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MAPPING THE PERFORMANCE INDICES OF THE ENTREPRENEURIAL ECOSYSTEM

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Antreprenoriatul sustenabil implică utilizarea instrumentelor și metodelor durabile. Pentru a activa cu succes pe cele trei dimensiuni de sustenabilitate – economic, ecologic și social – antreprenorii vor evalua potențialul propriu și vor proiecta direcții de dezvoltare strategică a companiilor. Aceste procese pot fi eficientizate prin intermediul cartării indicilor de performanță ai ecosistemului antreprenorial, care vor ajuta la înțelegerea structurii și dinamicii mediului de afaceri și la luarea deciziilor informate în vederea îmbunătățirii acestuia. Prin evaluarea și monitorizarea indicilor de performanță, se pot identifica punctele slabe și se pot dezvolta strategii eficiente pentru stimularea inovării, creșterea economică și crearea de locuri de muncă. Indicii evaluați vor include toate aspectele ecosistemului antreprenorial. Acest articol, care reprezintă continuarea studiului asupra indicilor de sustenabilitate a ecosistemului antreprenorial, prevede rezumarea acestor indici și categorizarea lor în funcție de componentele mediului ambiant al întreprinderii.

Cuvinte-cheie: *ecosistem antreprenorial, indici de performanță, durabilitate, creștere economică, dimensiuni de sustenabilitate, antreprenoriat, obiective de dezvoltare durabilă.*

CARTAREA INDICILOR DE PERFORMANȚA AI ECOSISTEMULUI ANTREPRENORIAL

Sustainable entrepreneurship involves sustainable tools and methods. In order to successfully act on the three dimensions of sustainability – economic, ecological and social – entrepreneurs will assess their own potential and design strategic directions for companies. These processes can be streamlined by mapping the performance indices of the entrepreneurial ecosystem, which will help to understand the structure and dynamics of the business environment and to make informed decisions to improve it. By evaluating and monitoring performance indicators, weaknesses can be identified and effective strategies can be developed to stimulate innovation, economic growth and job creation. The assessed indices will include all aspects of the entrepreneurial ecosystem. This article, which is an extension of the study on the indices of sustainability of the business ecosystem, provides a summary of these indices and their categorization according to the enterprise environment components.

Keywords: *entrepreneurial ecosystem, performance indices, sustainability, economic growth, dimensions of sustainability, entrepreneurship, sustainable development objectives.*

Introduction

The importance of long-term sustainable development is not a trend, but rather an absolute necessity. The serious impact of climate change is the subject of discussion on all international cooperation agendas. The United Nations' Climate Change Conference (COP26), which was held in Glasgow from October 31 to November 13, 2021, became the most important gathering of global leaders since the Paris Agreement was adopted in 2015. All participants agreed to keep global warming at 1.5 degrees Celsius. The Glasgow Climate Pact included a wide range of decisions and statements. It emphasizes the urgency of accelerating efforts to address climate change and the need for all Parties to share their plans and actions with each other. It also encourages the use of financial instruments and policies that are aligned with the climate-resilient development goals [10]. These instruments need to be assessed and developed at different economic levels. In this article, the authors will address only the level of entrepreneurship and will develop the topic of assessing the activity of its ecosystems.

The term entrepreneurial ecosystem has become the preferred term for describing the various elements of entrepreneurship. He became popular in the social sciences after the work of Michael Moore in 1993 [25]. An entrepreneurial ecosystem involves a collection of interconnected people, companies

and organizations that facilitate and support entrepreneurial activity. At the same time, as a cluster, an entrepreneurial ecosystem also involves key actors and other entities, including large firms, universities, financial firms, and public organizations that support new and growing firms [7]. That is, in order to streamline entrepreneurship and address the principle of sustainability, it is necessary to be aware of the interdisciplinarity of ecosystems and to identify the resources that are part of it. Respectively, more recent research on the entrepreneurial ecosystem tends to inspect the determinants of entrepreneurial activity using an exogenous approach, removing the entrepreneur from the „image” [21], [4], [20]. Entrepreneurs are individuals who recognize an opportunity and act, but are not isolated, because they are dependent on certain elements to make an effort. Edward J. Malecki believes that the existential purpose of an entrepreneurial ecosystem is its own renewal, through the continuous formation of new companies that use the support of the ecosystem and existing and previous entrepreneurs. A mature and self-sustaining ecosystem will not decline, as entrepreneurship in new sectors replaces firms in older sectors within the local ecosystem [22]. In the study of the sustainability indices of the entrepreneurial ecosystem, it is tried to investigate the relationship between sustainability, economic growth and the evolution of indices related to the business environment on several dimensions (micro (individual), meso (psychological, action), macro (systems, processes, markets, structures, institutions)). In this context, the authors consider it appropriate to study of the sustainability indicators through the perspective of the entrepreneurial triple bottom line in conjunction with the UN Sustainable Development Goals. These are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity [26].

Literature review

Global Competitiveness Index of the World Economic Forum [15] aims to measure the level of competitiveness of different countries and to highlight the extent to which various factors such as productivity, institutions and skills contribute to the development of the economy. It is based on an average of 12 pillars, which are organized into four general components - favorable environment, human capital, markets and the innovation ecosystem, but these components are not included in the calculation of this index. Thus, the calculation of the Global Competitiveness Index 4.0 (GCI) is based on successive aggregations of scores, from the indicator level (the most disaggregated level) to the global GCI score (highest level). At each aggregation level, each aggregate measure is calculated by taking the average (i.e. arithmetic mean) of its component scores [30].

The Human Development Index is a product of UNDP (invented by Pakistani economist Mahbub ul Haq), which is a summary measure of how people develop in different key dimensions: a long and healthy life, the provision of the necessary for the accumulation of knowledge and a decent standard of living [18]. The size of health is based on life expectancy at birth, and the size of education is calculated by the years of schooling for adults and children. HDI uses revenue logarithm to reflect declining importance of revenue as national gross income increases [18], thus being used to better compare a country's level of development than its GDP per capita, which only measures material prosperity, and not other socio-economic indicators [19]. Studies have shown that countries with a low HDI lead to unsustainable economies [27], respectively, the entrepreneurial ecosystem will not be sustainable either.

The ease of doing business aims to include different parameters which define the accessibility of doing business in a particular country. It was developed jointly by Simeon Djankov, Michael Klein and Caralee McLiesh, three leading economists in the World Bank Group [8]. The World Bank's ease-of-business index of improving regulations has shown that they have a strong economic impact and provide stronger protection of business property rights. It is intended to measure regulations that directly affect businesses and do not directly measure more general conditions, such as the proximity of a country to large markets, the quality of infrastructure, inflation or crime [33]. It is based on 10 subindexes. Studies show that the ease of doing business in countries with vulnerable economies seems to be detrimental to the environment. Thus, difficulties in conducting business in developing countries (such as those in the southern region of Africa) include tough regulatory requirements, tight bureaucratic structures, reduced access to finance channels, weak tax systems, low protection for private sector stakeholders, less expo-

sure to international trade. In this respect, such considerations ultimately affect a company's commitment to approaches that protect the natural environment in a negative way [13].

The Environmental Performance Index, developed by Yale University (Yale Center for Environmental Law and Policy) and Columbia University (Center for the International Earth Science Network) in collaboration with the World Economic Forum and the European Commission's Joint Research Center [11], is a method of quantifying and numerically assessing the environmental performance of a state's policies. The index shows a tension between two fundamental dimensions of sustainable development: the health of the environment, which increases with economic growth, and the degree of prosperity and vitality of the ecosystem, which is subject to industrialization and urbanization [1]. Governance is a critical and necessary factor that can help balance these distinct dimensions of sustainability [23].

Through the Global Entrepreneurship Index, the GEDI Institute has compiled and analyzed various statistics related to the health of the entrepreneurial ecosystem in 137 countries [16]. The index estimates the quality of entrepreneurship in various fields by considering different facets of the ecosystem (the quality and dynamics of a nation's economy). It helps to identify weaknesses and strengths and shows the improvements made by a particular country, respectively shows the relative strength of the country in relation to the rest of the world. It focuses on the three dimensions of these activities: entrepreneurial attitudes, entrepreneurship and high quality entrepreneurship - all are detailed in 14 pillars. Studies on this indicator have established a positive relationship between entrepreneurship and growth [28]. In addition, it has been found that entrepreneurship can only take place during a phase of economic recovery and that public institutions should become more active in promoting it [12].

Global Entrepreneurship Monitor's National Entrepreneurship Context Index (GEM NECI) [17]) provides policy makers with a set of tools to help promote a positive entrepreneurial environment. It was developed by London Business School and Babson College in the summer of 1997. The GEM concept (GEM NECI index) focuses on various factors that influence the activities and aspirations of young entrepreneurs. These include the geographical scope of their entrepreneurial activity and job growth expectations. Other factors include the level of innovation in start-ups and their potential profitability. All of these variables are extremely important because they influence the likely impact of the new business on its long-term sustainability and growth potential, according to researchers at Babson College [3].

The Entrepreneurship Psychometric Index is a measure of the psychological aspects of starting and running a business [9]. The PIKEN index is much deeper for estimating the entrepreneurial ecosystem, quantifying a person's potential value before becoming an entrepreneur. Attitudes, thinking and behavior are relevant dimensions of this indicator. This index has a direct impact on the entrepreneurial ecosystem on the secondary (psychological) dimension and, respectively, will influence the long-term activity.

Methodology

The presentation of the indices is not exhaustive, that, the authors consider it appropriate to detail them by dimension.

The macro level of entrepreneurship involves different indexes, presented in table 1.

The *transactional level* consists of „market forces”, including suppliers, supply and demand, distribution, competitors and strategic alliances.

The Environmental Suppliers Sustainability Index is a multi-dimensional measure of how suppliers perform in terms of their environment. It highlights the most significant environmental issues affecting consumer products [6]. Supply chain KPIs require organizations to collect data from relevant suppliers (direct or indirect) within the category (examples of suppliers' sustainability KPIs are presented in the Figure 1). These descriptions meant as suggestive rather than normative [14].

The authors of this article noted that the various aspects of the Sustainability index question asked of the supplier included the social, environmental, and economic dimension (Figure 2).

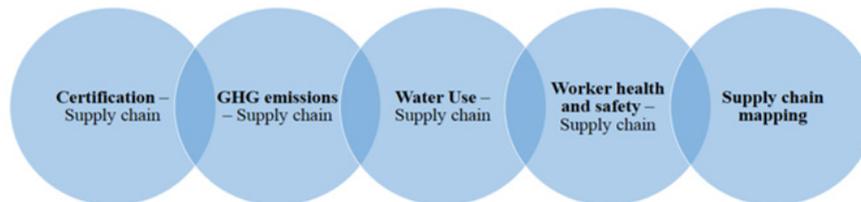
Yann Bouchery et.a. consider that transportation and warehousing are the most impacting distribution operations [5]. They developed an evaluation tool that allow users to assess the performance of distributed supply chains (DSCs) in terms of sustainable development. This method is based on a set of quantified Key Performance indicators (Table 2).

Table 1. The macro level of the entrepreneurship.

The macro environment (global forces)	Global Competitiveness Index	Global Entrepreneurship Index	Human Development Index	The ease of doing business	Environmental performance index	Global Entrepreneurship Monitor's National Entrepreneurship Context Index
Politics	Security Government adaptability					
Economic development	Transport infrastructure Utility infrastructure Macroeconomic stability Markets (Product market, Financial system, Market size)	Internationalisation Risk Acceptance Opportunity Startup Risk Capital Competition	A decent standard of living	Starting a Business Dealing with Construction Permits Getting Electricity Getting Credit Paying Taxes Trading across Borders Enforcing Contracts Resolving Insolvency		Access to Entrepreneurial Finance Government Policy: Taxes and Bureaucracy Government Entrepreneurship Programs Commercial And Professional Infrastructure Physical Infrastructure Ease of Entry: Market Dynamics Ease of Entry: Market Burdens and Regulations
Social developments	Social capital Human capital (Health, Skills) Markets (Labour market)	Cultural Support Start-up Skills Human Capital	Long and healthy life Knowledge	Protecting Minority Investors		Entrepreneurial Education at School Entrepreneurial Education Post-School Social and Cultural Norms Research and Development Transfer
Technological developments	ICT adoption Business dynamism Innovation capability	Networking Technology Absorption Product Innovation Process Innovation High Growth				
Ecological	Commitment to sustainability				Environmental health Ecosystem vitality	
Legal	Checks and balances Public-sector performance Transparency Property rights Corporate governance			Registering Property		Government Policy: Support and Relevance

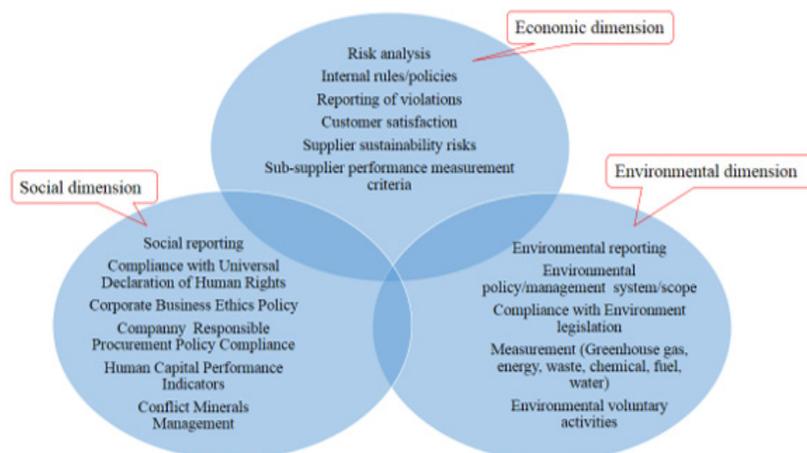
Source: Authors' data analysis.

Figure 1. Examples of suppliers' sustainability KPIs.



Source: [14].

Figure 2. The assessing social, environmental, and economic dimensions of organizations' suppliers.



Source: after [29].

Table 2. Evaluation tool of distribution subprocesses sustainability.

	01	02	03	04	05	06	07
KPIs	Proposed KPIs for Transportation Subprocess			Proposed KPIs for Warehousing Subprocess			
	Criterion	Indicator	Metric	Criterion	Indicator	Metric	
Economic Pillar	Financial Performance	Transportation Cost	€ / ton	Financial Performance	Warehousing Cost	€ / ton	
	Service Level	% of Product Deliver in Time	%	Service Level	Fill Rate	%	
Environmental Pillar	Energy Consumption	Energy Use	kJ / ton	Energy Consumption	Energy Use	kJ / ton	
	Resource Consumption	Material Use	kg / ton	Resource Consumption	Material Use	kg / ton	
	Global Warming	GHG Emissions	kg (CO ₂ eq) / ton	Global Warming	GHG Emissions	kg (CO ₂ eq) / ton	
				Space Utilization	Space Use	m ² / t	
Social Pillar	Human Toxicity	Human Toxicity Potential	(Disability Adjusted Life Year) ² / ton				
	Congestion	% of Time Lost due to Congestion	%				
	Work Conditions	Absenteeism Rate	number / ton	Work Conditions	Absenteeism Rate	number / ton	
	Safety	Injury Rate	number / ton	Safety	Injury Rate	number / ton	

Source: adapted after [5].

The importance of maintaining a competitive environment is key to building prosperous societies. It can be achieved through various policies that promote innovation, investment, and job creation. Due to the complexity of the concept of competitive assessment, there are various studies that try to provide a comprehensive and objective assessment of the various factors that affect the competitiveness of nations [32]. It could be argued that the various factors that are taken into account by the respondents are not representative of the private sector’s actual views and priorities. This is because the majority of private enterprises are SMEs and micro or small businesses. The main competitiveness indicators related to the organization’s sustainability are the ‘non-financial’ *relative market share* and the ‘financial’ *sales growth*.

Strategic alliances are another dimension of the ‘market force’ that should be assessed by organizations, in order to be more sustainable. The profitable enterprise shows how successful collaborations can benefit all parties involved. The importance of an alliance is obvious, but the challenge is to measure the alliance performance. Availing an alliance is a type of arrangement where multiple companies compete for a single benefit, which is often inflated. Another critical characteristic of an alliance is its operational interdependence. Most alliances receive input from their parent companies, which can create complex transfer pricing issues. The noncore position of alliances is typically not recognized by the management of corporations. Instead, they are typically treated as mere business units and are not subject to the same level of scrutiny as standard customer relationships [2]. To overcome these obstacles, companies must first assess their alliances’ performance on three levels (Figure 3).

The concept of the bottom-up indicators is to focus on the sustainability of various entities, such as households, companies, and individuals. This level involves forces that address the internal environment of the firm: vision, mission, strategy, resources, processes, products and services.

Corporate sustainability reporting is a type of measurement that helps the management of a company to formulate their sustainable goals. The vision and mission for sustainability refers to three subprinciples: availability (the access to necessary resources), scalability (the ability to grow without losing customers, diminishing quality, or changing the organization mission) and economical (reasonably priced). Formulating a green shared vision is an important step in the organization’s green development process. This strategy can help the members of an enterprise develop green product psychological ownership [34].

Figure 3. Alliance performance assessment.



Source: adapted after [2].

The paper by Park K. and Meglio O. [24] showed how organizations have a dilemma when it comes to deciding which sustainable options are best for their businesses. The goal of having a green shared vision is to enhance the psychological ownership of the organization’s members. This strategy can help boost an organization’s green image and increase its competitive advantage. A green governance model can help an organization achieve its goals in terms of sustainable development.

Resources and Processes. The most relevant sustainability indicators’ analysis is provided by the GEDI Institute [16] (Figure 4).

Figure 4. The variable of assessing micro organization sustainable environment.

	PILLARS	INSTITUTIONAL VARIABLES	INDIVIDUAL VARIABLES
Entrepreneurial Attitudes	Opportunity Perception	Market Agglomeration	Opportunity Recognition
	Start-up Skills	Tertiary Education	Skill Perception
	Risk Acceptance	Business Risk	Risk Perception
	Networking	Internet Usage	Know Entrepreneurs
	Cultural Support	Corruption	Career Status
Entrepreneurial Abilities	Opportunity Startup	Economic Freedom	Opportunity Motivation
	Technology Absorption	Tech Absorption	Technology Level
	Human Capital	Staff Training	Educational Level
	Competition	Market Dominance	Competitors
Entrepreneurial Aspirations	Product Innovation	Technology Transfer	New Product
	Process Innovation	GERD	New Tech
	High Growth	Business Strategy	Gazelle
	Internationalisation	Globalization	Export
	Risk Capital	Depth of Capital Market	Informal Investment

Source: [16].

Entrepreneurship is also an area that requires knowledge. There are various ways to measure it and monitor it (a list of 31 GEM Indicators is researched by the authors). The GEM concept looks specifically at the role of entrepreneurship — the processes of enterprise creation and business development — in contributing to economic growth [17].

Figure 5. Examples of product sustainability KPIs.

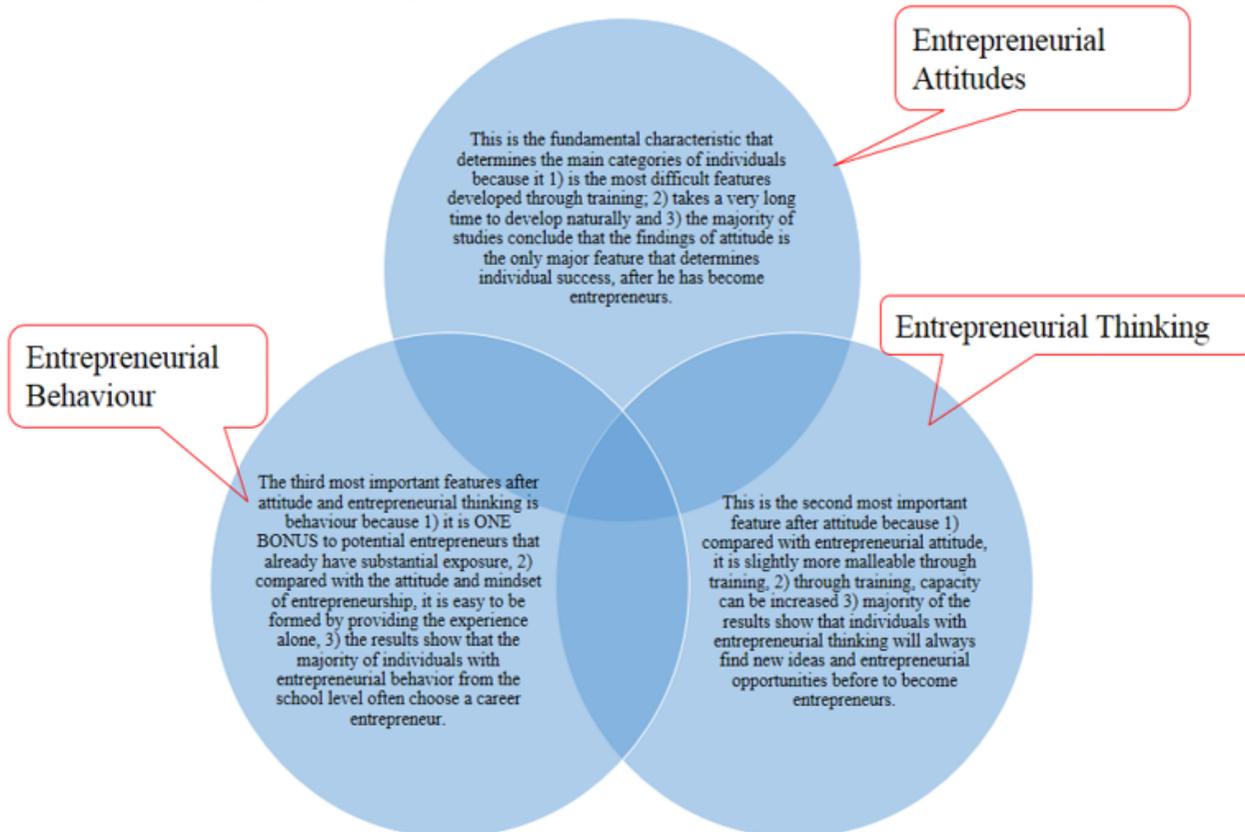
Category KPIs	Facility KPIs
<ul style="list-style-type: none"> • Product design • Product safety • Recycled content • Packaging raw material and end of life • Sustainable packaging design and production • Transportation to retailers 	<ul style="list-style-type: none"> • Air quality – Manufacturing • GHG emissions intensity – Manufacturing • Labor rights – Manufacturing • Water use intensity – Manufacturing • Worker health and safety – Manufacturing

Source: adapted after [14].

The sustainability of the Product-Service-Systems. This step requires the organizations` to collect data from all the products within a specific product category. It will be necessary to create a weighted average across all the products within the category and to set the relevant KPI (examples of products` sustainability KPIs are presented in the Figure 5). The facility KPIs require to collect data from each facility responsible for final manufacturing of products within the category. This may include contract manufacturers who provide such operations [14].

Concerning the entrepreneurs` psychological approach, it is relevant to analyze the Psychometric Index that aims to quantify the potential value of an individual before becoming an entrepreneur (Figure 6).

Figure 6. The Entrepreneur Psychometric Index.



Source: adapter after [9].

All these sustainable entrepreneurship indicators should be analyzed from the SDG perspective. For example, one of the company's goals is to provide a living wage to all its employees globally – SDG 8: Decent work and economic growth [31].

Figure 7. Example of breakdown of the SDG 8 targets into micro-, meso-, and macro-level perspectives and adding its KPIs.

Example of breakdown of the SDG 8 targets into micro-, meso-, and macro-level perspectives					
Micro level, Examples of KPI		Meso level, Examples of KPI		Macro level, Examples of KPI	
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading, and innovation, including through a focus on high-value added and labor-intensive sectors					
Entrepreneurs recognizing the importance of diversification, technological upgrading, and innovation and adapting the company vision and mission statements	% of men/women in senior management Revenue From New Digital Services Rate of Innovation	Enforcing connectivity with stakeholders for promoting diversification, technological upgrading, and innovation	Outbound Marketing Performance Operational Improvement Customer Experience Suppliers KPIs	Enabling 'global forces' for economic growth through diversification, technological upgrading, and innovation	Social capital Human capital (Health, Skills) ICT adoption Business dynamism Innovation capability

Source: Authors' data analysis.

A country's progress toward its SDGs can be monitored through a variety of micro-meso-macro-level indicators. These tools help develop effective systems of accountability and transparency. In the figure 7 the authors present an example of correlation, at various levels, of the environmental performance indicators with SDGs. This approach can serve an important tool for entrepreneurs in creating their sustainable organizations strategies.

Conclusion

It was found that the entrepreneurial ecosystem that encompasses three levels (dimensions) of manifestation (micro (individual), meso (psychological, action), macro (systems, processes, markets, structures)) and that identifies variables for each of these dimensions, is fundamental for sustainability and economic growth, as demonstrated by the relevant indicators analyzed in the study. The authors believe that the SDGs should be harmonized with companies' policies, that development strategies should be correlated with the triple bottom line approach, and that the indicators presented in the study should serve implicit support for every dimension of business.

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