

Exploring Sustainable Growth Via Socio-Economic Perspectives

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Abstract

Industries in developed countries consume natural resources at a staggering rate. The sustainability of their economic and industrial expansion is highly questionable. Experts argue that the current rate of resource-intensive production in these nations is unsustainable and contributes to the depletion of resources in other countries, as well as significant environmental harm. There is a growing chorus of criticism regarding this excessive use of natural resources in developed regions. Research indicates that each industry possesses unique characteristics, necessitating tailored labor policies. These policies are crucial for integrating social and human capital into the broader goal of sustainable economic development globally.

Key words: sustainable development, industry, tourism, agriculture, infrastructure

J.E.L. classification: M11

1. Introduction

In the modern global landscape marked by rapid technological advances and innovation, adapting to ongoing changes is crucial for maintaining worldwide communication. Hence, fostering innovation, building resilient infrastructure, and supporting industrialization are key pillars for a sustainable society. These interconnected elements are fundamental in promoting economic growth and overall well-being, emphasizing the development of infrastructure that is quality-assured, reliable, secure, and sustainable. However, developing nations face challenges in fully tapping into this potential due to limited investments in scientific research and innovation. Additionally, the recent health crisis has significantly hindered some countries' capacities for adaptation and resilience in our fast-paced world.

To address these issues, Sustainable Development Goal 8 focuses on fostering inclusive industrialization, boosting global productivity, and enhancing scientific research (Barros et al., 2015). In Romania's case, substantial improvements are necessary, as it ranks lowest on the European Innovation Scoreboard, primarily due to its weak competitiveness, as highlighted by the European Commission. Consequently, creating an environment that nurtures innovative initiatives is essential. Unfortunately, Romanian entrepreneurs often lack adequate financial support, limiting their marketing capabilities. Moreover, Romania is at the bottom of the EU list for research and development investment, consistently investing less than 0.5% of its GDP, which is nearly seven times lower than the leading country. The prolonged and profound impact of these factors has resulted in a significant scientific diaspora from Romania, the largest within the EU, with a noticeable presence overseas. After the economic downturn post-1989 and the deindustrialization that followed, discussing sustainable development might seem out of place. Yet, it's crucial to halt the economic and industrial decline, revitalize industries, and ensure development aligns with sustainability criteria.

Achieving this requires stopping the fall in industrial production and stabilizing production volumes. Romania must find and implement the necessary conditions to fully utilize the nation's potential and stimulate structural changes that align with market economy standards. From this period of economic downturn, it's possible to argue for sustainable industrial development by adhering to international treaties Romania is part of, such as those aiming to control the Earth's greenhouse effect, prevent ozone layer deterioration, and manage transboundary pollution and large water basins.

Aligning Romanian legislation with EU standards through association with the European Union includes adopting an action plan related to the Fifth Environmental Action Program. This program aims to integrate environmental protection across various sectors like agriculture, transport, energy, industry, and tourism, and to improve the enforcement and implementation of environmental laws. Priority areas include climate change control, ozone layer protection, acid rain control, water resources management, waste management, noise protection, and the preservation of nature and biodiversity.

The privatization of industrial enterprises offers an opportunity to assess environmental damages and develop remedies (Linton et al., 2007). Organic markets present opportunities for agricultural products, technologies for cleaner manufacturing processes, and products with lower pollutant potential. The National Strategy for Sustainable Development in Romania recognizes that the country's geological resources, identified for over 120 substances, provide a competitive advantage for industrial development and sustainable growth. The potential of hydro power, which currently constitutes about 40% of Romania's usable technical potential and provides over a third of its electricity, highlights the benefits of sustainable development, including renewable resources and pollution reduction. This necessitates a reconsideration of investment policies in this area to reduce material and energy intensity and promote the recycling and reuse of materials.

The central question in our research is whether sustainable industrial development affects Romania's main economic sectors, aiming to analyze its influence and the correlations with these sectors.

The paper is structured into several chapters, including an introduction to the scientific framework, a literature review of sustainable development approaches, a methodology using SPSS software to calculate the Spearman rho correlation coefficient, results and discussions on how sustainable development impacts Romania's main economic fields, and conclusions on the significance of sustainable development at macro and microeconomic levels and strategic planning for sustainability.

2. Literature review

Sustainability is now the crucial doctrine dictating the trajectory of economic development, requiring that progress occurs within ecological limits, recognizing the interdependence of human societies, the biosphere, and the physical and chemical laws that govern it (Taticchi et al., 2012). Environmental protection and economic development, once seen as opposing forces, are now understood to be deeply interconnected. As articulated by Manea in 1997, sustainable development forms the foundation of a new philosophical framework where principles of future orientation, equity, global environmental policy, and biodiversity are central to decision-making. This doctrine of sustainability manifests differently across various disciplines:

1. Biology views sustainability as akin to protecting biodiversity, emphasizing the preservation of natural capital for future generations.
2. Economics treats the environment as a form of natural capital. It highlights how traditional market environments fail to safeguard natural resources.
3. Sociology examines the impacts of resource use decisions on daily life and societal structures.
4. Urban Planning sees sustainability as a strategy for urban revitalization, balancing development with environmental conservation.
5. Environmental Ethics promotes the conservation and sustainable use of natural resources, urging a moral imperative to acknowledge and respect our bonds with nature.

Sustainable management of a resource, as defined by Bartles et al in 2019, requires not exceeding its capacity for recovery, using the example of fishing in a way that respects fish reproductive cycles to ensure sustainability for future generations. When resource use surpasses sustainable thresholds, significant depletions occur, causing both ecological and economic damage (Stiglitz, 2008).

In the neoliberal perspective, the environment is seen as capital, with the sustainability of air, water, and soil dependent on their preservation or renewal. Assigning economic value to natural capital allows for measuring development outcomes relative to sustainable use, although this approach faces challenges in valuing resources for future generations whose consumption patterns are yet unknown (Halldorsson and Kovacs, 2010). The popular approach promotes local production and trade to meet community needs, often contrasting with large-scale urban and industrial development models. However, this approach can create tensions when local resource use must be balanced with integration into the global economy (Blokdyk, 2020). The interventionist approach, influenced by international frameworks like the Brundtland Commission, emphasizes the role of international cooperation and environmental treaties, although it also faces challenges from industrialized countries that may dominate these agreements (Libert, 2017).

The need for sustainability is supported by economic, social, and ecological rationales (Patel, 2017). These three categories, initially seen as independent, began to be recognized as interdependent from the 1980s, emphasizing a holistic approach.

- The *economic approach* focuses on maximizing income while preserving natural, human, and economic capital (Cheo and Tapiwa, 2021).

- The *ecological approach* supports the stability of both natural and human-made biological systems, aiming to provide future generations with as many opportunities as possible, part of global biodiversity conservation (Goff, 2016).

- The *socio-cultural approach* aims to maintain the stability of social and cultural systems to ensure equity across and within generations by preserving cultural diversity and promoting a plurality of ideas (Keitsch and Vermeulen, 2020).

This multi-faceted interaction among economic, political, cultural, and social spheres with nature and human populations underlines the complex nature of sustainable development. By enhancing education, healthcare, and social services, sustainable development strategies aim to reconcile conflicts and focus on human development, placing human rights at the center of governance and policy-making.

3. Research methodology

The purpose of this article is to explore the correlation between sustainable industrial development and the main economic sectors in Romania. It specifically examines how such development influences the agricultural, tourism, and infrastructural fields.

Agriculture (D1) aims for sustainable development by:

- ✓ Establishing adequate credit and financing systems for rural areas, along with necessary infrastructure.
- ✓ Enhancing the training of the labor force engaged in agriculture.
- ✓ Supporting the growth of high-performance production units.
- ✓ Expanding agricultural consulting services.

Tourism (D2) seeks sustainable growth through:

- ✓ Providing technical assistance and consultancy for initiating specific projects.
- ✓ Enhancing and diversifying services offered.
- ✓ Increasing the promotion of tourism offerings.
- ✓ Improving training for the local population in tourism-related areas.
- ✓ Modernizing infrastructure to attract more tourists.

Infrastructure (D3) focuses on:

- ✓ Improving access to road and railway networks for the local population.
- ✓ Expanding and modernizing communication infrastructure.
- ✓ Extending natural gas supplies.
- ✓ Implementing sewage networks.

The research objectives include:

1. Analyzing industrial development advantages such as installation premiums, facilities for industrial units meeting local demands, and workforce training.
2. Examining each sector potentially influenced by industrial development.
3. Identifying connections between industrial development and the primary economic fields.

Based on literature studies and personal observations, the following hypotheses have been proposed:

H1: There is a significant positive relationship between sustainable industrial development and the agricultural sector.

H2: There is a significant positive relationship between sustainable industrial development and the tourism sector.

H3: There is a significant positive relationship between sustainable industrial development and the infrastructure sector.

H4: Agriculture and tourism mutually influence each other.

The research plan involved:

Step 1: Establishing a research community of managers in Romania who recognize sustainable development.

Step 2: Identifying the survey unit, represented by managers of Romanian companies within industry, agriculture, tourism, and infrastructure sectors.

Step 3: Developing a questionnaire as the basis of the article, which gathered the managers' opinions through a mix of open, closed, and control questions, including dichotomous, open-ended, and choice-based questions. A total of 723 valid questionnaires were collected, allowing the use of various statistical techniques for data analysis. The questionnaire featured sections on demographic characteristics, and elements defining sustainable industrial development across the discussed sectors.

Step 4: Using simple random sampling for participant selection, based on availability and accessibility.

Step 5: Conducting an exploratory quantitative analysis between November 2023 and February 2024. The questionnaire completion took approximately 20 minutes per participant.

The data collected were processed using the Statistical Package for the Social Sciences (SPSS), which facilitated the calculation of the Spearman rho Correlation Coefficient to determine the relationships between sustainable industrial development and the main economic sectors.

4. Findings

To confirm the objectives, we employed the widely used and highly effective Spearman rho correlation coefficient, utilizing the specialized statistical research software SPSS (see Table no 1).

Table no 1. Spearman rho correlation coefficient values

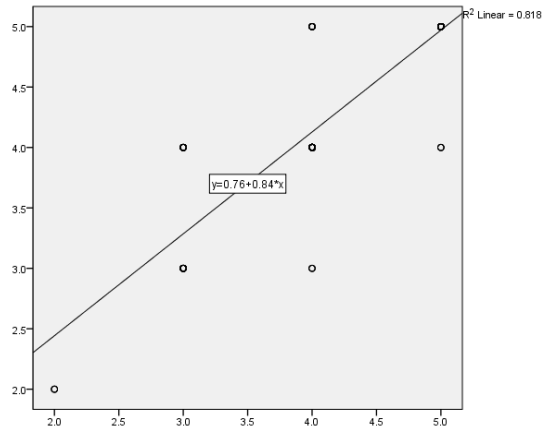
		Correlations			
Spearman's rho		Sustainable industrial development	D1.Agricultural field	D2.The tourist field	D3.Infrastructure domain
Sustainable industrial development	correlation coefficient	1.000	.921**	.837**	.823**
D1.Agricultural field	correlation coefficient	.921**	1.000	.800**	.784**
D2.The tourist field	correlation coefficient	.837**	.800**	1.000	.895**
D3.Infrastructure domain	correlation coefficient	.823**	.784**	.895**	1.000

Source: processing data obtained through SPSS program

Following the analysis of the Spearman rho correlation coefficient we can observe the following correlations:

1. There is a very high significant positive relationship between *Sustainable industrial development* and *D1.Agricultural field* ($\rho = 0.92$, $df = 723$, $p < 0.001$). From the scatter plot (Figure no.1) it can be seen that the point spread is relatively limited, which indicates a strong correlation ($R^2 = 0.81$). The slope of the scattering of the results is relatively straight, indicating a linear rather than a curvilinear relationship. - **Hypothesis 1 is thus validated**

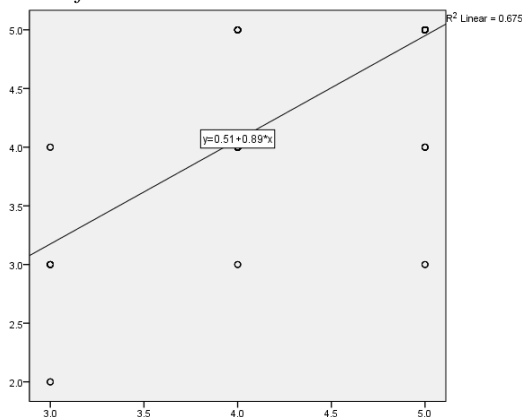
Figure no. 1 Dispersion diagram: the correlation between Sustainable industrial development and D1.Agricultural field



Source: processing data obtained through SPSS program

2. It can be seen from Table no. 1, that there is a very significant significant positive relationship between *Sustainable industrial development* and *D2.The tourist field* ($\rho = 0.83$, $df = 723$, $p < 0.001$). The scatter plot (Figure no. 2) reveals that the point spread is relatively limited, which indicates a strong correlation ($R^2 = 0.67$). The slope of the scattering of the results is relatively straight, indicating a linear rather than a curvilinear relationship. We can say that **Hypothesis 2 is fully validated**.

Figure no. 2 Dispersion diagram: the correlation between Sustainable industrial development and D2.The tourist field

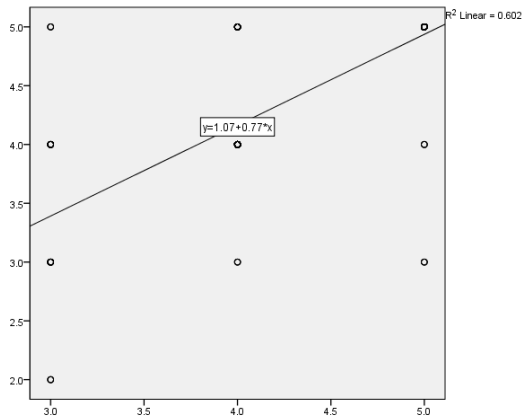


Source: processing data obtained through SPSS program

3. There is a very significant positive relationship between *Sustainable industrial development* and *D3.Infrastructure domain* ($\rho = 0.82$, $df = 723$, $p < 0.001$). From Figure no. 3, the scatter plot reveals that the point spread is relatively limited, which indicates a strong correlation. The slope of the

scattering of the results is relatively straight, indicating a linear rather than a curvilinear relationship. We can conclude that **Hypothesis 3 is also validated.**

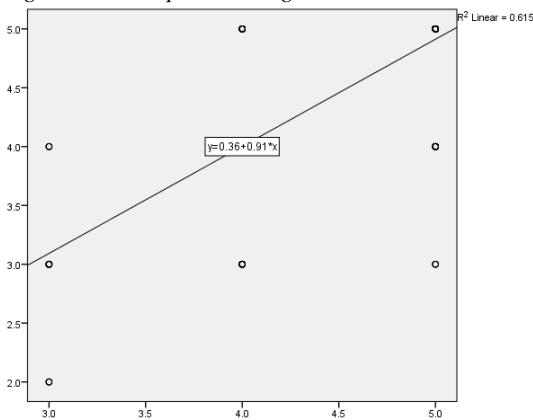
Figure no. 3 Dispersion diagram: between Sustainable industrial development and D3.Infrastructure domain



Source: processing data obtained through SPSS program

4. Analyzing *D1.Agricultural field* and *D2.The tourist field* results in a very significant positive relationship ($\rho = 0.80$, $df = 723$, $p < 0.001$). The scatter plot (Figure no. 4) reveals that the point spread is relatively limited, which indicates a strong correlation ($R^2 = 0.61$). The slope of the scattering of the results is relatively straight, indicating a linear rather than a curvilinear relationship. Thus **Hypothesis 4 is also validated.**

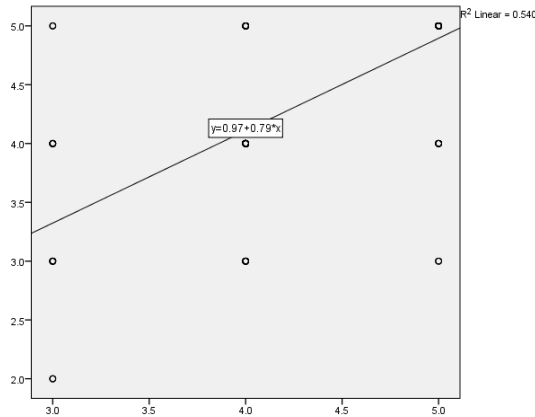
Figure no. 4 Dispersion diagram: the correlation between *D1.Agricultural field* and *D2.The tourist field*



Source: processing data obtained through SPSS program

5. There is a very significant positive relationship between *D1.Agricultural field* and *D3.Infrastructure domain* ($\rho = 0.84$, $df = 723$, $p < 0.001$). The scatter plot reveals that the point spread is relatively limited, which indicates a moderate to strong correlation ($R^2 = 0.54$) - Figure no. 5 The slope of the scattering of the results is a relatively straight line, indicating a linear rather than a curvilinear relationship.

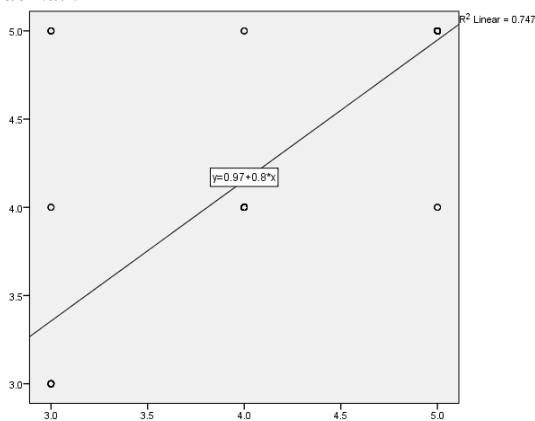
Figure no. 5 Dispersion diagram: D1.Agricultural field and D3.Infrastructure domain



Source: processing data obtained through SPSS program

6. There is a very high significant positive relationship ($\rho = 0.89$, $df = 723$, $p < 0.001$) and between D2.The tourist field and D3.Infrastructure domain (Table no. 1). The scatter plot (Figure no. 6) reveals that the point spread is relatively limited, which indicates a moderate to strong correlation ($R^2 = 0.74$). The slope of the scattering of the results is relatively straight, indicating a linear relationship rather than a curvilinear one.

Figure no. 6 Dispersion diagram: the correlation between D2.The tourist field and D3.Infrastructure domain



Source: processing data obtained through SPSS program

Industry, innovation, and infrastructure are critically important sectors, widely recognized at the national level. Sustainable industry development must therefore consider several key factors:

1. Upgrading and expanding high-quality, dependable, and robust infrastructure to support economic growth and enhance human welfare, ensuring wide and fair access for all.
2. Making industries more sustainable by improving their resource efficiency.
3. Focusing on boosting the digital economy and investments in the most lucrative segments of the value chain; enhancing scientific research, upgrading technological capabilities in industrial sectors, promoting innovation, and significantly growing the research and development workforce.

Amidst the economic downturn triggered by the COVID-19 pandemic, increased investments in infrastructure, sustainable industry, and research are even more critical to stimulate innovation across all sectors. Romania's rich natural environment, abundant in resources with great potential for renewable energy and enhanced resource efficiency, faces challenges from natural and human-induced pressures which impact biodiversity and ecosystems. A key priority is bolstering environmental protection and transitioning towards sustainable practices in agriculture, forestry, and rural settings overall. This includes initiatives for climate change mitigation and adapting to its effects, with environmental sustainability and climate response as overarching objectives.

Sustainable tourism development must align with national and regional economic and social plans. Efforts should focus on economic objectives like revenue growth, activity diversification and integration, and strategic development control and empowerment. Socially, the aims include reducing poverty and income inequality, safeguarding indigenous socio-cultural assets, and fostering local community engagement and participation. Ecologically, efforts should concentrate on protecting ecosystem functions and promoting the conservation and sustainable use of biodiversity. In formulating sustainable development policies, it's crucial to assess both the positive and negative economic impacts of tourism. A detailed examination of the adverse effects is essential to identify measures that can mitigate these impacts and enhance the benefits of developing this sector.

5. Conclusions

The findings of this study underscore the critical role of sustainable development in Romania, impacting both macroeconomic and microeconomic levels, and highlight the necessity of strategically planning, organizing, and managing sustainability initiatives. These initiatives should consider not just immediate impacts but also medium and long-term outcomes. In Romania, embracing sustainable development is not just an option among many but is seen as the only responsible method to plan for future development that aligns with national interests and international cooperation standards. Integrating Romania's national development goals with Western experiences concerning quality of life and future generations' well-being is crucial. The strategy for sustainable development in Romania should address specific concerns, including the design and implementation of systems to enhance professional and managerial training in accordance with global technological advancements, managing the migration of skilled specialists, and retraining excess workforce, particularly for developing specialized service sectors.

Key priorities for Romania to build a resilient infrastructure and promote sustainable industrialization include:

- ✓ Creating an environment that encourages private sector initiatives;
- ✓ Improving support services for entrepreneurial activities;
- ✓ Enhancing the capacity of public institutions to commercialize innovations;
- ✓ Advancing inclusive and sustainable industrialization;
- ✓ Financing significant infrastructure development projects;
- ✓ Acknowledging the social impacts of scientific, technological, and economic activities;
- ✓ Elevating the role of science in society.

Essential criteria for achieving sustainable development should involve:

- ✓ Reevaluating economic growth to ensure a more equitable resource distribution and focusing on the quality of outputs;
- ✓ Addressing essential human needs such as employment, food, energy, water, housing, and healthcare to eradicate poverty;
- ✓ Managing population growth to maintain it at sustainable levels;
- ✓ Conserving and enhancing natural resources, maintaining ecosystem diversity, and monitoring the economic activities' environmental impact;
- ✓ Redirecting technologies and managing associated risks;
- ✓ Decentralizing governance to increase participation in decision-making and standardizing environmental and international development decisions.

The management of natural resources in Romania aims to maintain ecological balance, preserve and enhance natural assets, ensure better living and working conditions for present and future generations, and protect the environment through rational resource use and pollution prevention. For the sustainable development of the industry, it involves:

- ✓ Promoting economically viable electrical technologies;
- ✓ Utilizing heat pumps to leverage secondary energy resources;
- ✓ Expanding process automation and monitoring.

Sustainable industrial development in Romania should also include a social aspect that integrates smoothly into the societal evolution. National industry human resource policies should strive to balance active and passive labor market policies and enhance the legislative framework. In essence, sustainable development is indispensable for maintaining long-term economic growth. Key solutions

for supporting sustainable industry development in Romania revolve around labor and human resources, such as:

- ✓ Fostering community and entrepreneurial spirit;
- ✓ Continuously upskilling and reskilling the workforce;
- ✓ Encouraging youth engagement in rural-specific activities;
- ✓ Enhancing public awareness of community challenges and opportunities offered by community programs;
- ✓ Designing organized frameworks for community consultation and project participation;
- ✓ Establishing frameworks for partnerships and supporting local initiatives;
- ✓ Developing and modernizing infrastructure to stabilize specialized personnel in rural areas and improve living standards;
- ✓ Expanding consultancy and support services across various sectors.

Despite initial progress and existing legislation aligned with international standards, and the increasing presence of environmental protection in media discourse, the journey from theory to practice remains long and challenging. However, steadfast efforts are expected to yield results in the foreseeable future. Future research could explore the moderating factors between sustainable industrial development and corporate social responsibility (CSR), providing valuable insights into their interplay.

The study's limitations are noted, including a relatively narrow time frame for research that often spans decades, a focus more on interpreting than on applying findings, and the straightforward realization of inductive research methodologies.

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