Article

Resilience in the face of socio-ecological and economic risks: concepts and proposals

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Resilience in the face of socio-ecological and economic risks: concepts and proposals

Abstract

Resilience, as a concept, indicates methods and procedures that can be oriented towards new development routes to mitigate or exceed crises. This article aims to associate this concept with the scenario of socio-ecological and economic risks at different geographical scales, with the purpose of contributing to the formulation of proposals that could lead to a more equitable and sustainable society, which is therefore less susceptible to periods of instability and uncertainty. Thus, this analysis, carried out from an extensive bibliographic review, poses new challenges that prioritise development based on endogenous natural, social, and economic potentialities, taking into account principles such as diversity, flexibility, adaptive capacity, and transformality.

Keywords: Resilience. Global crises. Socio-ecological and economic risks. Endogenous development. Equitable and sustainable society.

La resiliencia ante los riesgos socioecológicos y económicos: conceptos y propuestas

Resumen

La resiliencia, en cuanto concepto, indica métodos y procedimientos que pueden orientarnos hacia nuevas vías de desarrollo que mitiguen o superen las crisis. Este artículo tiene como objetivo asociar este concepto al escenario de riesgos socioecológicos y económicos en diferentes escalas geográficas, con el propósito de contribuir a la formulación de propuestas que nos induzcan hacia una sociedad más equitativa y sostenible, y por lo tanto menos susceptible a períodos de inestabilidad e incertidumbres. Para ello, este análisis, realizado a partir de una amplia revisión bibliográfica, plantea nuevos retos que prioricen el desarrollo a partir de las potencialidades naturales, sociales y económicas endógenas, teniendo en cuenta principios cómo diversidad, flexibilidad, capacidad adaptativa y transformalidad.

Palabras clave: Resiliencia. Crisis globales. Riesgos socioecológicos y económicos. Desarrollo endógeno. Sociedad equitativa y sostenible.

A resiliência frente aos riscos socioecológicos e econômicos: conceitos e propostas

Resumo

A resiliência, como conceito, indica métodos e procedimentos que podem nos orientar na definição de novas vias de desenvolvimento que atenuem ou superem as crises. O objetivo deste artigo é associar esse conceito ao cenário de riscos socioecológicos e econômicos em diferentes escalas, a fim de formular propostas que conduzam a uma sociedade mais equitativa e sustentável e, portanto, menos suscetível a períodos de instabilidade e incertezas. Para tanto, esta análise, realizada a partir de uma ampla revisão bibliográfica, se propõe a apresentar novas vias, cujos atributos priorizem um desenvolvimento com base nas potencialidades naturais, sociais e econômicas endógenas, levando em conta princípios como diversidade, flexibilidade, capacidade adaptativa e transformalidade.

Palavras-chave: Resiliência. Crises globais. Riscos socioecológicos e econômicos. Desenvolvimento endógeno. Sociedade equitativa e sustentável.

Introduction

Globalisation, as an economic, technological, political, social, and cultural process, has created a vast scenario of changing possibilities, aimed at increasing the profitability of capital. This includes the instantaneous fluidity of communication and information, without which, as Milton Santos (2012, p. 199) points out, there would not be a universally integrated technical system, transnational production and financial systems, or the current advance of information and globalisation.

In this new conjuncture, innovations and information processing, driven by the great mobility of capital, acquire important weight in the world economy (Harvey, 2011; Castells, 1997) and the production of space (Lefebvre, 2013). [1974]). The mergers carried out through various economic sectors have not only unified production, marketing, and financial interests in diversified business conglomerates (Harvey, 2005, p. 37), but have also fostered a high degree of connectivity and dependency between territories and their economic activities.

For this new paradigm of accumulation and expanded reproduction of capital to have great mobility and at the same time robustness and stability, the constant demands of large companies have prompted the creation of new algorithms and other instruments that, disseminated in networks, expand their multi-scale capabilities of operation. Support that, in addition to the structures, leads to an intricate network of flows and networks (material and immaterial) acting at multiple scales, without establishing a precise territorial division to distinguish and delimitate them. New dynamics are instituted to ensure territorial contiguity (the old social and economic relations are replaced or homogenised), unleashing a new spatiotemporal sequence in which new elements, more or less interdependent and in some cases contradictory, appear each time more associated and form part of an inseparable continuous movement.

In this complex dialectical process, the search for its relative equilibrium has favoured the expanded reproduction of capital in time and space, to the detriment of the individual worker and the environment.

This context has generated increasingly global instabilities and financial, economic, and health crises, due to the great dependence on the links that feed it, and whose purpose, according to David Harvey (2011, p. 18), has been to rationalise the irrationalities of capitalism.

The last two global crises [Subprime Mortgages (2007–2008) and the Covid-19 pandemic (2020–2021)] and their waves of expansion have accelerated the destruction of the socioeconomic and financial tissue of many countries, and required major efforts by States to recover the most affected sectors, be they financial institutions, economic companies, or workers.

The need to pay attention to environmental crises has also been highlighted, which in the long term could have very dangerous consequences for human survival, due to its irreversible and definitive nature.

Contributing to this debate, whose decisions can reduce or maintain our ability to survive as living beings, the purpose of this manuscript is to analyse concepts that imply the definition of *resilience* connecting them to the current context, aiming to formulate proposals for a more equitable and socially and environmentally sustainable society, from a systemic approach, and therefore less susceptible to instability and uncertainty. These proposals defend processes that connect public policies for greater citizen participation from the perspective of collective actions that contemplate progressive investment in well-being, social protection, and human capital, as well as promote central actions, including economic diversification, innovation, endogenous economy, and environmental sustainability, which are elements that enhance our multidimensional vitality in the face of crises.

To do this, we structure the text into three sections, in addition to this introduction and a conclusion. Initially, we proposed, using recent data, to contemplate the main global risks to which we are subject. Next, we examine, based on an extensive bibliographical review, the main contributions to the notion of *resilience* in the environmental and socioeconomic fields, through fundamental principles such as stability, adaptability, flexibility, and discontinuities.

Finally, we elaborate an analysis that articulates the academic contributions to this situation (the socioeconomic crises, mainly of social, health, and labour well-being, as well as the deterioration of our planetary ecosystem) to devise proposals that explore ways to reduce or overcome current crises, and prevent future ones.

The Anthropocene and global risk society

For decades, numerous studies have warned about how human action is destroying the planet, with the loss of its biodiversity and the depletion of its natural resources. They have also warned about how global warming, caused by the excessive increase in entropy, can have important consequences for the Earth's natural system, such as climate change, the thawing of the poles, and the rise in sea level (Zaar, 2021). What remains to be verified is how the increase in our ecological footprint that "undermines our natural capital and leads us to live at the expense of the future" (Sempere; Tello, 2007, p. 16), and whose solution requires a quantifiable objective, which will influence on the planetary sphere and our way of life.

These and other problems, despite not being considered a priority by many governments, are among the concerns of many scientists and other citizens. The Global Risk Reports released by the World Economic Forum in January of each year reveal this. Between 2011 and 2022, environmental issues have been identified as one of the five greatest global risks, together with corruption and fiscal crises (2011), social problems (2012, 2013, 2014, 2015, and 2016), international conflicts, large-scale involuntary migrations, and state crises (2014, 2015, and 2016). Since 2017, the increasingly frequent extreme weather activity (as well as natural disasters), the loss of biodiversity, and the failure to mitigate climate change have been of particular concern. In addition, human damage to the environment and viral diseases appeared as important global risks in 2021.

The risks with the greatest global impact are the financial and fiscal crises (2012, 2013, and 2014), water scarcity and the failure of climate action (2015 and 2016), weapons of mass destruction and extreme weather (2017, 2018, and 2019). In January 2020, the environmental issue appeared in three out of four risk factors with a strong impact: extreme weather, loss of biodiversity, water scarcity, and weapons of mass destruction. In 2021, due to the Covid-19 pandemic, the risk of contagious diseases appeared first, followed by the crisis of natural resources, and anthropogenic environmental damage. In 2022, the situation was very similar with the order: failure of climate action, extreme weather, loss of biodiversity, erosion of social cohesion, livelihood crisis, infectious diseases, anthropogenic environmental damage, and crisis of natural resources.

Parallel to this survey, the Global Risks Report 2020 (World Economic Forum, 2020), alluding to the WHO, which considers climate change to be "the greatest threat to global health in the 21st century," warned of how its effects are impacting health, as a consequence of the increase in food insecurity caused by high temperatures, the lack of rain, and the spread of mosquitoes that transmit diseases such as dengue fever, as well as the deterioration of the quality of air, water, and the food we eat.

The degradation of our vital support, due to the loss of biodiversity, has also been under discussion. The 2020 Living Planet Index revealed that between 1970 and 2016, vertebrate animal populations reduced 68%, mainly due to habitat degradation (WWF, 2020).

According to Robinson (2021), there have been five mass extinction events on Earth during the last 450 million years, caused by volcanic eruptions, ocean oxygen depletion, or collision with an asteroid. In each of these cases, it took millions of years to recover the number of species comparable to previous periods. Studies estimate that we are experiencing the sixth mass extinction of wildlife, in which the rates of species disappearance are hundreds of thousands of times faster than the *normal* rates that occurred in the last tens of millions of years.

The Global Risks Report 2021 (World Economic Forum, 2021, p. 16/23), in its analysis of the effects of Covid-19, stated that, "Despite these challenges, there is also space for building resilience…governments, businesses and societies can begin to take steps for better preparedness in the face of perpetual global risk" and that there is "no vaccine for environmental degradation. Without societal cohesion and stable international platforms, future transboundary crises will have greater impacts"

The World Economic Forum (2020) connects high rates of biodiversity with the improvement of human health, the economy, and well-being. Although the exact origin of the Sars-CoV-2 virus is not exactly known, we know that as human activities destroy forests, ecosystems shrink and wild animals migrate to areas closer to towns and cities, creating ideal conditions for the rapid spread of pathogens and zoonotic diseases; a process in which human behaviour associated with great mobility has decisively contributed.

Resilience as a theoretical concept

Geography and other sciences have long reflected on the relationships between social and ecological systems. Despite this, the expression "resilience", whose Latin root (*resiliēns*) refers to the ability of an entity or system to recover its shape after a disturbance or interruption of some kind, indicating the idea of returning to its initial state, only began to be used and disseminated in the scientific field in the second half of the 20th Century.

This term appeared for the first time in 1973, when the Canadian ecologist Crawford Staley Holling set out to study the non-linear dynamics of ecosystems and their possibilities of persistence, deducing that (a) the numerical instability of a species can contribute to a greater resilience of an ecosystem, since it favours a greater diversity of elements that, as a whole, could provide it with a greater equilibrium and consequently a higher ability to recover, (b) ecosystems in unstable environments, with greater fluctuation capacity and greater flexibility, could increase resilience (Holling, 1973, p. 18-19).

In 1975, Andrew Vayda and Bonnie McCay, based on studies published by Holling (1973) suggested that resilience may be a more useful concept to understand human adaptation than stability and resistance, stated that, "ecological systems that have survived are 'those that have evolved tactics to keep the domain of stability, or resilience, broad enough to absorb the consequences of change'". Thus, the consequence for social systems is that resilience means "remaining flexible enough to change in response to whatever hazards or perturbations come along". (Davidson-Hunt; Berkes, 2000).

From these and other studies, which associate the flexibility and stability or instability of systems with resilience, many other contributions appeared, which in the last two decades of the 20th century focused on the conditions and particularities that lead to a state of strength and overcoming. These include the adaptive capacity, which is considered the property that measures the transition between multiple stable situations (or domains of stability). Lance Gunderson (2000) believes that, it is essential to study the resilience of a system through the amount of disturbance it can withstand without changing its stability domains.

According to the author, this condition is generated in movements of destruction and renewal of its elements, ranging from microsystems to larger and more complex scalar structures, in which the *memory* of all elements involved plays a fundamental role, enabling the connection of the present with the past and the environment. Therefore, it is a permanent evolution, in which self-organised structures overcome periods of destruction and renewal.

Towards a socio-ecological resilience

Since the beginning of the 21st century, with the objective of overcoming the existing fragmentations between the epistemological, ontological, and analytical spheres, and confronting transformations in natural and socioeconomic systems, the definitions associated with resilience have evolved considerably, going beyond the restrictive division between nature and society and encouraging a more integrative style of research. This new situation has fostered more sensitive analysis of the interrelationship of structural attributes, enabling studies on resilience to transcend the areas in which they were initially used, such as ecology or studies of natural disasters, assuming a new challenge, that of interdisciplinarity. All this takes into account that social, political, economic, and ecological processes do not occur in isolation, but rather interact dynamically over time and at various territorial scales, increasing their complexity.

This new context was analysed early on by Ian Scoones (1999, p. 489/493), in his article "New ecology and the social science: What prospects for a frutiful engagement?", in which he highlights the emergence of a greater commitment between the new Ecology and Social Sciences, based on three key aspects: (a) concern with spatial and temporal dynamics, using historical analysis as a way of explaining environmental change through time and space, (b) growing understanding of the environment as the product of and the setting for human interactions, linking dynamic structural analyses of environmental processes to human action, (c) appreciation of complexity and uncertainty in social-ecological systems and the recognition of that prediction, management, and control are unlikely.

Thus, according to Javier Escalera Reyes and Esteban Ruiz Ballesteros (2011, p. 115/111-112), resilience has become "an attitude rather than a state, a process form rather than content, a way of modulating-modelling the dynamics inherent to a socio-ecosystem, only understandable from the corresponding human role" based on notions that "are embodied in conceptualisations such as non-linear systems, chaotic dynamics, sensitivity to initial conditions, unpredictability or stochastic systems."

As a consequence of these and other contributions, socio-ecological resilience has become associated with governance structures along with sociocultural, technological, and economic aspects, in addition to natural ones, obviously under dynamic and interdependent processes.

In this new conceptual framework, Carl Folke et al. (2010), argue that the idea of resilience addresses the dynamics and development of complex social–ecological systems from three aspects: stability, adaptability, and transformability. They conclude that (a) resilience is the tendency of changes in a socio-ecological system, always within a domain of stability and adaptability; (b) adaptability is part of the resilience and adjustment capacity of a complex socio-ecological system to internal changes and external drivers; and (c) transformability is the ability to create new domains of stability for development of a new landscape of crossed thresholds on a new development trajectory.

Furthermore, for Folke et al. (2010), the transformations are based on resilience in multiple scales, using crises as windows of opportunity and recombining sources of experience and knowledge so that socio-ecological transitions navigate from one stability landscape to another, which implies breaking the resilience of the old and building the resilience of the new, through the recombination of processes.

In turn, Simin Davoudi et al. (2012) develop the concept of evolutionary resilience, as a rejection of the concept of equilibrium, and emphasise the uncertainties and discontinuities that, associated with the dynamic interaction of processes such as persistence, adaptability and transformability, provide an effective field to assimilate the complexity of socio-ecological interdependencies.

Hence, resilience began to focus attention on the evolutionary movements that together drive change through different spatial and temporal scales. Furthermore, stability, adaptability, flexibility, and discontinuities constitute the fundamental principles that govern a resilient society, in which its territories and its inhabitants play a key role in the generation of alternative forms of development from the ideas of cohesion and equity.

Urban and regional resilience

Urban resilience can be defined as "a capacity of urban populations and systems to endure a wide array of hazards and stresses" (Romero-Lankao; Gnatz, 2013, p. 358-359) as well as the "ability to absorb, adapt and respond to changes in an urban system" (Desouza; Flanery, 2013, p. 90). These conditions are achieved by increasing the potential of cities to absorb disturbances, while maintaining their structural functions, by the evaluation and understanding of the vulnerable components and the fundamental processes and interactions that develop it.

Likewise, Sara Meerow, Joshua Newell and Melissa Stults (2016, p. 39), affirm that "urban resilience refers to the abilities of an urban system – and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales, – to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity".

Regarding the environmental risks that cities may suffer, the contributions of Yosef Jabareen (2013) are significant. He emphasises that urban resilience is a complex phenomenon that is affected by a multiplicity of economic, social, spatial, and natural factors. Based on the four concepts of vulnerability analysis matrix, urban governance, prevention, and uncertainty-oriented planning, he defends an urban governance with an integrative approach in which dangers can be anticipated by resisting, absorbing, and recovering, while preserving and restoring essential basic urban structures and functions. According to this author, this process that implies innovation, conscious change, and transformation plus requires creativity, leadership, and collaborative work between governmental, private, and social actors, whose interactions imply different interests and levels of power that can impose limitations on the creation of cohesive and broad-based actions.

However, it fell to Kathryn Foster (2006, p. 14) to specify regional resilience as "the ability of a region to anticipate, prepare for, respond to, and recover from a disturbance". For the conscious choices that can configure the duration and nature of regional adaptation, the author indicated three resources: foresight and intentionality, communication, and technology, according to their possibilities. She stated that:

> Foresight and intentionality enable a region to make, debate and respond to forecasts and warning signs, thereby reducing the potential for surprise and increasing resilience. Communication permits a region to document and learn from experience, to ask for help from external relations, and to motivate popular action against unwise choices by system leaders. Use of technology and innovation in regional systems such as transportation, economic development and health care enable regions to better control the social and economic environment and establish new competencies for resilience (Foster, 2006, p. 8).

Other contributions to the concept of resilience, applied to studies of regions, come from Rolf Pendall, Kathryn Foster, and Margaret Cowell (2007), who propose four criteria for the systems: (a) equilibrium, (b) systems perspective, (c) path dependence associated with high resilience that includes phases of creativity and flexibility, (c) dependency on decisions, path and interconnection, and (d) performance through time.

In turn, Edward Hill, Howard Wial, and Harold Wolman (2008, p. 5-6) study regional economic resilience based on three associated and complementary basic notions (equilibrium, path dependency, and medium and long-term perspectives of the system), which leads them to consider as potential attributes: (a) the role of product and profit cycles in regional economies in terms of their abilities to renew themselves, developing new goods or services; (b) the unresolved question of whether industrial specialisation or diversification promotes economic growth; and (c) human capital as an important driver of regional development.

In a similar line of reasoning, James Simmie and Ron Martín (2010, p. 41) defend the use of the notion of *evolution* instead of *equilibrium*. They argue that regional economies are continually changing and adapting to new environments; therefore, they are never in equilibrium but rather in continuous evolution. These authors apply adaptive and sequential cycles considering four phases of resilience: (a) innovation and restructuring from endogenous sources; (b) growth and taking advantage of opportunities, stability, and increasing rigidity, followed by a release phase, associated with different degrees of resistance; (c) connectivity; (d) accumulation or release of capital.

Furthermore, in 2010, Susan Christopherson, Jonathan Michie, and Peter Tyler, under the relevant perspective that each factor is different between regions and changes over time, emphasised the capacities that seem to be useful to achieve regional resilience: (a) a strong regional innovation structure, with universities linked to companies, and qualified human resources; (b) a diversified economic base supported by innovation and specialised labour, (c) a modern productive infrastructure (transportation networks, communication, etc.); (d) an effective financial system; (e) collaboration networks between companies and other organisations; and (f) cooperative governments committed to risk assessment and management, and that promote the country's incorporation into international markets.

Finally, we highlight the five proposals of Ricardo Méndez (2012, p. 229) about the unequal capacity to achieve urban resilience: (a) inherited urban structures and trajectory, (b) responses of the actors and mobilisation of local resources; (c) socioeconomic networks, social capital, and governance; (d) external insertion and multi-scale relationships; and (e) local strategies and innovative effort. All this indicates the possibility of integrating these studies into a framework to which relational geography, neo-institutionalism, and evolutionary approaches contribute.

Is it possible to devise a resilient global society?

The globalisation process is the result of a dialectical movement in which an intricate framework of flows and networks are articulated between institutions as well as economic, political, and social agents, anchored in specific geographical structures, from which exponential economic growth is promoted, without considering the limits of the planetary ecosystem. Its implementation has implied, in a dynamic complex between the local and the global, the emergence of a new situation, based on an unprecedented regional interdependence. Consequently, what happens in one place, alters profoundly, and sometimes immediately, all territories that are linked to it.

For this, the deindustrialisation of traditional manufacturing areas was primordial. Its transfer to countries with lax labour and environmental legislation and the intensification of intercontinental freight transport with extensive routes and large CO^2 emissions happened to the detriment of the consumption of local and regional products.

Thus, regions are encouraged to specialise in certain products and services, while they depend on the importation of many others to satisfy the needs of their inhabitants. The consequences have been the exploitation of labour and serious environmental impacts (especially in some countries); the gradual loss of a more diversified local economy; and the flexible capacity of many regions in the face of short-term adversities.

The enormous dependence on importation of basic products during the Covid-19 pandemic was disastrous. The lack of masks, all kinds of personal protective equipment, and artificial respirators facilitated the spread of the disease and increased mortality. Some countries only managed to overcome these limitations when some of their industries underwent restructuring to produce these and other products. Furthermore, the most vulnerable population was the most affected.

Faced with this scenario of unpredictable global crises, whose consequences tend to last for years, although the main causes have been tackled in a medium period of time, with specific policies accompanied by enormous economic waste, we ask: Is it possible to organise a resilient global society, with a greater capacity to face and overcome crises?

Although each territory has its idiosyncrasies with its own character and each city entails a certain complexity, since it is made up of a set of elements and articulated systems, very few political projects have been oriented to the unforeseen that integrate solutions for times of crisis, which often occur frequently in a globalised and interdependent economy.

For the most part, planning models are designed and executed from and for a foreseeable situation, in which the evolutionary process is constant and provides a certain stability. This, with respect to investments in education, research, and innovation as well as social welfare, infrastructure, etc., substantially reduces the ability of cities to renew and restructure themselves, and therefore their adaptability to new scenarios.

Therefore, these plans substantially reduce the levels of resistance and make it difficult to take advantage of opportunities that arise during and after crises.

For these reasons, we have examined some of the most relevant contributions regarding the guidelines and possibilities of a resilient society that could guide us in this endeavour.

Diversity and flexibility

Both Staley Holling (1973), studying natural systems, as well as Pendall, Foster, and Cowell (2007) and Hill, Wial, and Wolman (2008), analysing socio-ecological systems, maintain that diversity and flexibility associated with other factors produce more adaptive capacity to face adversities and absorb the consequences of changes, which expands the possibilities for recovery despite the complexity and uncertainty that crises can entail. Based on this assertion, we ask: have we been concerned with maintaining or increasing flexibility, diversity, and therefore, the region's ability to adapt and improve in especially critical periods?

In both the eco-social and economic spheres, the answer is quite negative. The growing demands for processed products have led to the replacement of large sections of natural ecosystems with monoculture crops, livestock farms, and forest plantations, urban, and industrial areas, to the detriment of more sustainable food systems, destroying soils (erosion and desertification) and preventing any attempt of regeneration and diversification. This society-nature relationship, as a dialectical process in space and time, brings with it important signs of regression, as Élisée Reclus expressed at the end of the 19th century and the beginning of the 20th (1906-1908), when he insistently warned that the limits of nature should not be crossed (Reclus, 1986[1906-1908]; Zaar, 2020).

Likewise, it supposes an opposite scenario of what Patricia Romero-Lankao and Daniel Gnatz (2013) and many other researchers defend as sustainability: the capacity of natural ecosystems to supply the needs of the population that are within their limits, and at the same time to protect resources to meet the needs of future generations.

In respect to the cultural, social, and economic transformations that have occurred in recent decades, the spread of globalisation has led to the homogenisation of consumption habits, ways of working, producing, and reproducing territories, with a single purpose: to increase the demand for certain products. This has led to the establishment of an increasingly automated supply chain and aggressive competition strategies to conquer new markets, facilitating the reproduction of the different branches of capital and absorbing or annihilating small local businesses.

Consumers have been induced to standardise our habits through invasive and alienating advertising. The metabolism of capital has generated important natural and social changes, with the overexploitation of natural resources and the destruction of biodiversity, temporary and low-wage jobs, which has been cynically labelled as "a world of opportunity".

We are facing a situation that generates vulnerability, insecurity, and dependency. Overcoming it requires (a) taking advantage of opportunities and periods of stability to provide the territory with planning oriented towards a creative and innovative environment that prioritises diversity and includes prevention and uncertainty, conditions that imply greater flexibility and adaptability; (b) action through a new political, social, and economic approach that is inclusive and favours the local over the global, through governance projects and inclusive socio-territorial policies.

In this sense, it is important to disseminate and expand successful experiences that have been put into practice at local levels and broader scales that include macro-regions and effective government policies. As an example, we can cite the measures for the protection of natural ecosystems of the Community Agrarian Policy (CAP) which, through programmes, such as LEADER (French acronym for Liaisons entre Activités de Développement de l' Economie Rural), have the objective of maintaining rural communities and improving their resilience capacities. The actions of LEADER include the multifunctionality and diversification of activities associated with the protection and conservation of the environment and the landscape, and the valuation of local heritage, through the improvement of infrastructure, social, and cultural facilities, as well as incentives for rural tourism, especially agrotourism, and the commercialisation of local artisanal products (Zaar, 2022a).

Actions like these can reverse, at least partially, the current process of globalisation and recurring crises, in which capital (the most powerful *totalising* control structure to which everything, including human beings, must adjust) must be understood as "an uncontrollable form of socio-metabolic control" (Mészáros, 2011[1995], p. 96).

Adaptive capacity and transformality

Territorial resilience can be defined as the capacity of a territory to create and implement new resources and capacities that allow it to prepare, respond, and adapt adequately to the new changing dynamics, resulting in situations of socioeconomic development as well as social and territorial cohesion. To do this, it incorporates multi-scale dynamics in the temporal, territorial, and sectoral spheres, requiring permanent negotiation to determine, in each case, the cause of the disturbances and the possible adaptation and transformation factors.

In this context, we ask: is it possible to increase our adaptive capacities to absorb the social and economic consequences of sudden changes caused by crises, and through transformation, to create new domains of stability for development?

The authors mentioned above indicate that it is possible to achieve an adaptive capacity for political-administrative projects with the central objective of strengthening internal economies from a set of inseparable attributes – stability, adaptability, and transformation (Folke et al., 2010; Lu; Stead, 2013). All this perceives the environment as a product and scenario of human interactions, and complexity, non-linearity and uncertainty, as part of socio-ecological systems (Scoones, 1999; Davoudi, 2012).

This is the key to the question: how should regional planning be coordinated with the interests of capital? Can we combine them to identify and reinforce vulnerable sectors so that these sectors acquire the resilience and adaptability to face changes?

The way towards an inclusive and more resilient society includes opportunities and priorities, such as (a) participatory planning in which citizens become the subjects of the process, and (b) budget priorities, which should be consistent with the degree of vulnerability of each area, to reduce the deep inequality that exists between regions and countries, in fields as basics as education and information, human and political rights, health, and labour. The most current

example is overcoming limits so that everyone on the planet has access to vaccines against Covid-19 and other diseases.

Likewise, the action of the State is relevant through legislation that controls the operation of capital and avoids its excesses caused by a neoliberal policy, which promotes the articulation of financial markets and globalisation, to the detriment of humans and the environment. This legislation, initially applied by social-democratic governments and aimed fundamentally at the most vulnerable sectors, such as labour and social sectors, natural resources, and environmental pollution, should become a universal objective.

Thus, the journey towards local and regional resilience would encompass all its possibilities through space-time scales, involving both its socio-ecological constituents (Meerow; Newell; Stults, 2016, p. 39), as well as the evaluation and understanding of its vulnerable components of its fundamental processes and interactions, resizing its capacity to respond to changes (Desouza; Flanery, 2013).

Foresight, intentionality, communication, and technology also play an essential role (Foster, 2006). The ability to renew; to diversify from a medium and long-term perspective, with prepared human capital (Hill; Wial; Wolman, 2008); and to stimulate investment in innovation and the restructure endogenous initiatives are also important to take advantage of both opportunities and stabilities as well as connectivity and capital accumulation (Simmie; Martín, 2010).

The implementation of programmes such as the Next Generation EU Fund in the European Union, and the Build Back Better Plan in the US, with significant public investment in social areas, infrastructure and environmental programmes, are examples of initiatives that well managed can address these perspectives.

Furthermore, the capacity for innovation and diversification of the internal economy must be expanded, since this opens opportunities for each country to compete technologically and economically in similar conditions, while also reducing dependence on the external market, conditions that increase multidimensional vitalities in the face of crises.

In this direction, some state policies are gaining prominence. The incorporation of new legislation in the European Union and the US is promoting, directly or indirectly, a reorganisation in global supply chains, which is a first step towards strengthening national economies.

In the European Union, the gradual tax on carbon at its borders will impose a climate tariff to tax the import of industrialised products more intensive in carbon dioxide (CO^2), such as iron, steel, aluminium, fertilisers, and electricity, and which will begin to be applied gradually from October 2023. In practice, importers must declare the emissions directly linked to the production process, and if these exceed the European limit, they will have to buy an 'emission certificate' at CO^2 prices in the EU. Through this, the European Union intends to preserve the competitiveness of its industries, guaranteeing fair competition with third countries that have less demanding climate standards and promoting the international fight against climate change.

In the US, the increase in tariffs on imports coming mainly from China, and the US Federal Inflation Reduction Act (IRA), aim to curb inflation and invest in the production of less polluting domestic energy.

Likewise, the aforementioned studies consider the various perspectives of the system and its performance over time: the potential of accumulated resources, interconnectedness, degree of vulnerability to surprise, tensions, and shocks, and the level of resilience associated with the phases of creativity and flexibility (Pendall; Foster; Cowell, 2007). In addition, strong financial and innovation organisations, with a modern and diversified productive base, must be based on collaboration networks and qualified human resources (Christopherson; Michie; Tyler, 2010). This should be supported by socioeconomic networks, social capital, strategies for mobilising local resources and insertion in the foreign economy (Méndez, 2012). All this should be based on analyses that include the study of vulnerability and integrated planning to help anticipate uncertainties (Jabareen, 2013).

Furthermore, in complex urban spaces, the dynamics of interdependence between human and environmental subsystems must be consisted to restore their equilibrium through organic articulation, as Murray Bookchin (1974) and Manfred Max-Neef (1993) point out. This should be aimed at conscious actions that involve the cooperation of all local actors and the development of innovation and transformation projects, through the praxis of social innovation, associated with open public management and through participatory methodologies with multi-actors and multi-sectoral transdisciplinary approaches (Zurbriggen; González Lago, 2014; Espiau, 2018; Zaar, 2022b).

In addition, the perspective of evolutionary resilience in planning is important, through which places can be understood, not as isolated units of analysis, but rather as complex and interconnected socio-spatial systems with extensive and unpredictable feedback processes, which are related to many spatial and temporal scales (Davoudi, 2012).

From this perspective, territorial planning tools must apply holistic approaches that mitigate risks and strengthen ecosystems, since urbanised areas, which are responsible co-dependents with living organisms, generate 70% of greenhouse gas emissions. Due to their propensity to contribute to the formation of heat islands, they are the first to suffer the impacts of climate change.

Moreover, public support should promote comprehensive projects that incorporate green infrastructures into urban design that expand and connect natural systems in cities and their surroundings.

As a result of collective actions, agreed through more effective governance processes, these new green corridors, which are more complex and diversified than the classic model (trees and grass), aim to re-naturalise urban and metropolitan territories, by preserving natural green spaces, such as networks of urban community gardens, parks, rivers, and streams, or other leisure areas, in addition to improving water management with sustainable drainage systems and permeable pavements.

These measures, associated with the construction of *smart buildings* (energy and water savers and with facades or roofs containing vegetation), the promotion of sustainable mobility, the use of clean renewable energy, and efficient recycling techniques (e.g., the European Green

Pact), represent advances towards significant benefits for the urban population and its natural environment. They improve air quality, reduce extreme temperatures, stop flooding, and preserve biological and landscape diversity from a systemic concept in that nature integrates and optimises the urban. With the dissemination of initiatives such as these and other similar ones, adapted to different territorial singularities, several of the Sustainable Development Goals could be achieved, such as Sustainable Cities and Communities.

In short, the study of resilience (whether urban, regional, or global) must use regulations and methodologies that take into account the evolutionary process of the various systems in their geographical areas, i.e., how their socio-ecological elements combine and reverberate in terms of the flexibility, abilities, discontinuities, etc. The purpose of all this is to reinforce and protect against the negative consequences of the crises and be a primordial instrument to set new goals, including inclusive and sustainable endogenous development. The proposals presented show some directions and require political and citizen will to overcome the susceptibility and risks that can lead to a crisis situation.

Concluding remarks

Many voices have been raised in favour of using the Covid-19 crisis to rethink our position in the context that led us to it. In other words, we must take advantage of this opportunity to start the process of change towards a more resilient society.

However, this will only be possible if we act together on a range of scales from the local to the global, aware of the challenges that we face when faced with the difficulty of proposing solutions in an increasingly globalised and complex world. Perhaps that is where the solution may be. Could we use the same instruments, inertia, and global dynamics that have engendered, provoked, and spread the latest crises to build a more resilient society?

For this, it essential to first convert the linear approach of possibilities and opportunities into a systemic approach, considering the interrelationship between all the elements that form part of it. In addition, it is necessary to pay attention to the dynamics of this evolutionary process (its combinations, transformations, permanence, contradictions, actions, and reactions) in search of solutions that increase our ability to adapt to the challenges of an increasingly globalised world.

The systemic approach makes it possible to evaluate territorial resilience from the understanding of its totality and transversality of its social, economic, governance, environmental structures, etc., and provides the community with the opportunity to reflect on their recent past and their present situation, as well as choose the most favourable paths to reach the desired levels.

In this task, States must play a fundamental role, committing themselves to new planning practices in which, at the local and regional levels, contemplates full human and social development of an endogenous economy in which human capital and participatory strategies are its foundation.

One of these praxes is the progressive investment in welfare and social protection, with redistributive fiscal policies, through the decentralisation of decisions, the reinforcement of micro and small organisations, shared projects, organisational culture, and management, in a process in which efficiency and transparency are transformed into synergy.

Another involves changes in globalised economic policy, principally in the industrial and technological sectors, with important incentives for research and innovation as well as the relocation of companies that moved to specific Asian countries. These conditions open up opportunities for countries to compete technologically and economically and reduce dependence on international commercial transactions, making it possible, according to Max-Neef (1993, p. 84-85), to free ourselves from the vicious circle of cultural, technological, and/or economic dependencies.

In relation to global actions, a more effective plan against climate change is the priority, which includes regional and local policies that stimulate renewable energy, green infrastructure, circular economy, territorial biodiversity, and efficient mandatory recycling procedures, and at the same time eliminate the use of the most polluting raw materials. The aim of all these actions are to protect ecosystems and recover those that have been degraded or plundered by the current model of exponential economic growth.

Likewise, agri-food, ecosystem, and eco-social approaches must be incorporated into territorial planning. Policies should be aimed at a green infrastructure to implement measures that institute programmes which reinforce people's food sovereignty and encourage sustainable, fair, and local agri-food systems.

Are we willing to do this? This hopeful and ambitious project is difficult to execute in its entirety, but the longer we take to organise and start it, the more complicated and painful the task will be, and the more unpredictable will be the future of planet Earth.

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