observed by thousands of people (Crosby et. all, 2016).

In the opinion of many experts and specialists, some of whom are quoted in the article, this technology is synonymous with bitcoin or other cryptocurrencies Diffe W. Helman M. (1976). Blockchain-based applications are springing up, covering numerous fields including financial services, reputation system and Internet of Things (IoT), and so on. However, there are still many challenges of blockchain technology such as scalability and security problems waiting to be overcome.(Zheng et all, 2017)

The focus of this study is actually on how prepared the country's economy is to assimilate these technologies of the future. It estimates the innovative potential in terms of business sophistication and the ability to produce innovations now and in the future.

As a database, we used recent international publications in the field, the Global Innovation Index Report published by WIPO, the UNECE (United Nations Economic Commission for Europe) Report, and official EU documents. The opinions of researchers, experts, and entrepreneurs relevant to this topic are also presented.

The subject addressed in this article is the presentation of our own point of view on this topic, the selection of relevant comparable indicators for the countries compared, and the information that essentially constitutes the originality and added value of the publication.

Methodology

In the research process, we used quantitative methods, reflected in the analysis of data from global reports, as well as qualitative analysis by addressing the skills required to use blockchain technologies. We also used methods such as data analysis and synthesis, deduction, and forecasting based on globally recognized indicators. Critical analysis based on factual data.

In order to validate the results, we conducted a comparative analysis with two EU member states: Romania as a neighboring country, and Latvia. Latvia was chosen because it is a small country in terms of territory and population and has the most modest results in terms of innovation compared to Lithuania or Estonia. We considered these two countries to be the most relevant for the comparative analysis at the current stage of innovation in the Republic of Moldova.

Research results

First and foremost, we wanted to present the key ideas of the EU Commission's WEB 3 Blockchain Strategy. This strategy supports the use and development of key areas of blockchain/web3 technology in line with European values and regulations.

It creates improved trust services because blockchain solutions offer a high level of trust and are used in many projects, policy actions, and investments in research and development. The sectors of application are diverse: such as climate, energy, mobility, and agriculture. In this context, the technology must be sustainable and energy efficient.

Last but not least, blockchain technology should ensure compliance with strict EU regulations on data protection and privacy.

This technology aims to improve the evolving digital identity frameworks for individuals, organizations, and objects. It can contribute to the implementation of the EUDI framework and support other relevant authentication purposes.

Blockchain technology can provide a high level of cybersecurity. Most importantly, for blockchains and Web3 to be successful, they must be interoperable with each other and with other existing systems.

Transforming industries and cross-border public services in Europe

Together with big data, artificial intelligence, and the Internet of Things, blockchain can help transform industries and public services in Europe to address the dual challenge of digital and sustainable growth. By promoting decentralization, it is particularly relevant in the context of a fair, green, and sustainable post-COVID recovery. For example, blockchain technologies can be used to facilitate the monitoring and efficiency of supply chains.

Building a citizen-centered digital society

Blockchain can help us build a fair, inclusive, secure, and democratic digital economy in Europe - for example, as the infrastructure behind a more citizen-centered, privacy-oriented, and secure internet and digital single market, by supporting e-voting and proposing new decentralized identity models.

Blockchain is a key technology for sustainability

The first generation of blockchain was energy-intensive for updating the decentralized database. However, more advanced blockchain technologies today consume no more electricity than traditional databases. Through regulations, public procurement, and policy initiatives, the European Union is promoting sustainable blockchain technologies over unsustainable ones.

As the EU promotes increased sustainability in blockchain technologies, it also supports the role that blockchains can play in a more sustainable economy to help achieve the European Green Deal. The Commission recognizes the importance of legal certainty and a clear regulatory regime in areas related to blockchain-based applications. It is currently implementing a legal framework conducive to innovation through the regulation of the crypto-assets market.

The European Commission has introduced provisions on smart contracts in the Data and Electronic Registers Act of the EU Digital Identity Regulation to protect consumers and provide legal certainty to businesses. The European Blockchain Sandbox (EBS), launched in February 2023, supports 20 innovative blockchain projects each year, encouraging cross-border regulatory dialogue and seeking to prevent legal fragmentation (European Commission, 2025).

The EBS provides a framework for cross-border regulatory dialogue between regulators, supervisors, and blockchain innovators. The 2024 Best Practices Report, published after the first regulatory dialogues, explores their results.

The EU provides funding for blockchain research and innovation through grants and support investments. The Commission has funded around 200 research and innovation projects, for innovation and piloting web3 in various fields of application. Between 2016

and 2024, research and innovation (R&I) programs under Horizon 2020 and Horizon Europe (EC) have provided grants worth approximately €700 million for projects involving blockchain or ledger technologies.

The Commission, in partnership with the European Investment Fund (EIF), has provided €100 million to set up the first European investment fund for artificial intelligence/blockchain. The fund attracts additional private investment through venture capital funds. The total investment volume in the first phase is estimated to be between €500 million and €700 million. The EU, together with its member states, plans to expand the AI/blockchain investment fund under the InvestEU program and the Recovery and Resilience Facility.

The Metaverse economy. This type of economy will also consist, perhaps primarily, of peer-to-peer sales. Let's take Roblox as an example. On the platform, users have the ability to create their own games using Roblox's development tools. They can then monetize their creations by selling them to other users.

The Metaverse refers to the convergence of physical and virtual space, accessed through computers and facilitated by immersive technologies such as virtual reality, augmented reality, and mixed reality (Ball, 2022).

Described by proponents as the next iteration of the internet, this 3D virtual world is seen as a persistent, collective, and shared space where our digital facsimiles, or avatars, move freely from one experience to another, taking our identity and monetary assets with us.

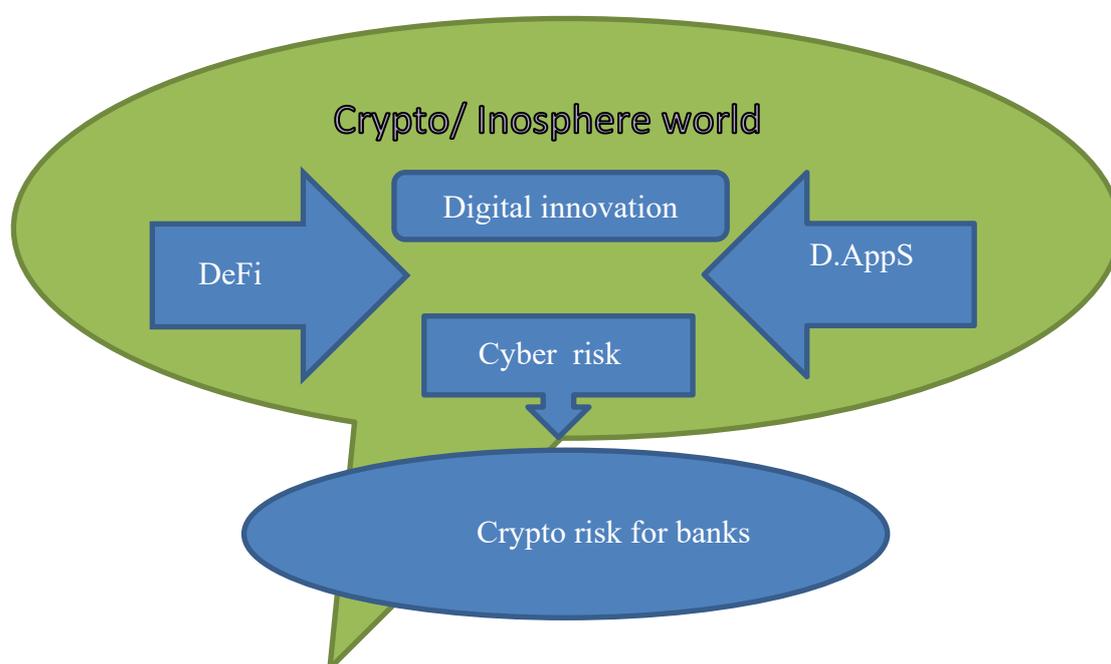


Figura 1. Layer of Metaverse

Source: Prepared by the autor inspired by the work Luciano Floridi Metaverse: a Matter of Experience (2022)

In the field known as the industrial Metaverse, exemplified by the Nvidia Omniverse platform, companies are building digital twins to design and monitor physical objects. Businesses are also using virtual reality (VR) to train employees and applying augmented reality (AR) to overlay information on real-world objects, helping their employees work better.

The growing interest and investment in augmented reality prompted the Pew Research Center and Elon University's Imagining the Internet Center to ask hundreds of technology experts to share their opinions on the topic. In total, 624 technology innovators, developers, business and political leaders, researchers, and activists provided open-ended responses to a question asking for their predictions about the trajectory and impact of the metaverse through 2040 (The Metaverse in 2040, report 2022).

The results of this survey:

- 54% of these experts said they expect the metaverse to be a much more defined and truly immersive and functional aspect of everyday life for half a billion or more people globally by 2040.
- 46% said they expect that by 2040, the metaverse will not be a much more refined and truly fully immersive and well-functioning aspect of daily life for half a billion or more people globally.

The Republic of Moldova has already approved its Smart Specialization Strategy for the period up to 2030. The directions and tasks of this strategy are:

- Focusing resources on those sectors where Moldova has natural competitive advantages or innovation potential (AgriTech, ICT, Energy, Biomedicine);
- Connecting Research with Industry: Stimulating joint projects (technology transfer) between universities, research institutes, and private companies;
- Infrastructure development: Creating and modernizing research and innovation infrastructure in the targeted areas;
- Integration into global value chains: Capitalizing on opportunities to connect innovative products and services to international markets.

The Specific Priority Areas are:

1. Agriculture and Agricultural Product Processing (AgriTech): Modernizing agriculture through technology.
2. Information and Communication Technology (ICT): Digital transformation, software development, and IT services.
3. Sustainable Energy: Focus on renewable sources and energy efficiency.
4. Biomedicine and Biopharmaceuticals: Development of the pharmaceutical and medical sector.

These are necessary things, but at the same time, the primary focus is on agriculture. There is not much emphasis on cutting-edge technologies. In this way, we believe it would be necessary to propose and implement AI Strategies and Blockchain Strategies. However, in order to see what we can propose, what steps we can take to move on to another stage of development more quickly.

Given the scope and interest in these technologies, we sought to evaluate the Moldovan economy's innovative potential. To this end, we analyzed the basic components of the country's GDP, specifically the percentage of industries, compared to EU member states. As shown in Table 1, the financial banking sector has a low share compared to countries with moderate economic levels within the EU, while the agricultural sector has a significant share.

This suggests that there is potential to develop the financial banking industry, which could be interested in using blockchain technology for more than just cryptocurrency.

Table 1. Share of industries in GDP, 2024, three countries compared

Indicators	Republic of Moldova	Latvia	Romania
Banking fin. service% GDP	16,8	21,7	20,9
Agriculture % GDP	8,2	4,6	3,1
Construction % GDP	8,3	6	8,8
Industry % GDP	12,2	15,2	19,1
Transport, communication, hotel service %GDP	34,1	28,6	30,3

Source: Prepared by the author based on UNECE report 2025

In order to deepen the analysis, we compared the level of innovation in our economy with that of the same EU countries, the intensity of the impact of knowledge, the collaboration between universities and local and European businesses, as well as the situation in cluster development. The situation shows a fairly significant gap between Moldova and countries such as Romania and Latvia. The relevant data can be seen in Table 2.

Table 2. Level of business sophistication

Indicators	Latvia	Romania	Republic of Moldova
Knowledge intensive %	47,7	35,5	19
GERD finance by business %	37,3	56,2	15,5
University industry. R&D collaboration%	40,1	31,4	8,6
Univ.industry international engagement%	26,1	16,6	0
State of cluster development	32,4	37,4	19,3
Research talent % in business	31,7	34,4	6,2

Source: Prepared by the author based on the GII Report 2025, WIPO

Although we are behind EU countries, we are taking steps to boost industrial innovation and establish connections between the research community and businesses. As disruptive technologies continue to develop and emerge, this connection will become even more important and absolutely essential. First and foremost, we must develop new skills among specialists.

Digital skills are crucial for Europe's future. The Commission is investing in Europe's citizens to ensure they have the digital skills to access, use, and develop the latest technologies. This includes blockchain technology, for which there are initiatives focused on developing the technical, commercial, legal, and organizational skills necessary for its prosperity in the region. We have discussed the need to prepare for the new technologies associated with Industry 5.0 in other papers, focusing on the revision of study programs and skills that also include aspects of blockchain (Pisaniuc, 2023).

Due to the complexity of the blockchain ecosystem, a wide range of blockchain occupations exist, each requiring different sets of skills. Figure 2 outlines how previously identified skills (with technological skills thresholds) might match different BC roles. For instance, BC Role 1 might refer to a BC Developer, who would need a strong basis of technological skills (expert level) and some transversal skills. While BC Role 3 might refer

to a position of a BC Manager, who would need a strong foundation in business and transversal skills and only some technological skills (general level). Therefore, designing a blockchain curriculum that fits all is not feasible. It is difficult to imagine a candidate who has strong business, cross-functional, and IT skills and an excellent understanding of industry specifics. Such individuals may exist, but they are rare. Companies should be aware of this and adjust their expectations accordingly. Building a blockchain curriculum is more of a journey than a one-time event, and blockchain training and education should be approached from a lifelong learning perspective.

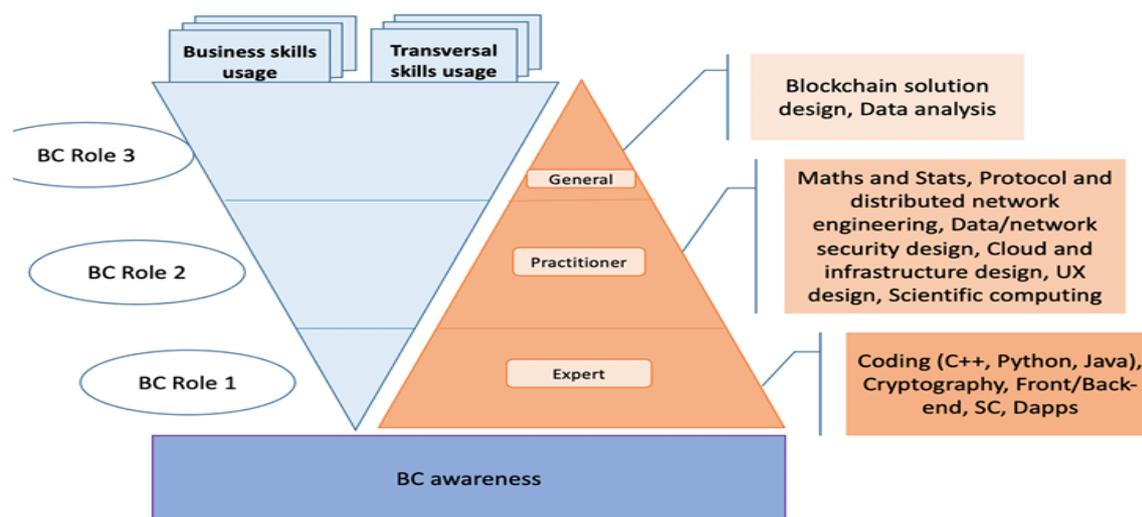


Figure 2. Cross-cutting and business skills of blockchain technology

Source: Taken from European document CHAISE_WP4_D4.3.1 Document title: D4.3.1 – European Blockchain Skills Strategy

The main mission of CHAISE, as a Sector Skills Alliance, is to address the skills gap in blockchain and develop a strategic approach to blockchain skills development in Europe. The lack of a comprehensive strategic vision and holistic governance hinders the potentially broad, catalytic effects of government support. Innovation policy needs an intergovernmental coordination mechanism, such as a National Innovation Council, to guide and align innovation policy efforts. The potential for innovation at the subnational level, although partially addressed by regional smart specialization initiatives, remains largely untapped. Increasing the capacity of local authorities to systematically experiment with, facilitate, and promote innovation, including by scaling up existing successful initiatives, will be essential. These efforts should build on recent decentralization reforms, clustering efforts, and donor-supported pilot projects (e.g., StartUp City Cahul, Tekwill), and include subnational authorities in national-level governance through the National Innovation Council.

In order to assess the future potential of economic innovation, we analyzed the number of researchers, and our situation is better than Romania's if we compare it to the population size. However, we would like to mention the advanced average age of researchers. Another problem associated with this indicator is that some researchers in these

two countries are employed in business, so the proportion of talent in business is higher in Latvia (around 31.7%), Romania (34.2%), and the Republic of Moldova (6.2%).

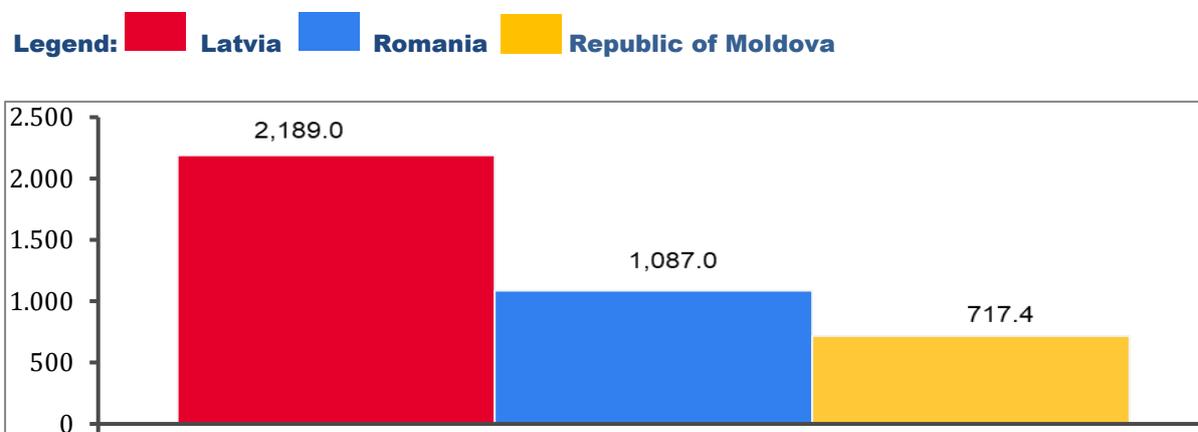


Figure 3. Number of full-time researchers in 2024

Source: Prepared by the author based on GII 2025, WIPO

In order to further the study, we analyzed education funding to assess the country's current actions. The results show that we have made the most progress, confirming the awareness of the need for quality education, because education is the essential pillar of innovation.

Table 3. Level of funding, share of education in the economy, 2024

Indicators	Latvia	Romania	Republic of Moldova
Education expenditure % GDP	5,4	3,3	6,6
Government funding per student, %	21,9	18,5	22,9
Tertiary education,%	38,6	36,1	33,6
Graduates in engineering and science,%	19,7	28,4	23,4

Source: Prepared by the author based on the GII Report, WIPO, 2025

Despite the positive quantitative indicators, we refer to the volume of funding and engineering specialists, we observe a substantial decline in the level of skills among our students, who are in fact the main indicators when analyzing future innovative potential.

Table 4. PISA index value and ranking position, by country, 2024

Indicator	Republic of Moldova	Latvia	Romania	Estonia	Switzerland
PISA (score)/ global ranking I	414,0/53	483.9/22	427,9/47	515,6/6	497,9/9

Source: Prepared by the author based on the GII Report, WIPO, 2025.

PISA describes student achievement through proficiency levels, where higher levels indicate the ability to perform more complex tasks. Compare the relative positions of countries and should be interpreted with caution, as a change in ranking can be affected by the number of participating countries rather than solely by changes in student performance. In subjects like math and reading, a multi-stage adaptive design is used. Students are

directed to more difficult questions if they perform well on early ones, allowing for more accurate measurement across the full range of ability. To use blockchain technology, it would be beneficial to focus on STEM disciplines (stands for Science, Technology, Engineering, and Mathematics).

But you can't have low indicators compared to other countries and steer young people towards STEM. The results recorded for this indicator are modest both in our country and in Romania. We have also analyzed other countries that are currently leading in innovation. Not only are they currently leading countries in innovation, but they also have a more promising future potential. In order to apply blockchain, it is necessary to develop usage skills at various levels. New technologies and digital innovations are gradually reshaping many sectors. We can see how blockchain technology, in particular, has proliferated across different industries and functional roles in recent years, having a significant impact on the current labor market.

Conclusions

In line with European values and regulations, the EU blockchain/Web3 strategy supports the use and development of these areas. It provides improved trust services and ensures environmental sustainability, including data protection, digital identity, cybersecurity, and interoperability. It also promotes the transformation of cross-border industries and public services in Europe. Blockchain technology plays a pivotal role in establishing a citizen-centric digital society by facilitating electronic voting and proposing novel decentralized identity models. Blockchain technology is also key to sustainability.

Implementing Web 3 will lead to transitioning to the metaverse, where physical and virtual spaces converge. This space is accessed through computers and facilitated by immersive technologies, such as virtual reality, augmented reality, and mixed reality.

Due to the complexity of the blockchain ecosystem, a wide range of blockchain occupations exist, each requiring different blockchain skill sets. In this regard, each EU member state must focus on developing these skills. The Republic of Moldova's Smart Specialization Strategy until 2030 does not directly address the field in question. Some areas of innovation are specified without greater clarity in this context.

To this end, we conducted a comparative analysis between the current level of innovation in the country and that of other EU member states. The study shows that the Moldovan economy has a level of only 15.5% funding for business research and development, which is below the European average, and only 6.2% of research talent employed in business, compared to 34.4% in Romania. We also observed a moderate level of future innovation potential in the country, referring to its 53rd position in the PISA index, which is the lowest position among the countries compared. A necessary task is to align the country's innovation strategies and policies with those of the EU in order to achieve the EU average indicators, with a main focus on education and research. These two components define the country's innovative potential.

Blockchain technology is expected to grow significantly in the next few years. Considered innovative and revolutionary, this disruptive technology will change existing business processes by offering efficiency, reliability, and security. The European Blockchain and Web 3 Strategy outlines the necessary steps to build an innovative, inclusive, and sustainable Europe.

However, we would argue that research in this field is underestimated. Some consider it a fantasy technology, particularly in the context of the metaverse, while others view it as a technology used solely for producing and disseminating cryptocurrencies.

In the near future, blockchain technology will become a widely discussed field with a significant impact on the European economy. Analyses and impact studies can be conducted by applying econometric models. Currently, it is more complicated because there are no validated official data at the EU or global level, especially evolving data that reflect trends.

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SUSTAINABILITY, RESPONSIBILITY AND TOURISM STUDIES: THE POLICY FRAMEWORK IN GREECE

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Abstract: *The issue of the interconnection between CSR (Corporate Social Responsibility) and SD (Sustainable Development) with administrative science and public policy constitutes a privileged field for development and specialization in the curricula of Hellenic University Departments in the field of tourism studies regarding policy and administration. This happens due to the economic growth of tourism as development and policy field in several regions of Greece, in particular insular areas where University Departments operate in tourism studies directly or indirectly (e.g. economics, policy). This paper analyses the European policy framework for CSR and SD within the context of a multigovernance level (Greece, EU, World Tourism Organization). and links it with the tourism academic field in university departments in Greece through and comparative analysis of courses and overall policy framework for sustainability and responsibility. The research methodology of this paper is based on qualitative research and it is based on literature review, archive research, grounded theory analysis and evidence-based policy analysis.*

Key words: *sustainability, corporate social responsibility, public policy, tourism*

JEL Code: *M14, Q01, Z31, I28*

UDC: *[338.48:005.35]:378.4(495)*

Introduction

Corporate Social Responsibility (CSR) is closely linked to businesses' contributions to social capital, environmental sustainability, and economic growth through responsible entrepreneurship. Its connection to sustainable development (SD) is based on the definition outlined in the Brundtland Report (1987, Chapter 3.3) and became more explicit at an institutional-political level with the European Commission's (EC) endorsement of CSR in 2002. The influence of neo-institutionalism on the evolution of CSR policy is significant, given its hybrid nature (EC, 2011; Steurer, 2010). CSR spans multiple policy fields, such as entrepreneurship, social welfare, and sustainability, while incorporating various political tools, including legal and economic mechanisms.

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The European Commission's 2002 report highlighted CSR's European dimension and its link to sustainable development. The initial EU definition of CSR in 2001 served as a guide for its adoption by stakeholders, including European businesses. A key milestone in this process was the 2011 revision of the CSR definition, which took into account the socio-economic effects of the financial crisis. Beyond philanthropy, CSR is fundamentally a structured process based on a postmodern political analysis of the synergies between state and non-state actors, such as businesses and universities.

At the EU level, the intersection of CSR and education represents a distinct policy field across various educational levels, including higher education (EC, 2007; 2011; 2014). Good governance, whether at the state or non-state level, is essential, particularly in diagnosing educational needs and developing CSR and SD programs within Greek higher education institutions - especially in social and administrative sciences related to tourism. Moreover, aligning these programs with the 2030 Sustainable Development Goals (SDGs) is crucial, particularly in key economic sectors such as tourism.

This raises the question of how responsible entrepreneurship relates to the 2030 SDGs and to what extent CSR and SD are integrated - either directly or indirectly (explicit vs. implicit CSR) - into tourism education in Greece's higher education system. CSR is not merely a matter of business ethics; it is a broader social and political issue that affects future decision-makers in both state and non-state sectors, including tourism. Therefore, it is essential to highlight the different types of educational interventions, such as undergraduate courses and training programs, as well as collaborations with the tourism industry in both the public sector (e.g., Municipal Tourist Offices) and the private sector (e.g., SETE).

This paper has two main objectives: first, to analyze EU policies on CSR and SD and their role in education as a CSR policy area; and second, to assess the extent to which CSR and SD are incorporated as distinct subjects within the curricula of university tourism departments in Greece.

The integration of CSR and SD into administrative science and public policy presents a significant opportunity for development and specialization within tourism study programs. This is particularly relevant given the sector's economic growth and evolving nature across various regions of Greece. Research in this field provides a foundation for discussing the successful alignment of academic education with CSR and SD in tourism and hospitality, whether as a business practice or within public policy frameworks.

The dynamic transformations within Greece's tourism sector, coupled with the evolving role of the Ministry of Tourism over the past decade, reflect the increasing significance of this public policy area. These changes underscore the need for tourism management and policy professionals in both the public and private sectors to be well-versed in concepts such as CSR (e.g., Environmental, Social, and Governance - ESG), sustainability (e.g., the SDGs 2030), and hybrid policies in EU and global tourism governance (e.g., climate change and CO2 emissions in transport).

This paper aims to examine CSR and sustainable development from a theoretical perspective, utilizing qualitative research methods, including literature review and archival

research. The literature review will provide a comprehensive yet concise examination of the theoretical evolution of CSR and SD at the academic level, with a particular focus on EU member states and Greece. Additionally, archival research will analyze definitions and public policies within the multi-level governance framework of globalization, encompassing international organizations (e.g., the World Tourism Organization), the European Union (e.g., the European Commission), and Greece (e.g., ministries and local government authorities).

Finally, a comparative policy analysis, based on empirical data (evidence-based policy analysis), will offer deeper insights into the concept of CSR and its implications for policy planning in higher education, particularly in tourism management, policy, and administration. To support this, a field study was conducted on the curricula of all university tourism and hospitality departments in Greece to determine their direct or indirect correlation with CSR and SD.

Corporate Social Responsibility and the ‘sustainability’ approach in Europe

Brief note

The concept of Corporate Social Responsibility (CSR) is widely recognized in European societies, business practices, and policy documentation - both explicitly and implicitly. While CSR is often seen as a modern concept, its roots date back to the 18th century, emerging alongside the Industrial Revolution and the formation of the working class. The rise of social movements advocating for labor rights and quality of life, combined with the prevailing Christian moral and social norms, led large corporations to engage in philanthropy and initiatives to enhance productivity (Taliouris, 2018; 2014; Banerjee, 2007). Some companies pioneered social responsibility efforts by providing workers with food, shelter, and other necessities to improve their quality of life (Carroll, 2008).

In the 20th century, the conceptualization of social responsibility increasingly emphasized legal compliance as a fundamental requirement for entrepreneurship, particularly in areas such as corporate governance and labor rights. The establishment of international organizations like the International Labour Organization (ILO) and the United Nations (UN) after World War II reinforced this perspective. The interwar period, World War II, and the financial crisis of 1929 further highlighted the need for social responsibility, not only at the corporate level but also in terms of the state's role in economic regulation and social welfare, particularly in the United States and Europe. In the 21st century, CSR has evolved beyond a business-centric issue to encompass political dimensions, particularly in the European Union (EU), where it is closely linked to national public policies related to sustainable development (SD), climate change, and the circular economy. The social responsibility of businesses is also intertwined with the institutional traditions of social welfare, emphasizing contributions to job creation, responsible entrepreneurship, and ethical codes of conduct. Additionally, international organizations such as the UN and the Organisation for Economic Co-operation and Development (OECD) have played a

significant role in shaping CSR through initiatives like the Global Compact and the Global Reporting Initiative (UN, 2010; 2003).

The Evolution of CSR: A Theoretical Perspective

Understanding the evolution of CSR requires recognizing the plurality of theoretical approaches and the dynamic discourse surrounding the concept during the 1960s, 1970s, and 1980s. Modern perspectives on CSR were primarily shaped in the post-war period of the 1950s and 1960s by scholars such as Howard Bowen (1953), Keith Davis, Douglas McGregor, William C. Frederick, and Richard Eells. Bowen's book *Social Responsibility of the Businessman* (1953) was particularly influential, earning him the title of the "father" of CSR (Carroll, 2008; Mele, 2008).

The later integration of CSR with the concept of sustainable development - particularly following the Brundtland Report (1987) - underscored the interdisciplinary nature of the field, particularly within administrative sciences. From a political science perspective, CSR has been implicitly linked to public policy planning within a multilevel governance framework, involving interactions with non-state actors such as multinational corporations and public-private partnerships in infrastructure and development projects (Taliouris, 2014; 2018). Milton Friedman's (1970) approach to CSR, which emphasized profit maximization, contrasts sharply with Archie Carroll's (1979) *Pyramid of CSR*, which categorizes corporate responsibilities into economic, legal, ethical, and philanthropic domains. Carroll's model remains a foundational reference for CSR conceptualization, often combined with frameworks such as the Triple Bottom Line (Elkington, 2004) or the 3Ps—People, Profit, and Planet (Commission, 2002). More recently, CSR has been integrated into broader sustainability frameworks, including the circular economy and the UN Sustainable Development Goals (SDGs) (Commission, 2019; EC, 2019).

CSR made in EU

The EU's approach to CSR reflects its institutional tradition of social welfare and environmental modernism. This perspective was formally introduced in the European Commission's reports, with significant milestones such as the 1993 statement by European Commission President Jacques Delors, who emphasized the role of European companies in combating social exclusion, particularly concerning youth employment and vulnerable social groups (Commission, 1993). The establishment of *CSR Europe* in 1995 further strengthened the grassroots movement advocating for a European approach to CSR, fostering synergies between businesses and the European Commission, culminating in the *Green Paper on CSR* (Commission, 2001a).

The Green Paper (2001) positioned CSR as a key aspect of public policy, establishing a unified definition across EU institutions and member states while aligning with international frameworks such as the Global Compact, the GRI, the OECD Guidelines, and the ILO's Tripartite Declaration (Commission, 2001a; EU Parliament, 1998; ILO, 2006;

2011; OECD, 2011; Ward, 2004). The initial EU definition of CSR, stated in 2001, was: "*A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.*" (Commission, 2001. p.6). In 2011, the definition was revised to: "*The responsibility of enterprises for their impacts on society.*" (Commission, 2011. p.6). This shift in definition reflected the increasing alignment of CSR with sustainable development and institutional governance. The evolution of CSR concepts - both in theory and practice - has been mutually influenced by developments in business management, governance, and public policy (Moon, 2007; Commission, 2006).

However, different interpretations of CSR persist across EU institutions, geographical regions, and industries (Albareda et al., 2007; 2009; Aaronson & Reeves, 2002; Matten & Moon, 2008; Gjolberg, 2009; Taliouris, 2014; Fairbrass, 2011). Despite this variability, the EU remains a key reference point for CSR in both political and educational contexts, particularly within higher education institutions. Several European member states have integrated CSR into public policy, linking it to broader strategies for sustainable development, international competitiveness, and social cohesion (Commission, 2001; 2011). The European approach to CSR incorporates institutional influences from member states, reflecting broader traditions of environmental governance, social welfare, entrepreneurship, and social capital (Matten & Moon, 2008; Impact, 2012; Commission, 2011; EC, 2011; 2014).

European Sustainability Policy Framework

Sustainable development has become a central theme in international and European politics, with governance implications across multiple policy domains. While policy experiences differ among EU member states, issues such as economic growth, social cohesion, poverty alleviation, and social exclusion have shaped EU institutional and political evolution - particularly in the wake of the 2009 financial crisis. The EU has historically linked sustainable development to broader social and economic concerns, including gender equality, human rights, and environmental protection. The Brundtland Report (1987) played a crucial role in framing the concept of sustainability, leading to key international summits such as the Rio Earth Summit (1992), the Johannesburg Summit (2002), and the Millennium Development Goals (MDGs). More recently, the UN's 2030 Agenda for Sustainable Development, adopted in 2015, introduced the Sustainable Development Goals (SDGs), which replaced the MDGs (UN, 2015a; 2015b).

In 2016, the EU set a policy framework to support SDG implementation, requiring member states to incorporate these goals into national strategies (Greece formalized its national plan in 2018). Under the leadership of European Commission President Jean-Claude Juncker, CSR was integrated into the EU's broader strategy for sustainability. The EU committed to aligning funding and legislation with sustainability objectives, with the goal of allocating 25% of the future EU budget to climate-related initiatives. The European Green Deal further reinforced this commitment, aiming for a climate-neutral economy by

2050 (EC, 2019). At corporate level, the EU has encouraged companies to integrate SDGs into their strategic planning, using tools such as non-financial reporting (e.g., GRI) and Environmental, Social, and Governance (ESG) metrics. The Non-Financial Reporting Directive (2017) exemplifies the EU's regulatory approach to CSR, supporting sustainable business practices and responsible corporate governance. Overall, the evolving EU framework for CSR and sustainable development underscores the growing interconnection between business innovation, governance, and public-private sector synergies, particularly in addressing global challenges such as climate change and social equity.

Public Education Policies for CSR-SD and the interconnection with tourism

The European approach to Corporate Social Responsibility (CSR), commonly referred to as “CSR made in Europe,” represents a distinct international model. This model has been formally defined twice by the European Commission - in 2001 and again in 2011. It is supported by a coherent strategy, comprehensive public policies, and dedicated instruments. Notably, the European Commission has been monitoring national public CSR policies at the Member State (MS) level since 2007, with successive reports published in 2011 and 2014 (EC 2007; 2011; 2014). These reports classify CSR public policy frameworks, outline political instruments, and describe policy models, including the concepts of explicit and implicit CSR. According to the 2011 EU report, the typology of political tools applied in CSR policies includes: Regulatory tools (legislation, soft law), Economic tools (financial incentives, compensatory benefits), Informational tools, Synergies, Hybrid tools, which typically combine several approaches (Steurer, 2010; EC, 2011; Albareda et al., 2007; Taliouris, 2014; 2018).

Evidence-based policy analysis at the EU and international levels (e.g., World Bank), combined with archival research and literature reviews on political CSR and public policy, indicate significant diversity in CSR policy perspectives (Taliouris, 2018). The style and implementation of CSR policies in both the EU and its Member States differ, reflecting either direct or indirect characteristics of CSR (explicit vs. implicit CSR), which vary by Member State (Matten & Moon, 2008). These differences are closely linked to governance structures, institutional traditions, and the dynamics of public policy formation (Apostolakou & Jackson, 2009; Kang & Moon, 2012; Aaronson & Reeves, 2002; Fairbrass, 2011).

The analyses of Albareda et al. (2007; 2009) are particularly important in understanding how governance systems and institutions (e.g., market structures, welfare state frameworks, environmental policies) interact with the political evolution of CSR. These analyses have contributed to the development of distinct CSR policy models: Partnership Model (Denmark, Finland, Sweden, the Netherlands), Business in the Community Model (United Kingdom, Ireland) Sustainability and Citizenship Model (Belgium, Austria, Germany, France, Luxembourg), Agora Model (Italy, Spain, Portugal, Greece) In practice, according to EU reports (2007; 2011; 2014), the main areas of CSR policy include National strategic plans, Socially responsible supply chain, Public

procurement (green, social, sustainable), Non-financial reporting, Climate change initiatives, Support for small and medium enterprises (SMEs), Socially responsible investment and Education and training

Assessing the impact of CSR policies has become increasingly important at the Member State level. The EU Commission's reports highlight key policy fields and instruments, with particular emphasis on education. It is evident that a "one-size-fits-all" approach to CSR policy is not feasible within the EU due to the variation in governance structures, institutions, entrepreneurship characteristics, firm size, and education levels across Member States. EU reports consistently emphasize the importance of CSR and SD in both formal and non-formal education, including lifelong learning programs, vocational training, and seminars. A key question that arises is whether SD and CSR should be considered issues of education or of policy. Analysis shows that, at the intersection of business practice and policy planning, social norms, institutional traditions, and ethical frameworks (e.g., business ethics) shape education aimed at fostering responsible entrepreneurship.

Education and training in CSR and SD have been recognized as critical policy areas as early as 2007, 2011, and 2014. These initiatives address key issues such as climate change, environmental sustainability, and social cohesion. However, the design and implementation of CSR educational policy is not a neutral process, as it is influenced by social norms and institutional traditions. According to the EU typology (EC, 2007; 2011; 2014), regulatory tools have been developed in France: Integration of CSR and SD into educational programs through legislation, such as the Grenelle Law (2009) and the Generalisation Plan for Sustainable Development Education (2011). In Poland through the incorporation into the national education plan since 2008 (Education System Act), covering topics like responsible consumer behavior and production - even at the preschool level. In Spain through central coordination of educational policies promoting CSR and SD, while in Finland via as systematic introduction of educational tools and programs on CSR and SD across schools, vocational training, and universities. In Sweden through the integration of CSR in higher education curricula and assessment systems.

The interdisciplinary nature of CSR and SD education is highlighted in EU reports (EC, 2011, p. 57). Across the EU, CSR and SD are incorporated into both formal education (e.g., undergraduate and postgraduate programs) and non-formal education (e.g., workshops, seminars). Special emphasis is placed on sectors like tourism and management, where CSR and SD are increasingly linked to the Sustainable Development Goals (SDGs). In 2017, the UNWTO declared the International Year for Sustainable Tourism for Development, emphasizing tourism's role in fostering cross-cultural understanding, protecting cultural heritage, and contributing to global peace (UN, 2017). The tourism sector is particularly relevant to three SDGs by 2030:

- SDG 8: Promoting employment and decent work (tourism accounts for 1 in 11 jobs globally);
- SDG 12: Ensuring sustainable consumption and production (e.g., advancing the circular economy);

- SDG 14: Conserving marine ecosystems (e.g., Greece has the sixth-largest coastline in the world).

The UN and UNWTO further highlight sustainable tourism as a tool for poverty eradication, environmental protection, improved quality of life, and economic empowerment for women and youth (UN, 2016). Tourism also contributes to:

- SDG 1 & 2: Local economic development and food security;
- SDG 3: Increased social welfare through foreign exchange and tax revenues;
- SDG 9 & 13: Greening the tourism sector through improved infrastructure and clean technologies.

The European Commission proposed doubling resources for social sectors and sustainable infrastructure while phasing out funding for environmentally harmful infrastructure (EC, 2016). Energy policies, climate change initiatives, and international green policy have shaped EU policy priorities. For example: Between 2014-2020 and 2021-2027, the EU allocated 20% and 25% of its budget, respectively, to climate change adaptation. These policies are linked to the 17 SDGs and are integrated into the European Green Deal (Commission, 2019), affecting industries like tourism, transport, and services. Greece's National Strategy for SDGs 2030 was launched in 2018, emphasizing eight national priorities, with a focus on protecting and sustainably managing natural capital as a foundation for social prosperity and a low-carbon economy. Specific emphasis is placed on SDGs 6, 7, 11, 12, 13, 14, and 15, particularly in sectors like rural development and tourism (Hellenic Republic, 2018). According to the Hellenic Statistical Authority (2022), Greece's SDG performance related to CSR and tourism includes:

- SDG 14: Marine protection (NATURA 2000 sites, bathing water quality) - stagnating;
- SDG 8: Employment and economic indicators - on track;
- SDG 12: Sustainable consumption/production - stagnating, SDG 6: Water resource management – on track;
- SDG 11: Sustainable cities (e.g., recycling, road safety) - moderately improving;
- SDG 16: Justice and governance - moderately improving.

Tourism and Higher Education in Greece: sustainability or responsibility

Tourism is a major economic engine in Greece, contributing significantly to GDP, employment, and regional development. Despite its vital role, the sector faces challenges such as seasonality, overtourism, and an unequal distribution of economic benefits. Addressing these issues requires sustainable tourism policies, infrastructure investments, and regional diversification to ensure long-term growth and employment stability. The Greek tourism sector encompasses a broad range of services, including air and marine transportation, trade, accommodation, and the agro-food sector. However, tourism activity is highly concentrated in just 5 out of Greece's 13 administrative regions: Crete, South Aegean (including the Dodecanese and Cyclades islands), Central Macedonia (e.g., Thessaloniki, Chalkidiki), Ionian

Islands (e.g., Corfu), Attica (Athens and Piraeus). This regional overconcentration leads to development asymmetries in popular destinations such as Chersonissos, Agios Nikolaos (North Crete), Mykonos, Santorini, Rhodes, Corfu, and Zakynthos (Zante). These locations often blend urban and rural characteristics, with insularity being a key feature for many. The overconcentration of tourism activities in these areas is considered a structural weakness, requiring balanced regional development strategies.

Tourism is a sector of vital importance for the Greek economy. In 2020, it contributed 30.9% of Greece's GDP, generated €15.6 billion in revenue, and created 988,600 jobs, accounting for 25.9% of total employment (SETE, 2020). By 2022, approximately half a million people were employed in accommodation and food & beverage (F&B) services, with 48.6% women and 16% youth representation. Tourism also holds a significant share of Greece's economy directly and indirectly, driven by millions of international visitors annually. It consistently contributes 20–25% of the country's GDP, making it one of Greece's leading economic sectors. International tourism alone generates €18–20 billion annually in direct revenue, supporting Greece's trade balance and foreign exchange reserves. Moreover, tourism is one of the largest employers in Greece, directly supporting 16–20% of the workforce in sectors such as hotels, restaurants, transportation, travel agencies, entertainment, and retail. Indirectly, it sustains jobs in industries like the food supply chain, construction, and cultural heritage management.

Given tourism's significance, sustainable development (SD) strategies are a prerequisite to ensure the sector's long-term viability. Sustainable tourism is essential for protecting Greece's environmental, human, and financial capital, in line with the UNWTO's Sustainable Development Goals (SDGs) for 2030.

Greece has the longest coastline in the European Union (first in length) and ranks 11th globally. With 12 out of 13 regions bordering the Mediterranean or Aegean Seas, Greece's territories are both vulnerable due to insularity and rich in opportunities because of their natural and marine beauty. These features highlight Greece's potential to develop sustainable tourism models that protect its unique environment while promoting economic growth. Local governance and synergies with academic institutions are key stakeholders in advancing sustainable tourism and responsible entrepreneurship in Greece. The academic sector plays a vital role in achieving the SDGs, particularly through knowledge sharing and developing policies that support sustainable tourism practices. In Greece, there are several educational initiatives at the Higher Education level, including vocational training institutes (IEKs) and specialized Tourism Schools in Rhodes and Crete (e.g., Agios Nikolaos). At the university level, dedicated Tourism Studies departments are relatively new. Historically, tourism and hospitality education was offered through optional or compulsory courses within broader Business Management and Administration programs. However, in recent years, there has been significant progress, including the establishment of specialized Bachelor's and Master's programs in Tourism Studies and Management.

Despite these developments, there is still limited emphasis on sustainability science, CSR (Corporate Social Responsibility), and SD (Sustainable Development) as explicit

components of tourism curricula at the undergraduate level. Strengthening the integration of sustainability science into tourism programs is crucial, particularly given the interdisciplinary nature of the field. Future professionals in tourism increasingly need to collaborate with experts in fields such as environmental science, engineering, and economics, all of which have strong ties to climate change, sustainability, and responsible practices (e.g., in hotel management, transportation, and energy efficiency). Several Universities in Greece have recently established Tourism Departments, with programs that incorporate sustainability and CSR in their curricula.

Below are some notable examples:

1. International Hellenic University (Thessaloniki). Department of Organization Management, Marketing, and Tourism (Founded in 2019) Key courses: Ecological Marketing, Business Ethics and Corporate Social Responsibility, Sustainable Tourism and Policy, Tourism Management of Marine Protected Areas, Social and Solidarity Economy Sustainability in the Tourism Flow System.
2. Hellenic Mediterranean University (Heraklion, Crete) Department of Business Administration and Tourism (Founded in 2019). Two study orientations: Business Administration and Tourism Management. Key courses: Business Ethics and Administration, Corporate Governance and Corporate Social Responsibility, Sustainable Tourism Development, Environmental Economics of Businesses and Organizations.
3. Ionian University (Corfu). Department of Tourism (Founded in 2019). Key courses: Sustainable Development and Tourism, Tourism and Accessibility, Thematic Tourism II (Agritourism, Ecotourism, Gastronomic, Wine Tourism).
4. University of the Aegean (Chios). Department of Tourism Economics and Management. Key courses: Business Ethics, Tourism and Sustainable Development, Environmental Management and Tourism Planning.
5. University of Patras. Department of Tourism Management (Founded in 2019). Key courses: Tourism and Environment, Sustainable Tourism, Sustainable Forms of Tourism and Management.
6. University of Piraeus. Department of Tourism Studies. Key courses: Tourism and Environment, Sustainable Tourism, Alternative and Special Forms of Tourism, Special Forms of Tourism II (Agritourism, Ecotourism, Gastronomic, Wine Tourism).

Hence, tourism is a dynamic pillar of the Greek development process, but its future success depends on addressing sustainability challenges. Efforts to incorporate SD and CSR into tourism education and policy planning are growing, but further progress is needed. Expanding interdisciplinary collaboration and enhancing educational programs that focus explicitly on sustainability science will be crucial for preparing future professionals to manage tourism sustainably. Strengthening the academic sector's role in knowledge transfer and policymaking will also be key to achieving Greece's sustainable tourism goals and meeting the UN's SDGs by 2030.

The European Commission's "Transition Pathway for Tourism" highlights the importance of vocational and higher education in achieving the SDGs 2030 and climate adaptation goals. EU initiatives like Erasmus+ are critical tools for promoting educational cohesion, offering significant opportunities for Greek universities to engage in partnerships with leading institutions from both South-Western and North-Western Europe. These collaborations are particularly valuable for advancing SD and CSR expertise in tourism education.

Sustainability science and CSR should be systematically integrated into curricula, teaching, and learning processes in Greece (Commission, 2011, p. 57). An interdisciplinary approach is essential to developing both accurate SD and CSR terminology and specialized tracks or course packages at the undergraduate level. These programs should employ experiential learning models such as "learning by doing, doing by learning, and learning to learn," in alignment with Erasmus+ and Next Generation EU priorities. Academia plays a pivotal role in ensuring the tourism sector becomes more responsible and sustainable. As the UN WTO (2018, p.1) notes: "Academia should advance research on the intrinsic relationship between tourism and the SDGs."

Elaborating new curricula for education would empower youth to support the sector in its ability to drive progress towards 2030 and beyond." Sustainability science is inherently interdisciplinary, and the practical implementation of SDGs requires integrated assessments. Greek academic institutions specializing in social sciences and tourism studies have a vital role to play, given the tourism sector's vast potential and the opportunities it presents to students. More specifically, the popularity of sustainability and its influence on responsible consumer behavior has grown in the post-COVID-19 period, as evidenced by Eurobarometer 499 (2021) and 527 (2022). EU citizens increasingly demonstrate a willingness to adopt responsible consumption habits in support of climate change adaptation. Tourism is no exception. Survey results reveal: 56% of respondents find it easy to access information on eco-friendly tourism activities at destinations; 41% report difficulty in finding information about a destination's SD commitments, while 43% find it easy; 46% report difficulty in finding information about SD certifications of accommodations, versus 38% who find it easy; Only 33% find it easy to access information on the carbon footprint of transportation options, while 48% find it difficult.

Conclusions

Tourism is a key development activity that delivers significant socioeconomic and environmental impacts to local societies within the European Union (EU) and its member states, including Greece. According to Eurostat (2018), more than one in ten enterprises in the European non-financial business economy belonged to tourism-related industries. These 2.3 million enterprises employed approximately 12.3 million people, accounting for 9.5% of total employment in the non-financial business economy and 22.4% of employment within the services sector. In the post-COVID-19 period, sustainable and responsible consumer

behavior has gained momentum. According to Eurobarometer 499 (2021), EU citizens have shown an increased willingness to prioritize local sustainability and environmental considerations when making consumption choices, including decisions regarding travel destinations. This trend underscores the importance of integrating sustainability science into the tourism sector, not only as a development priority but also as an educational imperative.

Greening entrepreneurship, including the tourism industry, is central to the Sustainable Development Goals (SDGs) 2030 framework and the EU's programming period for 2021-2027. The Next Generation EU investment package emphasizes transitioning development activities - tourism included - towards the achievement of SDGs and climate change adaptation objectives. As such, contemporary and future professionals in the tourism sector must become proficient in the EU policy framework for sustainable tourism, including SDG indicators and climate policy measures.

The EU's policy approach to sustainable tourism is not limited to Commission Communication (2010), but also extends to Article 195 of the Treaty on the Functioning of the European Union (TFEU, 2013). This article designates tourism as a shared competence, encouraging the exchange of best practices and policy tools between member states, including those related to education. The European Parliament's Strategy for Sustainable Tourism (2021) and the Council of the EU's "European Agenda for Tourism 2030" (2022) invite the European Commission to actively engage member states and stakeholders - including the business sector - in implementing and fulfilling the SDGs. This multi-level governance framework leverages Smart Specialization Strategies (RIS3) and mobilizes EU structural funds to support tourism's green transition and climate adaptation.

The EU's commitment to responsible and sustainable tourism is directly linked to the Green Deal's vision for 2050. The European Parliament (EP, 2021) emphasizes strengthening responsible, sustainable, and smart tourism across the Union, focusing on reducing tourism's environmental footprint through measures such as: Promoting sustainable and smart mobility; Supporting the green transition of SMEs; Advancing climate change adaptation strategies; Developing green skills for human capital; Enhancing the use of smart data for sustainable tourism management.

In December 2022, the Council of the EU presented its conclusions for the European Agenda for Tourism 2030, marking a significant step towards aligning the European tourism sector with the UN SD Agenda and SDGs. The agenda outlines the sector's green transition, emphasizing: Transport decarbonization and promotion of sustainable transport modes; Sustainable water management and resource efficiency, aligned with specific SDGs; Responsible entrepreneurship practices supporting SDG fulfillment; Circular economy initiatives and sustainable operations across the tourism industry and its infrastructure. These policy initiatives are closely tied to the EU's Corporate Social Responsibility (CSR) framework, which promotes responsible entrepreneurship throughout the EU's business landscape. The Commission's Directorate-General G – Ecosystems II: Tourism & Proximity's 2022 "Transition Pathway for Tourism" elaborates the regulatory and governance structures necessary for tourism's green transition. It also emphasizes

stakeholder synergies, monitoring processes across member states, investment strategies focused on green infrastructure, and the development of green skills within SMEs.

In conclusion, the insights above underscore the growing importance of sustainable tourism education and research in academic institutions, particularly in Greece. The integration of sustainability topics, CSR, and responsible entrepreneurship into tourism-related academic programs in Greece is crucial for the future of the sector. The Council of the EU emphasizes the need to develop quality education and skills as a core element of the European Agenda for Tourism 2030 through topic 21: Encouraging educational organizations to engage in developing and renewing tourism education and topic 22: Establishing a “Pact for Skills” in tourism. By developing sustainable tourism study tracks, Greek universities can create tools and disseminate best practices for resource efficiency, foster circular economy initiatives, and support start-ups in the tourism sector. Greece’s academic departments in tourism possess significant potential and quality in terms of curricula and academic personnel. They can meaningfully contribute to achieving the SDGs by cultivating highly educated decision-makers, managers, and policy administrators committed to sustainability and responsible tourism development.

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