

THE PERMACRISIS AND THE ADVANCED KNOWLEDGE BASED SUSTAINABLE DEVELOPMENT CONTEXT

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Abstract

The paper combines original concepts related to ecological-social-economic systems in the context of sustainable development. It emphasizes the identification, stimulation and evaluation of creativity through trans-thematic identifiers (know what), phenomenological descriptors (know how) and logical explanators (know why). The aim is to transform a monodisciplinary space into a transdisciplinary one by applying a breadth-through-depth approach to knowledge. To be creative in the context of innovation means exploring and possibly transforming, the conceptual space into a living system understood as a practical transdisciplinary knowledge space.

The paper attempts to connect transdisciplinarity, globalization and sustainable development through the apokataphatic method, which is used to identify what is ("yes"), what is not ("no") and how sustainability works ("go-so") within ecological-social-economic systems. The paper presents a new transdisciplinary approach and a new knowledge pattern, named DIMLAK (Data, Information, Messages, Learning and Advanced Knowledge), which explains how advanced knowledge is achieved as the highest level of a transdisciplinary, integrated and integrative knowledge system.

Considering the permacrisis context, characterized by five disruptive dimensions, the paper introduces a nonlinear approach to the analysis of sustainable development. This approach aims to assess the actual level of advanced knowledge within society and the economy and to achieve, implement and share integrative knowledge through KIM (Knowledge Integrative Management).

The paper argues that even when essential operational ingredients for success in a permacrisis context, such as sufficient financial resources, financial management skills, or appropriate logistics, are missing, innovative creativity can overcome these barriers and enable new perspectives on sustainable development. Success does not necessarily result from genius idea; it often emerges from relatively simple concepts, supported by creativity, passion, motivation and an extremely clear vision of the intended outcome. Success stories from the online business environment are indicative of this dynamic.

Keywords: *sustainable development, conceptual and practical space of knowledge, breadth through depth approach of knowledge, apokataphatic method, eco-social-economic systems, heterohierarchic DIMLAK tree of knowledge, business environment, permacrisis context, innovative creativity.*

PERMACRIZA ȘI CONTEXTUL DEZVOLTĂRII DURABILE BAZATE PE CUNOAȘTERE AVANSATĂ

Rezumat

Lucrarea combină concepte originale despre sistemele ecologico-social-economice în contextul dezvoltării durabile, considerând că cele mai importante aspecte sunt „identificarea, stimularea și evaluarea creativității”, prin intermediul identificatorilor transtematici (a ști ce), al descriptorilor fenomenologici (a ști cum) și al explicatorilor logici (a ști de ce), în vederea transformării unui spațiu monodisciplinar într-unul transdisciplinar, ca abordare a cunoașterii de tip „lărgime prin profunzime”. A fi creativ pentru inovare înseamnă a explora și, eventual, a transforma „spațiul conceptual” într-un sistem viu, ca „spațiu practic al cunoașterii transdisciplinare”.

Există aici o încercare de a conecta transdisciplinaritatea, globalizarea și dezvoltarea durabilă într-un mod foarte interesant, prin metoda apokataphatică, pentru a identifica ce este („da”), ce nu este („nu”) și cum funcționează („așa”) sustenabilitatea în sistemele ecologico-social-economice. Lucrarea prezintă o nouă abordare transdisciplinară, un nou model al cunoașterii, denumit DIMLAK (Date, Informații, Mesaje, Învățare și Cunoaștere Avansată), care explică modul în care este obținută cunoașterea avansată ca nivel superior al sistemului de cunoaștere integrat și integrativ transdisciplinar. Având în vedere contextul de permacrize, cu cinci spații perturbatoare, este introdusă o abordare neliniară în analiza dezvoltării durabile, în scopul stabilirii unui nivel real al cunoașterii avansate a societății/economiei, pentru a realiza, implementa și partaja o cunoaștere integrativă sub forma KIM (management integrativ al cunoașterii). Este important de știut că, chiar și atunci când lipsesc ingredientele proprii succesului într-un context de permacrize — de exemplu, resurse financiare insuficiente, competențe de management financiar, logistică adecvată și altele asemenea — creativitatea inovatoare poate depăși barierele și poate oferi o nouă perspectivă asupra dezvoltării durabile, cu o poveste de succes diferită. De altfel, succesul nu provine neapărat din idei geniale, ci adesea din gânduri relativ simple. Lipsa anumitor „ingrediente” operaționale poate fi compensată în mod convenabil prin creativitate, pasiune sau motivație și, mai ales, printr-o viziune extrem de clară asupra modului în care se va dezvolta afacerea respectivă. Poveștile de succes din mediul de afaceri online sunt destul de sugestive în acest sens.

Cuvinte-cheie: dezvoltare durabilă, spațiul conceptual și practic al cunoașterii, abordarea cunoașterii de tip „lărgime prin profunzime”, metoda apokataphatică, sisteme eco-social-economice, arborele heteroierarhic al cunoașterii DIMLAK, mediul de afaceri, context de permacriză, creativitate inovatoare.

“Our world is suffering from the impact of unprecedented emergencies caused by the climate crisis, pollution, desertification and biodiversity loss, the COVID-19 pandemic, by new and ongoing conflicts and by the ungoverned development of new technologies” [1]

“We are living in postnormal times, when nothing makes sense, including the future [2].

“...The old is dying and the new cannot be born” [3].

We, the authors as all the people, are searching for the black swan as a Holy Grail to overcome the collapse for the permacrisis society [4].

1. Sustainability, past, present and the future

Sustainability is an economico-political concept articulated in the Bruntland Report [5], determined by the tension between people’s *aspirations for a better quality of life* and the *imposed limitations arising* from the state of the nature [6,7]. Although there exists a wide range of definitions of sustainability, each of them has its own connotation and reflects a certain historical period and specific socio-economic needs. A *process-oriented* approach emerged in 1990. It introduced the idea that development could ensure sustainability and economic efficiency for local communities through the *circular economy paradigm* [4]. One strong definition emphasizes justice as a broader aspect of social life and defines sustainability as *“...living in harmony with social and environmental conditions based on a sense of equality and justice”*. Another, solution-oriented definition states: *“...sustainability is an awareness of the relationship between the world and the implications of our actions. It involves finding solutions through innovation approaches, expanding future choices by practicing environmental care and building institutions that constantly study and cultivate values promoting justice”* [5, 6, 7].

Through time, sustainability had been reinterpreted contextually on three levels: environmental, social and economic, as the ENSEC paradigm [8], or the 3P-Triple Bottom Line, comprising Planet (environment), People (society), Project (economy) [9], which analyze contextually what sustainability is and how it should be interpreted [6,10]. The study distinguishes between sustainable development, as an established idea and sustainability management, as an emerging discipline in a reshaped approach, namely Sustainable Knowledge Integration Management (KIM) [11]. Reconciling the strategic management imperatives for sales with the requirements of the knowledge-based society and economy requires certain dynamic factors, which interact synergistically to form a model of “commercial animation” grounded in advanced knowledge. In this paper, a hybrid sales strategic model is synthesized based on advanced knowledge, highlighting its antecedents and consequences [12]. Theoretical and practical sustainable development requires a sustainability management viewpoint that emphasizes safeguarding both man-made and natural assets. Sustainability management includes all actions and steps needed to achieve the goal of sustainable development in the permacrisis context [13,14]. Finally, sustainability management is essential for enhancing environmental and corporate governance mechanisms that provide access to all aspects of reality for current and future generations. The study also highlights the importance of developing a sustainability management strategy to guide human actions across political, economic, social, technological and legal domains toward long-term sustainability [8,14,15]. Sustainability can be understood as a concept that integrates nature and harmony, as well as a landscape animated by people in celebration, aiming for territories to be self-sufficient and to cooperate with each other by involving citizens in decision-making. In this context, universities must take on a new role: greater accountability to students, whose voices must be heard to foster a cultural change centered on increased responsibility toward others. Thus, there is a combination of sustainable education and trust in young people forming a foundation for building future society and economy [16,17,18]. The hope is to promote strategies that place the concept of pragmatic sustainability at the center, distinguishing it from ideological sustainability. It emerges unequivocally that sustainability washing does not solve problems and that solutions integrating multiple dimensions of sustainability must be developed while ethical aspects are

reconsidered within a transdisciplinary framework connecting entrepreneurship, business, technology and related domains [12]. Creativity for innovation in the context of social collapse involves exploring and potentially transforming the “conceptual space” into a living system, defined as a “*practical transdisciplinary knowledge space*” [17,19]. An attempt is made here to connect transdisciplinarity through cybernetic semiophysics, globalization understood as glocalization and sustainable development using the apokataphatic method to identify what is (“yes”), what is not (“no”) and how sustainability works (“go-so”) within ecological-social-economic systems [13,14,15,20,21]. *“Our world is suffering from the impact of unprecedented emergencies caused by the climate crisis, pollution, desertification and biodiversity loss, the COVID-19 pandemic, as well as new and ongoing conflicts and the ungoverned development of new technologies”* [22]. At the same time, international forums such as the G20 Summits [23] mentions that decarbonization, poverty, pandemic and efficient use of resources remain major unsolved issues; however, efforts to promote sustainable development appear more ideologically driven than focused on tangible progress capable of advancing society to the next level. Therefore, it is necessary to redefine the concept of sustainability and propose new approaches to address this complex challenge [13,14]. As the environment and geopolitics are becoming increasingly complex and unpredictable, must be approached from a transdisciplinary perspective to tackle the complexity and unpredictability of the world economy, environment and geopolitics.

2. A Transdisciplinary Approach of the Knowledge Integration in the Permacrisis Context

It is necessary to introduce a nonlinear approach to analyzing sustainable development to establish the actual level of advanced knowledge within society and the economy through the DIMLAK hetero-hierarchical paradigm [26]. This approach aims to achieve, implement and share integrative knowledge through KIM (Knowledge Integrative Management) [11] by linking the permacrisis to its five disruptive transitional spaces [19,26]: geopolitical reconfigurations [29,30]; energetic challenges [13,27,28]; climate and water disturbance [32,33,34,35]; demographic, food security and health realities [34,36,37,38]; and IT, automation and

technological development [9,34,40,41,42,43], requiring both individual and viable global and local solutions. The dilemma of economic progress versus environmental preservation under these unstable conditions remains unresolved, both conceptually and practically, particularly in creating viable economies that aim for permanent equilibrium rather than recurrent crises [14,62]. The concept of multiple crises reconfigures the three aspects of sustainable development: resilience, viability and disaster/crisis, along with their associated vulnerabilities, in a transdisciplinary manner. [8]. By understanding the dynamics of sustainability, it becomes possible to identify strategies and ongoing development that could be implemented through technology [34,60,61], science [8,25], education [15,17,44], legal regulations [7,45,46] and entrepreneurship [12,14,20,47,48]. A transdisciplinary approach facilitates a deeper understanding of complexity and provides insight for formulating contextual solutions that address human societal needs. The natural home of the synergistic integration of advanced knowledge through education, research and industry, characterized by flexibility and adequacy within the knowledge-based economic space, operates from a transdisciplinary “global village” perspective rather than an “ivory tower”, combining a highly demanding degree with broad competence across integrated disciplines and requiring depth-oriented research within one’s cognitive domain. To achieve sustainable advanced knowledge (AK), the semiophysical hetero-hierarchic DIMLAK approach was introduced (D, data-statistic; I, information-syntactic; M, message model-semantic; L, all life learning-pragmatic; AK-advanced knowledge-apobetic), complementing expertise with wisdom at the top-down level and integrating it with skills at the bottom-up level, thus connecting the knowledge system through KIM [8,11]. The purpose of the paper is to identify a comprehensive perspective on knowledge integration using a synergistic, generative transdisciplinary model that transfers and implements knowledge in the knowledge-based society and economy.

The proposed transdisciplinary model employs cybernetic synergistic synthesis methodologies within a defined framework, grounded in the fundamental pillars of knowledge: *learning to learn to know by doing* and *learning to understand to be by living together with others* [18,50], adopting a breadth-through-depth approach and opening a new vision in the process of knowledge acquisition [19].

To balance intergenerational welfare with material resources, it is necessary to distinguish two types of sustainability: strong sustainability at the macro level and weak sustainability at the micro level, in a complementary weak-strong relationship [51]. Weak and strong sustainability represent contrasting approaches to environmental and economic policy, particularly regarding the substitutability of natural and human-made capital [6]. Weak sustainability assumes that natural and human-made capital are largely interchangeable, allowing substitution as long as overall capital stock remains constant or increases. Strong sustainability posits that certain natural resources and ecological systems are irreplaceable and must be maintained without substitution. The debate between weak and strong sustainability revolves around valuing nature and its role in human well-being. While weak sustainability focuses on maintaining overall capital stocks, strong sustainability emphasizes preserving critical ecological systems and resources, even at cost of some economic benefits. Ayres and his colleagues [51] advocate for a nuanced understanding that acknowledges limits of substitutability and the importance of protecting natural capital. The authors address the issue of defining sustainable development [52], using a transdisciplinary, systemic, process-oriented and synergetic approach in the context of the five crises and transitions [13, 28]. Several key practical educational and environmental transdisciplinary spaces are introduced, such as Technopolis centers, knowledge factories and mobile platforms, functioning as innovative clusters that generate, transfer and implement knowledge to support sustainable development within an integrated and continuously evolving society. A creative system within these spaces must detect original ideas, perform efficiently and explore intelligently [15,19]. These transdisciplinary spaces aim to generate, transfer and implement advanced knowledge by integrating expertise, wisdom and skills using a breadth-through-depth approach. Transdisciplinarity operates through formulating and affirming original opinions, rational decision-making, problem-solving, responsible debate and teaching-learning processes that transcend traditional academic boundaries, bridging gaps within a sustainable, integrative, lifelong framework [17].

To integrate original sustainability concepts across ecological-social-economic systems in the permacrisis, focusing on the identification, stimulation and evaluation of creativity within the seven pillars model

of knowledge (where, when, who, with whom, why, what and how) in a cybernetic, synergistic-generative manner, to transform a mono-disciplinary space into a transdisciplinary one [19]. Creativity for innovation involves exploring and potentially transforming the “conceptual space” into a living “practical transdisciplinary knowledge space,” thereby connecting transdisciplinarity, globalization and sustainable development coherently through the apokataphatic method to identify what is (“yes”), what is not (“no”) and how sustainability works (“go-so”) in the permacrisis context [19,28,50].

3. Sustainability and the resilient development in the permacrisis context

This paper shows that gathering vital intelligence on business ethical standards, tacit and explicit corporate knowledge, market knowledge and sales governance has important practical implications for both a company’s business strategy and its sales strategy [21]. Contemporary economic realities do not necessarily change the results of effective strategic sales management, but they do influence how knowledge is converted into a strategic resource based on three cardinal notions: dynamic participation, versatility and integration. In such a context, this paper explores specific aspects regarding the link between strategic action and ethics, the integration of advanced knowledge into strategic planning, the synergistic interaction of market and organizational knowledge and the identification of key main interdepartmental drivers of efficient sales [11, 49]. Economic and environmental interventions by human societies have created disruptions that threaten the capacity of socio-ecological systems to recover from adversities and maintain key functions essential for resilience [8]. This paper underscores the benefits of a workshop-based methodology for developing a vision and approach to internal creation processes that increase resilience, address societal vulnerabilities and provide tools for planning at local, regional and global scales [56]. A framework is proposed that integrates human subjectivity and variability, including gender, in shaping experiences and responses to climate change and challenges such as COVID-19. Within the domain of socio-economic research, the authors call on researchers and policymakers to expand perspectives on resi-

lience through the proposed systemic vision. Transformative thinking requires internal exploration and visualization of desirable futures that integrate ecological, social, cultural, ethical and economic dimensions to transition toward livable, sustainable, equitable and resilient societies. Resilience is acknowledged both explicitly and implicitly across a range of targets within the United Nation's Sustainable Development Goals (SDGs) [53]. The United Nations 2030 Agenda for Sustainable Development (SD) [55] underscores the importance of sustainable, resilient and inclusive development guided by the seventeen interlinked SDGs [54]. It emphasizes addressing permacrisis conditions, where resilience and adaptive capacities operate amid climate, geopolitical, economic, energy, social-medical and technological hazards to build the resilience of vulnerable populations and reduce their exposure to extreme events [28, 55, 57]. This contributes a core feature of sustainable development, while the SDGs aim to achieve gender equality and empower women and girls, a challenge for SDG implementation [53, 65]. The integration of preventive, mitigative and adaptive policies, concepts and practices requires cooperation and coordination among policymakers, planners, institutions, local communities and global society [8]. Furthermore, the holistic approach should be based on transdisciplinary scientific collaboration, not limited to technological achievements but including ecological, social, economic and ethical dimensions [11]. Societies must be built on systemic equity, addressing threats to individuals' and communities' adaptive capacities, largely missing from current policies [28]. Therefore, effective disaster risk prevention, reduction and adaptation interventions require attention to differentiated vulnerabilities, inequalities and social changes [53,57]. This review of international cooperation for social and environmental change argues for replacing sustainable development with a new transdisciplinary approach connected to the permacrisis context [28]. Otherwise, progress toward the SDGs is likely to falter [58,65]. Alternative frameworks must relate to a new eco-social contract between citizens and the state and engage existing capabilities in a disrupted world. The case is made for an enhanced form of Disaster Risk Management (DRM) as an overarching framework [24].

Outsourcing, globalization and innovation have persisted as major trends in supply chains for a long time. They are included in, but not limited to, these efforts mainly provide insights into current and poten-

tial future developments in supply chain management and resilience inadequate data management techniques [11, 54]. Although numerous efforts have aimed to adopt more proactive supply chain crisis management approaches, these efforts mainly provide insights into the current and potential future developments in supply chain management and resilience [25,60]. It becomes necessary to consider resilience (Rsl), viability (Vbl) and vulnerability (Vlb) under possible disaster conditions to create dynamic conditions for subsistence (Sbs) living, reshaping each step to overcome challenges within ecological, social and economic subsystems of the ENSEC system under unstable conditions. A shift is required from a linear approach to sustainable development toward a nonlinear one, incorporating a circular economy [25], social-medical well-being and a new energy perspective, to reconfigure the framework of the knowledge process within a multi-parameter model. Certain aspects of sustainability must also be reconsidered in the permacrisis context [24], by identifying two dominant “dangerous dogmas” in climate debate and policy: the “climate-scam” dogma, which treats climate change as natural or exaggerated, often promoted by fossil fuel interests and the “carbon-centrism” dogma, which attributes climate change solely or primarily to CO₂ emissions [24]. These dogmas align with competing industries, fossil fuels versus lower-carbon energy, shaping capital flows, research funding and media narratives, which marginalize ecological perspectives and alternative science [56].

Regarding nuclear reactors, a dilemma arises: they can generate large amounts of energy but come with high costs and long construction times [25]. The greatest threat is radiation release due to leaks, explosions, or improper waste management, which can occur from war damage, plant control loss, overheating, lack of coolant, or natural disasters. Historical examples include Chernobyl (1986), Fukushima (2011) and the Zaporozhzia nuclear plant, affected by military actions in Ukraine [28, 59, 60]. In the permacrisis context, with energy as one of the five challenging transitions, this paper analyzes energy options and possible solutions within the broader global crisis [25, 27]. The main energy security question is how alternative sources can support decarbonization, ensure reliability, economic feasibility and geopolitical safety, given that gas is no longer a long-term option. The EU and the global community require climate-neutral energy and greater autonomy, in line with

net-zero greenhouse gas emission strategies. International projects and partnerships can serve as examples of green energy independence even amid escalating permacrises [28, 29, 57]. It is important to understand how sustainability can be maintained during prolonged global crises [28]. Although many mechanisms exist locally and internationally to support sustainable development and address ecological issues, major challenges have persisted since the Rio Earth Summit in 1992 [5]. These challenges have created a permacrisis, with five non-resilient transitions exceeding the limits of resilience mechanisms [57].

Energetic aspects of transdisciplinary sustainable development and emerging energy policy perspectives arise from the need for a green global energy system that preserves the natural ENSEC pattern [8], focusing on two primary natural resources: solar and gravitational [27]. In today's dynamic world, the energy sector faces a pivotal crossroads: growing global demand and intensifying environmental concerns make sustainable energy solutions increasingly urgent [63, 66]. Hydrogen energy technologies are considered worldwide as cutting-edge, clean energy [69]. A key focus is hydrogen as an alternative to methane, supported by an industrial ecosystem including water electrolysis and photocatalytic and electrocatalytic technologies [28]. Three major challenges limit widespread hydrogen adoption: production, storage and end-use, all interconnected in complex, highly material- and energy-intensive systems, contributing to environmental pollution. Hydrogen's benefits in transportation, residential and industrial sectors stem from its abundant availability on Earth, high energy storage capacity (nearly three times that of methane per unit volume) and potential for carbon-free energy use. Green hydrogen is expected to be produced at scale soon using carbon-neutral and environmentally processes [28, 57].

In the same "Pandora's energetic box", a high-capacity reversible hydrogen storage battery using H⁻-conducting solid electrolytes has been developed [70]. Hydride ion-mediated electrochemical storage was explored and a promising hydride ion-conducting solid electrolyte was identified from the pseudoternary barium-calcium-sodium hydride system. Its excellent electrochemical stability allows flexible coupling with various metal-hydride electrodes and magnesium-hydrogen cells using this electrolyte achieved a reversible capacity of 2030 milliampere-hours per gram at a relatively low temperature of 90°C [71].

Conclusions

Identifying, shaping, refining, implementing and monitoring business ideas, even online, is a complex yet increasingly undertaken by entrepreneurs. In collapsing modern societies, collaboration is possible, allowing freedom to mitigate impacts and regenerate the natural world. Moving beyond reactionary or panic-driven responses of elites, an equilibrium agenda for politics and practical action can be achieved. Anticipating potential “black swan” events and pursuing transformative opportunities (“holy grail”) daily, through authentic innovation, helps avoid permacrisis signs and build a sustainable entrepreneurial foundation. Once the “*eureka*” moment occurs, entrepreneurs should test their business ideas using proper marketing research tools. A good business idea is the most important thing, if not the only thing, that an individual with entrepreneurial spirit requires to become rich. Many entrepreneurs lack operational ingredients (e.g., financial resources, management skills, logistics), but creativity, passion, motivation and a clear strategic vision often compensate.

Success frequently emerges from relatively simple ideas rather than genius concepts, as shown in online business examples.

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