

PUBLIC GOVERNANCE DIRECTORATE

Centre of Excellence for Sustainable Development: Comparative Stocktake Report

A comparative literature review of operational and functional models and funding options for a Centre of Excellence for sustainable development in Romania.

The Comparative Stocktake Report presents a detailed analysis of Romania's approach to the Sustainable Development Goals (SDGs) and outlines potential improvements for more effective implementation. This comprehensive review leverages a multi-method research approach including literature reviews, case studies, in-depth interviews, and collaborative design workshops, with a focus on the structure, operation, and funding models for Romania's Centre of Excellence for Sustainable Development (CExDD).

Findings from the global literature review highlight various coordination bodies and centres of expertise pursuing Sustainable Development Goals employed around the world. Successful models from South Korea, Sweden, Germany, Finland, and the United States serve as benchmarks in this report, informing the comparison of governance structures, operating models, and funding scenarios.

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Table of Contents

ACKNOWLEDGEMENTS	4
EXECUTIVE SUMMARY	5
1 INTRODUCTION AND CONTEXT	6
SUSTAINABLE DEVELOPMENT GOALS AND ROMANIA	6
PROJECT BACKGROUND AND AIMS	6
PROJECT CONTEXT	7
EXISTING ROMANIAN GOVERNMENT STRUCTURE FOR SDG IMPLEMENTATION.....	7
2 METHODOLOGY AND SCOPE OF THIS REPORT	9
RESEARCH APPROACH.....	9
<i>Literature review and case studies</i>	9
<i>Deep-Dive Interviews</i>	9
<i>Collaborative Design Workshops</i>	9
<i>Research and Analysis Methodology</i>	10
SCOPE OF THE CExDD	10
<i>Five functions</i>	10
<i>Existing structures and expected synergies with the CExDD</i>	11
<i>Limitations of the CExDD</i>	13
3 SUMMARY OF LITERATURE REVIEW.....	14
THIS CHAPTER COMPARES GLOBAL BEST PRACTICES TO LEARN FROM RELEVANT SOLUTIONS FOR THE BEST DESIGN FOR ROMANIA.	14
KEY FINDINGS.....	14
GLOBAL EXAMPLES OF COORDINATION BODIES AND CENTRES OF EXPERTISE	16
<i>Case study: South Korea’s centralised governance approach to sustainable development</i>	16
<i>Case study: Sweden’s Decentralised Governance approach to sustainable development</i>	17
<i>Case study: Germany’s hybrid governance approach to sustainable development</i>	18
INTERNATIONAL EXAMPLES OF CAPACITY BUILDING FOR SDG IMPLEMENTATION.....	19
<i>Case study: Finland’s functional operational model for sustainable development</i>	19
<i>Case study: The US’ cross-functional model to capacity building</i>	20
<i>Case study: EIT’s hub-and-spoke operational model</i>	21
4 COMPARATIVE FINDINGS.....	22
<i>Analytical and evaluative model</i>	22
GOVERNANCE STRUCTURE COMPARISONS	22
<i>Centralised governance model</i>	23
<i>Decentralised governance model</i>	24
<i>Hybrid governance model</i>	25
<i>Comparison of the governance models</i>	26
OPERATING MODEL COMPARISONS	27
<i>Functional operational model</i>	28
<i>Cross-functional operational model</i>	29
<i>Hub-and-spoke operational model</i>	29
<i>Comparison of the operational models</i>	30
FUNDING MODEL SCENARIOS.....	32
<i>Core funding scenario (low-cost)</i>	33
<i>Integrated funding scenario (medium cost)</i>	34
<i>Innovative funding scenario (high-cost)</i>	35
<i>Comparison of the funding options</i>	35

5 RECOMMENDATIONS 40

 RECOMMENDED MODELS 40

Governance model: Board of Directors + Pilot an Advisory Body for Regional Scientific Arguments 40

Operating model: Hub and spoke 43

Funding options: 45

 IMPLICATIONS OF THE RECOMMENDATIONS 48

 RISKS AND ASSUMPTIONS, TRENDS AND SCENARIOS 49

Risks 49

Assumptions 50

Trends 50

Scenario planning 51

 LIMITATIONS OF THE REVIEW AND SUGGESTIONS FOR FUTURE RESEARCH 53

Suggestions for Future Research 54

6 REFERENCES 55

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Executive summary

The Comparative Stocktake Report presents a detailed analysis of Romania's approach to the Sustainable Development Goals (SDGs) and outlines potential improvements for more effective implementation. This comprehensive review leverages a multi-method research approach including literature reviews, case studies, in-depth interviews, and collaborative design workshops, with a focus on the structure, operation, and funding models for Romania's Centre of Excellence for Sustainable Development (CExDD).

Contextually, Romania is committed to the SDGs and has shown significant initiative in aligning its policies towards these goals. The report recognises the existing Romanian government structure for SDG implementation, while identifying potential synergies with the proposed CExDD, as well as exploring its limitations.

Findings from the global literature review highlight various coordination bodies and centres of expertise pursuing Sustainable Development Goals employed around the world. Successful models from South Korea, Sweden, Germany, Finland, and the United States serve as benchmarks in this report, informing the comparison of governance structures, operating models, and funding scenarios.

The governance structure comparison reveals three potential models: Centralised, Decentralised, and Hybrid. The Centralised model, with a unified control system, provides swift decision-making, while the Decentralised model encourages regional autonomy. The Hybrid model blends the strengths of both models.

In terms of operating models, the report compares the Functional, Cross-functional, and Hub-and-spoke models. The Functional model encourages expertise, the Cross-functional model promotes collaboration, while the Hub-and-spoke model combines central command with localised application.

Regarding funding, the report analyses a Core, Integrated, and Innovative options. The Core option provides a foundational funding structure, the Integrated option introduces a level of transformative change, while the Innovative option, though the most resource-intensive, delivers comprehensive and far-reaching impact.

Based on the comparative findings, a Centralised governance model is recommended for Romania, which would employ a Board of Directors alongside a pilot Advisory Body for Scientific Arguments. This structure balances central oversight with regional influence. Operationally, the Hub-and-spoke model is advised for its balanced structure, encouraging expertise while allowing multidisciplinary systemic solutions. As for funding, the Integrated option is suggested, factoring in Romania's readiness to implement and sustain each model, considering the country's economic situation, resource availability, and the urgency of the SDGs.

Despite these robust recommendations, potential risks and assumptions include financial feasibility, political volatility, political will and alignment with regional priorities. Given these factors, scenario planning becomes an essential tool for ensuring resilience in the implementation strategy.

Finally, while this review provides detailed recommendations on a potential structure for the Centre of Excellence, further engagement with stakeholders (in particular, regional actors) will be needed to refine the structure, purpose and functioning of the Centre to ensure it is fit for purpose and designed for impact.

1 Introduction and context

SUSTAINABLE DEVELOPMENT GOALS AND ROMANIA

As we approach the midpoint of the 'Decade of Action' for the United Nations' Sustainable Development Goals (SDGs), the urgency for effective strategies and initiatives has never been greater. In response, countries worldwide are re-evaluating their policies, with a keen focus on striking the balance between economic growth, environmental sustainability, and social equality. Among these, Romania has emerged as a nation committed to this cause, setting an example with its approach towards implementing the SDGs.

Romania's commitment is clearly manifested in its National Sustainable Development Strategy (NSDS), adopted in November 2018. This strategic document forms a comprehensive blueprint for the country's journey towards achieving the SDGs across economic, social, and environmental domains (Government Decision 754/2022).

Riding the tide of global change, Romania has seen marked improvements in multiple areas, such as reducing poverty, enhancing access to education, and promoting clean energy. Yet, it recognises the significant challenges ahead, including addressing income inequality, healthcare, and education systems reform, and the crucial transition to a circular economy (Eurostat, 2021)¹.

Keenly aware of these challenges, the Romanian government has focused its strategy on creating an inclusive, resilient, and sustainable society. A key marker of this commitment is Romania's alignment with the European Green Deal, which sets an ambitious target of a climate-neutral Europe by 2050 (European Commission, 2019)².

One of the most significant roadblocks to these efforts is the lack of widespread public awareness, particularly around climate issues³. This gap in understanding hinders the collective will to act, creating a vicious cycle where ignorance sustains inertia, "it is difficult to solve a problem that people do not recognise as a problem."⁴

In the quest to achieve the SDGs, the nation understands the need for continuous investments in sustainable solutions, fostering innovation, and the imperative of nurturing collaborative partnerships. In doing so, Romania strives for a future that is prosperous, equitable, and environmentally sustainable for its citizens.

PROJECT BACKGROUND AND AIMS

Romania's dedication to sustainable development has resulted in a plethora of projects and initiatives, including the Centre of Excellence for Innovative Public Administration in Sustainable Development (CExDD). This Centre, a key element of Romania's National Recovery and Resilience Plan (NRRP), is designed to bolster Romania's capacity to address sustainable development challenges effectively.

The CExDD aims to provide a platform for knowledge exchange, capacity building, and policy innovation, strengthening governance, and enhancing both human resources and monitoring capacities across administrative levels (NRRP, 2021)⁵. Furthermore, the CExDD will collaborate closely with Sustainable

Development Hubs in each ministry to propagate sustainable development policies and expertise throughout the government (OECD, 2020)⁶.

Success hinges on effective coordination, knowledge sharing, resourcing and collaboration amongst stakeholders, ranging from government agencies and civil society to the private sector and international organisations. Therefore, an appropriate design for the structure, functions and funding model for the CExDD is vital.

PROJECT CONTEXT

The establishment and design of the CExDD takes place amid a challenging and rapidly evolving context. The COVID-19 pandemic, geopolitical tensions, and rising energy and food prices have considerably shaped Romania's socio-economic landscape (World Bank, 2021⁷). Yet, Romania's commitment to the SDGs remains steady.

Romania's NRRP provides a balanced and comprehensive blueprint to navigate these challenges, aligning closely with the EU Recovery and Resilience Facility's six pillars, including green transition, digital transformation, and social and territorial cohesion (NRRP, 2021). The Plan accentuates the establishment of the CExDD as a critical reform for fortifying the government's sustainable development coordination (NRRP, 2021).

Given the dynamic environment Romania faces, the project context will inevitably evolve. Romanian authorities remain committed to the CExDD as it adapts, responds, and looks-ahead, ensuring its activities and objectives maintain relevance and effectiveness amidst changing circumstances.

EXISTING ROMANIAN GOVERNMENT STRUCTURE FOR SDG IMPLEMENTATION

Romania has established a robust institutional framework to support the implementation of the SDGs at the national level. This framework involves multiple government agencies and coordination mechanisms, ensuring a comprehensive and coherent approach to sustainable development.

The Department for Sustainable Development DSD, established under the Prime Minister's office in 2017, plays a central role in leading and coordinating SDG implementation in Romania (Government of Romania, 2017)⁸. The DSD is responsible for developing national strategies, policies, and action plans related to sustainable development and ensuring that they are aligned with the 2030 Agenda for Sustainable Development. Collaborating with the National Institute of Statistics (NIS) and Sustainable Development Hubs in each ministry, the DSD advances and supports sustainable development policies and expertise across the government (OECD, 2020).

Meanwhile, the Interdepartmental Committee for Sustainable Development, chaired by the Prime Minister, facilitates collaboration across government agencies (Government of Romania, 2019). This committee serves as a platform for inter-agency collaboration and coordination, facilitating the exchange of information and best practices and ensuring a coherent approach to SDG implementation.

Additionally, the Coalition for Sustainable Development was established as a multi-stakeholder platform comprising representatives from civil society, the private sector, and academia (Government of Romania, 2019). This coalition fosters public-private partnerships and facilitates dialogue between different sectors, encouraging innovative solutions and collaboration in support of the SDGs.

Sustainable Development Hubs have also been created within each ministry to promote and support sustainable development policies and expertise beyond central authorities (OECD, 2020). These hubs serve as focal points for SDG-related activities within their respective ministries, ensuring that sustainable

development considerations are integrated into all aspects of policy planning, implementation, and evaluation.

In alignment with these national structures, the NRRP advocates for the development of the online platform One-stop-shop Romania 2030 and the CExDD, to bolster local-level SDG implementation (NRRP, 2021). These initiatives aim to further strengthen Romania's institutional framework for sustainable development, fostering collaboration and capacity building across governmental levels and sectors.

2 Methodology and scope of this report

RESEARCH APPROACH

The research approach employed a literature review, case studies, deep-dive interviews, and collaborative design workshops. The objective of this approach was to gain a comprehensive understanding of global best practices and design a tailored model for the CExDD in the Romanian setting. This multi-method approach provides a solid foundation for the comparative assessment of different models, integrating diverse perspectives and facilitating collaborative decision-making (Creswell, 2014)⁹.

Literature review and case studies

The literature review was an essential component of the research approach. A range of documents including scholarly articles, government reports, and case studies relevant to sustainable development and public administration were used. This provided a basis for understanding the global landscape and identifying pertinent issues. The documents selected met a strict criterion of relevance to the research theme, credibility of the source, and recentness of the information. The analysis of the literature involved a thorough content review that identified and collated patterns, themes, and emergent issues, aiding the comparative assessment of different models.

Case studies were chosen based on their relevance to the research questions, the replicability of the model, and its outcomes. They served as real-life examples, illustrating the implementation of concepts and strategies discussed in the literature, providing a practical lens to this research.

Deep-Dive Interviews

Sixteen deep-dive interviews were a crucial data collection tool, offering rich qualitative insights. The interviewees were chosen on the basis of their roles, expertise, and affiliations. The approach targeted individuals who had direct experience in sustainable development for Romania within national governments. The semi-structured format of the interviews, with its open-ended questions, allowed for detailed, nuanced responses, and the opportunity for follow-up questions to further clarify points.

Interviewees included representatives from government officials, academics, and experts from various centres of excellence. Interviews were semi-structured, featuring open-ended questions designed to elicit in-depth responses that could directly inform the development of the CExDD model.

Collaborative Design Workshops

Two collaborative design workshops were conducted, which were instrumental in shaping the CExDD model. The workshops assembled over 50 representatives from the Romanian government, civil society, academia, and other relevant sectors. The workshops delved into findings from the literature review, case

studies, and interviews to collectively tailor a model for the Romanian context. These workshops offered a vibrant forum for group discussions, brainstorming sessions, and scenario planning exercises, fostering active involvement and the integration of diverse perspectives. Specific topics covered in these workshops included the role of digital democracy in Romanian public administration, potential challenges, and strategic planning for the implementation of the CExDD model.

Research and Analysis Methodology

The research and analysis methodology for this project combines qualitative and quantitative approaches (Gray, 2013)¹⁰. Qualitative methods, such as thematic analysis, were used to interpret data from the literature review, case studies, and interviews, assisting us in identifying salient themes and emergent issues. Quantitative methods, including descriptive and inferential statistics, were employed to analyse numerical data regarding the performance and impact of various models.

Throughout the research process, research was triangulated. This involved cross-verifying information from multiple sources and methods to enhance the validity and reliability of findings (Creswell, 2014). This strategy ensures a robust, comprehensive, and credible understanding of the research matter. This methodological approach is intended to yield a nuanced and well-rounded perspective, seamlessly integrating diverse perspectives and facilitating collaborative decision-making.

SCOPE OF THE CExDD

The proposed CExDD is designed to support the implementation of the SDGs in Romania, primarily through its five main functions¹¹. However, it is crucial to recognise the CExDD's mandate boundaries and its relationship with existing structures in the Romanian government. The following sections clarify the CExDD's limitations and how it is expected to synergise and cooperate with existing structures.

Five functions

The CExDD's functional domain spans five intertwined areas: the *data centre*, *generation of scientific arguments*, *strengthening networks and partnerships*, *think tank/strategic thinking*, and *communication and dissemination of knowledge*. These functions aim to synergistically operate to underpin evidence-based decision-making, encourage best practices, foster collaboration, induce strategic thinking, and drive effective implementation of sustainable development initiatives in Romania.

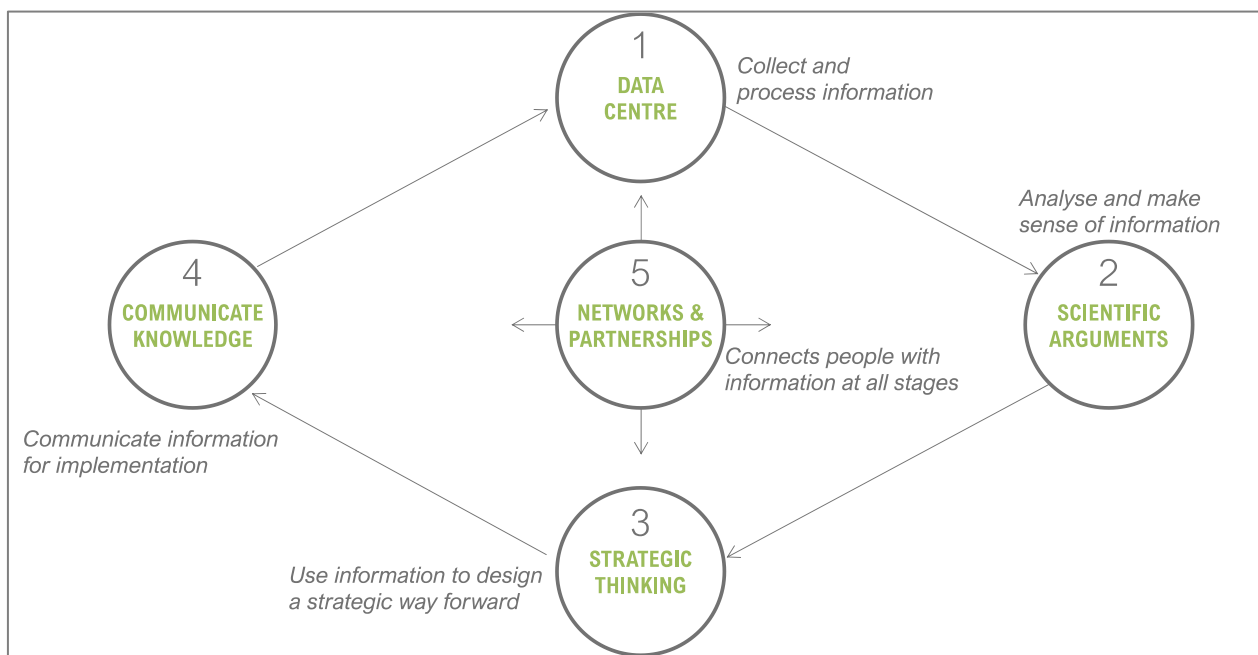
1. **Data centre:** The CExDD will develop contemporary, interoperable, and integrated methods and ways of collecting information to monitor the SDGs, track progress, measure results, and address implementation gaps. The Centre will be equipped with a reliable IT mechanism for data collection, correlated with SD targets and indicators, from all sectors of public administration. This ensures data-driven decisions support Romania's SDGs.
2. **Generation of scientific arguments:** The CExDD, collaborating with academic institutions, research organisations, and experts, will empower the generation of scientific arguments that pave the way for policy-making and innovation. It will equip policy and decision-makers with robust, research-based insights to efficiently address sustainability challenges.
3. **Strengthening networks and partnerships:** The CExDD will act as a hub for dialogue with stakeholders involved in the strategy's implementation and monitoring. Building on the experience of collaboration with Sustainable Development Hubs, CExDD will support the organisation of mutual learning workshops and the transfer of good practices at national and international levels. Thus, it will catalyse collaboration for SDG achievement.

4. *Think tank and strategic thinking:* The CExDD using advanced methods in the areas of foresight, analysis, and systemic policy formulation, will deliver scientific arguments to support public policy decisions and stimulate innovative policy opportunities. This aims to ensure that Romania harnesses innovation ideation processes to stretch and push thinking in this area. This function will ensure that the Romanian government is thinking innovatively and strategically about how to achieve the SDGs.

5. *Communication and knowledge dissemination:* In line with the 2030 Agenda, the CExDD will strive to raise awareness of the latest sustainable development legislation, policies, and good practices within public administration. A rapid response digital service will facilitate fast dissemination and acquisition of the latest knowledge in this field.

Collectively, these five functions present significant adjacency benefits, as each function's output fuels the input of another, creating a productive cycle. This begins with the *data centre* gathering and processing information, which is analysed by the *generation of scientific arguments*. The *think tank* uses this knowledge to devise strategic pathways, while the *communication* function disseminates timely and accessible information. Finally, the *strengthening networks* function facilitates the scaling up of sustainable development efforts by connecting individuals and information.

Figure 1. A visualisation of the CExDD five functions working together



As illustrated in Figure 1, this holistic approach fosters evidence-based policy-making, effective implementation, and continuous monitoring and evaluation, ensuring actions align with the SDGs. By leveraging the adjacent benefits of these functions, Romania can effectively manage risks, enhance citizen satisfaction, and stimulate strategic growth in its sustainable development endeavours.

Existing structures and expected synergies with the CExDD

The Romanian government has a solid foundation with several structures and mechanisms in place to facilitate SDG implementation¹². Key institutions include the Department for Sustainable Development (DSD), the Consultative Council of Sustainable Development, the Interdepartmental Committee for Sustainable Development, and the Coalition for Sustainable Development. Additionally, Sustainable

Development Hubs exist within each ministry to promote and support sustainable development policies and expertise¹³.

Department of Sustainable Development (DSD/DDD):

The CExDD stands to benefit from a close collaboration with the DSD. Both parties can merge their efforts towards Strategy 2030 implementation by sharing vital data, insights, and research findings. The CExDD, could add value to the DSD's operations by supplying scientific arguments and innovative policy opportunities. This relationship also enables CExDD to participate in monitoring SDG indicators and making progress reports to the government and parliament.

Interdepartmental Committee for Sustainable Development:

The Interdepartmental Committee offers a strategic platform for CExDD to ensure that sustainable development principles and targets are coherently integrated across various sectoral policies and strategies. By lending its expertise and analysis, the CExDD could facilitate the Committee in formulating proposals and endorsing a national set of indicators for sustainable development.

Consultative Council of Sustainable Development:

The Consultative Council, a body of scientific researchers, academics, and experts, can provide the CExDD with valuable insights. Collaborating with the Council enables CExDD to comprehensively track the impacts of sustainable development policies. The Council's input also guides the formulation of the CExDD's action plans, which is integral to ensuring effective and inclusive implementation of the SDGs.

Coalition for Sustainable Development:

The Coalition for Sustainable Development, acting as an NGO advocate for the SDGs, provides a conduit for continuous dialogue with the government. Engaging with the Coalition opens opportunities for enhancing stakeholder participation, fostering multi-stakeholder partnerships and facilitating knowledge sharing on best practices.

Inter-ministerial Committee for the Coordination of the Integration of Environmental Protection Principles:

The connections between environmental protection and sustainable development necessitates the collaboration of the CExDD with the Inter-ministerial Committee. This partnership will help ensure the seamless integration of environmental considerations into sectoral policies and strategies, promoting policy coherence and environmental protection measures.

Parliamentary Sub-Committee for Sustainable Development:

The Parliamentary Sub-Committee is another platform where the CExDD can contribute to SDG efforts. By providing the Sub-Committee with insights, data, and research on the SDGs, the CExDD supports can their work in legislative projects, fostering a better understanding of progress and challenges.

Network of Sustainable Development Hubs:

The Network of Sustainable Development Hubs enables the CExDD to tap into the expertise and competencies within each institution. A synergetic relationship with the Hubs helps the CExDD to gather specific SDG-related information, ensuring a coordinated approach to implementation.

National Institute of Statistics (NSI):

By working with the NSI, the CExDD can enhance the collection, processing, and monitoring of national SDG-related data. This collaboration, underpinned by the CExDD's data analysis and interpretation expertise, can support the NSI in updating the national set of indicators, thereby enhancing the quality and accuracy of SDG monitoring and reporting.

The ultimate goal of these collaborations is to create an aligned system that works efficiently with existing structures, promoting cooperation, knowledge sharing, and coordination. All of these synergies align with the overarching aim of implementing the SDGs in Romania, ensuring the nation moves closer to sustainable development. These partnerships represent a strategic approach, channelling the collective resources and expertise of different entities towards the realisation of a common goal: a sustainable future for Romania.

Limitations of the CExDD

While the role of the CExDD will be instrumental in achieving SDGs in Romania, it is essential to understand the Centre's limitations and the boundaries within which it operates.

Policy Implementation: While the CExDD aims to support policy development through the provision of research, data analysis, and technical advice, the execution of such policies falls outside its remit. The CExDD can collaborate with various government bodies and departments, offering insights and recommendations for integrating sustainable development principles into their operations. However, the responsibility of enacting and enforcing these policies rests with the respective governmental and legislative bodies.

Stakeholder Management: Although the CExDD seeks to foster multi-stakeholder partnerships and ensure broad participation in sustainable development, it does not have a capacity to directly engage with all stakeholders at all levels. Its primary role is to provide a platform for dialogue, collaboration, and learning among different stakeholders, rather than assuming the role of a negotiator or mediator.

Compliance Monitoring: The CExDD contributes to the monitoring of SDG progress by providing data, research findings, and expertise. However, it is not within its jurisdiction to enforce compliance with sustainability standards or penalise non-compliance. The Centre's role is purely advisory, aimed at guiding and informing decision-making processes.

The CExDD's role is to act as a coordinator, steering Romania's journey towards sustainable development by providing high-level scientific and technical support. Its function is to inspire, guide and facilitate – working in synergy with other entities to ensure Romania effectively moves towards a sustainable future. However, the primary responsibility for implementation of actions ultimately rests with the relevant governmental departments, non-governmental organisations, and societal stakeholders.

3 Summary of literature review

This chapter compares global best practices to learn from relevant solutions for the best design for Romania.

KEY FINDINGS

The literature review conducted in this study aimed to examine various sources to gain insights into sustainable development strategies, institutional mechanisms, and governance models that support the implementation of the Sustainable Development Goals (SDGs). The findings from the literature review can provide valuable guidance for Romania in its pursuit of sustainable development.

The European Union (EU) has been actively promoting sustainable development within its member states, and two key initiatives stand out in this regard. Eurostat (2021) not only provides an overview of sustainable development in the EU but underscores the EU's significant progress in the SDGs, particularly in the areas of poverty reduction and clean energy promotion. This commitment to sustainability offers Romania a framework to emulate. Alongside this, the European Commission (2019) has rolled out the ambitious European Green Deal, aiming to transform the EU into a sustainably prosperous economy. By examining these strategies, Romania can draw vital lessons to inform its own sustainable development efforts.

At the national level, Romania has already laid a foundation with its National Sustainable Development Strategy 2030 (Government of Romania, 2018) and a complementary National Action Plan (Government of Romania, 2022). These strategic documents guide Romania's pursuit of sustainable development, outlining key objectives and policy directions. They are essential for coordinating the efforts of various sectors and stakeholders towards achieving the SDGs, highlighting the importance of cohesive and coordinated action.

Building on this, institutional mechanisms enhance the effectiveness of sustainable development strategies. The Organisation for Economic Co-operation and Development (OECD, 2020) champions the integration of policy planning and budgeting to support SDG implementation in Romania. Romania's establishment of the Department for Sustainable Development (Government of Romania, 2017) and the Interdepartmental Committee for Sustainable Development (Government of Romania, 2019) illustrates its dedication to institutionalising sustainable development.

The concept of multi-level governance further complements these institutional mechanisms. Faguet (2014)¹⁴ highlights how decentralisation and governance can amplify adaptive capacity and local ownership, bolstering sustainable development. Similarly, Hooghe and Marks (2003)¹⁵ highlight the advantage of coordination and cooperation among different government levels. By adopting such multi-level governance approaches, Romania can ensure more efficient implementation of sustainable development initiatives.

Crucial to these governance arrangements are collaborative management approaches. Margerum and Whitall (2004)¹⁶ underscore the importance of stakeholder engagement and cooperation in sustainable initiatives, using river basin management as a case study. In a similar vein, Treib, Bähr, and Falkner

(2007)¹⁷ provide clarity on different modes of governance that highlight the need for coordination, cooperation, and network building among stakeholders. These insights should inform Romania's prioritisation of stakeholder engagement and collaboration in sustainable development.

Examining various operating models offers further insight. The Finnish Environment Institute (SYKE) serves as an example of a hub and spoke operating model, which promotes knowledge sharing, collaboration, and coordination (Finnish Environment Institute, n.d.)¹⁸. Further, Galbraith (1971)¹⁹ discusses matrix organisation designs that combine functional and project forms, enabling cross-functional collaboration and flexibility. Such models could be beneficial for Romania, fostering an environment of collaboration, innovation, and adaptability in implementing sustainable development strategies.

The capacity building of institutions and individuals is also pivotal for effective SDG implementation. Gupta et al. (2019)²⁰ stress the importance of enhancing the adaptive capacity of institutions and developing human resources. The European Institute of Innovation and Technology (EIT) has established Knowledge and Innovation Communities (KICs) to facilitate capacity building and innovation in specific sectors (EIT, n.d.)²¹. Similar initiatives could be instrumental in Romania, augmenting the skills, knowledge, and capabilities of its workforce and stakeholders, and strengthening their contribution to sustainable development.

Importantly, Romania can incorporate lessons from countries making substantial progress in sustainable development. South Korea's green growth policies (KDI School of Public Policy and Management, 2019; Kim & Chung, 2016; Lee, 2018; Yoon & Lee, 2015)²² and Sweden's sustainable development policies (Government Offices of Sweden, 2016; Swedish Environmental Protection Agency, 2020; City of Malmö, 2018; OECD, 2017)²³ provide instructive examples. By examining these, Romania can adapt successful strategies and approaches to suit its unique cultural, social, and economic context.

In conclusion, the literature review has provided valuable insights into sustainable development strategies, institutional mechanisms, multi-level governance, operating models, and capacity building. These findings can inform Romania's efforts to strengthen its institutional arrangements, governance models, and capacity-building initiatives for sustainable development. By drawing on the lessons learned from other countries and coordinating its efforts accordingly, Romania can enhance its effectiveness in achieving the SDGs and advancing sustainable development.

GLOBAL EXAMPLES OF COORDINATION BODIES AND CENTRES OF EXPERTISE

Case study: South Korea's centralised governance approach to sustainable development

Context: South Korea, an industrialised nation with a rapidly growing economy, has faced multiple challenges in its pursuit of sustainable development. These challenges include managing rapid urbanisation, addressing high greenhouse gas emissions, and tackling income inequality. Furthermore, the country has faced difficulty in coordinating and integrating sustainable development policies across various sectors and governmental bodies (Choi & Park, 2014)²⁴.

Problem: The South Korean government saw a need for a more unified approach. It recognised that fragmented structures led to inconsistent policy implementation and uneven resource allocation.

Solution: South Korea adopted a centralised governance model to streamline decision-making and promote better coordination across different sectors and agencies. In 2016, the government established the Presidential Commission on Sustainable Development (PCSD), which serves as the central authority for all matters related to sustainable development (Park, 2018)²⁵. The PCSD is responsible for formulating, implementing, and monitoring national policies and strategies, including the National Strategy for Sustainable Development (NSSD).

Outcome: The establishment of the PCSD has led to significant improvements in policy coherence and coordination, contributing to more effective implementation of sustainable development initiatives. The country has achieved notable progress in reducing greenhouse gas emissions, promoting renewable energy, and enhancing social welfare. The centralised approach has allowed for more efficient allocation of resources and improved accountability in the implementation of the SDGs (Kim, 2020)²⁶.

Relevance: South Korea's success in adopting a centralised governance model highlights the potential benefits of having a single authority responsible for coordinating and overseeing sustainable development efforts. Such a model could be pivotal for Romania to overcome fragmented governance issues and implement the SDGs more effectively.

Purpose/role: The PCSD's main role was to develop and coordinate national strategies, policies, and initiatives to address environmental, economic, and social challenges, while promoting sustainable growth and innovation (Oh, 2011)²⁷.

Structure: The PCSD was chaired by the President of South Korea, with the Prime Minister serving as the vice-chair. It included ministers from relevant government departments and non-governmental experts, ensuring a coordinated and inclusive approach to decision-making (Kim & Thurbon, 2015)²⁸.

Interactions with government and non-governmental actors: The PCSD worked closely with various government ministries, agencies, and local authorities, fostering policy coherence and coordination across different levels of government. It also engaged with non-governmental actors such as businesses, civil society organisations, and academia to ensure diverse perspectives and expertise were considered in the policy-making process (Oh, 2011).

Authority/delegations it holds: The PCSD had the authority to develop and coordinate national strategies, policies, and initiatives related sustainable development. It was responsible for overseeing the implementation, monitoring progress, and evaluating their impact (Kim & Thurbon, 2015).

Capabilities and data: The PCSD had access to a wide range of data, research, and expertise, which enabled it to make informed decisions and develop evidence-based policies. It also supported capacity building, innovation, and technology transfer in key sectors (Oh, 2011).

Case study: Sweden's Decentralised Governance approach to sustainable development

Context: Sweden has long been recognised as a global leader in environmental sustainability and climate action. However, the country faced several challenges in effectively addressing environmental issues, including the need for greater policy coherence, collaboration between multiple levels of government, and stakeholder engagement (Lafferty & Hovden, 2003)²⁹.

Problem: The diverse and complex nature of environmental issues called for a flexible governance approach, one that could adapt to varying local conditions and engage diverse stakeholders. A standardised, top-down approach wouldn't be suitable to meet the unique needs of different regions and communities across Sweden (Eckerberg, 2014)³⁰. There were risks of overlaps and conflicts in policies as different government levels and agencies had differing goals and methods. This fragmentation threatened the efficacy of Sweden's efforts to promote sustainable development (Lafferty & Hovden, 2003).

Solution: To address these problems, Sweden employed a decentralised governance model. Clear responsibilities were given to national, regional, and local levels. The national government gave the overall guidance and goals, and regional and local authorities had the flexibility to create and implement strategies tailored to their specific contexts. This approach paved the way for the better integration of environmental concerns into local planning processes and fostered cooperation among different stakeholders, including government bodies, businesses, and community groups (Nilsson et al., 2016)³¹.

Outcome: Sweden's decentralised governance model successfully promoted sustainable development and tackled a number of the country's environmental issues. This model facilitated the creation of innovative, locally-tailored solutions, boosted stakeholder engagement, and improved overall environmental governance (Eckerberg, 2014). A strong sense of local ownership and responsibility for environmental outcomes was also developed, fostering a culture of sustainability (Nilsson et al., 2016).

Relevance: Romania can learn from Sweden's approach where local authorities create their own solutions to sustainability challenges. This would need clear role definitions, strong coordination mechanisms, and capacity building for local stakeholders. By adopting a more decentralised governance model, Romania could improve stakeholder engagement, inspire innovative solutions, and enhance the overall efficacy of its environmental governance. For CExDD, this could mean delegating more decision-making along with adequate resources and knowledge, to address local challenges effectively.

Purpose/role: Sweden's decentralised governance model's aim is to better tackle the nation's environmental issues. By enabling regional and local authorities to create context-specific solutions, it promotes flexibility, adaptability, and stakeholder engagement, cultivating a culture of environmental stewardship (Nilsson et al., 2016).

Structure: The model in Sweden divides responsibilities among national, regional, and local levels. The national government sets the stage with overall guidance and goals, while regional and local authorities exercise autonomy in developing their own strategies (Eckerberg, 2014).

Interactions with government and non-governmental actors: Sweden's model encourages collaboration between various stakeholders, including government bodies, businesses, and community groups. This collaboration integrates environmental concerns into local planning processes and promotes knowledge sharing (Nilsson et al., 2016).

Authority: Regional and local authorities in Sweden are given significant autonomy to devise environmental strategies and policies that suit their contexts. The national government maintains oversight and ensures alignment with broader policy goals (Eckerberg, 2014).

Capabilities and data: Sweden's decentralised model relies on strong capacity-building initiatives for regional and local stakeholders to effectively address environmental challenges. This includes access to relevant data, technical expertise, and financial resources necessary to support the development and implementation of tailored solutions (Nilsson et al., 2016).

Case study: Germany's hybrid governance approach to sustainable development

Context: Germany, as one of the largest economies in Europe, faces numerous environmental challenges. They battle air and water pollution, waste management issues, and the constant need for renewable energy. Given its complicated political landscape, regional differences, and industry-based economy, Germany needed a flexible system to manage these challenges effectively (Knierim & Srivastava, 2019)³².

Problem: Traditional centralised and decentralised approaches were not sufficient to address Germany's challenges comprehensively. A centralised model could not cater to the diverse regional needs, while a decentralised model risked undermining the effectiveness of nationwide policies and goals (Hölscher et al., 2018)³³.

Solution: Germany found a balanced solution, adopting a hybrid governance model. It encourages coordination and guidance at a national level, while giving regional and local authorities the freedom to create tailored solutions for their specific environmental challenges (Bulkeley & Kern, 2006)³⁴.

Outcome: Germany's hybrid governance model has been successful. It's helped roll out nationwide policies like the Energiewende (Energy Transition), while also encouraging innovation at regional and local levels in renewable energy and waste management. The model also encourages collaboration and communication between various stakeholders, leading to the creation of inventive solutions and best practices. (Knierim & Srivastava, 2019).

Relevance: Romania can learn from Germany's hybrid governance model to address its own environmental challenges. By combining national-level guidance with regional and local flexibility, Romania can build a governance system that is both responsive and innovative, and ensures effective execution of national policies and goals. For Romania's CExDD, this means developing central policies that provide a clear direction for sustainable development, while also enabling regional bodies to tailor their strategies based on local context and needs.

Purpose/role: Germany's hybrid governance model's main aim is to address environmental challenges by merging centralised and decentralised tactics. It combines strong nationwide policies with regional and local ingenuity and flexibility.

Structure: Germany's model features a multi-tiered structure that includes federal, state (Länder), and local governments. The federal government sets the overall policies, while state and local governments create and execute measures that align with their regional needs (Knierim & Srivastava, 2019).

Interactions with government and non-governmental actors: The hybrid model promotes interactions between different government levels, and non-governmental actors like businesses, academics, and community groups. These interactions create partnerships, collaborations, and networks, leading to an exchange of information, best practices, and resources (Bulkeley & Kern, 2006).

Authority/delegations it holds: The hybrid model divides authority across various government levels. The federal government outlines nationwide policies, while state and local governments develop region-specific solutions. This division allows for the creation of tailored solutions that tackle unique regional challenges (Hölscher et al., 2018).

Capabilities and data: The hybrid model encourages the development of skills and use of data across different levels. It leads to the creation of monitoring systems, the growth of research and development, and the encouragement of innovation. (Knierim & Srivastava, 2019).

INTERNATIONAL EXAMPLES OF CAPACITY BUILDING FOR SDG IMPLEMENTATION

Case study: Finland's functional operational model for sustainable development

Context: Finland, nestled in the northern climates of Europe, faces a unique set of sustainability challenges. Their terrain, featuring vast forests and sparse population, makes infrastructure, energy production, and resource management difficult. Moreover, Finland is dedicated to tackling global issues such as climate change, environmental protection, and social equality, aligning with the SDGs (Statistics Finland, 2021) ³⁵.

Problem: To effectively address these challenges and achieve sustainable development, Finland needed a central organisation that could pull together efforts from different sectors like economic development, transport, and environmental management. A well-structured and cohesive approach was essential, calling for clear authority and responsibility lines, coupled with efficient resource allocation.

Solution: In response to these needs, Finland established the Centres for Economic Development, Transport, and the Environment (ELY Centres) ³⁶. These regional centres were organised into clearly outlined functional units, each responsible for specific tasks within the areas of economic development, transport, and the environment. This structure allowed for a targeted approach, with each unit focusing on their area of expertise and collaborating when necessary.

Outcome: The ELY Centres have effectively rolled out various projects to promote sustainable development in Finland. Their efforts have enhanced coordination between sectors, enabling more efficient resource allocation and well-targeted interventions (Aarnio and Hyvärinen, 2014)³⁷. This functional operational model has allowed the ELY Centres to maintain a sharp focus on their respective areas, resulting in more effective and comprehensive solutions to Finland's sustainable development issues.

Relevance: Romania could draw lessons from Finland's functional units approach. Having clearly defined units tackling specific tasks can enhance focus and efficiency. This model can foster better coordination, resource allocation. For CExDD, this could mean structuring internal teams to focus on specific tasks and fostering collaboration across these teams to achieve broader objectives.

Purpose/role: The primary role is to implement the Finnish government's regional policies in the areas of economic development, transport, and the environment (ELY, nd).

Structure: The ELY Centres are split into 15 regional units, each focusing on a specific area of Finland. Within each regional unit, functional units manage tasks related to economic development, transport, and the environment. This clear division of responsibilities allows each unit to focus on its core tasks.

Interactions: The ELY Centres engage with a variety of government and non-government actors at both regional and national levels. Collaborations with regional councils, local governments, and other public sector organisations are common. The Centres also engage non-governmental stakeholders like businesses, NGOs, and research institutions to gather input and ensure their interventions meet different sectors' and regions' needs.

Authority: The ELY Centres operate under the authority of the Ministry of Economic Affairs and Employment, the Ministry of Transport and Communications, and the Ministry of the Environment. These ministries delegate specific tasks and responsibilities to the Centres, which, in turn, have the mandate to make decisions within their areas of expertise. This delegation of authority allows the Centres to operate efficiently and respond effectively to regional needs.

Capabilities and data: The ELY Centres have access to data and information from various sources, such as governmental databases, research institutions, and international organisations. This allows the Centres to monitor trends, track progress, and develop evidence-based interventions to tackle Finland's sustainable development challenges.

Case study: The US' cross-functional model to capacity building

Context: The United States has faced increasing challenges in the areas of energy security, environmental sustainability, and economic competitiveness (National Research Council, 2012)³⁸. To tackle these challenges, it was necessary to spur innovation in energy technologies and foster collaboration among different sectors such as academia, industry, and government.

Problem: Despite various research and development (R&D) initiatives, coordination among different efforts and limited integration of multidisciplinary expertise hindered the start and execution of innovative energy solutions.

Solution: In response to these challenges, the US established the Advanced Research Projects Agency-Energy (ARPA-E)³⁹ in 2007, following a cross-functional operational model. ARPA-E aims to advance high-potential, high-impact energy technologies that are too early for private-sector investment. The agency brings together experts from various disciplines, including scientists, engineers, and entrepreneurs, to collaborate on cutting-edge energy projects.

The cross-functional structure of ARPA-E allows it to bridge the gap between research, development, and market deployment. The agency backs projects that can transform energy markets and give rise to new industries, all the while encouraging collaboration across academia, industry, and government (Bonvillian and Van Atta, 2011)⁴⁰.

Outcome: Since its beginnings, ARPA-E has funded over 500 energy technology projects, with many resulting in major breakthroughs and commercial successes. Using a cross-functional operational model, ARPA-E has sped up innovation in the energy sector, created new jobs, and enhanced US energy security and environmental sustainability.

Relevance: Romania can learn from ARPA-E's cross-functional model and enable the Centre to leverage multidisciplinary expertise needed to address complex sustainable development challenges. By creating teams from various sectors and the Centre can integrate diverse perspectives and speed up the development and implementation of innovative solutions. For CExDD, this could mean encouraging more collaborative projects between sectors and focusing on early-stage, high-impact initiatives.

Purpose/role: ARPA-E's primary purpose is to advance high-potential, high-impact energy technologies that are too early for private-sector investment. It plays a critical role in accelerating energy solutions, fostering collaboration among sectors, and supporting sustainability goals.

Structure: ARPA-E operates as an independent agency within the U.S. Department of Energy, with a flat organisational structure that encourages team collaboration and communication. The agency is led by a director, who is appointed by the President and confirmed by the Senate. Under the director, there are program directors who are responsible for identifying and managing projects within their respective areas.

Interactions: ARPA-E cooperates with other government agencies, research institutions, and private-sector organisations. Through funding agreements and initiatives, ARPA-E fosters partnerships and facilitates knowledge and resource exchange among these actors. For instance, ARPA-E has partnered with the Department of Defence and the National Science Foundation to support joint research projects and share expertise (National Research Council, 2013)⁴¹.

Authority: As an independent agency within the U.S. Department of Energy, it has the authority to set its own priorities, award research grants, and negotiate funding agreements with project recipients. The agency has the flexibility to manage its portfolio and allocate resources according to its strategic objectives.

Capabilities and data: The agency collects data on project performance, technology advancements, and market impact to inform its decision-making and evaluate the effectiveness of its investments. This data-driven approach enables ARPA-E to identify promising technologies, monitor progress, and adapt its strategies to achieve its mission.

Case study: EIT's hub-and-spoke operational model

Context: The EU has been facing a slew of challenges linked to innovation, competitiveness, and sustainable development. Despite a strong scientific base, the EU has struggled to convert research into market-ready products and services, falling behind global competitors in terms of innovation performance (European Commission, 2021)⁴². Moreover, the EU has been tackling issues such as climate change, energy security, and digital transformation, requiring multi-disciplinary solutions and close collaboration among various stakeholders (European Commission, 2019)⁴³.

Problem: To address these challenges, the EU needed a fresh approach to bolster innovation, enhance competitiveness, and drive sustainable growth. This approach had to integrate research, education, and business sectors and promote cross-border collaboration and knowledge sharing (EIT, 2018)⁴⁴.

Solution: In response to these challenges, the European Institute of Innovation and Technology (EIT) was established in 2008 as an independent body of the European Union. The EIT adopted hub-and-spoke operational model, focusing on the creation of Knowledge and Innovation Communities (KICs) - large, multidisciplinary partnerships that bring together actors from research, education, and business sectors. These KICs operate as independent legal entities, with the EIT acting as the central coordinating hub, providing funding, support, and strategic guidance.

Outcome: The EIT's KICs have successfully nurtured innovation and collaboration across various sectors and regions in Europe. They've developed a broad array of products, services, and solutions to address societal challenges like climate change, digital transformation, and sustainable food production (24). Moreover, the KICs have contributed to the creation of new businesses, job opportunities, and the development of human capital in Europe.

Relevance: The EIT's hub-and-spoke operational model offers valuable lessons for Romania's CExDD. By adopting a similar approach, Romania could cultivate an ecosystem that encourages collaboration and knowledge sharing among different stakeholders. Forming partnerships and facilitating cross-sector cooperation can also contribute to the development of human capital and foster a culture of innovation in Romania. For example, CExDD could consider creating its own version of KICs, enabling collaboration between universities, NGOs, and businesses to address national sustainability goals.

Purpose/role: The primary purpose of the EIT's Knowledge and Innovation Communities (KICs) is to create an ecosystem that fosters collaboration among research, education, and business sectors to address societal challenges and enhance Europe's competitiveness. They aim to develop marketable products, services, and solutions that contribute to sustainable growth and job creation.

Structure: Each KIC operates as an independent legal entity, with its own governance and management structure. The KICs consist of partners from various sectors, including universities, research institutions, businesses, and NGOs, working together in a collaborative and cross-disciplinary manner. The EIT serves as a central coordinating hub, providing funding, support, and strategic guidance to the KICs. It also monitors their performance and ensures compliance with EIT guidelines and objectives.

Interactions: The KICs interact with a wide range of stakeholders, including national, regional, and local governments, as well as non-governmental actors like industry partners, research organisations, and civil society groups. These interactions are vital for ensuring that KICs effectively address societal challenges, develop innovative solutions, and contribute to policy development.

Authority: As independent legal entities, KICs have the authority to make their own strategic and operational decisions within the framework established by the EIT. They have the autonomy to manage their resources, establish partnerships, and develop their innovation agendas. The EIT, on the other hand, is responsible for overseeing the KICs, ensuring their alignment with EU objectives and compliance.

Capabilities and data: The KICs also leverage data from various sources, such as research institutions, businesses, and government agencies, to inform their innovation strategies and track their impact.

4 Comparative findings

Analytical and evaluative model

To compare the different governance and operational models, an analytical framework is employed to systematically assess and evaluate their strengths, weaknesses, opportunities and threats. This framework considers various dimensions of governance, including decision-making, coordination, accountability, and adaptability (Pahl-Wostl, 2009; Gupta et al., 2019)⁴⁵. It considers contextual factors, such as the institutional landscape, political culture, and available resources, which significantly influence the feasibility and success of each model in a specific country context (Faguet, 2014; Hooghe & Marks, 2003).

The evaluation model involves four key criteria, each addressing a different aspect of governance:

1. **Decision-making efficiency:** The extent to which a model facilitates timely and effective decision-making. Factors such as responsibilities, information flow, and the balance of decision-making between structures are considered here (Faguet, 2014).
2. **Coordination and integration:** The ability of a model to promote alignment and bring together different sectors, levels of government, and stakeholders, ensuring policy coherence and a comprehensive approach to sustainable development (Margerum & Whittall, 2004; Vink et al., 2013).
3. **Accountability and transparency:** The model's capacity to ensure accountability and transparency in decision-making and implementation processes, which is crucial for building trust, legitimacy, and public support (Treib, Bähr, & Falkner, 2007).
4. **Adaptability and flexibility:** The extent to which a model can adapt to changing circumstances, such as new challenges, evolving stakeholder needs, and shifting political priorities, to ensure effectiveness and resilience in the long run (Pahl-Wostl, 2009; Gupta et al., 2019).

Using this analytical framework and evaluation model, the governance structures of the centralised, decentralised, and hybrid models are compared in the following section, drawing on the examples and insights provided in the literature review. Following this is a comparison of the operational structures of the functional, cross-functional and hub-and-spoke models that draw on examples and derive insights relevant to Romania.

This comparative analysis aims to identify the most suitable governance and operational models for the CExDD in the Romanian context, considering the opportunities and challenges specific to the country's institutional landscape, political culture, and resource availability.

GOVERNANCE STRUCTURE COMPARISONS

Effective governance models are essential for addressing complex, multidimensional challenges such as sustainable development⁴⁶. Contextual factors, including political, economic, social, and environmental conditions, play a crucial role in determining the success and adaptability of a governance model (Ansell & Gash, 2008). By taking these factors into account, governance structures can be tailored to the specific

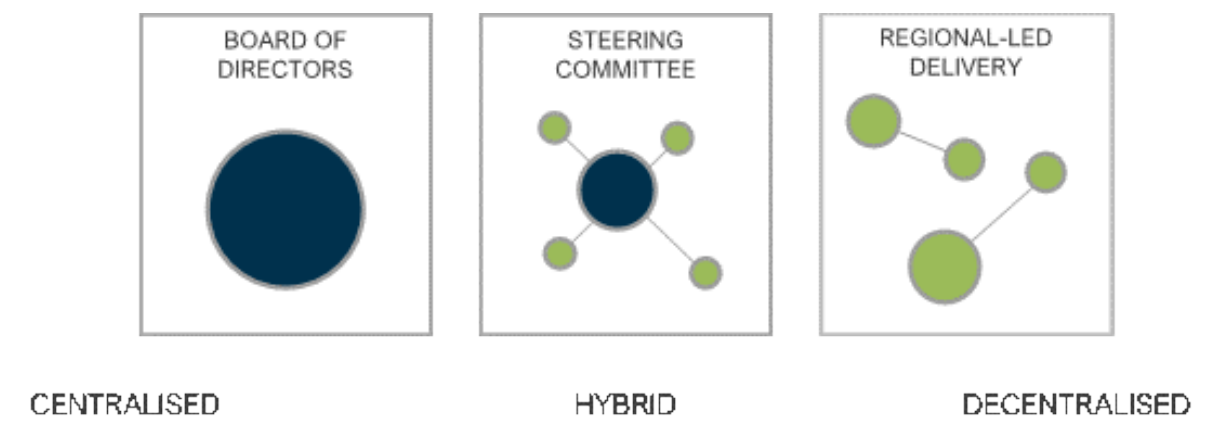
needs and priorities of the area they serve, leading to more efficient and effective implementation of policies and initiatives (Vink, Boezeman, Dewulf, & Termeer, 2013)⁴⁷.

This section provides an overview of three governance models – centralised, decentralised, and hybrid – in the context of sustainable development.

Each model offers unique advantages and challenges, depending on the specific needs, priorities, and contextual factors of a given region. Centralised models concentrate decision-making and implementation authority within a central government, ensuring consistency and efficiency. Decentralised models distribute decision-making authority and responsibilities across multiple levels and institutions, allowing for greater responsiveness to local needs and enhanced stakeholder engagement. Hybrid models combine elements of both centralised and decentralised approaches, offering a balance between policy coherence and flexibility in implementation.

The analysis aims to identify the most suitable governance model for the CExDD in the Romanian context, considering the unique opportunities and challenges faced by the country in terms of its institutional landscape, political culture, and resource availability.

Figure 2. A visualisation of the different governance models



Centralised governance model

The centralised model of governance concentrates decision-making and implementation authority within a central government, ensuring a consistent approach to policy development and execution across the country. This model can offer several advantages, including consistency, efficiency, and streamlined decision-making (Treib et al., 2007). However, it may also suffer from limited responsiveness to local needs and reduced stakeholder engagement. A prime example of this model is South Korea's strategy for sustainable development (KDI School of Public Policy and Management, 2019).

In South Korea, the national government plays a significant role in driving and coordinating sustainable development efforts across the country. The country has adopted a highly centralised approach to sustainable development governance, with the national government taking the lead in formulating and implementing policies and programs (Kim & Chung, 2016). This centralised approach has allowed for a more uniform and consistent implementation of sustainable development initiatives across the country (Lee, 2018).

A key structure of the centralised approach is the Presidential Committee on Green Growth (PCGG), which was established in 2009 to coordinate sustainable development efforts across various government ministries and agencies (Kim & Chung, 2016). The PCGG, chaired by the President, is responsible for

developing and overseeing the implementation of the National Strategy for Green Growth, a long-term plan that outlines the country's sustainable development objectives, targets, and policy instruments (Lee, 2018). The centralised model allowed the South Korean government to effectively align various ministries and agencies under a common vision, ensuring policy coherence and efficient use of resources (KDI School of Public Policy and Management, 2019).

The centralised approach in South Korea has enabled the government to mobilise resources efficiently and effectively to address sustainable development challenges at the national level. By providing a clear policy direction and coordinating efforts across different government entities, the PCGG has facilitated the implementation of large-scale projects and initiatives, such as the Four Major Rivers Restoration Project and the Low Carbon Green Growth Strategy (Kim & Chung, 2016).

While South Korea's centralised approach to sustainable development has been successful in driving ambitious national initiatives and fostering a strong sense of national ownership, it may face challenges in terms of engaging local communities and adapting policies to specific regional contexts (Yoon & Lee, 2015). Critics identify that the top-down approach can hinder the development of context-specific solutions and lead to a lack of ownership among local governments and communities (Kim & Chung, 2016).

In the context of establishing a CExDD, the South Korean example illustrates the potential strengths of a centralised governance model in terms of policy coherence, resource mobilisation, and large-scale implementation. However, it also highlights the importance of ensuring adequate stakeholder participation and addressing local context and needs (Kim & Chung, 2016; Lee, 2018).

Decentralised governance model

A decentralised governance model distributes decision-making authority and responsibilities across multiple levels and institutions, allowing for increased responsiveness to local needs, enhanced stakeholder engagement, and context-specific policy solutions (Faguet, 2014). Despite these advantages, decentralised models may face challenges such as coordination difficulties, inconsistent policy implementation, and potential inefficiencies.

The decentralised model of governance empowers local and regional authorities to take the lead in developing and implementing sustainable development strategies, allowing for greater flexibility and responsiveness to local conditions and needs. A notable example of this model is Sweden's approach to sustainable development (Government Offices of Sweden, 2016).

Sweden has a long-standing commitment to sustainable development and has integrated the principles of sustainable development into various aspects of its public policy (Swedish Environmental Protection Agency, 2020). While the Swedish government has established overarching goals and priorities through its national "Agenda 2030" strategy, the implementation of these goals is largely decentralised, with local and regional authorities playing a crucial role in adapting and applying the strategy to their specific contexts (Government Offices of Sweden, 2016).

Sweden's decentralisation of sustainable development governance is characterised by the establishment of Regional Development Councils (RDCs) and Local Agenda 21 (LA21) initiatives. The RDCs are responsible for formulating and implementing regional sustainable development strategies, while the LA21 initiatives focus on local-level sustainable development planning and action (Bäckstrand, 2006). Both RDCs and LA21 initiatives are supported by the Swedish Environmental Protection Agency (SEPA) and the Ministry of the Environment, which provide guidance, resources, and expertise (Schmidt, 2015).

For example, the city of Malmö has developed its own "Malmö Commission" report, which outlines a comprehensive plan for addressing various social, economic, and environmental challenges faced by the city, including climate change, housing, and social inequality (City of Malmö, 2018). The Malmö

Commission's recommendations are aligned with the national Agenda 2030 strategy and the UN's SDGs, ensuring coherence and continuity between different levels of governance.

The decentralised model in Sweden has been successful in fostering local innovation and encouraging stakeholder participation in sustainable development efforts (OECD, 2017)⁴⁸.

However, the decentralised model has also faced some challenges in Sweden, particularly in terms of ensuring consistency and coherence in sustainable development policy across different levels of government (Schmidt, 2015). To address this issue, the national government has introduced frameworks and guidelines that promote policy coherence while still allowing for local autonomy (Bäckstrand, 2006).

In the context of establishing a CExDD, the Swedish example demonstrates the potential advantages of a decentralised governance model in promoting context-specific, innovative, and flexible approaches to sustainable development. However, it also highlights the importance of finding a balance between local autonomy and national-level policy coherence (Schmidt, 2015; Bäckstrand, 2006).

Hybrid governance model

The hybrid model of governance combines elements of both centralised and decentralised approaches, allowing for greater flexibility in policy implementation and a more inclusive decision-making process. A notable example of a hybrid model can be found in Germany's approach to sustainable development (BMU 2016)⁴⁹.

An example of a hybrid governance model relevant to the CExDD is Germany's approach to sustainable development, which relies on a federal system with shared responsibilities between the national government and the Länder (state governments) (BMU, 2021)⁵⁰. Germany's federal system allows for a high degree of autonomy and flexibility at the state (Länder) level, which encourages the development of regionally tailored sustainability strategies and initiatives (Biermann et al., 2009)⁵¹. Each state has its own approach to sustainable development, resulting in diverse policy solutions that consider local context and needs (BMU, 2021).

The national government has established a comprehensive framework for sustainable development, known as the German Sustainable Development Strategy (GSDS). The GSDS sets out overarching goals, priorities, and targets for the country's sustainability efforts, providing a clear direction and ensuring policy coherence at the national level (BMU, 2016).

At the same time, Germany's federal structure allows individual states (Länder) to develop and implement their own sustainability strategies, tailoring policies to address specific regional needs and circumstances (Sustainable Development Solutions Network, 2018)⁵². This decentralised aspect of the hybrid model fosters innovation, as states can experiment with different approaches and learn from one another's experiences.

In addition, the German Council for Sustainable Development (RNE) plays a critical role in coordinating and advising the national government on sustainable development matters, as well as promoting dialogue between various stakeholders, including civil society, the private sector, and academia (RNE, 2021)⁵³. This multi-stakeholder approach to governance ensures a more inclusive and participatory decision-making process.

This hybrid approach has facilitated a higher degree of responsiveness to regional and local issues, as state-level strategies can be tailored to address the specific needs and priorities of each region (Enderlein et al., 2010)⁵⁴. For example, the state of Baden-Württemberg has implemented a comprehensive sustainability strategy that addresses region-specific challenges, such as promoting sustainable mobility solutions and preserving local biodiversity (State of Baden-Württemberg, 2021)⁵⁵.

However, the decentralised nature of Germany's sustainable development governance also presents challenges, such as coordination difficulties and potential inconsistencies in policy implementation across

different states (Enderlein et al., 2010). Additionally, the decentralised approach may be more resource-intensive, as multiple institutions and strategies are involved in the governance process (Faguét, 2014).

Comparison of the governance models

Centralised model: Romania, a country in transition with a pressing need to address sustainable development issues, may find strength in the centralised model. As observed in South Korea, centralisation facilitates swift decision-making, ensuring that critical policies can be implemented rapidly to address urgent needs. It would provide a singular vision to align the efforts of different stakeholders and ensure a consistent approach to sustainable development nationwide. However, this top-down approach may overlook local and regional nuances and demands, possibly leading to disparities in policy efficacy across the country.

Decentralised model: Alternatively, the decentralised model, as demonstrated in Sweden, offers the potential for strategies finely tuned to local and regional specificities. Romania's diverse geographical and socio-economic conditions could benefit significantly from this model. Empowering local and regional authorities to develop and implement their own sustainable development strategies could lead to innovations and policies better tailored to local realities. However, the risk lies in maintaining cohesion in policy implementation and resource allocation.

Hybrid model: The hybrid model, striking a balance between the strengths of both centralised and decentralised approaches, may be the most viable choice for Romania. Combining the top-down authority of a centralised model with the bottom-up adaptability of a decentralised model could offer a more inclusive and flexible governance structure. Germany's success with this model underscores its potential. Romania's clear national framework for sustainable development can encourage regional and local adaptation and innovation, accommodating its diverse landscape.

Table 1. Comparison of governance models using evaluation criteria

	CENTRALISED MODEL	HYBRID MODEL	DECENTRALISED MODEL
DECISION-MAKING EFFICIENCY	This model enables quick decision-making, as it is led by a central authority.	This model balances efficient decision-making with stakeholder involvement.	Decision-making may be slower, as it involves multiple stakeholders at the local level.
COORDINATION AND INTEGRATION	A centralised approach ensures coordination and integration across different sectors and agencies.	The hybrid model ensures coordination and integration across different levels of governance.	This model may face challenges in ensuring coordination and integration across different regions.
ACCOUNTABILITY AND TRANSPARENCY	The centralised model may have limited transparency, as it relies on top-down decision-making.	Combining centralised and decentralised elements, this model fosters transparency and accountability.	The decentralised model promotes transparency and accountability by involving local stakeholders.
ADAPTABILITY AND FLEXIBILITY	This model might struggle to adapt to local contexts due to its centralised nature.	The hybrid model provides adaptability and flexibility by incorporating	Highly adaptable to local contexts, as it allows for tailored policies and strategies.

	CENTRALISED MODEL	HYBRID MODEL	DECENTRALISED MODEL
		both centralised and decentralised elements.	
HIGHLIGHT FEATURE	Capacity building through centralised resources and expertise sharing.	Fosters capacity building and innovation by combining top-down resource sharing with bottom-up experimentation.	Encourages innovation through localised experimentation and bottom-up approaches.
TRADE-OFF	While the centralised model allows for quick decision-making and efficient resource allocation, it may struggle to adapt to local contexts and priorities.	The hybrid model balances the strengths of both centralised and decentralised approaches but may introduce complexity in governance structures and decision-making processes.	The decentralised model fosters innovation and adaptability at the local level but may struggle to coordinate efforts and resources across regions.

Romania's choice of governance model for its Centre of Excellence for Sustainable Development will significantly impact the nation's journey towards sustainability. While the centralised model offers swift, uniform action, it risks neglecting local needs. Conversely, the decentralised model may yield locally nuanced and innovative solutions but grapples with challenges in coordination. The hybrid model potentially provides a balanced approach, but with an added layer of complexity. Thus, a careful appraisal of these trade-offs is crucial to shaping Romania's path to sustainable development.

OPERATING MODEL COMPARISONS

This section delves into the comparisons of operating models for CExDD. The operating model plays a critical role in shaping the Centre's functioning, governance, and strategic approach towards sustainable development. An operating model defines how the Centre functions, how its various components interact, and how it delivers its services and outputs to stakeholders (Ross et. al., 2006)⁵⁶. It encompasses the organisational structure and resource allocation mechanisms (BCG Henderson Institute, 2020)⁵⁷. The section will explore various operating model options, drawing on real-world examples and lessons learned from other countries' experiences. By exploring and evaluating different operating models, the most suitable framework for Romania's specific context, challenges, and objectives can be identified.

Figure 3. A visualisation of the different operating models



Functional operational model

In this section, the functional operational model is explored in more detail identifying its key features, advantages, and potential drawbacks. The functional operational model is characterised by a hierarchical structure in which each department or unit focuses on a specific function or expertise, such as finance, human resources, research, or policy development (Mintzberg, 1979). This model is particularly suited for organisations with a clear division of responsibilities and a need for specialised knowledge and skills.

A key advantage of the functional operational model is that it promotes specialisation and efficiency within each department, as employees can develop a high level of expertise in their respective fields (Chandler, 1962)⁵⁸. This specialisation can lead to improved performance, faster decision-making, and a greater ability to address complex and specialised issues. Additionally, the functional model can facilitate clear lines of authority and communication within the organisation, promoting accountability and reducing the potential for confusion or duplication of efforts.

However, the functional operational model also has some potential drawbacks. One key challenge is the risk of siloed thinking and limited cross-functional collaboration, as departments may focus primarily on their own objectives and priorities, potentially leading to a lack of coordination and integration across the organisation (Lawrence & Lorsch, 1967)⁵⁹. This can hinder the organisation's ability to respond effectively to complex, multi-faceted challenges that require interdisciplinary approaches and innovative solutions.

A prominent example of a functional operational model is the Finnish Environment Institute (SYKE), an independent research and expert organisation focused on environmental issues and sustainable development (Finnish Environment Institute, n.d.). SYKE is structured into several specialised departments, such as environmental research, environmental policy, and marine research. Each department is responsible for a specific area of expertise, enabling the organisation to develop specialised knowledge and contribute effectively to environmental policymaking and research in Finland.

SYKE's functional operational model has contributed to its success as a leading environmental research organisation in Finland and Europe, providing valuable data, analysis, and policy recommendations to support sustainable development (Finnish Environment Institute, n.d.). But even with this success, SYKE exemplifies the challenge of this model: siloed departments risk restricting cross-departmental collaboration, a vital asset when tackling complex environmental challenges.

The functional operational model offers several advantages, such as specialisation, efficiency, and clear lines of authority, but also presents potential drawbacks, such as limited cross-functional collaboration.

Cross-functional operational model

The cross-functional operational model is characterised by a matrix or team-based structure, in which employees from different departments and areas of expertise come together to collaborate on specific projects, tasks, or initiatives (Galbraith, 1971). This model is particularly suited for organisations that seek to foster innovation, collaboration, and integration across various sectors and disciplines.

A key advantage of the cross-functional operational model is its ability to promote collaboration, knowledge sharing, and creative problem-solving among employees with diverse backgrounds and expertise (Ancona & Caldwell, 1992)⁶⁰. By breaking down departmental silos and encouraging interdisciplinary teamwork, the cross-functional model can enable organisations to develop innovative solutions and respond effectively to complex, multifaceted challenges that require a comprehensive and integrated approach.

However, the cross-functional operational model also presents some potential challenges. One key issue is the potential for increased complexity in decision-making and communication, as employees may need to navigate multiple reporting lines, conflicting priorities, and diverse perspectives within their cross-functional teams (Davis & Lawrence, 1977)⁶¹. Additionally, the cross-functional model can sometimes lead to confusion and ambiguity around roles, responsibilities, and accountability, particularly if the organisational structure and processes are not well-defined and communicated. To mitigate these challenges, strong leadership and de-confliction skills are essential (Katzenbach & Smith, 1993)⁶².

A notable example of a cross-functional operational model is the United States Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE), which focuses on advancing clean energy technologies and sustainable practices (U.S. Department of Energy, n.d.)⁶³. EERE is organised into interdisciplinary teams, each working on a specific technology area, such as solar energy, wind energy, or vehicle technologies. These teams bring together experts from various departments and disciplines, fostering collaboration and innovation in the development and deployment of clean energy solutions.

EERE's cross-functional operational model has contributed to its success as a leading organisation in clean energy innovation, supporting the development of ground-breaking technologies and promoting sustainable practices across the United States (U.S. Department of Energy, n.d.). However, the inherent complexity of this model becomes clear when considering the challenge of managing multiple reporting lines, conflicting priorities, and diverse perspectives within teams. Therefore, it's crucial for organisations using this model to establish clear processes, roles, and communication channels, thereby ensuring smooth operations.

The cross-functional operational model offers several advantages, such as collaboration, innovation, and integration, but also presents potential challenges, such as increased complexity and potential confusion around roles and responsibilities.

Hub-and-spoke operational model

The hub-and-spoke operational model is characterised by a central core or "hub" that coordinates and supports a network of peripheral units or "spokes" (Ernst & Kamrad, 2000)⁶⁴. This model is particularly well-suited for organisations that aim to foster collaboration, knowledge exchange, and capacity building across a diverse and geographically dispersed network of partners and stakeholders.

A key advantage of the hub-and-spoke operational model is its ability to facilitate effective coordination, communication, and knowledge sharing among the various spokes, while allowing each spoke to maintain a degree of autonomy and flexibility in addressing local needs and priorities (Hansen et al., 1999)⁶⁵. By centralising certain functions and resources at the hub, the model can achieve economies of scale and promote efficient resource allocation, while also encouraging innovation and learning across the network through the sharing of best practices and expertise.

However, the hub-and-spoke operational model also presents some potential challenges. One key issue is the risk of over-centralisation, which may limit the responsiveness and adaptability of the spokes to local conditions and reduce their sense of ownership and engagement in the network's activities (Ernst & Kamrad, 2000). Additionally, the success of the model depends on the hub's capacity to effectively coordinate and support the spokes, which may require strong leadership, communication, and management skills, as well as adequate resources.

A notable example of a hub-and-spoke operational model is the European Institute of Innovation and Technology's (EIT) Knowledge and Innovation Communities (KICs) (EIT, n.d.). Each KIC comprises a central hub or "co-location centre" that coordinates the activities of a network of partners, including universities, research institutions, businesses, and public organisations, from across Europe. The KICs focus on addressing key societal challenges, such as climate change, digital transformation, and sustainable food systems, through the development of innovative products, services, and solutions.

The EIT's hub-and-spoke model has proven successful in fostering collaboration, innovation, and capacity building across its network of partners, contributing to the development of numerous ground breaking technologies and initiatives (EIT, n.d.). However, the key to this model's success is the hub's ability to coordinate and support the spokes effectively, a challenge requiring a careful balance to prevent over-centralisation. Hence, for an organisation like EIT, the hub's ability and the spokes' engagement are pivotal to success.

In conclusion, the hub-and-spoke operational model offers several advantages, such as effective coordination, communication, and knowledge sharing, but also presents potential challenges, such as the risk of over-centralisation and the need for strong hub leadership and management.

Comparison of the operational models

In assessing the suitability of each operational model for Romania's CExDD, the evaluation criteria outlined earlier are considered: decision-making efficiency, coordination and integration, accountability and transparency, and adaptability and flexibility.

The functional operational model offers efficient decision-making for Romania's CExDD but may hinder cross-sector collaboration and integration, essential for addressing complex sustainable development challenges.

The cross-functional operational model is suitable for Romania's CExDD, as it promotes collaboration, innovation, and integration across various sectors and stakeholders. However, the increased interaction among different functions may lead to conflicts or slower decision-making, requiring strong leadership and deconfliction skills.

The hub-and-spoke operational model is highly suitable for Romania's CExDD, enabling effective coordination, communication, and knowledge sharing among various partners and stakeholders. However, the success of this model depends on the hub's ability to effectively coordinate and support the spokes, and there is a risk of over-centralisation, which may reduce the responsiveness and adaptability of the spokes to local conditions.

Table 2. Comparison of operational models using evaluation criteria

	FUNCTIONAL MODEL	HUB-AND-SPOKE MODEL	CROSS-FUNCTIONAL MODEL
DECISION-MAKING EFFICIENCY	The hierarchical structure facilitates efficient decision-making through	This model relies on the hub's ability to effectively coordinate and support the spokes, which may	The cross-functional model may face slower decision-making processes due to

	FUNCTIONAL MODEL	HUB-AND-SPOKE MODEL	CROSS-FUNCTIONAL MODEL
	clearly defined roles and responsibilities.	impact the speed of decision-making.	increased collaboration and interaction among different functions.
COORDINATION AND INTEGRATION	The compartmentalised structure may hinder cross-sector collaboration and integration, which are essential for addressing complex sustainable development challenges.	This model enables effective coordination, communication, and knowledge sharing among various partners and stakeholders.	This model promotes collaboration, innovation, and integration across various sectors and stakeholders, fostering a culture of cooperation and knowledge sharing.
ACCOUNTABILITY AND TRANSPARENCY	The clear division of responsibilities in the functional model helps to maintain a high level of accountability and transparency.	The model's success depends on the hub's leadership, which may impact overall accountability and transparency in the network.	It may present challenges in assigning responsibility and ensuring transparency due to overlapping roles and responsibilities.
ADAPTABILITY AND FLEXIBILITY	While the functional model can adapt to changing circumstances, its hierarchical structure may limit its flexibility compared to other models.	This model can adapt to changing circumstances through effective coordination and support from the hub, promoting innovation and learning across the network.	This model's collaborative nature enables it to adapt to changing circumstances and evolving stakeholder needs effectively.
HIGHLIGHT FEATURE	Clear responsibilities and streamlined decision-making.	Effective coordination and knowledge sharing across a diverse network.	Enhanced collaboration and innovation across sectors.
TRADE-OFF	<p><i>Efficiency vs. Coordination</i></p> <p>The functional model offers high efficiency in decision-making but may struggle with cross-sector collaboration and integration. Romania must consider whether the gains in efficiency outweigh the potential limitations in fostering cooperation and innovation among different functions.</p>	<p><i>Network Effectiveness vs. Decision-making Efficiency</i></p> <p>The hub-and-spoke model relies on the hub's ability to effectively coordinate and support the spokes, which may impact the speed of decision-making. Romania must consider the advantages of a networked approach against the potential for slower decision-making processes.</p>	<p><i>Collaboration vs. Decision-making Efficiency</i></p> <p>The cross-functional model promotes collaboration and integration but may experience slower decision-making processes and less clear responsibilities due to increased interaction among different functions. Romania must determine if the benefits of enhanced cooperation</p>

	FUNCTIONAL MODEL	HUB-AND-SPOKE MODEL	CROSS-FUNCTIONAL MODEL
			justify potential delays in decision-making.

Romania's CExDD must carefully consider the trade-offs associated with each operational model to select the most suitable approach for addressing its sustainable development goals. The functional operational model offers clear lines of authority and specialised knowledge but may struggle with cross-sector collaboration and integration. The cross-functional operational model fosters collaboration, innovation, and integration across various sectors and stakeholders, but increased interaction can lead to conflicts or slower decision-making. Finally, the hub-and-spoke operational model enables effective coordination, communication, and knowledge sharing but depends on the hub's ability to support the spokes and may risk over-centralisation.

Taking these trade-offs into account, Romania's CExDD could benefit from a combination of elements from the cross-functional and hub-and-spoke operational models. This approach would promote collaboration and innovation while maintaining effective coordination and communication among partners and stakeholders. To implement this hybrid operational model successfully, it is crucial for Romania's CExDD to establish clear processes, roles, and communication channels, foster a culture of cooperation and knowledge sharing, and invest in strong leadership and management skills.

Ultimately, the chosen operational model should align with Romania's context, objectives, and stakeholder needs, providing a solid foundation for the country to address its sustainable development challenges effectively and holistically. By learning from the experiences of other countries and organisations, Romania can develop an operational model that maximises its potential for success in achieving its sustainable development goals.

FUNDING MODEL SCENARIOS

This section explores three funding scenarios for the CExDD: Core, Integrated, and Innovative options. Each scenario's funding structure influences the Centre's core functions and potential impact on Romania's efforts to pursue sustainability goals. The section employs a contemporary analytical model that evaluate these options, based on capabilities rather than financial indicators alone.

The chosen analytical model aligns with Nobel laureate Amartya Sen's advocacy for capability assessment (Sen, 2000)⁶⁶. Unlike traditional cost-benefit analyses, this model emphasises the capabilities or opportunities that each funding option would enable, rather than solely focussing on monetary input and output. By employing this model, the three funding options can be systematically compared against a predetermined set of criteria that align with Romania's specific challenges, objectives, and capability needs.

This approach aligns with the ethos of sustainable development, which prioritises holistic and lasting improvements in societal structures. By evaluating the funding options through the lens of capabilities, it can be assessed how each scenario would enhance the CExDD's operational effectiveness, partnership building, knowledge generation, strategic thinking and communication. Furthermore, this model also enables us to consider the potential of each funding scenario in strengthening Romania's broader sustainability capabilities. The assessment criteria considered in the model are:

1. **Capability Enhancement:** This criterion focuses on the potential of each funding model to enhance Romania's ability to meet its 2030 SDG targets (OECD, 2021)⁶⁷.
2. **Resilience and Equality Benefits:** The section assesses each model's capacity to foster resilience and promote equality within Romania (UNDP, 2020)⁶⁸.

3. **Potential for Innovation:** This criterion evaluates the degree to which the funding model fosters innovative practices and thinking, a crucial aspect of sustainable development (European Commission, 2022)⁶⁹.
4. **Financial Feasibility:** It is essential to determine if the financial commitment required by each model is realistic and sustainable given Romania's economic situation (World Bank, 2023)⁷⁰.
5. **Speed to Impact:** Considering the urgent nature of the 2030 SDGs, the section assesses how quickly each model can deliver tangible results (Sustainable Development Solutions Network, 2023)⁷¹.

Applying these criteria to the three funding scenarios, Core, Integrated, and Innovative, provides a nuanced understanding of the strengths, weaknesses, opportunities, and threats. It allows stakeholders to determine the most suitable funding model given Romania's specific context, strategic priorities, and resource constraints.

The following sections delve into the details of the Core, Integrated, and Innovative funding options, examining their potential effects on the functions and capabilities of the CExDD, and, by extension, on Romania's pursuit of the SDGs.

Core funding scenario (low-cost)

The Core funding scenario lays the foundation for the CExDD by prioritising in three key functions: a data centre, networks and partnerships and knowledge communication. The remaining two functions, generation of scientific arguments and think tank and strategic thinking rely on partnerships and opportunistic donor funding. This funding model aims to establish a fundamental platform for sustainable development work in Romania, creating new capabilities, fostering inter-functional collaborations (adjacency benefits), and nudging practices aligned with the SDGs. However, it also presents challenges, such as the unpredictability of donor funding and potential slow progress towards the 2030 SDG targets.

This funding scenario provides a solid starting point for building Romania's capabilities in sustainable development. By investing in a data centre it enhances the country's data processing capabilities, which are crucial for monitoring and analysing SDG progress (United Nations, 2015)⁷². The data centre, in conjunction with the knowledge communication function, transforms raw data into valuable information, enabling informed decision-making. Moreover, by strengthening networks and partnerships, the Core option brings together stakeholders from various sectors, fostering a sense of shared responsibility and cooperation in achieving the SDGs (Djalante et al., 2011)⁷³. This not only delivers new capabilities but also harnesses adjacency benefits to accelerate the adoption of SDG-aligned practices. It also includes nudges for practices aligned with SDGs. Despite these benefits, the Core option presents challenges related to the unpredictability of donor funding and the potential slow pace of progress towards 2030 SDG targets.

However, the Core option's reliance on donor funding for scientific arguments and strategic thinking introduces operational uncertainties. Donor funds are often project-specific and time-limited, which may jeopardise the continuity and depth of these crucial functions (Morin and Lebdioui, 2018)⁷⁴. It is essential to address these challenges to ensure the sustained effectiveness of the Core funding scenario.

Analogous funding models, such as Australia's National Climate Change Adaptation Research Facility (NCCARF), have demonstrated success in addressing SDG challenges (Barnett, J., & O'Neill, S. 2010)⁷⁵. NCCARF, primarily funded by the Australian government, served as a vital centre for data collection, communication, and partnership-building. While relying on core funding, NCCARF also leveraged resources from other stakeholders for specific research and strategic initiatives. This approach facilitated valuable research, strategic planning, and collaboration among institutions. However, it also faced challenges in securing and maintaining funding for strategic initiatives (Barnett, J., & O'Neill, S. 2010).

Drawing from the Australian experience, the Core funding scenario for CExDD presents both opportunities and limitations. It establishes the groundwork for Romania's sustainable development strategy, provide important new capabilities, and stimulate practices aligned with the SDGs. However, its effectiveness is heavily on the availability and reliability of donor funding for key strategic initiatives, which could potentially limit its reach and impact.

Integrated funding scenario (medium cost)

The Integrated funding option for Romania's CExDD presents a medium investment scenario that builds upon the foundational work established by the Core option. This option introduces a significant addition to the core functions by incorporating regional capability. By doing so, it expands the scope and deepens the impact of the CExDD, offering a more holistic and nuanced approach to the diverse challenges the nation faces in achieving its 2030 SDG targets.

Unlike the Core option, the Integrated option funds four functions with a particular emphasis on the Generation of Scientific Arguments. This scenario establishes a funded pilot program that directly engages with regions, fostering a symbiotic relationship between national objectives and regional realities. This approach strengthens the interconnectedness of all functions, resulting in operational synergy that generates high-impact outcomes.

At the heart of the Integrated funding option is the recognition that regional issues play a crucial role in the attainment of national SDGs. Therefore, cultivating regional innovative capability is considered essential for Romania's sustainable development strategy. By incorporating region-specific considerations into the generation of scientific arguments, this option enables the development of tailored solutions that address the unique challenges and opportunities of each region. It empowers regional stakeholders to actively participate in the sustainable development process.

The advantages of such an approach are many. By focusing on regional nuances, the Integrated option allows for more targeted and effective solutions that resonate deeply with local communities, increasing their engagement and commitment to sustainable practices. Incorporating regional perspectives into the national agenda helps guard against top-down, one-size-fits-all approaches that may overlook crucial local realities.

Moreover, the funded pilot program under the Integrated option serves as a testing ground for new ideas and strategies. It provides an opportunity to evaluate innovative solutions in a regional context before scaling them up nationally, minimising risks and enhancing the likelihood of success.

However, while the Integrated option represents a significant step up from the Core scenario, it still requires donor funding for the Think Tank/Strategic Thinking function.

A relevant example of the integrated funding option is demonstrated by the Federal Ministry of Education and Research (BMBF) in Germany. The BMBF funds a wide range of research and innovation projects, including the generation of scientific arguments that directly contribute to Germany's sustainability goals (BMBF 2018)⁷⁶. Additionally, the BMBF has played a vital role in strengthening networks and partnerships by facilitating communication between researchers, industry, and policy-makers (BMBF 2019)⁷⁷.

In the context of Romania's needs, the Integrated option, as exemplified by BMBF, can foster a more collaborative, regionally responsive, and robust approach towards SDGs. However, it is important to anticipate and address the challenges associated with relying on donor funding to ensure the sustainability and effectiveness of the approach.

Innovative funding scenario (high-cost)

The Innovative Option represents the highest level of investment and ambition among the three funding options for Romania's CExDD. This option fully funds all five functions of the Centre, creating a robust framework to tackle the complex and interconnected challenges of sustainable development head-on.

By opting for the Innovative option, Romania can anticipate a profound increase in capabilities across the entire spectrum. Building upon the foundation laid by the Integrated model, this option takes it a step further by fully funding the Think Tank/Strategic Thinking function, making the Centre self-sufficient and forward-thinking. This enables deeper exploration of strategic and innovative solutions, fostering an environment that promotes intellectual stimulation and holistic development. With the full funding of scientific arguments generation, a comprehensive research ecosystem can be established, providing in-depth and context-specific insights to guide sustainable development efforts. Additionally, a funded think tank function can pioneer strategic thinking and scenario planning to anticipate and respond to emerging trends and challenges (Quist and Vergragt, 2006).⁷⁸

One primary benefit of the Innovative option is its comprehensive and integrated approach to sustainable development, which has a higher potential for innovation and equality benefits (Hargreaves et al, 2013)⁷⁹. It provides Romania with a stronger foundation to adapt to emerging complexities and catalyse transformative change towards sustainability.

The adjacency benefits of fully funding all five functions are substantial. While each function has its own distinct role, they are closely interlinked and mutually reliant to maximise their effectiveness. The all-inclusive funding model creates an opportunity for synergies to emerge between the functions, leading to an exponential increase in their impact and, consequently, Romania's overall progress towards the SDGs.

For example, a fully funded Think Tank/Strategic Thinking function enables robust research and investigation into sustainable practices. It provides a platform for forecasting future trends and anticipating challenges, equipping Romania with the necessary tools to mitigate risks and capitalise on opportunities. A well-funded Think Tank function can act as a catalyst for new initiatives, drive discourse on sustainability, and help shape national and regional policies aligned with SDG targets.

The combination of this innovative capability with the already funded Data Centre, Generation of Scientific Arguments, Networks and Partnerships, and Communication and Dissemination of Knowledge functions creates a powerful and cohesive unit. It enhances the CExDD's ability to navigate complex sustainable development challenges and drive innovation.

A relevant example of the innovative funding scenario is Denmark's Danish Innovation Fund. The fund invests in novel ideas across research, technology, and innovation, fostering innovative thinking and an entrepreneurial spirit. Through this approach, Denmark has emerged as a global leader in sustainable technologies (Danish Innovation Fund, 2018)⁸⁰.

For Romania, the Innovative option provides the best chance to tackle complex and interconnected challenges to meet its 2030 SDG targets. While it requires a more substantial financial commitment, it also provides the greatest potential for innovation, equality, and overall sustainability outcomes.

Comparison of the funding options

Core Option: The Core option serves as a critical baseline for Romania to build upon. By focusing on the Data Centre, Networks and Partnerships, and Knowledge Communication, this model lays the foundation for improvements in data management, strengthened partnerships, and effective communication of sustainability knowledge. It acts as a springboard, delivering necessary capabilities and introducing new sustainability practices. The highlight feature of the Core option is its potential to deliver new capabilities, particularly in the realm of data management, which can provide valuable insights into Romania's SDG progress and inform future strategies.

Integrated Option: Taking a step further, the Integrated option has the potential to trigger transformative changes in Romania's SDG efforts. By introducing funding for the Generation of Scientific Arguments, it enhances the regionally innovative capabilities developed through this model. This approach can significantly contribute to addressing region-specific sustainability challenges. However, it is important to note that the Integrated option still relies on donor funding for the Think Tank and Strategic Thinking function. The highlight feature of this model is the potential to deliver regional innovative capability, fostering solutions that are relevant to specific regions and promoting their overall development.

Innovative Option: The Innovative option represents the most ambitious funding model, offering substantial benefits to Romania. By fully funding all five functions, it provides the maximum uplift in capability across the board. The comprehensive approach of this model has the potential to catalyse changes towards sustainability, making it particularly well-suited to address complex and interconnected sustainability challenges. The highlight feature of the Innovative option is its potential to enhance equality benefits and stimulate deeper innovative capability, promoting both social and economic development.

Figure 4. Visualisation of the included functions across the three funding options.

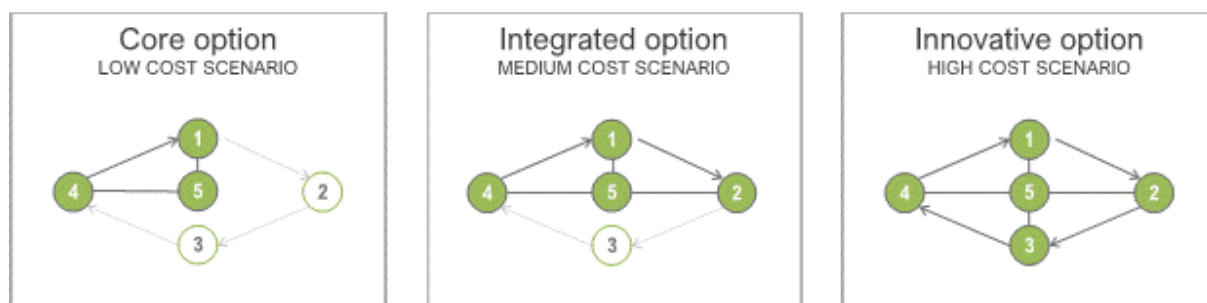


Table 3. Comparison of capability between funding options

	Core option (Low investment scenario)	Integrated option (Medium investment scenario)	Innovative option (High investment scenario)
High-level description	A critical baseline capability to boost the network and data to drive efforts in Romania.	Transformative capability to integrate and connect central and regional governments.	Capability to tackle deeper and complex, interconnected challenges.
Function 1: Data centre	✓ Funded	✓ Funded	✓ Funded
Function 3: Strengthening networks and partnerships	✓ Funded	✓ Funded	✓ Funded
Function 5: Communication and dissemination of knowledge	✓ Funded	✓ Funded	✓ Funded
Function 2: Generation of scientific arguments	⊖	✓	✓

	Core option (Low investment scenario)	Integrated option (Medium investment scenario)	Innovative option (High investment scenario)
	Needs donor funding	Pilot funded	Funded
Function 4: Think tank/ strategic thinking	⊖ Needs donor funding	⊖ Needs donor funding	⊕ Funded
Capability Enhancement: This criterion focuses on each funding model's potential to enhance Romania's ability to achieve its 2030 SDG targets (OECD, 2021).	The Core option provides a solid foundation for sustainable development work in Romania. While it enhances certain capabilities, such as data processing and information dissemination, it may face challenges in fully addressing the diverse range of SDG targets due to its reliance on opportunistic donor funding for scientific arguments and strategic thinking.	The Integrated option builds upon the Core scenario and further enhances Romania's capabilities by funding the generation of scientific arguments. By working directly with regions, it strengthens the interconnectedness of functions and enables a more targeted approach to regional challenges. This integrated approach has the potential to significantly enhance Romania's capability to address a wider range of SDG targets.	The Innovative option represents the highest level of investment and offers the most ambitious approach. By fully funding all five functions, including think tank and strategic thinking, it enables deep exploration of strategic and innovative solutions. This comprehensive funding scenario has the potential to uplift Romania's capabilities across the board and drive deep change towards sustainability.
Resilience and Equality Benefits: We assess each model's capacity to foster resilience and promote equality within Romania (UNDP, 2020).	Provide foundational support, may face challenges in ensuring resilience and promoting equality due to its limited financial resources and potential reliance on opportunistic donor funding.	With its focus on regional collaboration and innovative practices, this has the potential to foster resilience and promote equality. By engaging regional stakeholders and addressing their specific challenges and opportunities, it can contribute to more inclusive and locally relevant sustainable development initiatives.	This comprehensive and integrated approach has the potential to foster resilience and promote equality on a broader scale. By fully funding all functions, including think tank and strategic thinking, it can generate innovative solutions that address systemic challenges and contribute to more equitable outcomes.
Potential for Innovation: This criterion evaluates the degree to which the funding model fosters innovative practices and thinking, a crucial aspect of sustainable development	While providing a fundamental platform, may have limitations in terms of fostering innovation due to its reliance on opportunistic donor funding for	The emphasis on regional collaboration and innovative approaches, has a higher potential for fostering innovation. By fully funding all functions, including the generation	This offers the greatest potential for fostering innovation. By fully funding all five functions, including the think tank and strategic thinking, it creates an environment

	Core option (Low investment scenario)	Integrated option (Medium investment scenario)	Innovative option (High investment scenario)
(European Commission, 2022).	strategic thinking. However, it can still support innovative practices within its funded functions, such as data processing and knowledge dissemination.	of scientific arguments, it enables the exploration of new ideas and solutions that address the specific challenges faced by different regions in Romania.	conducive to intellectual stimulation and holistic development. This enables the generation of innovative ideas, strategies, and solutions to address complex sustainability challenges.
Financial Feasibility: It is essential to determine if the financial commitment required by each model is realistic and sustainable given Romania's economic situation (World Bank, 2023).	The foundational investment pathway, may be relatively more financially feasible compared to the other options. However, it should carefully consider the potential challenges associated with securing and maintaining donor funding for strategic initiatives.	With its medium investment level, requires a more substantial financial commitment. It should be assessed in terms of its long-term sustainability and the availability of resources to support the envisioned regional collaborations and innovative practices.	As the highest level of investment, may pose financial challenges. It requires careful consideration of the financial resources available and the ability to sustain the fully funded functions, including the think tank and strategic thinking.
Speed to Impact: Considering the urgency of the 2030 SDGs, we assess how quickly each model can deliver tangible results (Sustainable Development Solutions Network, 2023).	This can deliver tangible results in the short to medium term. However, the pace of progress towards the 2030 SDG targets may be influenced by the reliance on donor funding and the potential limitations in addressing a wide range of targets.	By fully funding all functions and focusing on regional collaboration, has the potential to accelerate progress towards the SDG targets. The engagement of regional stakeholders and the targeted approach to regional challenges can lead to more immediate and localised impacts.	The comprehensive and integrated approach, has the potential to drive transformative change and achieve significant progress towards the SDG targets. However, the pace of implementation and impact may depend on the availability of financial resources and the ability to effectively leverage the funded functions.
Strengths	A fundamental platform for progressing towards the 2030 SDG targets. It enhances capabilities in key areas and creates adjacency benefits, nudging practices towards sustainability.	An integrated approach and delivers regional innovative capability, strengthening Romania's SDG system. It brings more functions into the funded sphere, reducing the reliance on donor funding. This model increases the potential for	Accelerates Romania's path to the SDG targets. It funds all five functions, allowing for a strong, integrated approach to tackling sustainability challenges. This model has the highest capacity for innovation, and it's the fastest to make an impact, given its

	Core option (Low investment scenario)	Integrated option (Medium investment scenario)	Innovative option (High investment scenario)
		innovation, especially in regional areas.	comprehensive funding scope.
Weaknesses	Reliance on donor funding for two functions could create uncertainties and delays in implementation. Its speed to impact would be slow due to the lack of integral functions such as strategic thinking. While it is the most financially feasible option, its capacity for innovation is limited.	However, it still depends on donor funding for strategic thinking, limiting its speed to impact. While requiring more financial resources, the Integrated model offers better resilience and equality benefits.	Requires significant resources and increases expectations of success.
Estimated cost ⁸¹ (Infrastructure setup, human resources, and operating costs)	€2-3 million annually	€4-6 million annually	€7- 10 million annually

Each funding model presents unique opportunities and challenges. The Core option provides a solid foundation, with a feasible financial requirement, making it ideal for immediate implementation. The Integrated option, while requiring more investment, provides an opportunity for transformative change and is well-suited to addressing region-specific challenges. The Innovative option, despite being the most expensive, offers the most comprehensive solution, promising transformative change on a broader scale. Romania's decision should weigh the costs, benefits, and their readiness to implement and sustain each model, considering their current economic situation, resource availability, and the urgency to meet the SDG 2030 targets.

5 Recommendations

This section presents the recommended governance, operating, and funding models for the CExDD, along with the implications of these recommendations for the successful establishment and operation of the centre. It also identifies any potential risks or assumptions that need to be considered and provides suggestions for future research.

RECOMMENDED MODELS

Governance model: Board of Directors + Pilot an Advisory Body for Regional Scientific Arguments

"You cannot change a country only with a couple of people working in in the centre of government. That's not possible."

Interviewee from the project

"In the domain of sustainable development, you cannot think just about your country. The challenge is regional and global. And to have a relationship with different bodies in Europe and the world."

Interviewee from the project

The recommended governance model for the CExDD involves the establishment of a Board of Directors, along with a pilot program for an Advisory Body focused on regional engagement with academia for scientific arguments. This model aims to ensure effective decision-making, strategic planning, and regional engagement within the Centre's operations. The strength of this approach allows the Board of Directors to focus on strategic oversight, policy development, and overall direction for CExDD. While the Advisory Body, on the other hand, has a comparative advantage in representing and engaging the regions and the expertise from academia, to ensure the regional relevancy of the centre's initiatives.

"During the last three, four years, we witnessed an explosion of strategies, we have too many strategies"

"The centre needs to focus on the way policies are coordinated"

Interviewee from the project

The Board of Directors will serve as the core governing body of the CExDD, responsible for providing oversight, guidance, and direction to the Centre. The composition of the Board will be diverse, encompassing individuals with expertise in various fields related to sustainable development, including academia, research, policy-making, civil society, and private sector. The board members will bring different perspectives, knowledge, and experiences to the table, allowing for comprehensive and well-informed decision-making. Research has consistently shown that gender-balanced boards perform better across various dimensions, including decision-making quality, innovation, and social responsiveness (Post & Byron, 2015)⁸². Therefore, ensuring a balanced representation of genders on both boards using policies

like those adopted by the United Nations (UN Women, 2020)⁸³, serve to increase the performance of the Centre.

“It is this group that can steer and coordinate the mixture of different strategies, action plans, and inter institutional frameworks to put in place and to make them functional”.

Interviewee from the project

The specific qualifications for board members may include a background in sustainable development, environmental sciences, economics, social sciences, policy-making, and governance. It is crucial to ensure a balanced representation of gender, age, cultural backgrounds, and regional expertise to foster inclusivity, diversity, and equal participation. This diverse composition will enable the Board to consider multiple viewpoints and ensure that the decisions made reflect the interests and needs of different stakeholders.

“An international advisor on the board will give Romania not only important visibility, but also trust”

Interviewee from the project

In addition to the Board of Directors, the recommended governance model includes a pilot program for an Advisory Body focused on scientific arguments. This Advisory Body will consist of experts and practitioners with a deep understanding of sustainability challenges, local contexts, and innovative solutions. The purpose of this board is to enhance regional engagement with the academic sector, foster local ownership, and customise strategies and actions to address region-specific sustainability issues.

“A centre of excellence should, in the future involve researchers and experts from the diaspora, it's important to have them well connected in a formal, organised structure, well funded and supervised by, by the body of management directors, of course, in order to have I think, to adapt the agenda to the needs of the Romanian economy and to implement research, mission oriented research to do large projects, or small studies on different topics in order to bring data to the excellence, Centre of Excellence.”

The Advisory Body for Scientific Arguments will work closely with the Centre to provide valuable insights, research findings, and recommendations on regional sustainability challenges. It will serve as a platform for knowledge exchange, collaboration, and co-creation between the Centre and regional stakeholders. The Advisory Body members will contribute their expertise, scientific research, and practical experiences to inform decision-making, policy formulation, and the development of sustainable development initiatives.

“We need National Academies to get involved into the process of research and bringing empirical data to support government's policies”

Interviewee from the project

Strengths:

- Diverse expertise and perspectives from board members enable comprehensive decision-making.
- Inclusivity and diversity in board composition ensure a wide range of voices are represented.
- Regional Advisory Body promotes local ownership and customisation of strategies.
- Knowledge exchange and collaboration between the Centre and regional stakeholders enhance the effectiveness of regional sustainability efforts.

Weaknesses:

- Potential challenges in coordinating the efforts of the Board of Directors and the Advisory Body (see mitigation notes below).
- Balancing diverse interests and priorities within the decision-making process.
- Ensuring effective communication channels and collaboration mechanisms between the two boards.

Opportunities:

- Leveraging regional expertise and innovative solutions for sustainable development.
- Creating a sense of ownership and commitment among regional stakeholders.
- Strengthening regional collaboration and partnerships for sustainable development.

Threats:

- Potential misalignment of priorities among board members.
- Adequate resource allocation for supporting the functioning of both boards.
- Maintaining a balance between regional perspectives and national priorities.

Communication and Collaboration Mechanisms

"We need at the highest level of institutions to have cooperation. It is critical to remove roadblocks in communication in cooperation."

Interviewee from the project

For effective communication and collaboration between the two boards it is important to establish regular joint meetings and maintaining clear, open channels of communication. The World Bank's guidance on board-management communication highlights the importance of direct interaction, transparency, and sharing of relevant information (World Bank, 2021)⁸⁴.

An example is the Global Green Growth Institute (GGGI), which has successfully implemented a governance model with multiple boards, utilising frequent meetings, shared strategic objectives, and inter-board communication platforms (GGGI, 2017)⁸⁵. It could be beneficial to adopt a similar model for CExDD.

To facilitate seamless and efficient communication and collaboration between the Board of Directors and the Advisory Body, it is essential to adopt several structured approaches:

1. **Regular Joint Meetings:** The two boards should hold joint meetings on a regular basis. These could be quarterly or biannually, depending on the needs and schedules of the board members. Joint meetings provide a platform for the members to share updates, discuss strategic matters, and resolve potential conflicts (GGGI, 2017).
2. **Defined Communication Channels:** Use online platforms for constant and instantaneous communication. Platforms like Slack or Microsoft Teams can provide dedicated channels for board discussions, allowing for quick queries, updates, and decision-making.
3. **Inter-Board Liaisons:** Designate specific members from each board to act as liaisons. Their role would be to communicate updates, concerns, and recommendations between the two boards, ensuring that all members are informed and engaged.
4. **Shared Documents and Resources:** Using cloud storage platforms can help keep all important documents, meeting minutes, strategic plans, and other resources in a single, easily accessible location. This shared repository will ensure transparency and equip all board members with the necessary information for informed decision-making.

Selection Processes

The credibility and transparency of the CExDD governance model largely depend on the selection process of board members. An independent, merit-based process can ensure the selection of individuals with the right skills, experience, and commitment. The process could include the following steps:

1. **Open Call for Nominations:** Start with an open call for nominations from stakeholders, including academic institutions, government entities, private sector organisations, and civil society groups. This would ensure a diverse pool of potential candidates.

2. **Screening:** Screen the nominations based on a predefined set of criteria. This can include professional experience, academic qualifications, areas of expertise, proven commitment to sustainable development, and other relevant factors.
3. **Selection by an Independent Committee:** Establish an independent selection committee to review the shortlisted candidates. This committee could include senior personnel from the GSG, external experts, and stakeholders. Their task would be to assess each candidate impartially and select the most suitable individuals for the roles.
4. **Staggered Terms:** Implement staggered terms for board members to ensure continuity and stability in the governance of the CExDD. This means that not all board members' terms will end at the same time, allowing new members to benefit from the guidance and experience of their seasoned colleagues.
5. **Rotation Policy:** Establish a rotation policy to allow for fresh perspectives and ideas. After serving a predefined number of terms, a board member should step down to make way for new members. This can help maintain dynamism and prevent stagnation in the board's functioning.

By considering these factors and implementing the recommended governance model, the CExDD can benefit from robust decision-making, inclusive representation, and regional engagement, leading to more effective implementation of sustainable development initiatives.

Operating model: Hub and spoke

"the Centre of Excellence will be an amazing mechanism, not only to coordinate, but also to for capabilities to walk the talk."

Interviewee from the project

The recommended operating model for the CExDD is a Hub and Spoke model, which enables effective coordination, collaboration, and implementation of the five functions of the Centre. This model is designed to optimise the utilisation of resources, foster knowledge exchange, and enhance the Centre's overall impact on sustainable development in Romania.

In the Hub and Spoke model, the CExDD serves as the central hub or core entity responsible for strategic planning, coordination, and oversight of the Centre's operations. It acts as the focal point for integrating and synthesising information, promoting collaboration, and facilitating the implementation of sustainable development initiatives. The hub ensures the alignment of activities and provides support to the various functions of the Centre. The hub includes the following functions the Data Centre, Strengthening Networks and Partnerships and Communication and Dissemination of Knowledge. The functions, Generation of Scientific Arguments and Think Tank and Strategic Thinking are represented as spokes connected to the hub. Each spoke function has its own specific roles and responsibilities within the sustainable development framework.

The Hub

The Data Centre function, located within the hub, focuses on collecting, processing, and analysing data related to the SDGs in Romania. It establishes robust data management systems, ensuring the availability of accurate and up-to-date information for monitoring progress and informing evidence-based decision-making.

The Strengthening Networks and Partnerships function, another function in the hub, works to establish and nurture collaborations with various stakeholders, including government agencies, civil society organisations, businesses, and academia. It facilitates knowledge sharing, best practices exchange, and the formation of strategic partnerships to enhance the implementation of sustainable development initiatives.

"It is necessary to develop common projects that are specifically designed to bringing the regions together"

Interviewee from the project

The *communication and dissemination of knowledge* function, also a function in the hub, focuses on effectively communicating sustainable development information, knowledge, and best practices – including training – to diverse audiences. It uses various communication channels, including digital platforms, media, and outreach activities, to raise awareness, engage stakeholders, and promote public understanding of sustainable development goals and actions.

At a practical level, when a local authority wants to know how to tackle an SDG goal, if they could have a manual that provides a baseline of what it is, why it is important, the benefits, targets, indicators and things to consider when designing solutions.

Interviewee from the project

The Spokes

"It's about connecting the dots, and creating a meaningful jigsaw of different functionalities"

Interviewee from the project

The *Generation of Scientific Arguments* function operates as a spoke, generating research, conducting analysis, and providing scientific insights to support policy formulation and innovation. It collaborates with academic institutions, research organisations, and experts to produce evidence-based arguments that contribute to sustainable development practices.

The *Think Tank and Strategic Thinking* function, as a spoke, fosters innovative thinking, scenario planning, and strategic foresight to address complex sustainability challenges. It engages experts and stakeholders in critical analysis, ideation, and the development of forward-thinking solutions and strategies.

Strengths:

- Effective coordination and integration of the five functions, ensuring coherence and synergy.
- Clear roles and responsibilities for each function, promoting specialisation and expertise.
- Facilitation of knowledge exchange and collaboration among stakeholders.
- Efficient resource allocation and utilisation.

Weaknesses:

- Potential challenges in maintaining communication and coordination between the hub and spoke functions.
- Ensuring effective information flow and data sharing across the different functions.
- Balancing the autonomy of individual functions with the overall objectives of the Centre.

Opportunities:

- Leveraging technological advancements for data management, research, and knowledge dissemination.
- Building strategic partnerships and networks to expand the Centre's reach and impact.
- Incorporating emerging sustainability trends and practices into the operating model.

Threats:

- Resource constraints that may limit the effectiveness of individual functions.

- Potential gaps or overlaps in responsibilities among the different functions.
- Ensuring ongoing adaptation and flexibility to address evolving sustainability challenges.

Balancing Autonomy and Alignment

Striking a balance between the autonomy of individual functions and the overall objectives of the Centre is crucial. A governance mechanism that establishes clear roles, responsibilities, and decision-making authority for each function, while also setting the broad strategic direction, can help maintain this balance (Meyer, E. 2015)⁸⁶. Regular feedback loops, performance reviews, and mutual goal-setting can further enhance alignment while respecting the autonomy of individual functions.

1. **Decision-making authority:** It is crucial that individual functions have the autonomy to make decisions pertaining to their responsibilities. However, decisions with broader implications should involve the hub to ensure alignment with the overall strategic direction. Regular consultation mechanisms and participatory decision-making can facilitate this process.
2. **Mutual goal-setting:** To enhance alignment, the Centre could engage in a mutual goal-setting process. This involves the hub and individual functions collaboratively setting function-specific objectives that align with the Centre's overall strategic objectives (Locke, E. A., & Latham, G. P. 2006)⁸⁷.
3. **Roles and responsibilities:** Clearly defined roles and responsibilities can ensure that all functions understand their scope and limitations, fostering autonomy within specified boundaries. This can be achieved through a well-defined operational charter or guidelines, detailing each function's mandates and intended outcomes (Kunisch, S., Müller-Stewens, G., & Campbell, A. 2012)⁸⁸.

Flexibility and Adaptability

Given the dynamic nature of sustainable development, the Centre must ensure that its operational model remains flexible and adaptable. Regular reassessments and revisions of operational strategies based on changing circumstances, emerging trends, and feedback from functions can help maintain this adaptability. It's also important to cultivate a culture of learning and innovation that encourages each function to continually adapt and improve (Doz, Y., & Kosonen, M. 2008)⁸⁹.

1. **Reassessment and revision:** To ensure flexibility, the Centre should adopt a cycle of continual reassessment and revision. This involves regular operational audits and reviews to identify potential areas for adjustment or improvement. Feedback from all stakeholders can guide revisions, ensuring the model remains fit-for-purpose as circumstances evolve (Denning, S. 2018)⁹⁰.
2. **Embrace uncertainty:** Adopting a dynamic capabilities approach, the Centre can identify, seize, and reconfigure opportunities in a rapidly changing environment. This might involve using scenario planning, which can equip the Centre to respond to different potential futures (Teece, D. J. 2007)⁹¹.
3. **Learning and innovation:** Fostering a culture of learning and innovation can promote adaptability. Encourage experimentation, learning from failures, and sharing of best practices. Continuous learning initiatives, such as workshops, seminars, and training sessions, can further enhance this culture (Senge, P. M. 2006)⁹².

By adopting the Hub and Spoke operating model, the CExDD can leverage the strengths of each function, enhance collaboration, and promote efficient implementation of sustainable development initiatives in Romania.

Funding options:

"It is unbelievable that in Romania today there is not a place to put ideas, new ideas and strong ideas, into practice"

Interviewee from the project

The Integrated option is a recommended funding model that holds great promise for driving transformative changes in Romania's sustainable development efforts. This funding model builds upon the Core scenario by incorporating funding for the *generation of scientific arguments* function, further enhancing the regionally innovative capabilities developed through this approach. By adopting an integrated approach, the Integrated option has the potential to significantly contribute to addressing region-specific sustainability challenges and fostering the overall development of the country.

Under the Integrated option, a comprehensive funding structure is proposed to support the four funded functions and one donor-funded function. The funded functions include the *data centre*, *generation of scientific arguments*, *strengthening networks and partnerships*, and *communication and dissemination of knowledge*, while the *think tank* and *strategic thinking* functions relies on donor funding. Donor funding provides a viable pathway, even for complex projects are often divided into smaller, donor-funded 'work packages'⁹³.

For example, successful European initiatives such as the Horizon 2030 project, which leveraged a diverse range of funding sources to support research and innovation. The Graphene Flagship project under Horizon 2030, with a budget of €1 billion, successfully used an integrated funding model to drive its research and innovation efforts⁹⁴. In the context of the CExDD, similar strategies can be adapted to Romania's unique needs and sustainability objectives.

The *data centre* function serves as the foundation for the other funded functions. It receives ongoing funding to ensure the availability of reliable data and information essential for evidence-based decision-making. This function is responsible for collecting, analysing, and disseminating data related to sustainable development indicators, allowing policymakers and stakeholders to monitor progress, identify gaps, and develop targeted strategies.

"A centre of excellence should not be only a hub for data, but also a hub for data interpretation for modelling and analysing the various scenarios for decision making."

Interviewee from the project

The *generation of scientific arguments* function plays a vital role in the Integrated option. It receives dedicated funding through a pilot program that focuses on working directly with regions. This funding enables the establishment of collaborative platforms and networks involving local stakeholders, such as researchers, practitioners, and community members. Through these collaborations, region-specific sustainability challenges are identified, and scientific arguments are generated to address them. The function harnesses the expertise and knowledge of regional stakeholders, ensuring that the generated arguments are relevant, context-specific, and innovative.

"We need more expertise, we need more studies, we need more analysis".

Interviewee from the project

The *strengthening networks and partnerships* function is another crucial element of the Integrated option and receives continued funding. This function facilitates collaboration and cooperation among various stakeholders, including government agencies, non-governmental organisations, academic institutions, and community groups. Through networking events, workshops, and knowledge-sharing platforms, it fosters the exchange of best practices, expertise, and resources. This function aims to establish strong and dynamic partnerships, promoting synergy and collective action for sustainable development.

The *communication and dissemination of knowledge* function is essential for effectively sharing the generated scientific arguments, data, and best practices with diverse audiences. It receives dedicated funding to develop tailored communication strategies and platforms. These strategies include the production of reports, policy briefs, multimedia materials, and online platforms. By disseminating

knowledge widely, this function ensures that the outcomes of sustainable development efforts reach policymakers, professionals, and the general public, promoting informed decision-making and fostering a culture of sustainability.

“A guide for sustainability, aimed for public authorities, local public authorities to better understand how what is sustainable development and how they can integrate it in the local policies. That would be an extraordinary instrument.”

Interviewee from the project

While the four aforementioned functions receive funding, the *think tank* and *strategic thinking* function relies on donor funding. This function plays a critical role in providing independent and strategic analysis, long-term visioning, and policy recommendations for sustainable development. Donor funding allows for the engagement of expert researchers, analysts, and thought leaders who contribute their insights and expertise to shape Romania's sustainable development agenda (Rellion, 2016)⁹⁵. This function serves as a catalyst for innovative ideas, holistic thinking, and long-term planning. To manage and evaluate the impact of the donor funding, a robust monitoring and evaluation system could be implemented.

“We have to find a flexible way to attract expertise”.

Interviewee from the project

Strengths:

- It takes an integrated approach, which promotes collaboration, knowledge exchange, and region-specific innovation. This approach enables Romania to address a wider range of SDG targets and enhances its capacity to tackle region-specific sustainability challenges effectively.
- Comprehensive funding ensures the sustainability and continuity of the Centre's operations.
- Enhanced capabilities and expertise in each function due to adequate financial resources.
- Ability to adapt and respond to evolving sustainability challenges through sustained funding.

Weaknesses:

- Potential dependence on external funding sources, which may introduce uncertainty and limitations. To mitigate this weakness, it is crucial to establish robust partnerships with donor organisations and explore alternative sources of funding to ensure the continuity and independence of this function.
- Risk of overemphasis on individual functions, potentially overlooking the holistic nature of sustainable development.

Opportunities:

- Potential for innovation and transformative change due to the availability of financial resources.
- Possibility to attract additional funding and partnerships through demonstrated impact and success.
- Alignment with national and international funding priorities for sustainable development.

Threats:

- Uncertainty in long-term funding commitments, leading to instability and limitations in implementation.
- Economic or political factors that may impact the availability of financial resources.
- Competition for funding from other initiatives and priorities.

By adopting the Integrated funding model, the CExDD can ensure the necessary financial support to effectively carry out its functions, promote collaboration, and drive sustainable development in Romania.

IMPLICATIONS OF THE RECOMMENDATIONS

The proposed governance and operational models, along with the funding options for the CExDD, greatly improve its effectiveness. These three parts, working together, boost cooperation, spark positive connections, and increase the Centre's capability to foster sustainable development in Romania.

"Sustainability is not yet mainstream in Romania"

Interviewee from the project

The governance model includes a Board of Directors and an initial Advisory Body for Scientific Arguments. Their key role is to provide guidance, strategic advice, and boost engagement across the regions of Romania within the CExDD. The Board of Directors brings together a diverse group of experts. This ensures well-rounded decisions are made by taking into account a variety of viewpoints. Inclusion and considering the needs and interests of many stakeholders become possible with such varied representation.

The Advisory Body is the key to stronger regional involvement. Experts and experienced practitioners with in-depth knowledge of local conditions, sustainability issues, and innovative solutions form this board. Their close cooperation with the Centre allows them to contribute valuable insights, research outcomes, and suggestions for regional sustainability issues. The Advisory Body supports local ownership and the development of effective, relevant sustainable initiatives at the regional level by sharing knowledge, developing strategies together, and customising solutions.

"It's very important for us to really understand how different actors see sustainability in Romania, and especially how they expect to manage to implement the agenda."

Interviewee from the project

The recommended Hub and Spoke operational model, enhances the governance model. This model offers the possibility of an efficient coordination and collaboration framework to implement the Centre's roles. The central hub of the CExDD includes the data centre, strategic partnerships and knowledge communication functions and takes charge of strategic planning, coordination, and management. It facilitates the integration of information, knowledge sharing, and cooperation between the various stakeholders.

Every role within this operational model has its own specific responsibilities. The data centre, knowledge communication and networks and partnerships functions, housed within the hub, guarantees access to accurate, current data for decisions based on evidence and shifts this knowledge into action through timely and relevant communication. Other functions create multi-disciplinary teams convening around an opportunity or challenge, represented as spokes, and collaborate to generate scientific insights, offer strategic analysis, and enhance cooperation.

The recommended funding model, the Integrated option, works hand in hand with our governance and operational models. This option ensures the Centre's functions are fully financially supported. Integrated funding covers a range of tasks: data collection and analysis, the development of region-specific scientific arguments, the enhancement of cooperation and knowledge sharing, and the effective spreading of sustainable development knowledge.

"In Romania there is not at this moment an institution to ensure the support of the public administration in terms of collecting, processing and dissemination information for decision making, in the form of studies, scientific data, offering innovative solutions."

While four functions are covered by this funding, the think tank and strategic thinking function depends on donor funding. This function, funded by donors, provides independent analysis and offers long-term vision

and policy suggestions. The availability of donor funding ensures the contribution of expert researchers, analysts, and thought leaders to the Centre's activities.

"The Centre of Excellence will be an amazing mechanism, not only to coordinate, but also to for capabilities to walk the talk."

Interviewee from the project

The governance, operational, and funding models working together can build a cohesive framework. This framework can boost cooperation, foster inclusivity, encourage regional engagement, share knowledge, and provide comprehensive funding. The governance model ensures sound decision-making and strategic guidance, while the operational model fosters coordination and collaboration. The funding options support the Centre's work, encourage an integrated approach between the centre of Government and regional interests, and tackle sustainability challenges.

"Romania needs to have an integrated view and discuss topics which are of interest to different sectors and regions, and also to different goals and targets from the agenda 2030"

Interviewee from the project

The CExDD can make the most of its impact on Romania's sustainable development by leveraging the strengths of each model and dealing with potential weaknesses and threats. The seamless integration of the governance, operational, and funding models enables the Centre to effectively tackle region-specific sustainability challenges, engage with stakeholders at all levels, and drive transformative change towards a sustainable and resilient future.

RISKS AND ASSUMPTIONS, TRENDS AND SCENARIOS

Risks

Implementing the recommended governance, operating, and funding models for the CExDD is not without risks. It is crucial to identify and address these risks to ensure the successful implementation of the models and the achievement of sustainable development goals in Romania.

Insufficient Financial Resources available: Adequate financial resources are essential for the Centre's operations, including funding for the functions, staffing, infrastructure, and ongoing capacity building. However, there is a risk of insufficient funding, especially for the donor-funded function of *think tank and strategic thinking*. To mitigate this risk, the Centre should explore diverse funding sources, establish partnerships with donor organisations, and demonstrate the impact and value of its activities to attract financial support.

"The most the most significant opportunity could come from financing, which now is annually but a move to be multi-year budgeting could enable better projects."

"The essential issue remains the way of financing. Part of the financing can be provided from the state budget, for salaries and current operating expenses. But it would be ideal if the centre could benefit from European funds."

Institutional and Policy Constraints: The successful implementation of the recommended models requires a supportive institutional and policy environment. However, there is a risk that existing institutional structures and policies may pose challenges, such as bureaucratic hurdles, limited policy coherence, or resistance to change. To mitigate this risk, the Centre should actively engage with relevant government entities, advocate for policy reforms, and seek opportunities for collaboration and alignment with existing initiatives and frameworks.

We need to first cement a political decision and a common view that Romania must implement the 2030 agenda, if it does not start at the political level, it's if it's not seen as a responsibility, it's not going to be implemented in, in government strategy strategies and plans”.

Lack of Regional Engagement: The success of the CExDD relies on the active engagement and participation of various stakeholders, including government agencies, civil society organisations, businesses, and local communities. However, there is a risk that some stakeholders may not fully engage in the Centre's activities due to competing priorities, limited resources, or differing agendas. To mitigate this risk, proactive efforts should be made to involve stakeholders from the planning phase, ensure their representation in decision-making processes, and communicate the benefits of their participation in achieving sustainable development objectives.

Assumptions

Alongside risks, there are assumptions that underlie the recommended models for the CExDD. These assumptions shape the expectations and effectiveness of the models and should be considered during implementation.

Stakeholder Collaboration and Commitment: The recommended models assume a high level of stakeholder collaboration and commitment to sustainable development goals. However, if this assumption does not hold due to lack of stakeholder engagement, as identified in the Risks section, this could hinder the success of the CExDD. Proactive efforts should be made to engage stakeholders, ensure their representation, and communicate the benefits of their participation (OECD, 2020).

Availability of Resources: The success of the recommended models relies on the availability of adequate resources. However, there is a risk of insufficient funding. In the event that the assumed availability of resources does not meet expectations, the Centre should explore diverse funding sources, establish partnerships with donor organisations, and demonstrate the impact and value of its activities to attract financial support (United Nations Development Group, 2017).

Supportive Policy and Regulatory Frameworks: The recommended models assume supportive policy and regulatory frameworks. However, there is a risk that existing institutional structures and policies may pose challenges, such as bureaucratic hurdles, limited policy coherence, or resistance to change. If this assumption fails, the Centre should actively engage with relevant government entities, advocate for policy reforms, and seek opportunities for collaboration and alignment with existing initiatives and frameworks (Chaffin, Gosnell, & Cosens, 2014).

Trends

As Romania pursues its Sustainable Development Goals (SDGs) to 2030, several important trends are likely to shape its journey towards sustainable development. These trends reflect global and regional developments, as well as specific challenges and opportunities within Romania. The following trends are worth considering:

Climate Change and Environmental Sustainability:

Romania has already begun to experience the impacts of climate change, with a 0.8°C increase in annual average temperature between 1961 and 2015 (European Environment Agency, 2018)⁹⁶. The country is committed to the Paris Agreement and the European Green Deal, aiming to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990 levels (European Commission, 2020a; Government of Romania, 2021)⁹⁷. This emphasises the increasing importance of transitioning towards renewable energy, sustainable agriculture and land use, and the adoption of circular economy practices. The Paris Agreement and the European Green Deal are key frameworks guiding such actions (United Nations, n.d.)⁹⁸.

Digital Transformation and Innovation:

In 2020, Romania ranked 26th out of 27 EU countries in the Digital Economy and Society Index (DESI), indicating a need for significant progress in digitalisation (European Commission, 2020b)⁹⁹. However, the country is experiencing a rapid growth in its IT sector, with software and services exports reaching 4.5 billion euros in 2019, a 13% increase from 2018 (Romanian Software and Services Industry Association, 2020)¹⁰⁰. Romania can leverage digital technologies to enhance efficiency, transparency, and inclusiveness in sectors such as governance, education, healthcare, and business. This includes initiatives like e-governance, digital skills development, and fostering digital entrepreneurship. Embracing innovation and digitalisation can unlock new opportunities for economic growth and sustainable development (European Commission, 2020b)¹⁰¹.

Social Inclusion and Equality:

Despite economic progress, Romania still has one of the highest rates of poverty and social exclusion in the EU, affecting 31.2% of the population in 2019 (Eurostat, 2020). Promoting social inclusion and reducing inequalities are fundamental aspects of sustainable development. Furthermore, the gender employment gap remains high, standing at 12.6% in 2019 compared to the EU average of 11.7% (European Institute for Gender Equality, 2020)¹⁰². These statistics underline the need for promoting social inclusion, reducing inequalities, and improving access to education, healthcare, and social protection. To achieve the SDGs, efforts should focus on improving access to quality education, healthcare, and social protection, as well as promoting gender equality, inclusive economic growth, and social cohesion.

Circular Economy and Sustainable Consumption:

Transitioning towards a circular economy is crucial for sustainable development. Romania's recycling rate stood at just 13.9% in 2018, well below the EU average of 46.4% (Eurostat, 2019). Romania can promote resource efficiency, waste reduction, and sustainable consumption patterns by adopting circular economy principles. The government has begun to implement the EU's Circular Economy Action Plan, aiming to transform waste management and promote resource efficiency (European Commission, 2020c; Government of Romania, 2021)¹⁰³.

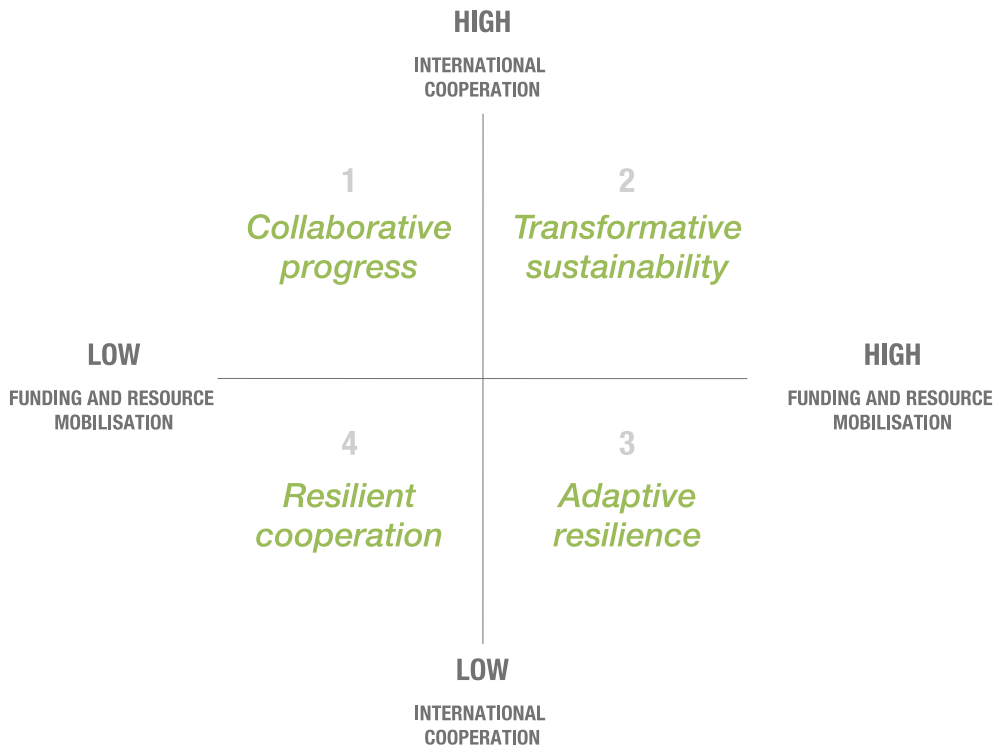
Regional Collaboration and Partnerships:

Romania's active participation in the EU's funding programmes, such as the Cohesion Fund and the European Regional Development Fund, reflects its commitment to regional collaboration (European Commission, 2020d)¹⁰⁴. Moreover, Romania is part of the Three Seas Initiative, a regional platform promoting cooperation in Central and Eastern Europe (Three Seas Initiative, 2021). These engagements underscore the role of partnerships and collaborations in achieving SDGs.

Scenario planning

Figure 5 shows a scenario matrix of two critical uncertainties, on the x axis funding and resource mobilisation and the y axis international cooperation and geopolitical dynamics.

Figure 5. Scenario Matrix



Scenario 1: "Collaborative Progress"

Description: This scenario envisions Romania with restrained funding, but highly advantaged by international cooperation and stable geopolitical dynamics. Romania has actively engaged in global partnerships, leveraged diplomatic relations, and fostered multilateral cooperation. The country has successfully positioned itself as a trusted partner in sustainable development initiatives, attracting support from international organisations, donor countries, and non-governmental entities. Despite financial limitations, Romania successfully attracts support from global organisations and NGOs, courtesy of active engagement in partnerships and diplomatic relations.

Role of CExDD: Here, the Centre acts as an essential facilitator, fostering knowledge exchange and collaboration. Its influence helps mobilise resources, access funds, and transfer global best practices to Romania. It serves as a platform for exchange, collaboration, and joint research projects between Romanian stakeholders and international partners. The CExDD uses its networks and expertise to mobilise resources, access funding opportunities, and facilitate the transfer of best practices and innovative solutions from global partners to Romania.

C

Description: This ideal scenario sees Romania with high funding, resource mobilisation, and robust international cooperation amidst a peaceful geopolitical climate. With substantial financial resources at its disposal, Romania undertakes significant sustainable development initiatives. International cooperation is strong, with shared goals and collaborative partnerships driving progress towards the SDGs. The geopolitical environment is stable, fostering trust and cooperation among nations.

Role of CExDD: In this setting, the Centre serves as a strategic advisor and implementer. Leveraging ample resources, it coordinates sizeable initiatives, aligns national strategies with global best practices, and ensures effective implementation of sustainability programs.

Scenario 3: "Adaptive Resilience"

Description: In this scenario, Romania benefits from high funding and resource mobilisation, but experiences limited international cooperation due to strained geopolitical relationships. Despite this, the country stays focused on sustainable development, using its resources to achieve the SDGs independently.

Role of CExDD: The CExDD acts as a catalyst for domestic collaboration and resilience-building in this scenario. It collaborates closely with national institutions, research organisations, and civil society to harness internal expertise and develop innovative solutions. The CExDD plays a vital role in fostering domestic partnerships, facilitating knowledge exchange, and ensuring the efficient utilisation of available resources. By concentrating on capacity building and evidence-based policies, it drives sustainable development in the face of international collaboration challenges.

Scenario 4: "Resilient cooperation"

Description: In this scenario, Romania is under resource constraints and limited international support due to geopolitical strains. Nonetheless, Romania persists with its SDG commitments, adapting innovatively to achieve its goals within existing means.

Role of CExDD: In this context, the Centre is key in facilitating adaptive transformation. It maximises available resources, promotes local innovation, and fosters self-reliance. By engaging with local stakeholders and promoting context-specific solutions, the Centre plays a resilient and adaptive role in supporting Romania's sustainable development efforts.

These scenarios provide a framework for decision-making, preparing the CExDD for potential uncertainties. However, they represent hypothetical situations, and the actual unfolding of events may diverge. The Centre should remain flexible, continuously reassess its strategic approach, and adapt to evolving circumstances.

LIMITATIONS OF THE REVIEW AND SUGGESTIONS FOR FUTURE RESEARCH

In designing and assessing recommendations for the governance, operating, and funding models of the CExDD, certain limitations of the review process are recognised.

Time Constraints: The recommendations presented in this report are based on the available information and discussions within the given time frame. The depth and breadth of the review are influenced by the time limitations, which may have restricted the scope of the analysis and the inclusion of additional perspectives or case studies.

Data Availability: The review heavily relies on the information and data that were accessible within the given timeframe. There may have been additional sources, such as unpublished Romanian government reports or certain international best practices not accessible in our databases, which were not factored in due to limitations in data availability or accessibility. The reliance on existing literature introduces the possibility of overlooking emerging trends or developments in sustainable development practices.

Contextual Specificity: The recommendations are tailored to the context of Romania and the specific objectives of the CExDD. While efforts have been made to consider broader sustainability principles and international best practices, the implementation of the models may require further nuanced adaptation to local conditions and stakeholder dynamics.

Mitigation Plans: Each identified risk comes with a general plan for mitigation. As decisions take the CExDD closer to implementation, it would be beneficial and timely to create detailed strategies or actions. For instance, to mitigate the risk of stakeholder concerns, future work could focus on creating a

comprehensive stakeholder management plan, drawing on best practices from similar initiatives globally or within Romania.

Suggestions for Future Research

Stakeholder Engagement:

Future research should delve into enhancing stakeholder engagement. A collaborative approach is proposed, which ensures the initiatives are based on stakeholder values and perspectives. Collaborative engagement should entail active participation, co-creation, and shared decision-making among different sectors and societal levels, which heightens inclusivity, transparency, and accountability.

Research Agenda:

To ensure impactful research at the CExDD, a collaborative approach to prioritising the research agenda is recommended. This approach should involve stakeholders in setting research priorities and uses multi-factor criteria to ensure research focus aligns with the Centre's objectives.

Research could explore methodologies for conducting collaborative research prioritisation exercises within the CExDD. This would involve developing inclusive processes that allow stakeholders to contribute their perspectives, insights, and knowledge to identify research priorities. The use of multi-factor criteria, such as urgency, feasibility, impact potential, and relevance to sustainable development goals, can help ensure that the identified research priorities align with the broader goals and objectives of the Centre and address pressing sustainability challenges.

Furthermore, research should explore potential mechanisms for continuous stakeholder engagement. This research should cover maintaining stakeholder involvement throughout the research lifecycle and bridging the gap between research and practice to ensure research findings translate into actionable recommendations.

With this collaborative approach, the CExDD can ensure its research efforts are responsive to stakeholder needs, align with sustainable development goals, and meaningfully address Romania's pressing sustainability challenges.

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⁸¹ Please note that these are only estimates and the actual costs could be significantly higher or lower. A more accurate estimation will be conducted when a clear understanding of the scope and nature of the projects to be undertaken by Romania's Centre of Excellence of Sustainable Development is conducted.

Function	Lowest cost estimate	Highest cost estimate
Data Centre	EUR 1 million (Slovak Data Centre, 2013)	€15 million (15% of NCCARF's budget as per Gartner's estimate)
Generation of Scientific Arguments	€165,000 (average NSF grant)	EUR 1.5 million (European Commission, 2020)
Strengthening Networks and Partnerships	EUR 1 million (European Commission, 2020)	EUR 2.5 million (Estonian Research Council, 2020)
Think Tank and Strategic Thinking	EUR 1.2 million (Latvian Council of Science, 2018)	EUR 2 million (Slovenian Research Agency, 2019)
Communication and Knowledge Dissemination	EUR 1.2 million (General Secretariat for Research and Technology, 2020)	EUR 2 million (Cyprus Research and Innovation Foundation, 2019)

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