2. Presuming a nature in the context of resilience

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Abstract

Over the last decades, the debate on climate change has brought back the everlasting discussion on the conceptualization of nature and the delimitation of our relationship with it. The emergence of „destruction“ has been instrumental in transforming moral evil to natural, viz the transition from the mechanistic-instrumental view of nature to a romantic one, where the superiority of “logos” over nature is now reversed. In the context of this conceptual shift, the rhetoric of „security“ was raised, and today is mainly expressed through the mechanisms of „mechanistic resilience“, namely the persistence in an ideal, almost a metaphysical equilibrium state of functioning of all biotic and abiotic systems. However, at the same time and in the context of ecological science, in recent decades, parallel transformations have also occurred in the notion of „resilience“. The latter is no longer defined on the basis of maintaining a balance, but rather adapting to lasting change (part of which is the „destruction“) which is recognized as a structural element of all natural and non- natural processes. If faith in the equilibrium tried to respond to a “revengeful nature” or a nature perceived as danger, then which nature responds to adaptation? Accepting the latter as the new state of optimum functioning means that we must accept a new notion of evil that stems from the theory of resilience but ultimately expands to the „construction“ of a nature.

Recent transformations and the reorganization of institutional and social structures and political associations on a global scale, adopt and respond to the possibility of destruction as a result of unpredictable „natural“ or „moral“ evil. Their impressive syneresis through the lens of the „apocaliptic“ threat and the effort to overcome their distinction not by slipping into the „naturalization“ of the social but highlighting the systemic nature of evil[1] reveals the importance of re-conceptualization of the very notion of nature. Nowadays, climate change is the central subject of a contemporary discourse that concerns our stasis towards the environment. This working hypothesis suggests a relationship of “resilience” to the concept of nature as both a biased and a contradictory one: the way we currently grasp nature shapes the context of the discourse on resilience as stability and equilibrium; At the same time, contemporary shifts in the understanding of resilience as complexity and change, suggest „a nature,“ and thus a society, open to the future, to contingencies, and the infinite possibilities.

Interpretations of nature through externality and sovereignty

The dualism of Logos and nature in western thought legitimized very early the supremacy of the “rational” and the instrumentalization of nature. In this sense, in the whole history of western civilization, with few exceptions, understanding of nature is filtered through the concept of **sovereignty** (Terzakis 2003). The „isomorphic“ relations of sovereignty, beyond dualism, rely on the hierarchy that characterizes the **order** of the cosmos under the Word (Logos). What emphatically comes to the foreground is the raising of human-subject displacing God Logos and claiming dominance over nature. Human as a sovereign claims and „confesses“ its externality to the non-reasonable nature at the cost of fully assuming the responsibility of evil (Bauman and Bordoni 2017, p.10).

Romantic nature is attempting a reversal that makes nature dominant and humans humble and unwieldy. From this romantic nature, that preserves dualism and externality in its core, a line of thought emerges that establishes the naturalization of evil, releases from the burden of responsibility and at the same time, legitimizes the regaining of sovereignty at

[1] For the notion of «systemic» evil and the Enlightened Doomsaying, see Dupuy, J.-P. 2008: A Short Treatise on the Metaphysics of Tsunamis

any cost. The naturalization of evil and the recovery of tooling sovereignty of techno-science form the framework of modernity and one of its fundamental contradictions. The understanding of nature in modern theory seeks to incorporate this contradiction thus avoiding its nullification. According to Horkheimer: „…*without committing the fallacy of equating* ***nature*** *and* ***reason****, mankind must try to reconcile the two*" (Terzakis 2003, p.90).

The distinction between anthropocentric and ecocentric approaches of nature is based on the human-subject externality or non-, which results to a nature of an intrinsic or extrinsic value[2]. The following schematic coding of multiple meanings of nature, nature as perfect machine or clockwork, nature as finite asset and nature as risk (Davoudi 2014), derives from and keeps the anthropocentric approach of nature. These meanings of nature are all characterized by instrumentalism and sovereignty. Although they follow the shifts in the understanding of resilience, they fail to infuse a new, resilience based intake of nature.

Nature as a perfect **machine** implies a nature governed by laws that can be scientifically studied and thus formulated and described. At the same time, holding the knowledge of these laws allow for gaining control over nature, and hence make use of it. The **demystification of nature** and the abandonment of a ruling divine economy are prerequisites for a de-symbolized nature, available for science supported and technology driven exploitation to meet the needs of progress and development. The implications of such an ethos in the human-nature relationship rapidly proved to be not manageable and gradually provoked a shift that questions nature and its „delicate balances". Culminating in the rhetoric of sustainability, what was put forth was the need for human progress to be planned in the long run on the basis of „natural" processes and ecological procedures.

In this context, **nature** is perceived **as finite asset**, and an eventually scarcity of resources for the progress suggests an urgent need to adjust the relationship of developmental mechanisms to nature. The exploitation of nature and its protection in order to secure progress itself generated a range of specialized environmental managerial practices and legislative adjustments on the one hand, and fed a whole field of advanced technological approaches ending up to the commoditization of nature on the other. Nature downgraded to "a set of environmental problems" (Davoudi 2014, p.362) prevails against a

wide spectrum of radical ecological and social movements declaring that the problem lies to progress itself and not to nature.

This promising, consensual rhetoric of sustainability, which largely internalizes and eases the tension of movements and radical ecology, is replaced by the prevalent discourse of the environmental risk. „*The first promise [of modernity] to be withdrawn was that Enlightenment idea of security, provided by the prospect of controlling nature*" (Bauman and Bordoni 2017, p.9). **Nature** reconceived **as risk**, is a concept consistent with modernity's externalities but still a surprisingly setback in relation to the extent of control provided by techno-science and its managerial practices. In fact, this seemingly retreat is a complex mechanism that establishes and legitimizes the contemporary security society. Against nature as an unpredictable threat, complex and intertwined policies of fear and security is reorganized on a global scale. What emphatically occurs is the need to shield against unpredictable dangers and threats by legitimizing political decisions and prioritizations and avoiding time-consuming, consensus-seeking planning.

From securitization of nature to naturalization of evil through resilience

Nature, in the context of risk and security, degenerates to an incomprehensible externality, equally threatening compared to terrorism, nuclear weaponry, refugee flows, pandemics, economic collapse. While all these threats are obviously socially originated, they are related to climate change and nature-as-risk approach (Jabareen 2013) sharing the same prerequisite externality. This externality allows for legitimizing our shielding against these constructed threats instead of de-legitimizing the social practices that reproduce them. At the same time, the equalization of a threatening nature to all other threats naturalizes the social constructions of evil. The issue of resilience and the relevant scientific discourse is a part of the above context with increasing interest over the last decade. Resilience is currently synonymous with „security", a mechanism that is equally constructed by the destruction and the shielding against it.

Although the term „resilience" has now been incorporated through many different scientific fields into the daily vocabulary, the plurality and semantic scope of the definitions are indicative of ambiguity and the need to identify each time the context and the conditions of its use and therefore its meaning.

The term appears initially in the context of ecology science and its first formal definition was given by CRAWFORD HOLLING: "*Resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist.*" (HOLLING 1973, p.17). This definition, in the following years, has undergone several modifications and reformulations (table 1)[3], and the term was used beyond the boundaries of ecology.

Holling himself reworded this definition twice to date, once in 1986 (HOLLING 1986, p.76): „Resilience is the ability of a system to maintain its structure and patterns of behaviour in the face of disturbance", and once more in 2002 (GUNDERSON and HOLLING 2002, p.28): „*Resilience is the magnitude of disturbance that can be absorbed before the system changes its structure by changing the variables and processes that control behaviour*". Similar definitions will be formulated by other researchers like WALKER et al. (2006), S.E. VAN DER LEEUW (2000), C. FOLKE et al. (2003).

First author, year	Domain	Definition	First author, year	Domain	Definition
Gordon, 1978	Physical	The ability to store strain energy and deflect elastically under a load without breaking or being deformed	Ott, 2004	Ecological system	Maintenance of natural capital (as the basis for social systems' functioning) in the long run
Bodin, 2004	Physical	The speed with which a system returns to equilibrium after displacement irrespective of how many oscillations are required	Walker, 2004	Ecological system	The capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks
Holling, 1973	Ecological system	The persistence of relationships within a system; a measure of the ability of systems to absorb changes of state variables, driving variables, and parameters, and still persist	Adger, 2005	Ecological system	The capacity of linked social-ecological systems to absorb recurrent disturbances ... so as to retain essential structures, functions, and feedbacks
Holling, 1995	Ecological system	Buffer capacity or the ability of a system to absorb perturbation, or the magnitude of disturbance that can be absorbed before a system changes its structure	Longstaff, 2005	Ecological system	The ability by an individual, group, or organization to continue its existence (or remain more or less stable) in the face of some sort of surprise....Resilience is found in systems that are highly adaptable (not locked into specific strategies) and have diverse resources
Abel, 2001	Ecological system	The ability to persist through future disturbances	Resilience Alliance, 2006	Ecological system	The capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure and feedbacks – and therefore the same identity.
Waller, 2001	Ecological system	Positive adaptation in response to adversity; it is not the absence of vulnerability, not an inherent characteristic, and not static	Resilience Alliance, 2009	Ecological system	The capacity of a system to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes.
Brock, 2002	Ecological system	The transition probability between states as a function of the consumption and production activities of decision makers	Adger, 2000	Ecological and social systems	The ability of communities to withstand external shocks to their social infrastructure
Klein, 2003	Ecological system	The ability of a system that has undergone stress to recover and return to its original state; more precisely (i) the amount of disturbance a system can absorb and still remain within the same state or domain of attraction and (ii) the degree to which the system is capable of self-organization	Adger, 2003	Ecological and social systems	The ability to persist (i.e., to absorb shocks and stresses and still maintain the functioning of society and the integrity of ecological systems) and the ability to adapt to change, unforeseen circumstances, and risks
Anderies, 2004	Ecological system	The amount of change or disruption that is required to transform the maintenance of a system from one set of mutually reinforcing processes and structures to a different set of processes and structures			

Table 1: Definitions of "resilience" (Source: COMMUNITY & REGIONAL RESILIENCE INSTITUTE 2013, p.3-9)

[3] See COMMUNITY & REGIONAL RESILIENCE INSTITUTE 2013, BRAND F. S. and K. JAX. 2007.

What is quite obvious through the extensive bibliography is the fact that there is not only one „resilience“ but many (ecological, social, urban, mechanistic, evolutionary, etc.), even within the boundaries of a particular discipline. But the way this term each time is understood is not just a simple matter of hermeneutics but it is rather related to serious theoretical oppositions and shifts on issues that deal with the functioning mechanisms of complex biotic and abiotic systems, and particularly in the case of ecological resilience, to the very notion of nature, and our relationship as species and societies with it.

Diverging "resiliences"

Equilibrium based resilience

In the first definitions of resilience, (Holling 1973, 1986), what was clearly expressed through the terms of „persistence“ and „conservation“ was the concept of equilibrium, ie the steady state of the ecological systems in times when no stresses or external forces are applied to them. In this initial apprehension of resilience also relies the main conceptual frame of later sustainability approach, which sets “equilibrium” (of natural systems) in a high priority zone in order to maintain the uninterrupted operation of the Western world‘s post-war-development course or, in other words, to preserve the natural resources.

What, however, has also been introduced in this initial approach of resilience for the first time along with the concept of equilibrium, is the existence of not a single, but rather **multiple equilibrium states** for a given system. In this case, resilience is the measure of the disturbance that a system is capable of absorbing before it flips into a new equilibrium state (C.S. Holling 1996, 2002). Both concepts, should be marked as the first turbulence in the post-war notions of nature (table 2) and in understanding of crucial issues of society-nature relationship, concerning the primacy of rational, the instrumentalization of nature, and sovereignty as a dominant value.

From another point of view, at the same time, a new notion of „resilience“, which is found in the literature as „engineering resilience“, has been born, and is the one that basically acts as the theoretical legitimation of the recently established rhetoric of „security“, as mentioned above. In this case, which is the most widespread (in fields such as engineering, risk management, economy etc) and acceptable interpretation

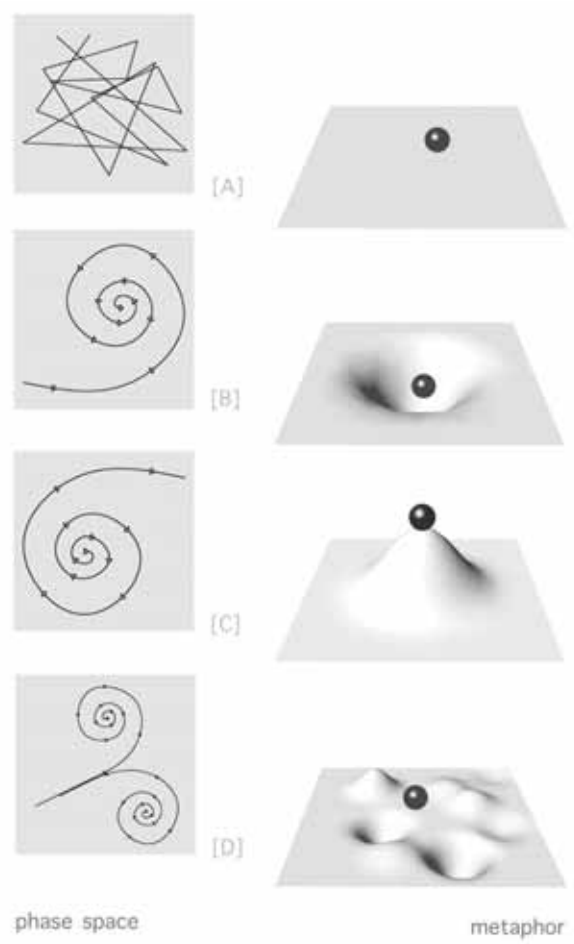


Table 2: Depictions of four myths of nature: (A) Nature Flat, (B) Nature Balanced, (C) Nature Anarchic, and (D) Nature Resillient. (Source: Gunderson and Holling 2002, p.11, Authors' redesign)

of the term, resilience is considered as the persistence at a single equilibrium state, while the resistance to disturbance and the return rate to the previous equilibrium state are the measure of resilience (C.S. Holling 1996). The use of this particular notion of resilience until today is directly related to two phenomena attached to "hypermodernity" (Lipovetsky 2013): the largely failure of sustainability approach, and the emergence of catastrophe that demystifies the future and „shrinks time into an urgent logic."[4]

Resilience through constant change

From the 1980s onwards, and mainly because of the effects of complex systems theory on other sciences, the definition of ecological resilience is reworded once again. A typical example of this shift is the definition as currently accepted by the Resilience Alliance[5]: „*Resilience is the capacity of a social-ecological system to absorb or withstand perturbations and other stressors such as that the system remains in the same regime, essentially maintaining its structure and functions*." Through this definition, three key characteristics of resilience emerge: a) the amount of change a system can absorb without flipping into another equilibrium state, b) the extent to which a system is capable of self-organization, and

[4] For the hypermodern relation with time, see Lipovetsky, G. 2013: Globalization and hypermodernity: Cosmopolitanism and western culture

[5] https://www.resalliance.org/resilience

c) the ability of a system for self-learning[6] and adaptation.

Beyond the multi equilibrium states schema and the unified approach of complex social and natural systems, it is also accepted that change is a structural component of systems, and adaptation to it through learning and self-organization is a part of the function mechanisms of each system (S.E. VAN DER LEEUW 2000). The above concepts -of multi equilibrium states and change as an inherent feature of systems- are also present in the shaping (Figure 1) of the properties of a system's resilience by B. WALKER (et al., 2004) where its characteristics determine the position of the system in its "stability landscape", ie the set of different states in which the system can be found. These characteristics are: (L) the maximum change that a system can absorb before it changes basin of attraction (its function changes), (R) the system's sensitivity to change (how easily it can change), (Pr) the distance of a system from critical thresholds (where changes that happen are irreversible), and (P) Panarchy, which deals with the interconnections of different systems[7] among spatial and temporal scales or between different scales that set one system external to another.

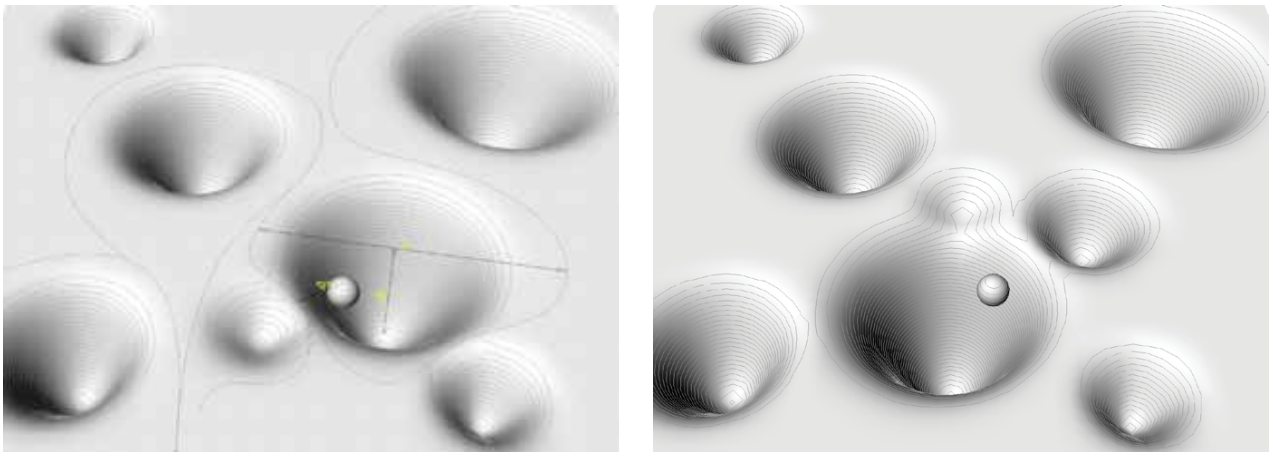


Figure1: Three dimensional stability landscape with basins of attractions: (a) system characteristics, (b) changes in the stability landscape (Source: WALKER et al. 2004, p.4, Authors' redesign).

Adaptive (or ecological) resilience – Panarchy

The latest and most contemporary notion of resilience was largely shaped by the influences that ecology science has

[6] The latter is related to the experience and the memory of a system and hence to its "identity".

[7] The concept of wholeness as introduced here implies in part the connection, or interdependence, of systems of different identity, such as physical and social. However, this critical linkage, which often leads to the naturalization of social systems (eg the elimination of human intentionality), but also to the rationalization of natural (eg, deterministic nature), has been widely criticized (DAVOUDI et al. 2012) due to emerging deductions, or even generalizations that are loose and risky to use them.

received from the Panarchy theory as proposed from HOLING (2001): „Panarchy" is the term we use to describe a concept that explains the evolving nature of complex adaptive systems. Panarchy is the hierarchical structure in which systems of nature (for example, forests, grasslands, lakes, rivers, and seas), and humans (for example, structures of governance, settlements, and cultures) (GUNDERSON et al. 1995) and social-ecological systems (for example, co-evolved systems of management) are interlinked in the never-ending adaptive cycles of growth, accumulation, restructuring, and renewal."

The main concept of this model is the adaptive circle (Figure 2), the four stages that all systems are constantly and continuously running through due to adaptation to change[8]. The adaptive circle is characterized by: the endogenous dynamics of the system available for change, ie the „wealth" of the system, the internal interconnection of system factors which determines the flexibility or stiffness of the system, that is, its sensitivity to disruptions, and its inherent adaptive ability. The four stages of the cycle are: exploitation (r), conservation (K), release (Ω), and reorganization (a). The main theoretical shift that is crucial to understanding the contemporary perception of resilience is that events and processes such as destruction and collapse (stage K to Ω) are not perceived according to their common original negative meaning but instead are incorporated into a scheme that regards them as moments of capital

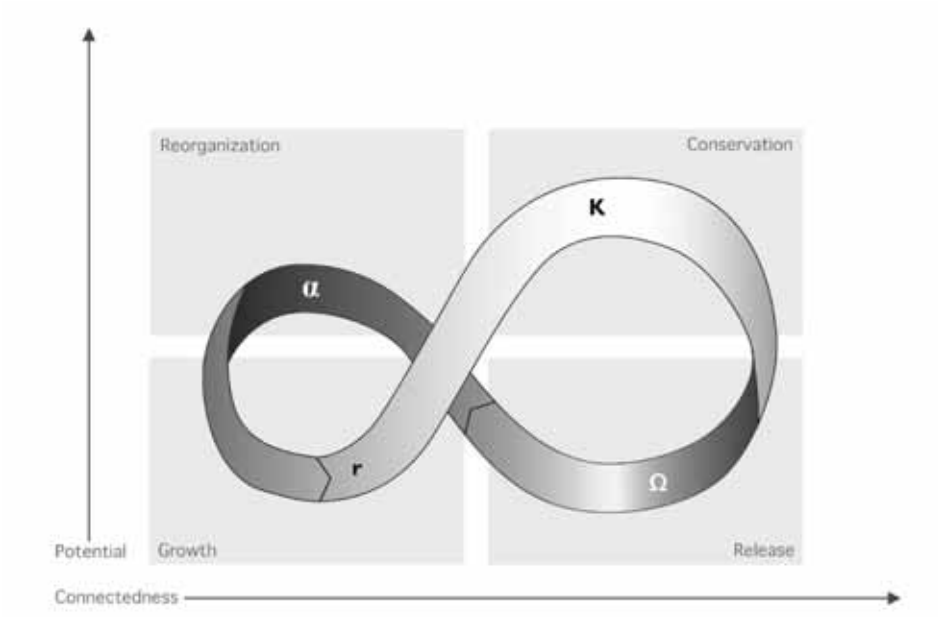
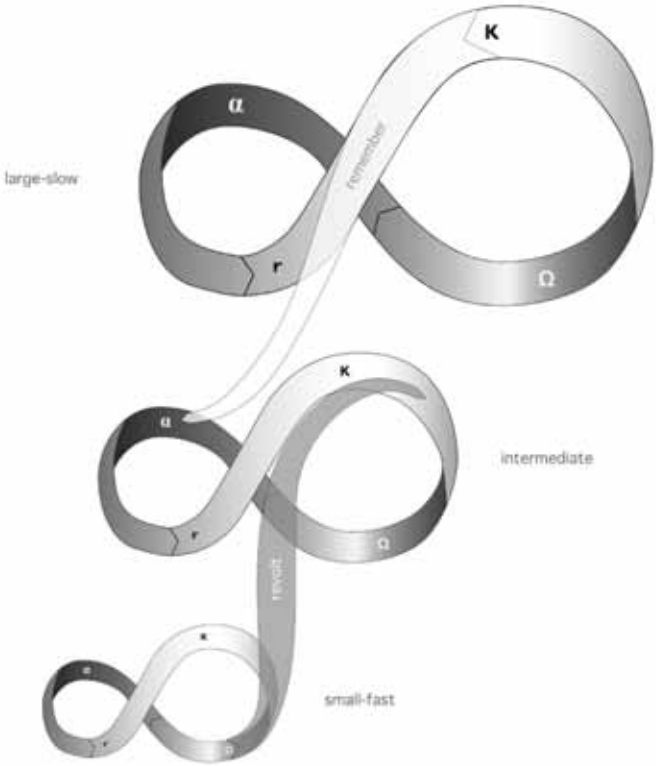


Figure 2: Adaptive cycle in 2D (Source: GUNDERSONE and HOLLING 2002 p.34, Authors' redesign)

[8] The succession of the adaptive cycle stages is neither linear nor deterministic due to the fact that external pressures, or leaks (to other such systems) interfere with it.

release and hence times when the possibilities and possible ways of a system reconstruction increases, ie stages necessary for regeneration, creation, and evolutionary heterogeneity[9].

In addition, and taking notice of the three dimensional representation of the adaptive cycle (Figure 3), is understood that the resilience of a system is greater when the available capital is free and unbound, and the possibilities and variable combinations of regeneration are maximum (in short, no fixed links between the parts of the system are attached), and continuously diminishing by the consolidation of relationships and forms, ie it passes from a liquid and flexible form into a more solid and inelastic one.



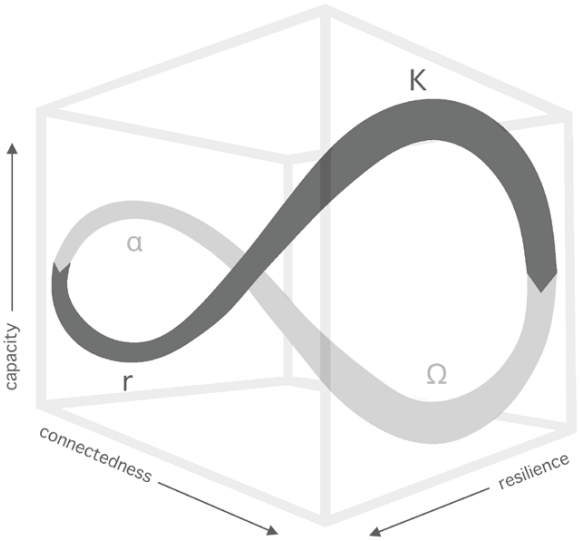


Figure 3 (right): Adaptive cycle in 3D (Source: http://www.ecologyandsociety.org, Authors' redesign)

Figure 4 (left): Panarchy in 2D (Source: https://www.researchgate.net, Authors' redesign)

The scheme of Panarchy (figure_4) is being completed with the reduction of the adaptive circle into a hierarchical structure (not only top down but also bottom-up, thus in the regular sense is a non-hierarchical system) of successive cycles accumulated in different scales and in constant communication and interaction with each other (various connections are presumed as being related to the heritage - **memory** - the spread of destruction - **revolt** - and others) thus shaping the wholeness of the ecosystem as well as its self-organizing mechanisms (Craig R. Allen et al. 2014).Thus, bearing in mind these con-

[9] The latter is considered an important feature of resilience by cultivating flexibility, and thus shaping the conditions for assimilation of the unpredictable. (Holling 1973)

temporary aspects of the Panarchy model, it is understood that the term "resilience" in this new era is conceived as the ability of a system to adapt, change, and transform, rather than to resist to disturbance and stay within the same equilibrium regime (Davoudi et al. 2012), a scheme that is totally opposed to the predominant use of the term today, and also to **the mainstream notion of nature as danger**. Summarizing the three most widespread interpretations of the term „resilience" in the contex of ecology we may conclude that it is defined as:

- The ability of a system to return –or to bounce back- to a steady equilibrium state after a shock, or disturbance.
- The magnitude of the disturbance that a system can absorb before it changes to a new equilibrium state.
- The ability of complex social-ecological systems to change, adapt and transform in response to stresses and pressure.

Nature and resilience, from inevitability to intentionality

It is evident that the use of the term "resilience" equally refers to "stability", "elasticity", and "adaptability". Apparently enough, these perspectives do not emerge out from an isolated scientific field but they are influenced, and co-shaped by neighbouring theoretical thesis and related issues (nature-man-society). Simultaneously they set the critical foundations for concepts such as sustainability, growth, development, destruction, etc., and they reflect on patterns related to linear and hierarchical relationships (in the classical sense of the term), such as evolution.

At the core of the discourse regarding the notion of resilience is precisely standing the concept of the disaster. A deep understanding of the distinctions between natural and moral evil[10], as well as of their revealing syneresis to a metaphysical evil that threatens the ‚equilibrium' of human societies and cities, reveals an urgent need to define from the beginning the nature and the way we relate to it. "*Are we in a "deep back loop" that presents the [ecological studies] opportunities and crises*?", as Holling (2004) asks.

The shift in understanding of resilience from the equilibrium all the way to change and transformation (through multi-equilibrium states) is crucial particularly as it destabilizes the political, ideological and philosophical basis on which the

[10] An overview of "evil" conceptions and origins in modern thought, see Neiman, S. 2002: Evil in modern thought. An alternative history of philosophy.

securitization is progressively institutionalized as urgent as inevitable (Coaffee 2013). Resilience as constant transformation opens up our understanding and receptivity to contingency and unpredictability. Resilience is thus providing an interpretative lens that enables us to detect a new conception of nature as a „*matrix of all possibilities or the perennially open*" (Terzakis 2003, p.26).

However, if, in the context of resilience, disaster is internalized and is only regarded as a part of the process of a constant transformation -an eventual outcome rather than danger-, translating this understanding to the social context remains seriously problematic at two levels. One concerns the naturalization of evil by relocating the systemic and institutional into natural procedures, which consequently implies that intentionality is ignored if not denied. The second level concerns the subsequent legitimization of the reshaped sovereignty relations in the name of transformation and adaptability[11]. Despite these contradictions and restrictions we need to surpass, the re-conceptualization of nature in the context of resilience as the perpetually open, assures "*the continuous possibility of recourse to something amorphous which eludes any social (and linguistic) determinations, a stock of inexhaustible freedom and creativity that, ex post, makes the historical change of the world possible*" (Terzakis 2003, p.29).

[11] As Bauman describes it: "…adaptability, the trademark of fluid modernity, an advantage for the governors and a handicap for the governed, is in fact the new strategy of sovereignty". See Bauman and Bordoni 2017, p.57

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