

**The Interplay Between Socio-economic Crises and Disaster Risks:
Examples from the Developed and Developing World**

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ABSTRACT

Regardless of the origin, financial and socio-economic crises feature combinations of adverse conditions: lack of access to financing/credit, slump in investments, household demand and consumption, a falling GDP, high deficits and debt ratios, loss of income, unemployment, shrinkage of state provisions, poverty, enforced migration, homelessness, and an incapacity to satisfy basic needs. These translate into losses for collective and private agencies in the crisis community. The systemically interrelated losses are not only financial and economic but also physical, human, social, and political (e.g., loss of trust in political leadership).

Each agency that suffers losses experiences an increase in vulnerability because vulnerability, by definition, is a susceptibility to loss. Resilience is also badly affected as a result of the crisis impacting properties through redundancy, robustness, diversity, self-sufficiency, autonomy, and flexibility. Therefore, communities faced with socio-economic crises are simultaneously faced with a higher vulnerability and lower resilience. Thereby, disasters become high-probability events, even in the case of low-intensity hazards.

The reverse is also true: High disaster risks (DRs) incubate socio-economic crises. This is evident in the case of slow-onset disasters related to critical resource scarcities which are systemically interconnected (e.g., water, fertile land, and food). DRs such as drought, desertification, and famine may trigger market speculation on scarce resources, rising prices, a decline of dependent economic sectors, a fall of GDP and income, an incapacity to satisfy basic needs, a disruption of social cohesion, and even armed conflicts. The basic reason DRs translate into socio-economic, and even geopolitical crises, lies with scarce resources being multiple necessities: input for socio-economic sustainability, means to reduce exposure to the hazard of resource depletion, and assets for resilience-building.

Case studies of developed (Greece) and developing countries (Somalia) test theoretical hypotheses and illustrate the 'switchover' processes from socio-economic crisis to reinforced DRs and vice versa. Both cases are evidence of a perpetual interplay between DRs and socio-economic crises. Breaking the vicious cycle requires (a) comprehensive policy packages integrating anti-crisis measures with DRR, (b) correction of risk misperceptions and (c) control of vulnerability and resilience dynamics that grow stronger in crisis periods. Establishment of Risk Observatories may prove to be an important step forward.

1. Basic Theoretical Assumptions and Research Questions

1.1 The Concepts of 'Crisis' and 'Socio-Economic Crisis'

Crisis is a difficult and ambiguous concept and term to understand because there are multiple meanings. In fact, Heath and Millar (2004) quote twenty definitions of the term. Some of these definitions focus on the turning point in the history of a social organization, and others designate the necessity for management efforts that are much more intense than those needed during normal periods. Some definitions give prominence to stress, others to an uncontrollable situation. However, a few put emphasis on uncertainty, breach of law and ethics, and on tort.

According to the Oxford Dictionaries, 'crisis is a time of intense difficulty or danger' (e.g., the recent Greek economic crisis), and there are 'two distinct cases: (a) a time when a difficult or important decision must be made and (b) the turning point of a disease when an important change takes place, indicating either recovery or death'.

According to Wikipedia,

Crisis (from the Greek word *krisis*) is any event that is going (or is expected) to lead to an unstable or dangerous situation affecting an individual, group, community or whole society. Crises are deemed to be negative changes in the security, economic, political, societal or environmental affairs, especially when they occur abruptly with little or no warning.

Crisis is a situation that only a complex system can experience (family, economy, society); such a situation emerges when the system functions poorly or an immediate decision is necessary, but the causes of the dysfunction are complex and uncertain or unknown, ultimately impeding rational, informed decisions to reverse the situation. While it is difficult to arrive to a consensus regarding a definition of the term *crisis*, it seems that there is a consensus over the defining features of a system/organization in crisis (Seeger, Sellnow, and Ulmer 1998; Venette 2003):

- The event or emerging difficult situation is unexpected.
- It creates uncertainty.
- It is seen as a threat to important goals.
- The event indicates a need for change.

The last point was introduced by Venette (2003), who argues that 'crisis is a process of transformation when the old system can no longer be maintained'.

There are several forms of crisis (e.g., financial, economic, social, environmental, personal, community, international). The present work is basically concerned with socio-economic and geo-political crises.

According to the Business Dictionary,¹ 'economic crisis is a situation in which the economy of a region/country experiences a sudden downturn brought on by a financial crisis... An economy faced with an economic crisis will most likely experience a falling GDP, a drying up of liquidity and rising/falling prices due to inflation/deflation'. An economic crisis can take the form of a recession or a depression; sometimes it refers to the rapid transition to a recession. As mentioned above, more often than not, economic crises are brought on by financial crises, which reflect situations where financial assets lose a large part of their nominal value. Financial crises are associated with banking panics, stock market crashes or other financial bubbles bursting, currency crises, and sovereign defaults (Kindleberger and Aliber 2005). A representative of the latter case is the Greek government debt crisis, i.e., the sovereign debt crisis Greece has been facing since the international financial crisis of 2007–2008.

Financial and the resulting economic crises have serious implications for both economic and social well-being of the respective communities. Indeed, past financial crises provide ample evidence of marked short- and long-term deterioration in social well-being indicators to such a degree that justify the term *socio-economic crisis* as most descriptive of the situation. Ötoker-Robe and Podpiera (2013, p.5-6), who analysed empirical evidence from the East-Asian crisis of the late 1990's (Indonesia, Malaysia, Thailand and Korea) and the Argentina (1995) and Venezuela (1994) crises, remark that 'poverty rose in virtually all financial crises as a result of a combination of loss of income, jobs and access to goods and services by households and communities, of rising prices and falling asset values'. The above authors also emphasize that financial/economic crisis disproportionately hurts the poor and the most vulnerable in every sense (e.g., the young, the old and ill, women). Additionally, social exclusion and increased income inequalities associated with financial/economic crisis have an adverse impact on social cohesion.

According to World Bank (2001) the impact of economic crises on living standards is not limited to rising income poverty and inequality. Economic crises are featured by extensive mobility in the sense that previously non-poor social groups may become poor and previously poor may escape poverty. This was confirmed for instance in Russia which experienced a sharp downward and upward mobility after the 1998 crisis (Lokshin and

1 www.businessdictionary.com/definition/economic-crisis.html

Ravallion 2000). Therefore, the case may arise that the newly poor out of an economic crisis have different characteristics than the chronically poor. This was the case in Philippines where the households with more education were found to be more vulnerable to wage and employment shocks (Datt and Hoogeveen 2000).

Ötker-Robe and Podpiera (2013) suggest that there are certain channels converting a severe financial crisis into a social one: the product and labour market channel, the financial market channel, the public coping strategies, and the channel of private coping strategies. The financial crisis working its way through these channels results in a number of adverse socio-economic consequences and losses: job losses and higher unemployment (or vulnerable employment); reduced demand, work hours, and earnings; higher costs for food and energy; erosion of savings and falling asset values; reduced access to credit (financial de-leveraging); tight liquidity conditions and reduced remittance inflows; reduced governmental spending on social welfare programmes and reduced private spending on food, health, and education; and child labour and sales of productive assets.

Indeed, most social indicators, predominantly health and education indicators, have been found to either deteriorate or improve at a slower pace during a macro-economic crisis (World Bank 2001). Deterioration may simply come from demographic changes as a result of outward migration of fertile age population groups; it may also come from compressed social services and narrowing down safety nets. Deterioration of health and education indicators is more severe among poor people or those at risk of poverty.

It has become evident that all forms of crisis (including financial and socio-economic):

- refer to the stake of survival of a system or social organization;
- involve negative changes and losses in the security, economic, political, societal, or environmental affairs/domains; and
- entail management efforts that are much more difficult and demanding than the respective of the routine periods should they be intended, of course, for survival/sustainability of the social organization.

At this point it is important to refer to the significant contribution of social and cultural anthropology regarding our knowledge of the particular ways through which people (in particular those experiencing a crisis) perceive, categorize, give meaning and act in critical social conditions. This contribution is eloquently presented and analyzed by Visacovsky (2017, p.12) who suggests that anthropology offers an innovative analytical concept of crisis situations:

'Crisis situations must be understood as special cases of the experiences of time. A crisis arises when we can recognize empirically that a discontinuity or rupture has occurred and time is perceived as *stagnant, stopped* or *frozen*. The order and the course of events assumed as *normal* are altered but not replaced by new ones. Everything seems to happen at the present time and future cannot be immediately imagined'.

This concept of crisis in the context of social anthropology followed earlier concepts of 'moral crisis' (Gluckman 1972) and 'crisis of meaning' suggested by Berger and Luckmann (1995). These concepts are linked to situations where the individuals are driven to act in different ways on account of diverse social rules and values, with no clear and distinct solution or vision. Especially interesting about these concepts is that they identify crisis as part of a process of social change meaning that the resolution of crisis presupposes the genesis of something new or at least different from the previous state of affairs. Crisis then is the *liminal* phase offering room to those experiencing the crisis in order to imagine other ways of social existence reversing or annulling altogether previous hierarchies, rules and cultures. It is exactly for this reason that Visacovsky (2017) considers crises as incubators of innovation associated with the creation of new views, practices, customs and social structures.

The anthropological contribution to our understanding of crises is very important because it represents a step forward to planning their resolution. Anthropological analysis made clear that narratives about the attribution of culpability of crises are crucial to framing the visions of the future and generation of scenarios for social transformation.

The present paper's basic assumptions to be discussed in theoretical terms and tested empirically in two country cases from the developed and developing world (Greece and Somalia, respectively) are the following:

- a) There are certain deterioration processes that turn a community in socio-economic crisis to a community suffering from reinforced DRs, unprecedented DRs, and ultimately from more frequent and more catastrophic disasters. The reverse is also true: High DRs activate socio-economic crises, particularly in cases of slow-onset disasters.
- b) High DRs and socio-economic crises in a specific community are causal origins of one another; their combination calls for an integrated treatment/governance.
- c) Policies that address the vulnerability and resilience dynamics which transform a socio-economic crisis into a high DR context and inevitably into an actual disaster are the only way to DRR.

The content of the following sections (1.2 and 1.3) is a theoretical discussion of the processes leading from socio-economic crisis to reinforced DR and vice versa.

1.2 The Path from Socio-Economic Crisis to Amplified Disaster Risk (DR)

It has been suggested that in the future it will be difficult to distinguish between natural hazard origin and human-induced crises. Socio-economic crises will trigger disasters, and conversely, high DRs will become more and more accountable for long-term socio-economic turmoil (Sapountzaki and Dandoulaki 2016). To understand this suggestion, we should just think about migration as a result of a drought crisis and refugee flows that are accountable for epidemics. But what are the underlying reasons and mechanisms that are produced by a socio-economic crisis to amplify afterwards existing DRs or generate new ones? A brief answer to this query might be the following: Escalating losses and negative changes in the crisis community or social organization elevate vulnerability and reduce resilience assets and opportunities.

It has become clear already that socio-economic crises turn up as simultaneous or successive compounds of adverse social and economic conditions entailing losses for collective and private agencies in the crisis community. It is reasonable to assume then that during a socio-economic crisis, susceptibility to loss increases and capacity to recover decreases. Consequently, all aspects of vulnerability in public, private, and social agencies deteriorate. At first, economic vulnerability of households, firms, and all sorts of organizations is affected adversely by loss of income and jobs, pension cuts, erosion of savings and falling asset values, reduced access to credit, and constrained funding. Human and social vulnerability also grows worse due to poverty; energy poverty; unemployment and job insecurity; a lack of access to welfare public provisions; reduced spending on food, health, and education; homelessness; and psychological depression. As a result of losses and negative turns, health, education, nutrition, and old and young age welfare indicators aggravate and often fall below acceptable standards. Examples of such indicators are proportion of population at risk of poverty and social exclusion, rate of population living in conditions of extreme material deprivation, early leavers from education and training, rate of participation in primary education, mortality, morbidity, life expectancy.

Institutions, public and private, are another victim of socio-economic crises; their institutional vulnerability heightens not only due to reduction of the respective public funding but also due to public agency mergers, staff shortages, a compression of public insurance budgets owing to unemployment, and so on.

Finally, physical vulnerability (referring to material structures, predominantly buildings and technical infrastructure) increases as well, basically due to increases in all other background aspects of vulnerability (i.e., institutional, economic, and social). Building, planning, and environmental regulations relax in an effort to attract investments and create jobs; safety and maintenance standards become looser and looser; maintenance works in

the building, transportation, and manufacturing sectors are cancelled or avoided due to shortfall budgets; and environmentally hazardous and technologically unsafe practices are followed in an effort of households, firms, and organizations to cut budgets and reduce costs. Examples of such dangerous practices in an effort to reduce economic vulnerability through increase of physical and health vulnerability are, for instance, moving to cheaper rent but unsafe housing buildings, using polluting wood, and refusing fuel for heating to avoid high energy costs.

The escalation of economic, social, human, institutional, and physical vulnerability translates into even faster escalation of territorial vulnerability due to systemic interrelations. To explain the situation in another way, we may recall the well-known 'Hazards of Place Model of Vulnerability' by Cutter (1996) and Cutter et al. (2003). According to the respective diagram, 'place vulnerability' may skyrocket as a result of increasing both 'bio-physical and social vulnerability'.

The worst aspect of vulnerability increase during a socio-economic crisis is that the extra vulnerability principally falls on the already vulnerable because it is these groups that are mostly hit by the socio-economic crisis (see section 1.1). In other words the already poor and vulnerable experience increase of their 'everyday vulnerability' (Lavell 2004) or 'base-level vulnerability' (Watts and Bohle 1993), notions which have been associated with permanent conditions of poor people, i.e. health problems, malnutrition, unemployment, income deficits, illiteracy, social and domestic violence, alcoholism, etc. (Villagrán de León 2006). Therefore, wealth, opportunity, and social welfare injustice aggravated by the crisis gradually leads to vulnerability injustice as well.

Increases in vulnerability in communities under crisis and respective territories leads to higher DR. This may result in an outbreak of disasters, even in the case of low-level hazards, where, moreover, their impacts are unevenly distributed. Finally, increases in human and physical vulnerability and environmental degradation that result from a socio-economic crisis may bring to light new, unprecedented technological, environmental, and biological hazards which can easily turn into disasters.

DRR depend largely on resilience and the critical query here is whether a community having experienced a socio-economic crisis can preserve and keep active resilience potential to face amplified risks. A brief general answer to the query is no, because resilience assets and other prerequisites, if pre-existing, might have been capitalized by the community to overcome the socio-economic crisis. More in particular, redundancy and diversity, which are critical preconditions of resilience, might be lost due to job losses, reduced earnings, an erosion of savings, sales of assets, falling asset values, and reduced access to credit. Other important resilience components such as self-sufficiency and autonomy might also be lost because communities under crisis are

usually subject to exogenous control as they are dependent on imported resources and outside lenders. Creativity and innovation show a mixed picture: on one hand they decline because of a lack of economic and other incentives on the other they thrive since crises have been recognized as incubators of innovation (see section 1.1). Networking shows a mixed picture also: some networks dissolve while new ones emerge during the crisis. Finally, flexibility becomes more difficult in times of crisis due to the decline of available assets and opportunities.

Additionally, private adaptations and resilience implemented at the socio-economic crisis stage may transfer vulnerability to the future, other agencies or the wider community further raising DRs (Sapountzaki 2012).

All in all, socio-economic crises seem to amplify pre-existing DRs, produce new ones and weaken the resilience potential of the crisis communities to face them, i.e., the potential for DRR.

1.3 The Path from High-Level DRs to Socio-Economic Crises

One of the scientific paradigms for the concept of 'disaster' associates disasters with crises as perceived by social anthropologists, i.e. as the collapse of the communication code (the system of meanings) within a community (Lagatoc 1988). This paradigm is based also on the work of Rosenthal et al (1989) who suggested that uncertainty which is an important descriptor of the crisis lies also at the heart of the theory of disasters. Even before the above-mentioned authors Quarantelli (1986) had suggested that 'crises' are the wider general category covering disasters as only one type of crisis situations.

A sound distinction of disasters from crises is made by Rosenthal et al. (1994) with their reference to the disaster of a Boeing 747 of the Israeli airline El Al which crashed in Biljmer, a densely populated residential area in Amsterdam in 1992. The cargo plane destroyed 266 apartments in two nine-storey apartment buildings and killed forty-three people. As Frandsen and Johansen (2016) remark the crash disaster offered the empirical basis to Rosenthal et al (1994) to develop their concept of 'crisis after crisis'. Frandsen and Johansen (2016, p. 40) interpreting the work of Rosenthal et al (1994) observe that

'...the event started as (1) a disaster due to the plane crash but it turned into an example of (2) urban crisis management and (3) a 'loose ends' crisis because...it was very difficult to distinguish between the real victims and pseudo-victims, i.e. unregistered migrants who claimed that they lived in the area, although they did not...; in 1996 the crisis turned into (4) a public health issue, since many surviving residents suffered from post-traumatic stress disorder; and lastly following the formation of a 1998 parliamentary commission of inquiry looking into the rights and treatment of the surviving residents the crisis turned into (5) a national political crisis in the Netherlands.'

Indeed, it is not rare for disasters to be followed by socio-economic and political crises. This is usually the case where, during recovery periods, central governments underestimate social issues and the needs of the homeless and display (while prioritizing the ruling party's recovery needs) large engineering works and/or macro-economic indicators. This is especially confirmed in the case of developing countries; instructive examples are the cases of post-disaster recovery after the 1985 earthquake in Mexico City and the 1999 landslide in Vargas state, Venezuela (Vale and Campanella 2005). According to the World Bank (2001), disasters such as earthquakes, droughts, floods, and landslides interrupt economic development from time to time and may cause sharp increases in poverty and a decline in the pace of human development. These disasters both hurt poor people in the short-term and eliminate their chance of escaping poverty in the long-term. The triggering factors and the profile of the socio-economic crisis after disasters depend greatly on the type of disaster. Droughts for instance, may result in heavy agricultural losses while leaving infrastructure and productive capacity largely unaffected.

Human and economic losses after disasters that may translate into a socio-economic crisis if not prevented and absorbed by the impacted society, include injuries and temporary or permanent disabilities; displacement of people and losses in human capital; break up of families and social networks; increased poverty, disease, and psychological trauma; losses of fixed capital and inventory; destruction of poor households' physical and social assets; changes in fiscal policies and disruption of social assistance programs; harm to current living standards; and decline of agricultural, manufacturing, and overall GDP (World Bank 2001).

So far, socio-economic crises have been considered in the present section as an after-effect of actual disasters. A further query is whether periods of high DRs, and not actual disasters, might also lead to socio-economic crises. It seems that this is possible indeed, especially in the case of slow-onset disasters related to critical resource or service scarcity. In such cases, there is no easy way to separate the stage of high DR level from that of actual disaster. In other words, there is an important overlap between the two stages. Indicative is the example of drought.

Drought starts as a meteorological drought; it then becomes sensible as agricultural (when the level of water in reservoirs and underground aquifers lowers rapidly), and only afterwards transforms into socio-economic drought. This means that there is a serious time lag between appearance of a drought as a hazard (i.e., the high DR stage) and manifestation of its socio-economic impacts (i.e., its development into a disaster). To be more specific, a divergence from the normal quantity and quality of agricultural output or lowering of the level of an aquifer may be important signs for an imminent long-term drought disaster. Insufficient precipitation may lead

to a decrease of soil moisture which is immediately recognizable by farmers, but the effect of this insufficiency on reservoir levels and actual water uses, such as water powered electricity, becomes sensible many months later. Besides, stored water resources are intended for multiple competitive purposes (e.g., irrigation, water power production, flood control, navigation, and recreation), leading to a gradual escalation of conflicts among water users.

It becomes evident that the stage of high drought DR preceding the actual drought disaster is featured by high-risk perception levels and conflicts among multiple agencies attempting to obtain access to water and other scarce resources (e.g., fertile land) for resilience to drought. It is exactly this stage that market speculation upon water and food price rising occur as well as a decline of water-dependent economic sectors (e.g., livestock farming, forestry, fishery, and energy). The repercussions may be unemployment, loss of income and fall of GDP, public health problems, inequalities regarding water accessibility, water users' antagonisms, poverty and migration, disruption of social cohesion, social agitation, and even armed conflicts. The armed conflicts for a sought-after area with water and pastureland have been a real historical problem in East African countries at the local, national, and supra-national level. According to Maystadt and Ecker (2014), the majority of conflicts in Somalia converge around the fertile river basins of Juba and Shabelle, and it is exactly this area in the central and southern part of the country where the guerilla Islamic movement is active.

On top of the socio-economic and sometimes geo-political crisis generated in regions by periods of high drought and desertification DR, a food insecurity crisis may emerge. According to FAO (2001), 'food security is a situation that exists when all people, at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life'. Food insecurity comes up when one of the prerequisites of food security is missing (i.e., food availability, access, stability, or biological utilization) (Gibson 2012; FAO 2001). Food insecurity may be either the cause or the end result of prolonged high drought DR and the socio-economic crisis ensuing; it may also be accountable for the activation or expansion of armed conflicts (Ebi and Bowen 2016).

When food availability decreases, food security changes into food insecurity, the worst scenario of which is famine. Food insecurity may be either temporary or chronic; only the chronic version translates gradually into high human vulnerability to hunger that finally leads to the famine disaster. This means that food insecurity is a crisis and not a disaster, a period of high DR that may lead or may not lead to the famine disaster. In this sense, famine does not hit unexpectedly; there is a considerable time lag between the prediction of famine and its actual

manifestation. Hence, during the food insecurity crisis period, famine prevention is possible. Should the famine disaster outbreak, it will confirm its man-made origin, revealing the international society's accountability and/or the making of false decisions in the crisis period (Ayalew 1997).

In conclusion, places and periods featured by high DR of the types that are related to scarcity of basic resources for human life are themselves crisis periods in the sense that critical decisions have to be taken in these periods to avoid/prevent the forthcoming disasters. On top of that, they are incubators of other forms of crisis (e.g., socio-economic, food insecurity, geopolitical, and civil war crisis). We can argue then that territories and communities running periods of high DR, especially when this is recognizable, perceivable, and measurable, will most probably experience consequently multiple crisis situations systemically connected with one another. However painful these situations are, they offer room for intense preventive/preparedness action and the last chance for disaster avoidance. It is much better for the international community and NGOs to organize and put emphasis on their support at this stage of critical decisions rather than on humanitarian assistance in the aftermath.

In the following sections, two country case studies indicate the channels and processes through which a socio-economic crisis turns into high DRs (Greece) and reversely a high DR condition produces a multiple crisis context (Somalia).

2. Testing the Theoretical Assumptions

2.1 Greece: From Socio-Economic Crisis to Amplified DRs

Historically, Greece is exposed to geophysical, meteorological, hydrological, and climate-related hazards, predominantly earthquakes, floods, heat waves, and forest fires. Exposure is higher in the Metropolitan regions of Athens and Thessaloniki due to high concentration within hazard-prone zones of people, economic activity, technical infrastructure, and other valued assets, as well as strong interdependencies among them. Of the exposures mentioned, those related to climate change (CC) hazards are expected to increase in the future (in frequency, duration, and severity), principally exposure to heatwaves, floods, and forest fires. According to Tolika et al. (2008), the Mediterranean basin will experience a much warmer climate in the future, with prolonged heat wave events, lower precipitation, and more frequent and intensive extreme rainfalls (Bank of Greece 2011).

However, the most important factor for DR is vulnerability: human, social, economic, institutional, and physical. Of these forms, what matters mostly is institutional vulnerability because, as Dynes (2006) and Cutter

(2006) argue, human, social, physical, and economic vulnerability of individuals, groups, and communities to natural hazards depends for the most part on institutional factors. Relevant examples are safety of public facilities, civil protection, and safety of hospitals, fire stations and other critical infrastructure, provisions for security of homes, water, food and work, disaster insurance, and the quality and security of the social welfare system. Beyond institutional factors, several social, economic, and political factors impact not only human, social and economic vulnerabilities but also physical and territorial ones. Such factors are social cohesion and exclusion, income inequality and poverty, household structure, unemployment, low education levels, morbidity and disability, lack of entitlements to access resources, risk information, and risk culture.

During the Greek government debt crisis (i.e., the sovereign debt crisis faced by Greece in the aftermath of the international financial crisis of 2007–2008, and the economic recession that followed [2009–2016]), almost every critical vulnerability factor deteriorated. In the paragraphs following, the evolution of the socio-economic crisis and its chain-impacts on critical vulnerability and resilience factors are presented.

As the great recession of 2007-2008–spread to Europe, the amount of funds lent from the European core countries to peripheral countries like Greece began to decline. Reports in 2009 of Greek fiscal mismanagement and revelations that previous data on government debt levels and deficits had been under-reported by the Greek government increased borrowing costs. Greece, then, could no longer finance its trade and budget deficits at an affordable cost. The Greek Ministry of Finance (2010) listed poor GDP growth, budget compliance, and data credibility as root causes of the financial crisis government debt and deficits. However, causes identified by others included excess government spending, current account deficits, and tax avoidance.

Attempting to face financial crisis, Greece required bailout loans in 2010, 2012, and 2015 from the International Monetary Fund (IMF), the Euro-group, and the European Central Bank, negotiating a 50 percent ‘haircut’ on debt owed to private banks in 2011. As compensation, the Greek government was forced to adopt ‘a series of ambitious multi-year adjustment programs to lower the fiscal deficit and public debt ratio, reduce domestic demand in line with supply capacity and increase supply and competitiveness so as to invigorate investment, exports and private sector growth’ (IMF 2013).

The financial turned to socio-economic crisis soon as a result of closure or bankruptcy of businesses; a rapidly falling GDP (recession) and loss of income; rapid increase of unemployment (from below 10% in the period 2005–2009 to around 25% in 2015); an unemployment rate amongst youth around the unprecedented rate of 59 percent (UN/Human Rights 2014); wage and pension cuts; elevation of direct and indirect taxation; an estimated

44 percent of the population living below the poverty line (Eurostat 2014); shrinkage of social welfare public provisions and social exclusion; and energy poverty, homelessness, forced migration, and high rates of depression.

In the 2014 Report (p. 16) by the UN Independent Expert on Foreign Debt and Human Rights it is clearly stated that ‘the prospects of a significant number of Greeks securing an adequate standard of living in line with international human rights standards have been compromised by bailout conditions’. Additionally, the UN Expert warned that more than 10% of the population lives in extreme poverty while Greece remains the only country in the Euro-zone where a comprehensive social assistance scheme serving as a social safety net of last resort is missing.

It goes without saying that the above mentioned turns dramatically deteriorated economic, social, human, and functional vulnerability of individuals, groups, institutions, and communities. Special emphasis should be placed on institutional vulnerability mostly affected by the crisis. Indeed, critical organizations and public agencies for civil protection and risk mitigation lost personnel, funding support, equipment and skills, and part of their overall operational capacity. Their decline has been the result of mergers, budget cuts, and phasing out of public organizations. As an example, forest protection policy institutions experienced cutting of budgets which used to be invested in the past in hiring seasonal fire fighters, procurement, and the maintenance of fire-fighting equipment, the clearance of forest fuels, and the opening of forest road network (Sapountzaki and Chalkias 2014).

The increase in institutional vulnerability had an additional impact on those already worsened by the crisis in terms of their human, social, and physical vulnerability. This is in line with the definition of institutional vulnerability by Parker, Tapsell et al. (2009) as the exposure and vulnerability of individuals, communities, or organizations to the uncontrollable adverse consequences of another organization’s critical shortcomings.

Not only vulnerability but also resilience dynamics amplified DR in the course of the Greek crisis. Resilience and adjustments of people, groups, and institutions to the socio-economic crisis impacted on the levels of exposure and vulnerability to natural and human-induced hazards, and their allocation in time and space. Some examples of these dynamics are (Sapountzaki and Chalkias 2014)

- households increasing their exposure and vulnerability to health risks by changing food consumption and patterns of appealing to medical care services;
- households increasing their housing vulnerability by moving to cheaper housing accommodations (of lower maintenance and building quality standards) in an effort to cut household budgets;

- businesses and households transferring vulnerability to the future by rearranging their housing or business loan repayment period;
- manufacturing, retail, and wholesale businesses transferring vulnerability to customers and consumers by turning to cheaper raw materials and low-quality goods and services to cut their costs;
- planning and other regulatory institutions aggravating building, housing, and territorial vulnerability by relaxing building, planning, and environmental regulations and safety standards to facilitate investment and create jobs;
- regional and local authorities, landed property owners heightening also housing and territorial vulnerability by avoiding maintenance costs in the building, transportation, and manufacturing sectors;
- low-income, already vulnerable groups increasing their and others' vulnerability to technological and environmental hazards by turning to practices technologically unsafe and environmentally unfriendly (e.g., wood-burning stoves).

Heightened vulnerability and expanded exposure in Greece translated soon into extremely high levels of DRs and frequent outbreak of unprecedented disasters. The most outstanding examples are the floods of November 2017 in Mandra, West Attica claiming twenty-four lives and the deadly forest fires of July 2018 in East Attica claiming almost 100 lives. The report on the provisional findings of the investigation of the first disaster by the Inspector General of Public Administration reads (*Kathimerini* 2017) as follows:

'Surely, the extremely intensive precipitation, limited spatial spread of the rainfall, the steep slopes of the surrounding mountains combined with the covered stream network, encroachments by building developers and forest cover extinction are conditions accountable for the tragedy in West Attica. However, the causes of the disaster should not be sought solely in the geomorphology of the area but primarily on societal and institutional factors. Exposure and vulnerability of the West Attica area had been known already since 2012, when it was recorded as a zone of high level flood risk (Directive 2007/60/EC). Nevertheless the area remained unfortified. Flood protection projects have been in place for years but the construction works have not started yet...and while the institutions responsible have been aware of the flood risk in the area they used to grant building permits for underground building spaces and allow for their residential use... debris clearing in torrents has not been carried out periodically and their encroachment has been tacitly allowed by planning institutions.'

Regarding the second disaster of forest fires in East Attica in July 2018, the notice from the prosecutor's office is still pending, but there are provisional findings by the team of the post-graduate course 'Environmental, Disaster and Crisis Management Strategies' of the Department of Geology and Geo-environment at the Kapodistrian University of Athens (Lekkas et al. 2018):

'The disaster in Mati settlement was a typical case of a wildland-urban interface fire that spread as an active crown fire...Strong west winds with velocity exceeding 90 km/h locally and their interaction with topography played a crucial role to the rapid downslope spread of the fire front...People who happened to be near the coast at the time were informed about the rapidly approaching fire not in the form of early warning by some authority but by people evacuating the uphill part of Mati settlement. Urban Planning (or rather the lack of it) in the area functioned as a trap for the evacuating population (i.e. lack of refuge areas, narrow streets, numerous dead ends, long building blocks)...Structural vulnerability of buildings (e.g. wooden or plastic open windows, surrounding spaces with dead biomass) has been accountable for the large number of totally destructed buildings... Finally, the escape attempt was not an organized evacuation procedure. This resulted in a traffic jam caused by people trying to flee the area in panic.'

All above findings evidence amplified institutional, physical, social, and economic vulnerability and low resilience owing, at least partly, to the socio-economic crisis. They are also indications of fading DR perceptions due to the public attention and action priorities turned to the problems of socio-economic crisis.

2.2 Somalia: From High Drought DR to Socio-Economic and Other Crisis

The climate category of Somalia (BWh and BSh) according to the well-known climatological map by Köppen² is the same as in the case of desert Sahara or the deserts of Australia (i.e. hot, desert, arid or semi-arid climate). In some way, geography has been unfair to Somalia since it has been constantly exposed to high drought DR contrary to the countries of the same northern tropical zone that enjoy a wetter climate. Somalia's high exposure to drought is also evidenced in the history of actual catastrophic drought events which alternate with normal periods of exposure to high drought DR however. According to table 1, the country has experienced at

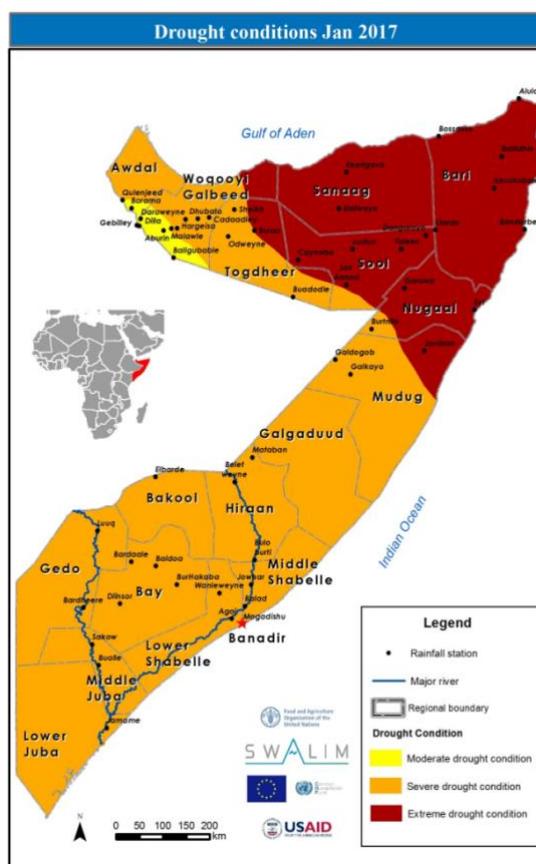
least sixteen severe drought episodes that caused many losses among the population, as well as other socio-economic impacts.

Exposure of population and agro-pastoral production to drought is not equally distributed across the country. A small part of the country in the west enjoys moderate drought conditions; on the contrary, an extensive area in the north-east suffers extreme drought conditions jeopardizing livestock-breeding (goats and sheep) (i.e., the basic economic activity of the area [Map 1]).

Table 1: The recent history of catastrophic drought events in Somalia. Source: Mutua and Balint, 2009; Masih et al, 2014; Al Jazeera, 2017; Carty, 2017; Adamopoulos, 2018

Map 1: Drought Conditions in Somalia, January 2017. Source: FAO-SWALIM, 2017

Date of Drought Onset	Number of People Affected
12/1964	700000
1969	30000
12/1974	230000
1980	No data
1983	No data
4/1987	500000
1988	53500
1/2000	1200000
6/2001	1100000
12/2001	500000
1/2004	200000
2005	No data
2008	No data
2010	260000 life losses alone for both years
2012	
2017-July 2018	No data



In any case, the majority of the country's territories are exposed to high drought DR and so are most parts of agro-pastoral activities. Livestock, including camels and bovine animals, and cultivations of sorghum, corn, and beans are located within high-drought risk zones. The fertile river basins of Juba and Shabelle are also located within these zones and their contribution is fundamental not only for the basic life necessities of the population but also for economic activity, since it is in this area that most part of exportable agricultural goods are produced. The basin sustains a wide variety of crops that are supported not only by rainfalls but also by natural water sources such as rivers, marshes, underground aquifers, and natural surface reservoirs. Natural vegetation such as forests, bushes, meadows, and pastures allows farmers to keep animals without being forced to follow a nomadic existence.

Since February 2017, Somalia has been faced with an unprecedented drought, and Somalia's Prime Minister declared the country in a condition of national disaster. Almost half of the population has been seeking urgent food aid, and the fears of a new famine have been constantly growing (*Al Jazeera* 2017). For the people in East Africa, this drought could be worse than the drought of the period 2010–2011 when it claimed more than 260,000 human lives. However, joint efforts by the Somali Government and local and international partners in 2017 averted another famine. Nevertheless, by the end of 2017, 6.2 million people were in need of humanitarian assistance and over 1 million people internally displaced (UNDP 2018).

The time periods in-between drought disasters are periods of high drought DR. They are featured by meteorological drought, fluctuations of rainfalls (in terms of frequency and season of occurrence) and increased temperatures, the first signs of reduction of agricultural production jeopardizing food availability, fears of famine, and high drought DR perceptions. Extreme climate conditions make difficult the preservation, storage, transportation, and distribution of food and other basic goods. These conditions cause an increase of prices of basic goods, making them almost inaccessible to the population as a result of lowered purchasing power owing to income losses associated with bad harvests. Nutrition then becomes insufficient, vulnerability of the population to disease and epidemics increases, and a famine crisis is considered imminent (Adamopoulos 2018).

During the food crisis of 2017, the prices of local food have increased rapidly, and poor households (including those who have been forced to move away from home) have not had access to essentials for living. It has been estimated that in June 2017, 6.7 million people (more than half of the population) was suffering from food crisis (FAO 2017). This was partly due to doubled prices of raw cereals (compared to previous-year prices) in the principal markets of central and south Somalia in January 2017. Additionally, the labour value collapsed, and thousands of people migrated (OCHA 2017). This has been indeed a socio-economic and humanitarian crisis that emerged after meteorological drought which signified a period of high probability for a drought disaster to follow (i.e., socio-economic drought and/or famine). This stage preceding drought disaster (which might or might not actually happen) features heightened risk perceptions among the population and a series of adjustments and resilience practices aimed at crisis management (Maxwell et al. 2016; Le Sage and Majid 2002; Adamopoulos 2018):

- Population groups move constantly with their animals;
- they make temporary movements to urban areas for temporary job searching;
- they take advantage of whatever opportunity (including humanitarian aid);

- they migrate as a last resort solution;
- they share their food with their animals;
- they buy water for their animals;
- in the case of migration, someone stays behind to protect the land and land ownership;
- they sell animals and other private property;
- they mortgage their land;
- they put their farmland up for rent, particularly in the riverine areas;
- they change their diet and nutritional habits;
- they exploit natural resources (such as wood for fuel) as much as possible;
- they adopt strategies for fair distribution of food;
- their households split in parts to minimize consumption and maximize resource acquisition;
- they borrow money or utilize their savings;
- they go begging, break the law, or prostitute themselves.

The above adjustments help the exposed population survive the drought, but on the other hand they might deepen the socio-economic crisis and generate environmental and geopolitical consequences. The already poor become poorer, illegality and corruption prevails, and competition for meagre resources (water and grassland) leads to severe conflicts at the local, national, and supra-national level. In periods of high drought DR, movements of nomadic herdsmen for water and grazing land increase, and different factions of them claim the same eligible area. Conflicts between these factions are usually resolved by their aged leaders according to traditional rules. However, high drought DR conditions make negotiations even more difficult. Conflicts also arise between livestock breeders or traders and farmers cultivating land for food.

In central and south Somalia, where climatic conditions favour banana tree and citrus fruit cultivations, the leaders of several factions activate their families to obtain control over these economically beneficial areas. In some cases, they aggressively displace indigenous populations in the valleys of Juba and Shabelle rivers in an effort to establish a new relationship between land owners and tenants (Adamopoulos 2018). Historically, the availability of light weapons was necessary for fertile land owners to protect themselves from pastoral tribes that invaded their areas. Proliferation of weapons gradually drove armed conflicts to take over and expand at the national level. The problem is that communities exposed to drought develop a collective sense of marginalization and disdain; consequently, they organize armed groups of guerrillas to fight against central government in order

to express their disappointment (Mutua and Balint 2009; Adamopoulos 2018). Though this sounds like a mechanistic approach, it has been estimated, however, that temperature increases of 1°C raises the probability of armed conflict in sub-Saharan African countries by 4.5 percent in the same year and 0.9 percent in the year to follow (Maystadt and Ecker 2014).

Conflicts are not limited to those inside the country. A serious and continuous conflict between Somalia and Ethiopia has lasted for more than fifty years, and it is widely known as the 'cross-border conflict'. This has turned into war from time to time (1964, 1977, 1982, 1998, 2006), and it is basically driven by economic interests and the efforts of either side to control the limited resilience resources (such as wells and pasture lands). Somalians have always been anxious and insecure regarding the degradation of their two basic water resources, the Juba and Shabelle rivers, because upstream areas are situated in the Ethiopian territory (map 1). Hence, high drought DR and desertification are the root cause of cross-border conflicts; though the two countries put forward other reasons, such as nationalist disputes or religious differences (Kendie 2007; Adamopoulos 2018).

In conclusion, high drought DR is a major cause of socio-economic crisis at the local, national, and supra-national level up to the extreme point of armed conflicts, civil war, and cross-border instability. High drought risk perceptions and consequent social struggles for resilience assets to face the imminent disaster lie at the roots of such crises. The resilience dynamics that are developed in the above crisis conditions deprive large parts of the population of their limited resilience assets and make the already vulnerable even more vulnerable. Shouldn't these crises be considered as turning points for taking decisions on imminent disaster prevention and/or fair re-allocation of resilience assets, the drought disaster will become an unavoidable fatality for thousands of vulnerable and non-resilient Somalis.

3. Conclusions and the Necessity of Risk Observatories

While socio-economic crises have been acknowledged as the aftereffect of disasters, their effect on Disaster Risk dynamics and the actual manifestation of disasters has not been recognized yet.

Regardless of their origin, socio-economic crises involve vulnerability and resilience dynamics. Socio-economic crisis may be either a precursor/cause of high DR situations or the consequence of the latter. If the origin of the socio-economic crisis of a society is a financial crisis, it soon translates to higher vulnerability (economic, social, institutional and territorial), lower DR perceptions, and lower resilience. If exposure to high DR

is the origin of a society's socio-economic crisis, it has actually resulted from high DR perceptions, social competition, and even social struggles for higher resilience.

The Greece case study indicated that socio-economic crises of financial origin cause expansion and the increase of all forms of vulnerability in private, public, and social agencies. The potential for actual disaster manifestation, even in the case of low-level hazards, rises rapidly, especially due to territorial vulnerability increasing faster than other vulnerable aspects (human, social, economic, institutional, physical) because of its systemic connection to each of them. While DR escalates, the potential for DRR lowers due to the gradual exhaustion of resilience potential, especially since the respective community is prioritizing overcoming the socio-economic crisis.

The case of Somalia indicated that the first stages of slow onset disasters, especially drought, are stages of high DR featured by signs of the upcoming catastrophe. In the case of drought, this is the stage of meteorological drought that may or may not drive socio-economic drought and consequently drought disasters, even famine. This preliminary stage is characterized by high-risk perceptions amongst the exposed population and hence conflicts with the limited resilience assets. Evidently, these conflicts are incubators of multiple crises (socio-economic, political, civil war, geopolitical) at all relevant levels (local, regional, national, supra-national). It should not go without saying that the crisis for control of the resilience to drought assets usually turns to the disadvantage and deterioration of conditions of the most vulnerable and least resilient, who are going to suffer most of the disaster's impacts.

The two case studies indicated that both low- and high-risk perceptions may adversely affect the capacity for DRR. In the first case, resilience to DR is depleted; in the second, high-risk perceptions result in a high demand for resilience, crises, and unfair reallocation of resilience assets, leading to a magnified catastrophe. Therefore, risk perceptions are a key issue for DR and DRR; however, very high and very low DR perceptions are equally problematic.

Socio-economic crisis periods, either as precursors or after-effects of high DR conditions are critical for DR mitigation and avoidance of actual disasters or reduction of their impact. No matter how painful these periods are, they offer the last opportunity for DRR. This is in line with the definition of crisis as a turning point of a social organization where important decisions have to be taken to avoid its collapse.

There are three basic messages out of the case studies. First, the transition from a crisis to high DR and an actual disaster (and vice versa) depends on vulnerability and resilience dynamics; DRR policies should address

and control these dynamics as soon as they are detected in the crisis period. Second, policies targeting a financial and socio-economic crisis should not be separated from DRR policies; anti-crisis measures and DRR policies should rather formulate a comprehensive and integrated policy package. Third, DRR policies overlooking risk perceptions are doomed to failure.

DRR policies in crisis periods should turn special attention to resilience and the holders of resilience assets. Only those who can be resilient (private agencies, social groups, or public institutions) are in a position to reallocate/redistribute vulnerability and exposure to DRs. DRR policy makers should bear in mind then that it is both possible for resilience to contribute to and/or undermine social justice, should the latter be considered in terms of distribution of risk and vulnerability. The establishment of multi-risk observatories in crisis periods and territories, to focus basically on vulnerability to hazards and resilience dynamics – and be based on the model of urban sustainability audits and environmental monitoring systems – might be useful for policy makers to monitor fluctuations of vulnerability; the impact on technological, environmental, and other risks; and any violation of human rights to safety.

To date the only Risk Observatories established at the national and supra-national level are (a) those monitoring, collecting and building information on single and multiple natural hazards (e.g. the French National Observatory of Natural Hazards -ONRN) and (b) centres monitoring epidemiological risks, or risks in occupational health and safety. However, these do not cover exposure, vulnerability, resilience and DR dynamics at the local/regional level, especially when these dynamics are strengthened as a result of socio-economic crisis conditions. It has been already evident that during crises new hazards emerge (principally manmade) and disaster occurrence becomes a greater probability owing to higher levels of vulnerability (usually unobservable and unperceivable) and lower levels of resilience. The worst aspect of this interaction between crises and incidental realization or outbreak of accidents, catastrophes and losses here and there, imply short- or long-term violation of human rights.

If adopted and established, Risk Observatories at regional or local level should serve three interrelated goals: (a) to produce information on escalating or newly appearing DRs in the region or locality, owing to vulnerability and resilience dynamics in certain sections/areas of the community/territory especially in crisis periods; (b) to correct overly high or low risk perceptions in crisis periods and establish a level of awareness commensurate with existing DR levels and (c) safeguard human rights relevant to safety and coverage of basic needs, and prevent their scattered, periodical violation, which is common in periods of socio-economic crisis and

high DRs. Such Risk Observatories, that support the above goals and integrate social protection with DRR, represent a deviation from traditional approaches considering different but interconnected shocks (e.g. economic crises and disasters) individually (see also UN/ESCAP 2013). They are supposed to perform the following functions:

- Collect data on losses caused by the socio-economic crisis those that increase everyday vulnerability, violate human rights or impede satisfaction of basic needs. This translates into recording of homelessness cases, dismissals, unsafe conditions at home or at work, sufferings from extreme material deprivation; also addressing policy recommendations to competent authorities.
- Identify conditions of increase of exposure and human-social-economic-physical-territorial vulnerability that may activate technological, natural, epidemiological or other hazards. This presupposes monitoring the degree of implementation of building, spatial and environmental planning regulations, and the degree of compliance with operational, functional and maintenance standards; also informing and keeping alert responsible institutions.
- Identify and locate conditions of increase of institutional vulnerability to natural hazards that is a prognosis of magnified losses in case of disaster outbreaks and emergency situations. This pre-supposes monitoring of changes in the building infrastructure, competences, personnel, skills, equipment, funding, stock inventories and other resources of emergency and civil protection services; also changes in the degree of observance of seismic design codes and other hazard-resistant regulations.
- Consider and survey resilience dynamics and “bad” resilience practices in crisis periods, causing unwelcome vulnerability reallocation.
- Release scientific risk information upon request and according to socially accepted ethics in order to adapt institutions’ and people’s risk perceptions with scientific risk assessments.

Performance of above functions presupposes the establishment of permanent two-way communication and cooperation channels of these risk and crisis observatories with single-hazard observatories (natural, environmental, technological) and research centres, emergency, civil protection and welfare institutions, NGOs, observatories for safety and health at work, supra-national institutions for human rights and the mass media.

Vulnerability and resilience dynamics are key determinants in the production of risks and disasters and backward and forward interconnections with crises. This is common knowledge among scholars in the field of disasters, but something almost inconceivable and unobservable not only by the general public but also the responsible authorities. Risk observatories performing the functions proposed above are envisaged as risk

information production and dissemination centres correcting misperceptions and giving rise to DRR and crisis resolution policies which are vulnerability and resilience-oriented.

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