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Some Challenging Transdisciplinary Aspects of the Sustainable Waste Management in the Permacrisis Context

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Abstract

The purpose of the paper is to identify a new and complete perspective on knowledge integration in permacrises. This model is based on another scale, in a synergistic-generative transdisciplinary manner, in order to transfer and implement knowledge in the knowledge based society/economy context, in order to realize an adequate model to overcome the global and local damages generated by the permacrises with its five disturbance transitional spaces: geopolitical; energetic and waste management; climate and water; demography, food security and health endemism; and finally the big challenge of the development and impact of IT, automatic and technological transition. The waste is a very challenging problem in the context of the rise of population, the diversification of industries, the complexity of transportations, energetic problems, and the lack of the specific culture for all is connected to this troubling issues. The climate crisis, pollution, desertification and biodiversity loss, the health and pandemics, the new global and local conflicts, and the ungoverned development of new technologies are parts of the manifestation of the permacrises as a global collapse, necessitating specific creative innovative specific solutions.

Keywords: Waste Management; Permacrises; Five Disturbance Spaces of Knowledge; Creative Innovative Solutions; Waste Sustainable Development, Transdisciplinary Cybernetic Approach; Energetic Challenges; Waste Management

Abbreviations

SDGs: Sustainable Development Goals; DRM: Disaster Risk Management; AK: Advanced Knowledge Apobetic; SD: Sustainable Development.

Introduction

It is necessary to combine original concepts about sustainability through ENSEC, ecological-social-economic model [1] in the context of the permacrisis [2-4], considering that *"the identification, stimulation and evaluation of the creativity"* as the most important scope by the seven pillars model of the knowledge, where, when, who, with whom, why, what and how, in a cybernetic semiophysical synergistic-generative manner, in order to transform a monodisciplinary space in a transdisciplinary one, as breadth through depth approach of knowledge [5]. It is important to be creative for innovation exploring, and possibly transforming any *"conceptual space"* into a living *"practical transdisciplinary knowledge space"* [6], to connect transdisciplinarity, globalization as glocalisation, and sustainable development in a very interesting way, the apo-kataphatic approach, as a method to identify what is (*"yes"*), what isn't (*"no"*) and how does work the sustainability through ecological-social-economic systems in permacrisis context, in a transdisciplinary way, through included middle, (*"go-so"*) [6-8].

The United Nations Agenda 2030 for Sustainable Development (SD) [9], underlines the importance of transforming societies through sustainable, resilient, and inclusive paths, encompassed by the seventeen interlinked and universal sustainable development goals (SDGs) [10], adding the necessity of reshaping the permacrisis conditions, with resilience and adaptive (flexible) capacities working in the disaster collapsing situations, climate, geopolitical, economical, energetic, social-medical and even technological-related hazards, to build the resilience of those in vulnerable situations and to reduce their exposure and vulnerability to contextual-related to extreme events with economic, social-medical, environmental shocks and other disasters [11,12]. Therefore, designing and implementing effective disaster, risk prevention, reduction, and adaptation interventions requires attention to differentiated vulnerabilities and inequalities and social changes [11,13]. This transdisciplinary review of research about international cooperation on social and environmental change builds the case for replacing Sustainable Development as the dominant framework for an era of increasing crises and disasters, with a new transdisciplinary approach connected to permacrises context [12], otherwise being detected a failure to progress towards the Sustainable Development Goals (SDGs). Alternative frameworks for organizing action on social and environmental issues are briefly reviewed, arguing that a future framework must relate to a new eco-social contract between citizen and state and engage existing capabilities that are relevant to an increasingly disrupted world. The case is made for an upgraded form of Disaster Risk Management (DRM) as an overarching framework [3]. EU and entire world need climate-neutral energy and more autonomy in this respect, and, according to long-term strategy, with an economy of net-zero greenhouse gas emissions. The projects and international partnerships could be a good example of green and energy independence, but in the collapsing permacrises context [2,11]. So, it is of great importance to know the way in which the concept of sustainability could be available throughout the biggest crisis context associated with a globally extended period of instability and [2,14]. Although there are a lot of local and international mechanisms for providing sustainable development and solving ecological issues, there are still a lot of challenges to the sustainability goals since the Rio Earth Summit in 1992 [15]. These new challenges are creating permacrisis, with five non-resilient transitions presented above, associated as well with crisis types that resilience is limited in tackling them [11].

A New Transdisciplinary Approach of the Waste Management

Outsourcing, globalization and innovation have been some of the main trends persisting in the supply chains for a significant amount of time. There are included but not limited to the interdependence on the cross-national borders, in a very transdisciplinary context, with constantly changing requirements, uncertainty and paperwork, lack of transparency and unified systems for monitoring and tracking the real-life data and the appropriate data management techniques [10]. The concept of multiple crises reconfigures, in a transdisciplinary manner, the three aspects of sustainable development: resilience, viability, and disaster/crisis, with afferent vulnerabilities [1]. Although a lot of efforts were performed trying to take more proactive approaches, in the supply chain crisis management, to provide insights about the current and possible future developments of supply chain management and resilience [14,16]. In this way we have to reconsider resilience (Rsl), viability (Vbl), vulnerability (Vlb) in possible disaster conditions to create the dynamic necessary conditions for a subsistence (Sbs) level to live, reshaping every step to overcome the state of living on every subsystem, ecological, social and economic, of the ENSEC system in unstable possible, but non-desirable situation. It is necessary to switch from a linear approach of the sustainable development into a non-linear one with a circular economy [17,18], a social-medical wellness, a new energetic perspective, to reconfigure the framework of the knowledge process in a multiple parameter model.

Considering the permacrisis context [2,3,14] it is necessary to introduce another scale of research, the nonlinear approach in the analysis of the sustainable development in order to establish a real level of what is advanced knowledge of the society/economy, with the DIMLAK hetero-hierarchic paradigm [19] to achieve, implement and sharing an integrative knowledge as KIM (knowledge integrative management) [20], connecting the permacrisis with its five disturbance transitional spaces [3,18]: the reconfiguration of the geopolitical transition [8,21]; a reconsideration of the energetic challenges [2,22]; a revaluation of the climate and water disturbances [23]; an objective analysis of the demographic reality, the waste management, food security and health endemic problems [24-26]; and a big challenge of the development and impact on IT, automatic and technological transition [27-30]. These five unstable knowledge permacrisis spaces has to be evaluated in the context of the last years with these five disturbance transitions being necessary individual and viable global and local solutions, as well. The dilemma of economic progress and environmental preservation in these conditions is still not solved both in terms of the conceptualization of the waste sustainability and practically, by the creation of viable economies in a desirable permanent equilibrium [31,32]. By understanding the dynamics of sustainability, it is possible to identify the types of strategies and ongoing development that could be implemented through technology [33,34], science [1,17,18], education [18,35], legal reglementations [36-38],

and entrepreneurship aspects [31,39,40]. Transdisciplinary approach could help to understand complexity and provide new level of understanding to give us the best contextual solutions for the human needs of society. Reconciling the strategic management imperatives for sales with the requirements of the knowledge based society/economy can be achieved only with the participation of certain dynamic factors, bound, by the synergistic interaction between them, into a particular model of *"commercial animation"*, uplifted on advanced knowledge, as a global solution, especially for waste management, as a hybrid sales strategic model, based on advanced knowledge, and provides insight into the antecedents and consequences of this model, even on the waste management, in the circular economy with (2+2)R's (recycle, reuse, recombine, reconvert) paradigm [5,41,42]. Theoretical and practical sustainable development is said to call for a sustainability management viewpoint that emphasizes safeguarding both man-made and natural assets, as well. The management of sustainability comprises all of the actions and steps that must be taken to realize the goals proposed for sector of the development in the permacrises context [2]. The last but not the least, sustainability for waste management is essential for improving environmental and corporate governance mechanisms that work to ensure that all people, both now and in the future, have access to all aspects of the reality, in a clean, safe and secure way. The study also highlights the importance of developing a sustainability waste management strategy to guide human actions across the political, economic, social, technological, and legal domains toward a long-term for development [1,22]. Sustainability, established in the permacrisis context can be a concept that integrates nature and harmony, a transdisciplinary landscape that wants to be animated by people in celebration, aiming for territories to be self-sufficient and to cooperate with each other by involving citizens in decision making [41]. The proposed transdisciplinary model is working with specific cybernetic synergistic synthesis methodologies, and methods in a very specific framework, with its basic pillars of knowledge in an original framework, as is proposed, *learning to learn to know by doing* and *learning to understand to be by living together with others* [5,7], as *breadth through depth approach*, opening a new vision in the advanced knowledge achieving process [5]. In this context, universities must take on a new role: greater accountability to students, who must be listened to to engender a cultural change centred around greater responsibility toward others [7,17,18]. Thus, there is a combination of sustainable education and trust in young people, involved to build the future society/economy with a resilient circular economy [6,17,18]. The natural home of the synergistic integration of advanced knowledge through education, research and industry, with its flexibility and adequateness in the knowledge economic space is working in the transdisciplinary *"global village"* perspective instead of the *"ivory tower"* one in a continuous possible reconfiguration in a combination of a high-required degree with breadth profile competence in the integrated fields of different disciplines, with the necessity to have a depth profile of the knowledge in research on own cognitive field. In order to achieve the advanced knowledge (AK) was introduced the semiophysical hetero-hierarchic DIMLAK model with five levels (D, data-statistic; I, information-syntactic; M, message model-semantic; L, all life learning-pragmatic; AK-advanced knowledge-apobetic) to attend the expertise with wisdom as top-down level of knowledge process complementary working with skills as bottom-up level [19].

Energetic Challenges for the Waste Management

Energetic aspects of the transdisciplinary sustainable development and new perspectives of the energetic policies start from the necessity of a green, global energetic system without any disturbance of the natural ENSEC pattern [1], considering the two natural resources, solar and gravitational [22]. In today's dynamic world, the energy sector stands at a pivotal crossroads; as global demands grow and environmental concerns intensify, the search for sustainable energy solutions has never been more urgent [43-45]. The green deal is not an easy problem because a lot of divergence between the social-economic-political responsible factors especially on climate and water disturbance, connected with energetic aspects. It is important to reconsider some of the aspects of the waste sustainability in the context of the permacrisis, as are presented by Bendell [3], identifying two very important *"dangerous dogmas"* dominating climate debate and policy**:** *the "climate-scam" dogma,* **as a** belief that climate change is natural or exaggerated, often promoted by fossil fuel interests, dismissing the need for urgent action and legitimizing continued extraction and burning; the second dogma is ***the*** *"carbon-centrism" dogma,* **with th**e conviction that current climate change is solely or primarily driven by CO_2 emissions. This view dominates mainstream climatology and policy, supported by the low-carbon energy industry, leading to narrow solutions focused on emissions reduction, sometimes at the expense of ecosystems [3]. These dogmas are aligned with two competing industry sectors, fossil fuels on one side, lower-carbon energy markets on the other one, both generating massive flows of capital, research funding, and media narratives that shape what is considered a legitimate science. Was created a no desirable tribalism, suppressing alternative perspectives, marginalizing ecological understandings of climate [46].

The second aspect discussed is about the nuclear reactors as a big dilemma because they could produce a massive clean quantity of energy, but with significant problems

associated with nuclear power plant, being very expensive whilst also time-consuming to build, to maintain at high security, and with a very dangerous possible threats [17,18]. The biggest threat posed by nuclear energy is radiation polluting the environment in the instance of a leak, or an explosion in the reactor, even the wastes. This may happen because of a number of reasons such as damage during war, loss of control at the power plant, overheating, lack of the reactor coolant, or a natural disaster. Such examples are the two recent catastrophes, in Chernobyl (1986), Fukushima (2011), and the very closed at Zaporozhie in Ukraine, the largest nuclear power plant in Europe, as part of the military action in this region in the context of the Russian Ukrainian war [17,18,47,48]. In the context of permacrisis, with energy representing one of the five challenging transitions, the analysis of this paper is focused on the energetic options and solutions in the large global crisis [3,22]. The biggest energy security question is now, how could be used alternative sources of energy with the goal of decarbonization (which is one of the EU goals) to assure reliable, economically feasible, and geopolitical safer energy, because gas is no longer a reliable long-term option because of permacrises. We consider that the only nuclear energetic solution has to be the fusion, not fission one.

Another energetic challenge is represented by hydrogen technologies considered as the cutting-edge clean, energetic solutions all over the world [49]. One of the most important aspects analyzed in this sequence is the hydrogen energy resource instead of methane, with a very important industry adjacent to the production of hydrogen, even by the water electrolysis solution to produce hydrogen completed with photo-catalitic and electro-catalitic technologies [2]. There are three major challenges for using hydrogen: production, storage, and end-use, all of these being parts of a bigger system and processes that are highly intensive in terms of material consumption, which contributes to the pollution of the environment. The benefits of utilizing hydrogen as an energy source in transportation, household and industrial environments would come mainly from: a potentially unlimited supply due to its highest mass abundance on Earth compared to other chemical elements; a significant energy storage capacity, nearly three times higher per volume unit than those of other classic sources such as methane; and, the control of carbon-related emission and pollution, as zero carbon emissivity. As a positive practical aspect green hydrogen is expected to be produced massively soon from carbon-neutral and environmentally benign processes [2,11].

In the same *"Pandora's energetic box"* with the hydrogen energy as a resource instead of methane was discovered a high-capacity, reversible hydrogen storage battery using hydrogen conducting solid electrolytes [50-53].

Conclusions and Further Research

Identifying, shaping, refining, implementing and monitoring business idea, even online, is a complex yet challenging experience that an increasing number of entrepreneurs are willing to try. In the context of the collapse **of modern societies we can be breaking together, not apart, with essential freedom to soften the fall and regenerate the natural world. It is possible to advance an equilibrium agenda for both politics and practical action in the broken collapsing world.** In this context it is important to guess the *"black swan", "holy grail"* in a daily *"Pandora's box"* in an authentic innovative approach to avoid the signs of permacrisis at every step, achieving a successful entrepreneurial base data in order to obtain the password to the *"virtual treasure",* even thinking *"outside-the-box"* much more useful than a brilliant business idea. *"A good business idea is the most important thing, if not the only thing that an individual with entrepreneurial spirit requires to become rich".* Success doesn't necessarily come from genius ideas, but from rather simple thoughts.

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