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Short Communication

The Evolutionary Horizons of Social Systems

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Abstract

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This brief article addresses the concern arising from the accelerated whirlwind of changes of all kinds experienced by our social systems, some of which have a significant evolutionary impact, largely driven by advances in science and technology. Particular interest has emerged in connecting certain properties inherent to the behavior of complex systems far from equilibrium—such as social systems—under the framework of properties currently studied in Complexity Sciences. The article outlines this concern, which is, for now, merely the beginning of what could develop into a groundbreaking investigation. It references laboratory simulation work aimed at understanding the evolutionary horizons of Chile's social system. The text includes an example of some graphs that illustrate a potential method for detecting and anticipating possible evolutionary horizons of the social system, based on the role played by certain "attractor variables" within the system. However, the research is still exploratory, and this article serves merely as a general description of the initial concern.

Introduction

The starting point of our intellectual inquiry is propelled by the theories of "accelerationism" (Srnicek, Williams, Fisher, etc.) juxtaposed against various "models" of social systems (Capitalism, Socialism, Neoliberalism, Conservatism, etc.). Notably, this includes the debate surrounding "Post-Capitalism" (Paul Mason[1]) [1], which seems imminent and, incidentally, revives the moribund state of orthodox socialism, as evidenced by the pragmatic response of openness embodied in the Chinese political-economic model. As Mason aptly points out, capitalism is an open system that interacts with its environment and adapts, changes, and evolves without disappearing upon reaching moments of criticality [2-14].

However, these "accelerationist" theories are not far removed from the concerns raised in philosophy regarding the characterization of Postmodernity (Deleuze, Lyotard, Shafiro, Noys, etc.) and its transcendence into Transmodernity (Kracauer, W. Benjamin, Rodríguez Magda[2]) [15]. Transmodernity is characterized by transience, immediacy, fashion, and opinion as forms of valuation and social behavior—phenomena anticipated, interestingly, by Nietzsche. These describe socio-cultural evolutionary phenomena as attempts to "transcend" the modernity born out of the European Enlightenment of the 18th century, which should also include K. Marx as an heir of the "rationality" pervasive in that Enlightenment. It has often been suggested that both Smith and Marx are children of the same parent: the culture of the Enlightenment, which now appears poised to be subsumed by evolutionary processes.

This context increasingly prioritizes the widespread concern about the evolutionary trajectory of our social systems. The "accelerationism" characterizing these processes, driven by scientific development and its technological outputs (with AI as its emblem), has culminated in an unprecedented capacity for information production in human

[1]*Mason, Paul; "PostCapitalismo, a Guide to Our Future", Paidos Publishing, Chapter. 5, pp 157-200.*

[2]*Magda, Rodríguez, Rosa María; "The Smile of Saturn", Anthopos Publishing, 1989, Barcelona, Spain, Introduction, Chapters. I,II,III. pag. 10-39.*

history[3]. N. Luhmann[4] [14,16] insightfully defined society as communication (information-energy flows), asserting that without communication, society ceases to exist. From his systemic perspective, Luhmann also recognized the inherent evolutionary sense of the social system, a vital characteristic absent from earlier social theories.

Perhaps—unwittingly—the Internet, as a response to these processes was invented, addressing phenomena of increased entropy, disorder, chaos, and criticality. These challenges seem manageable only by generating even more energy, characteristic of systems far from equilibrium whose emergent behavior might obey principles rooted in thermodynamics and entropy. The paradox of complexity lies in the apparent need to address complexity by increasing it[5]. This concern extends to social systems, encompassing the intrinsic self-destructive capacity that has haunted humanity throughout history, manifesting in violence accompanying political crises and intensifying social conflicts, often witnessed in real-time on our portable devices.

Complexity sciences, complex networks, and simulation models

This initial general approach aims to situate what has become an intellectual concern that could evolve into a significant and growing line of research. It relates to the evolutionary processes of social systems, particularly the potential "evolutionary horizons" that can be simulated today to offer general characterizations. This aligns with I. Prigogine's [17] focus on the properties of evolution in complex systems far from equilibrium, such as social systems. It seems unprecedented, demanding an integrative and collaborative effort across sciences that has yet to emerge fully [17,18-27].

Recently, the general simulations of the behavior of a particular social system (Chile), integrated the phenomena of Complexity Sciences as a theoretical foundation. Using Complex Network models, the aim is to identify the general characteristics of the system's potential evolution, particularly the role of the most significant "attractor variables," which may influence the system's dynamics as nodes of attraction, shaping potential evolutionary trajectories toward states such as innovation, prosperity, conflict, crisis, destabilization, stability, or progress.

To this end, "attractor variables" related to the most significant "adaptive pressures" driving the system's evolutionary dynamics were defined. The "new social values," which similarly function as "attractor variables were also incorporated." This extensive list of 160 variables has been subjected to mutual impact analysis, using the theory of complex adaptive systems. This approach abandons linear cause-effect logic, as noted by Prigogine[6], [17]. Prioritizing emergent phenomena arising from the intricate interrelations in systems far from equilibrium.

Various simulations with differing evolutionary horizons were constructed, graphing the system's behavior in complex networks that highlight the most crucial nodes (adaptive pressures) in its potential evolution. The results have been fascinating, opening exciting prospects for analytical contributions from science to understanding such an essential phenomenon as characterizing the evolutionary processes of our social systems, considered complex, adaptive, and unpredictable systems.

As noted at the outset, this is merely a preliminary exploration of the evolutionary behavior of a singular "object"—our society as a complex adaptive system. The intent is to develop a research line that enriches knowledge through an integrative effort spanning sciences, humanities, arts, and religion, all of which are essential to confronting this challenge.

Below are some illustrative graphs of the simulations regarding the evolution of Chile's social system (society). These are presented solely as an example of the type of analysis that could be conducted in future research. They serve no purpose beyond the one stated.

Simulation models

Examples of associated graphs[7]: Example of graphs showing the evolution of the social system, using as an example the system's displacement based on the role played by certain "attractor variables" within the system and their effect on shifting towards conditions of "stability" or "instability" over different time horizons (15–20 years) (Figure 1).

Example of a complex node graph representing the complete network of the social system and its interactions and influences (Figure 2).

Discussion

Simulation models not only allow us to observe how certain attractor variables can shift the system toward different evolutionary stages—whether positive or negative—but also to evaluate the likelihood of such shifts occurring under specific conditions within defined time horizons. The included graphs serve as illustrative examples of this. Furthermore, it is possible to identify the potential impacts and risks associated

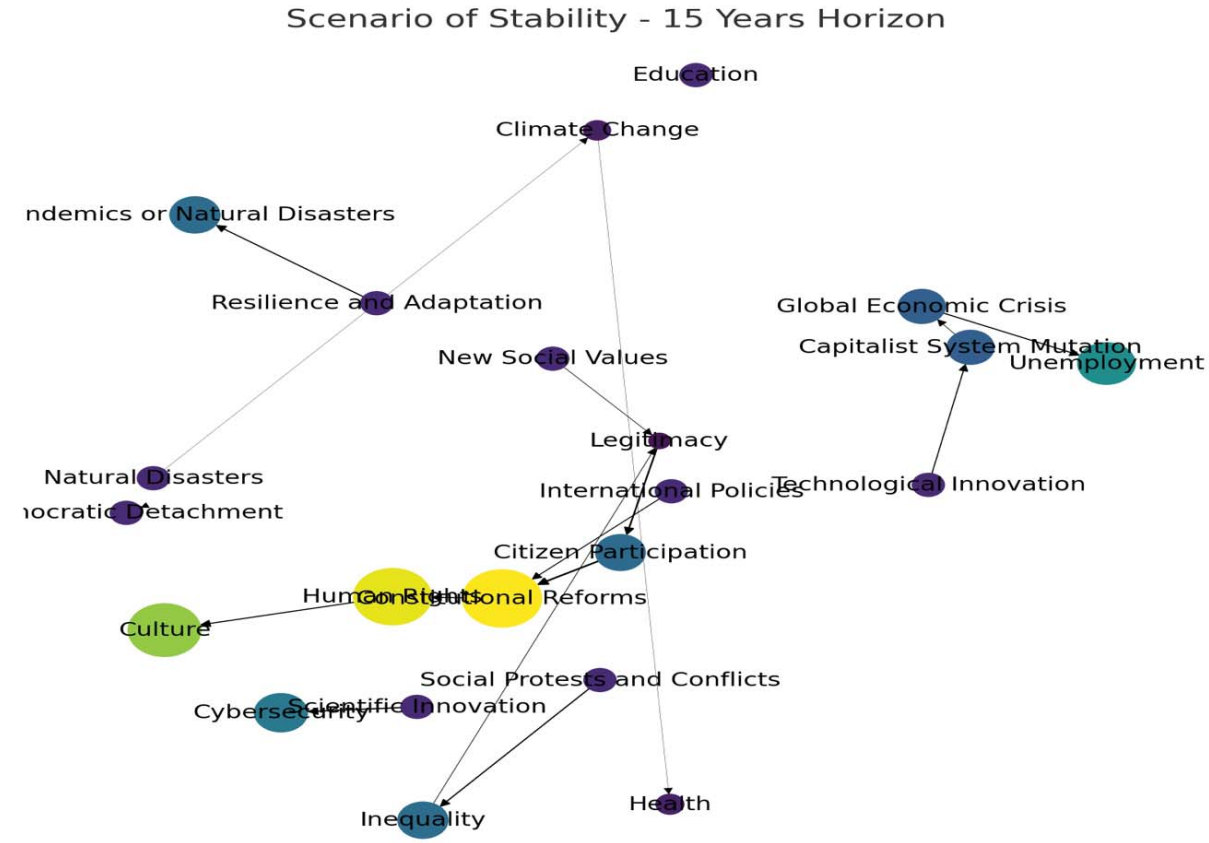
[3]*Aguado Miguel, Scott Bernard, Buchinguer Eva; "Technology and Social Complexity, University of Murcia Publishing, Spain, 2009, see pp. 115–133 (Expanding Burkley's Adaptive as a Sociocybernetic Technology).*

[4]*Navas, Alejandro; The Sociological Theory of Niklas Luhmann, University of Navarra Editions, 1989, pp. 373–391.*

[5]*We refer to the expression used by PhD. Juan Pablo Cárdenas in a short essay titled "Just Around the Corner", where he thoughtfully explores this paradox.*

[6]*Prigogine, Ilia; Stengers, Isabelle; Between Time and Eternity, Alianza Editorial Universidad, 1992, Argentina, pp. 185–214.*

[7]*The graphs included in this document are presented (4) in English and (1) in Spanish. For any inquiries regarding their content or translation, please feel free to contact the author (rgavidal@gmail.com)*


Scenario of Stability - 15 Years Horizon
Education
Climate Change
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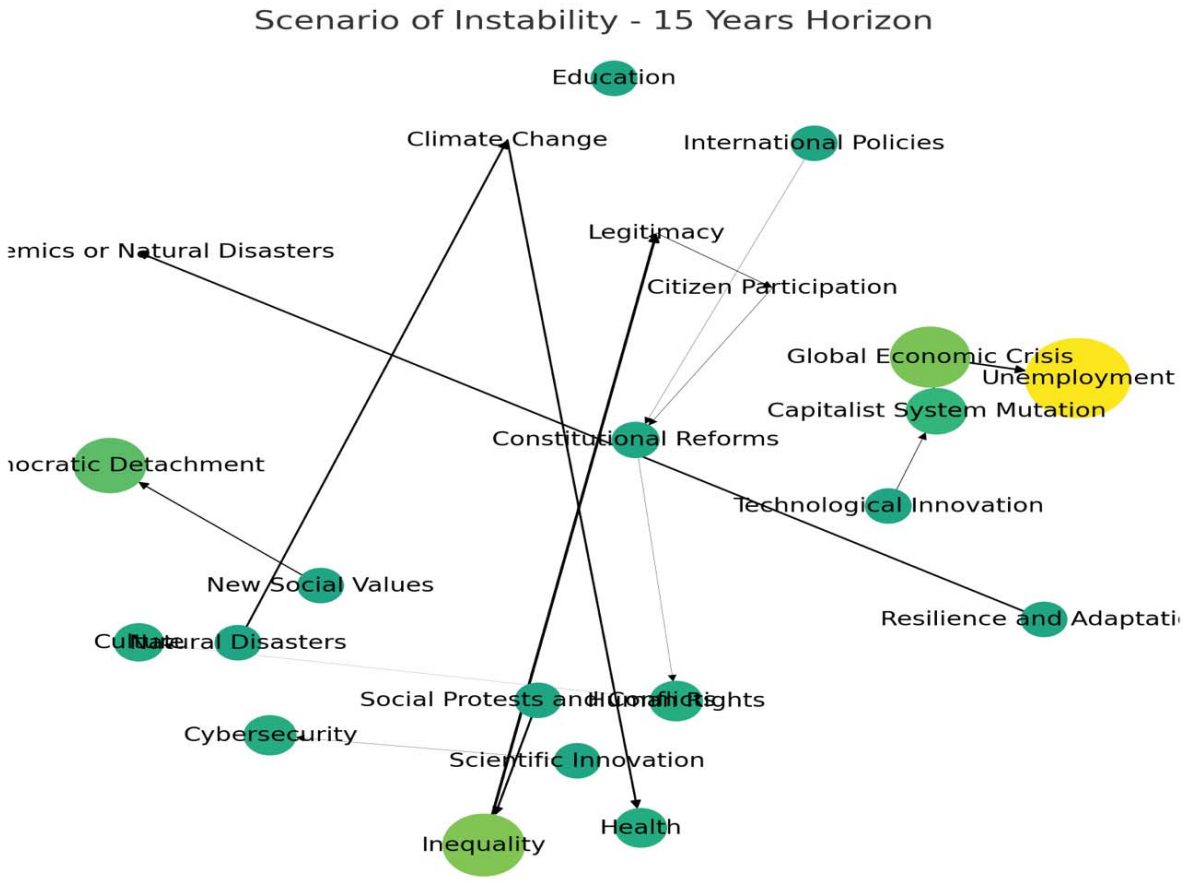
Resilience and Adaptation
Global Economic Crisis
Capitalist System Mutation
Unemployment
New Social Values
Legitimacy
Natural Disasters
ıocratic Detachment
International Policies
Technological Innovation
Citizen Participation
Human Rights
Constitutional Reforms
Culture
Social Protests and Conflicts
Cybersecurity
Scientific Innovation
Inequality
Health


Scenario of Instability - 15 Years Horizon
Education
Climate Change
International Policies
Legitimacy
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Citizen Participation
Global Economic Crisis
Unemployment
Capitalist System Mutation
Constitutional Reforms
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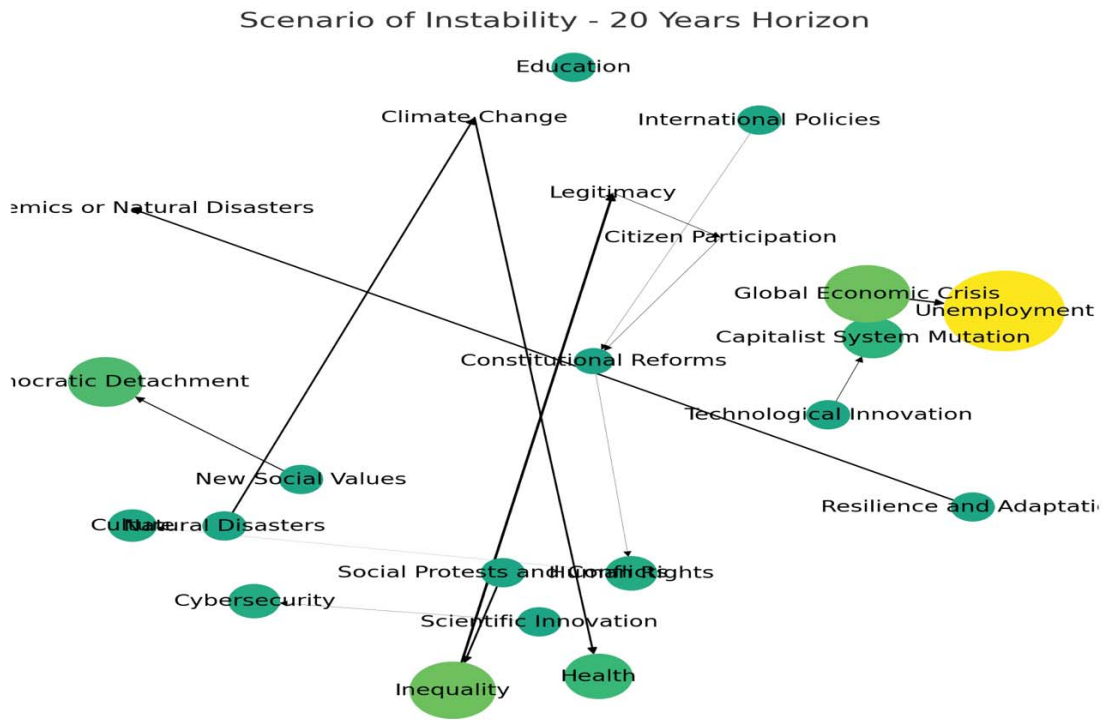

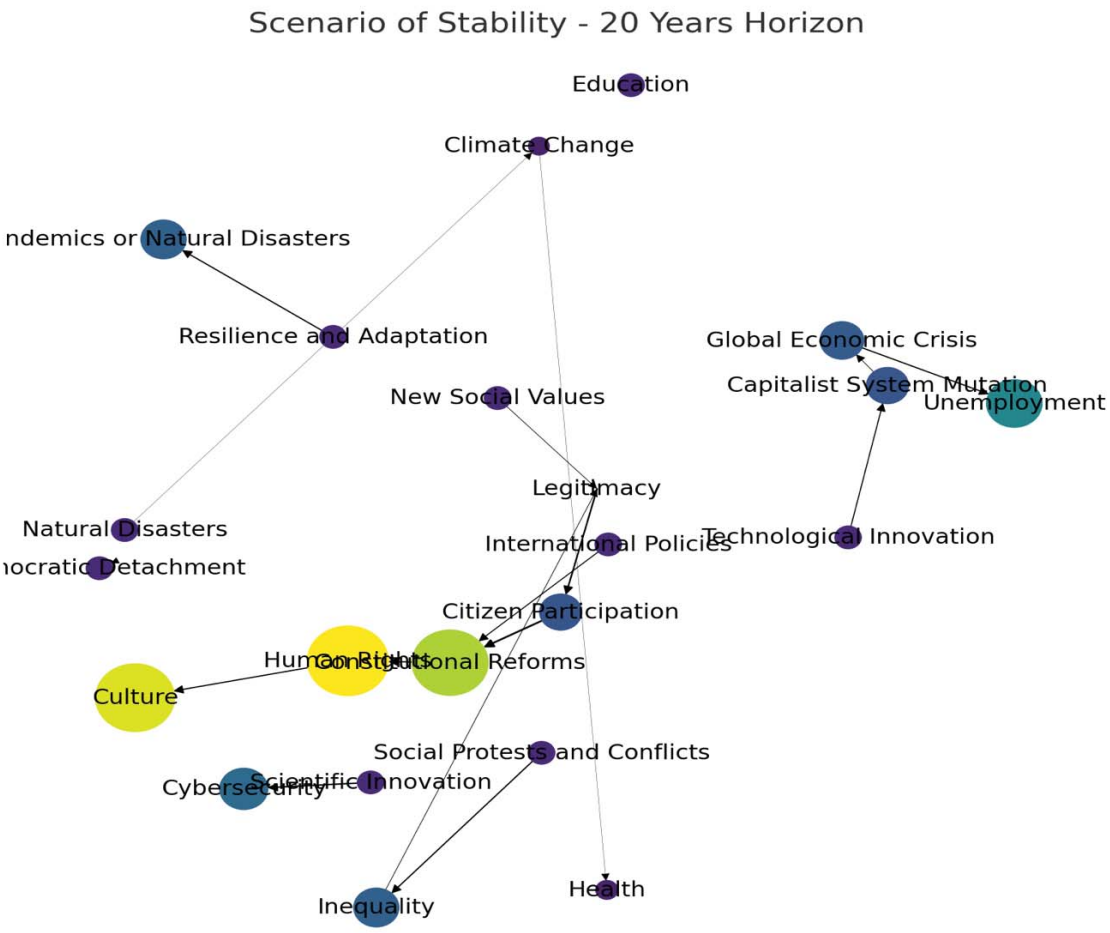

Figure 1: Scenario of stability and instability -15 & 20 years of horizon respectively.

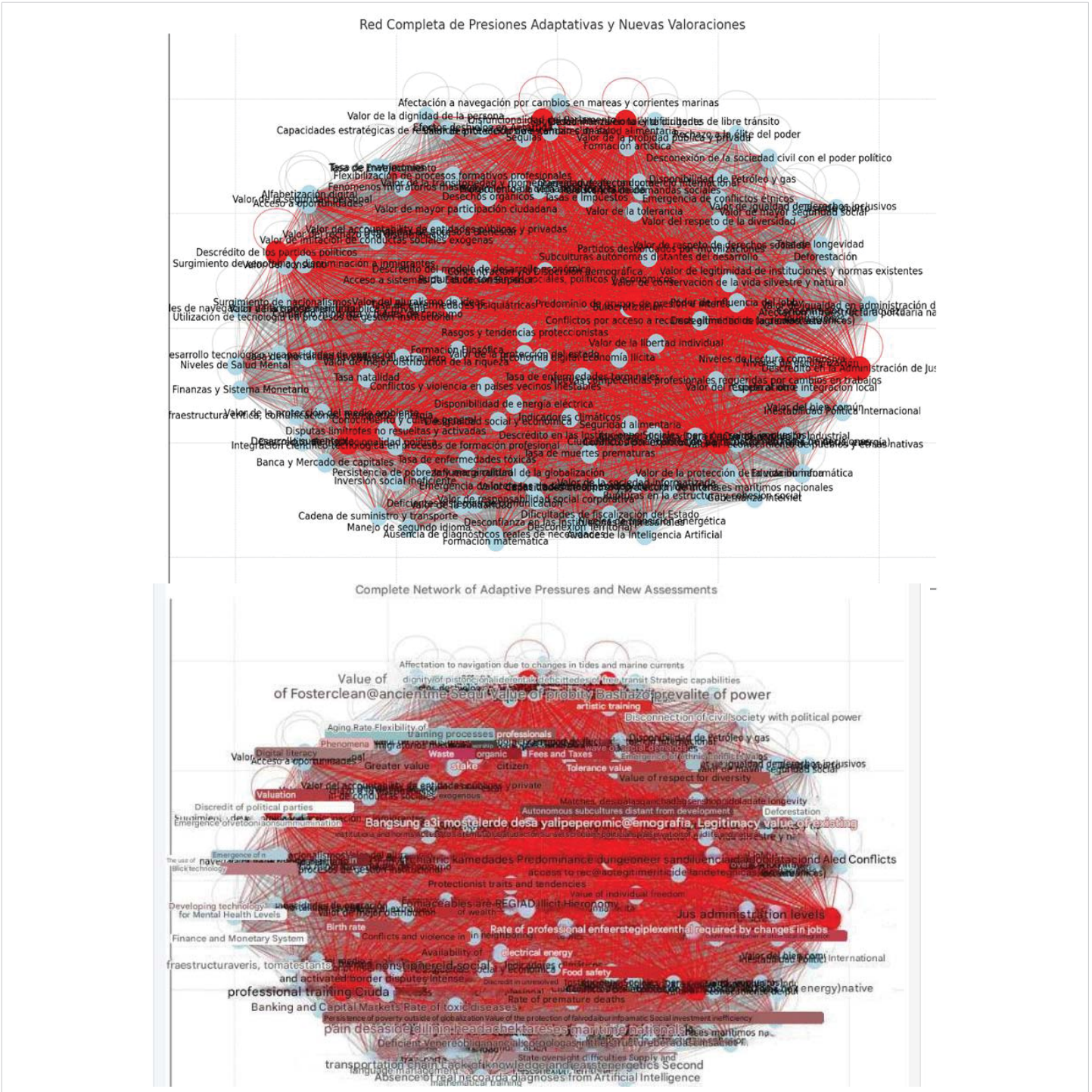

Figure 2: The complete network of adaptive pressure and new assessments.

with these evolutionary possibilities and, in turn, assess the implications (both positive and negative) they may have for social systems.

Of course, many limitations remain, as the behavior of social systems is not solely determined by these properties but also by the decisions individuals make based on numerous sociocultural factors. For this reason, variables related to new social values were also incorporated. It is essential to generate an integration of knowledge derived from the Social Sciences, as this is necessary to better understand the evolutionary behavior of social systems.

The closest examples are some recent analyses presented by the World Economic Forum [28-34] in their Strategic Intelligence reports, although these do not yet appear to fully integrate complexity phenomena within their interaction networks. From an analytical perspective, it was found to be compelling to further explore the potential that simulation models, grounded in these theoretical frameworks, might offer.

Conclusion

If anything stands out, it is necessary to respond with knowledge and science to where we are heading as a "society" (social systems). Perhaps this integrative knowledge approach is indispensable for identifying potential risks and impacts.

AI declaration

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Acknowledgment

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