

Working Paper

**ADAPT**  
www.adapt.it  
**UNIVERSITY PRESS**

Associazione per gli Studi Internazionali e Comparati sul Diritto del lavoro e sulle Relazioni industriali

# Preventing and Managing Natural Disasters: Welfare Systems, Employment Safeguards and Industrial Relations

## Some Research Notes

by **Michele Tiraboschi**  
ADAPT Scientific Coordinator

Working Paper ADAPT, 27 May 2014, No. 157

ISSN 2240-273X – Registrazione n. 1609, 11 novembre 2001 – Tribunale di Modena

A stark difference can be found in the attitude that public opinion, the media, as well as experts have towards natural disasters on the one hand, and technological ones, on the other hand.

Natural disasters (i.e. earthquakes, tsunamis, floods, hurricanes, and so forth) evoke a sense of helplessness and inevitability, arousing feelings of apprehension, anxiety, solidarity and human compassion. By contrast, a sense of anger and defiance emerges against environmental or technological disasters (as in the case of the Ilva steel plant in Taranto, Italy); the predictability of these events calls for justice, in order to find the perpetrators and attribute legal, political and institutional accountability.

The aim of this contribution is to assess the soundness of the juxtaposition between “natural disasters” <sup>(1)</sup> and “environmental or technological disasters” <sup>(2)</sup> taking into account the consequences from a labour law and industrial relations perspective. Because of the unpredictability of natural disasters, the role of the welfare system is limited to providing mere emergency support and first aid to the population and the affected areas in the aftermath of a disaster (*infra* §2). Conversely, because of the predictability of technological and environmental disasters, it is up to the courts to reconstruct the causal nexus and to impose compensatory and/or sanctioning measures on those held responsible in civil, criminal and administrative terms <sup>(3)</sup>.

The question that arises here – and that we try to address for the first time <sup>(4)</sup> – is whether the labour law and the industrial relations system may also provide a contribution in terms of prevention and proactive management of the consequences of natural disasters on individuals, economies and labour markets.

According to a widely accepted interpretation, technological or environmental disasters are attributable to human behaviour, thus implying that one can be held legally responsible or criminally culpable <sup>(5)</sup>. However, the same does not apply to natural disasters, generally deemed as completely unpredictable.

---

<sup>(1)</sup> According to a widely accepted definition in the relevant literature, the expression “natural hazards” refers to phenomena taking place in the physical environment which are harmful to men and which are caused by forces beyond them. In this sense, see, I. Burton, R. W. Kates, *Perception of Natural Hazards in Resource Management*, in *Natural Resources Journal*, 1964, 413, and I. Burton, R. W. Kates, G. F. White, *The Environment as Hazard*, Oxford University Press, 1978. The International Disaster Database of the Centre for Research on the Epidemiology Disaster (<http://www.emdat.be/classification>) further classifies natural disasters considering the following sub-categories: geophysical, meteorological, hydrological, climatological and biological disasters.

<sup>(2)</sup> “Environmental hazards” refer instead to those man-made phenomena that have an impact on the environment such as pollution, chemical contamination, and industrial accidents. See again I. Burton, R. W. Kates, G. F. White, *op. cit.* In these cases, The International Disaster Database of the Centre for Research on the Epidemiology Disaster (<http://www.emdat.be/explanatory-notes>) makes use of the wording “technological disasters”, which includes industrial accidents.

<sup>(3)</sup> See among others the contributions in G. Alpa, G. Conte, V. Di Gregorio, A. Fusaro, U. Perfetti (eds), *Rischio di impresa e tutela dell’ambiente*, Napoli, Edizioni Esi, 2012, and I. Nicotra, U. Salanitro (eds.), *Il danno ambientale tra prevenzione e riparazione*, Torino, Giappichelli, 2010. For a conceptual and theoretical approach to the problem of liability today, see cf. H. Jonas, *Il principio di responsabilità. Un’etica per la civiltà tecnologica*, Torino, Einaudi, 1990 and U. Beck, *La società del rischio. Verso una nuova modernità*, Roma, Carocci, 2000.

<sup>(4)</sup> Up to now, no contributions can be found in the labour law literature on these issues, at least in those covering industrial relations.

<sup>(5)</sup> See, in particular, Directive No. 2004/35/EC, inspired by solutions already identified in the *White Paper on Environmental Liability in 2000* ([http://ec.europa.eu/environment/legal/liability/pdf/el\\_full\\_it.pdf](http://ec.europa.eu/environment/legal/liability/pdf/el_full_it.pdf)), that addresses the issue of environmental liability, drawing a distinction between strict liability (damage caused by hazardous activities) and fault-based liability (damage to biodiversity in the performance of non-hazardous tasks).

This seems undoubtedly true when considering a series of natural disasters occurring one at a time, for it is impossible to foretell “where”, “how” and “when” each event will actually take place. Yet this interpretation shows some caveats if a broader and long-term perspective is taken <sup>(6)</sup>.

We know in advance that some areas are more susceptible than others to the risk of natural disasters. We are also aware that certain economic activities or industries in areas which are more susceptible to natural disasters can trigger technological disasters (so-called anthropogenic hazards) <sup>(7)</sup> such as the release of substances in the atmosphere or liquid spills, as in the 2011 Fukushima nuclear disaster.

Since the Industrial Revolution, human behaviour has contributed to increasing, albeit indirectly, the risk of natural as well as environmental disasters.

Technological innovation, demographic changes, social transformations and even simple economic activities <sup>(8)</sup> produced a significant impact on the surrounding environment and on certain geophysical and hydro-meteorological phenomena, at least in the long run.

The consequences of climate change on certain natural processes <sup>(9)</sup> are among the most contentious issues on which experts and scholars in the natural and social sciences have long been focused <sup>(10)</sup>.

---

<sup>(6)</sup> The critical perspective adopted in the present study to track the issues under investigation is groundbreaking, but not without a solid basis if we consider that even the most recent international literature has raised the problem of the limited number of contributions by economists on the prevention of natural disasters. This is especially true for labour lawyers and industrial relations experts who have never dealt with the matter for the reasons explained above. See, for all, L. T. Bang Vu, D. Hammes, *Dustbowls and High Water, the Economic Impact of Natural Disaster in China*, in *Asia-Pacific Journal of Social Sciences*, special issue No. 1/2010, especially page 122 where it is argued that “Research in both the social and natural sciences has been devoted to increasing our ability to predict, prepare for, and mitigate the costs of disasters. Curiously, despite the deaths, dislocation, and direct damage caused by natural disasters, few economists participate in developing this agenda. Nor have many attempted to answer the many economically relevant questions relating to natural disaster”. In the same vein, see E. Cavallo, I. Noy, *Natural Disasters and the Economy — A Survey*, in *International Review of Environmental and Resource Economics*, 2011, 63-102.

<sup>(7)</sup> Environmental or technological disasters triggered by natural hazards are referred to in the relevant literature as “Natech calamity” See E. Krausmann, V. Cozzani, E. Salzano, E. Renn, *Industrial Accidents Triggered by Natural hazards: An Emerging Risk Issue*, in *Natural Hazards and Earth System Sciences*, 2011, 921-929 and the references therein.

<sup>(8)</sup> See the recent *Report on the Hydrocarbon Exploration and Seismicity in Emilia Region* (in *Bollettino ADAPT* No. 16 of 22 April 2014): Final report of February 2014 of the technical and scientific commission established on 11 December 2012 by The Decree of the Head of the Civil Protection Department of the Leader of the Cabinet in charge of assessing the potential relationship between the exploration activities in search of hydrocarbons and the increase in seismic activity in the area affected by the earthquake in Emilia Romagna in 2012. On page 190, it is pointed out that “numerous reports describe authoritative and well-argued studies which demonstrate that the extraction and/or injection of fluids in oil or geothermal fields has been associated with the occurrence of earthquakes, sometimes even with a magnitude greater than 5”.

<sup>(9)</sup> *Climate Change, Impacts and Vulnerability in Europe 2012*, EEA Report No. 12/2012. See also the Communication From The Commission to The European Parliament, The Council, The European Economic and Social Committee and The Committee of The Regions, *An EU Strategy On Adaptation To Climate Change*, Brussels, 16.4.2013 COM(2013) 216.

<sup>(10)</sup> In addition to the vast literature on climate change, see again the *Final Report* of the Technical and Scientific Commission on the 2012 earthquake in Emilia Romagna, which identifies (8-9, 189-190 and 196) certain types of seismic activities that are, to different extents, directly related to the human activity, including anthropogenic earthquakes, induced earthquakes, and triggered earthquakes.

Past experience can help us predict – on the basis of the characteristics of each area and type of disaster – the possible consequences of a natural disaster in relation to human lives, damage to property and people, and the impact on the economy and on the labour market of the affected communities.

According to a recent report by the European Environmental Agency <sup>(11)</sup>, Europe and Italy are experiencing a surge in the number of natural and environmental disasters <sup>(12)</sup> that are caused by a combination of physical as well as technological and socio-economic changes. Between 1998 and 2009, Europe has reported 576 disasters caused by natural hazards that have resulted in an estimated 100,000 deaths and a loss of about 150 billion Euros with a serious impact on its economic stability and growth. Over the same period, more than 11 million people (out of an overall population of 590 million people in the member countries of *European Environmental Agency*) have been affected by a disaster caused by natural hazards. The impact of natural disasters in Europe in terms of loss of human lives has not been uniform: Italy and France have been hit the hardest (over 20,000 deaths each), followed by Turkey (18,000) and Spain (15,000).

We do not know “where”, “how” and “when” natural disasters originate, but we certainly expect them to occur at some point, in some areas more than in others. Thus, we can predict their consequences on the safety and integrity of people, buildings, infrastructure as well as their impact on stricken communities in economic and employment terms.

Moreover, not only is the wording “natural disasters” inappropriate <sup>(13)</sup>, but also anachronistic, being increasingly unsuitable to describe the phenomenon under investigation, for “It is human behaviour that transforms natural hazards into what we call natural disasters” <sup>(14)</sup>.

Consequently, if “natural disasters” are somewhat as predictable as natural ones, and if their direct and indirect consequences on people and things are increasingly exacerbated by human behaviour, then it becomes clear that they can no longer be categorized as instances of misfortune similarly to the way they are portrayed in the media and considered by the public at large.

Acknowledging this is important because it places emphasis on the relevance of prevention – not so much of the event itself – but of the consequences for people, local productions and the labour market, rather than merely focusing on emergency and recovery measures. With hindsight, prevention should also play a key role with respect to environmental or technological disasters. As the case of Taranto-based Ilva

---

<sup>(11)</sup> *Mapping the Impacts of Natural Hazards and Technological Accidents: An Overview of the Last Decade*, EEA Report No. 13/2010.

<sup>(12)</sup> According to the *World Disaster Report of the International Federation of Red Cross and Red Crescent Societies* (available at <http://www.ifrc.org>), Asia is still the most affected area, with more than 2,900 disasters between 2000 and 2010 (40% of the global total), which affected over 2 million people, with over 900,000 deaths and 386 billion dollars in damage.

<sup>(13)</sup> In these cases, the seriousness of the “disaster” can be conceived only by human beings, being these completely natural processes. See *Mapping the Impacts of Natural Hazards and Technological Accidents: An Overview of the Last Decade*, EEA Report, cit. 18.

<sup>(14)</sup> As pointedly noted by K. Annan, *Report of the Secretary-General on the work of the Organization*, General Assembly Official Records Fifty-fourth Session Supplement No. 1 (A/54/1), United Nations, New York, 1999, here page 2, 11: “Human communities will always face natural hazards — floods, droughts, storms or earthquakes; but today’s disasters are sometimes man-made, and human action — or inaction — exacerbates virtually all of them. The term “natural disaster” has become an increasingly anachronistic misnomer. In reality, human behaviour transforms natural hazards into what should really be called unnatural disasters”.

demonstrates <sup>(15)</sup>, it is important not to give attention to these issues only after the catastrophe occurred, through street rallies in the affected areas or in courtrooms.

The recent rise in natural, environmental and technological disasters <sup>(16)</sup> has led international institutions <sup>(17)</sup> and social science experts <sup>(18)</sup> to advocate measures aimed at reducing vulnerability – making this one of the pillars of integrated risk management <sup>(19)</sup> – and at minimising the impact on productive systems and labour markets <sup>(20)</sup>. As we will demonstrate further, it is based on this perspective that there seems to be much room for intervention, in terms of prevention and proactive engagement, both within the industrial relations and welfare systems, also considering labour legislation, which needs to be revised and adapted accordingly.

It is true, moreover, that workers – along with the elderly, the disabled, immigrants and children – are among the most vulnerable groups <sup>(21)</sup>.

When it comes to natural disasters, the dominant paradigm is still based on the geophysical component of risk and on a prescriptive and centralising approach to risk management, aimed at identifying the technology which is more suited to risk mitigation <sup>(22)</sup>.

Conversely, the paradigm of vulnerability is very different; in promoting the social, economic, political and cultural determinants of a disaster <sup>(23)</sup>, it emphasizes an approach based on subsidiarity, decentralization and cooperation to enhance risk prevention and management. This takes place on the assumption that the main conditions of vulnerability to natural, technological and environmental hazards are connected to pre-existing economic imbalances, power inequalities between social groups, educational levels, limited access to information and training – which are

---

<sup>(15)</sup> Cfr. R. Caragnano, M. Giovannone (a cura di), *ILVA: le relazioni industriali tra diritto alla salute e diritto al lavoro*, Bollettino speciale ADAPT, 22 maggio 2013, n. 13.

<sup>(16)</sup> See again *Mapping the Impacts of Natural Hazards and Technological Accidents: An Overview of the Last Decade*, EEA Report, cit.

<sup>(17)</sup> See The World Bank, *Building Resilient Communities - Risk Management and Response to Natural Disasters through Social Funds and Community-Driven Development Operations*, Washington DC, 2008 and World Economic Forum, The World Bank, United Nations, *Building Resilience to Natural Disasters: A Framework for Private Sector Engagement*, 2008.

<sup>(18)</sup> Among the many works advocating the contribution of social sciences to the prevention of disasters from the perspective of so-called *social resilience*, see P. Blaikie, T. Cannon, I. Davis, B. Wisner, *At Risk: Natural Hazards, People's Vulnerability and Disasters*, New York, Routledge, 2004 *passim* and page 11 for the definition of the concept of vulnerability as: “characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard”. See also K. Warner (ed.), *Perspectives on Social Vulnerability*, United Nations University – Munich Re Foundation, Source, No. 6/2007.

<sup>(19)</sup> See on the topic, *Mapping the Impacts of Natural Hazards and Technological Accidents: An Overview of the Last Decade*, EEA Report, cit. here, 22.

<sup>(20)</sup> See for instance M. F. McIntosh, *Measuring the Labor Market Impacts of Hurricane Katrina Migration: Evidence from Houston, Texas*, in *The American Economic Review*, 2008, 54-57.

<sup>(21)</sup> See A. Ono, *Employment of Disaster Victims Supporting the Reconstruction – Emergency Job Creation Program in Emergency Temporary Housing Support*, paper presented at the conference organized by ADAPT and the Japan Institute for Labour Policy and Training in Sendai City (22 November 2013) on *The Labour Market Impacts of Natural and Environmental Disaster*.

<sup>(22)</sup> See also D. S.K. Thomas, B. D. Phillips, W. E. Lovekamp, A. Fothergill, *Social Vulnerability to Disasters*, CRC Press, 2013, 4 (table 1.1.) and 5-10.

<sup>(23)</sup> Still on the topic D. S.K. Thomas, B. D. Phillips, W. E. Lovekamp, A. Fothergill, *op. cit.*, 4 (table 1.1.) and 10-20.

worsened by social security systems <sup>(24)</sup> – and to weak unstable relationships in society and in the production system <sup>(25)</sup>. In this context, the risks, or rather the consequences, of a natural disaster do not solely depend on the event itself but on the different degrees of resilience of individuals and social groups <sup>(26)</sup> to which the systems of welfare and industrial relations can contribute significantly.

---

<sup>(24)</sup> See P. Blaikie, T. Cannon, I. Davis, B. Wisner, *At Risk: Natural Hazards, People's Vulnerability and Disasters*, cit., 5. According to these authors, “hazard vulnerability is determined by social influences and power and not by the forces of nature”. See also T. Cannon, *Vulnerability Analysis and the Explanation of 'Natural' Disasters*, in A. Varley, *Disasters, Development and Environment*, John Wiley and Sons Ltd, 1994.

<sup>(25)</sup> See in this respect H. Toya, M. Skidmore, *Do Natural Disasters Enhance Social Trust?*, CESifo working paper No. 3905/2013.

<sup>(26)</sup> See again P. Blaikie, T. Cannon, I. Davis, B. Wisner, at *Risk: Natural Hazards, People's Vulnerability and Disasters*, cit., chap. II where the following formula is theorised: “Risk (disaster) = Hazard + Vulnerability”.