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# Journal of Sedimentary Research

An International Journal of SEPM

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Review accepted 18 March 2009



*Large-Scale Disasters—Prediction, Control, and Mitigation*, edited by Mohamed Gad-El-Hak, 2008. Cambridge University Press. Hardback, xiv + 576 pages. Price GBP 100.00. ISBN 978-0-521-87293-5.



The first 14 roman-numbered pages present a preface, an introduction about the editor, and a list of the 32 authors who have contributed to this publication. Thus, the book is a collective work, following a scientific meeting held in Cairo, Egypt, 13–15 March 2006, after the editor's demand and the request of the U.S. –Egypt Workshop on Predictive Methodologies for Global Weather-Related Disasters. This meeting occurred with the help and the financial support of the U.S. State Department and its National Science Foundation, which invited 50 North American (U.S.A. and Canada) and Egyptian, Sri Lanka, and Italian scientists: engineers, meteorologists and medical personnel. Thirty oral presentations were given, followed by numerous workshops.

The book has 21 chapters, preceded by a short introduction on the definitions and the art and manner to evaluate these disasters (Chapters 1 and 2, by M. Gad-el-Hak), such as The Twin Towers of the World Trade Center in Manhattan (and later in the book the 2003 dog-day or canular heat in France). Chapter 3, by R. M. Pidaparti, discusses various examples of large-scale disasters to illustrate the principal phenomena and the wide range of spatial and temporal scales involved. An overview of applicable multi-scale modeling techniques for investigating and predicting the behaviour of large-scale disasters is presented. Chapter 4, by I. Kelman, defines again risk, danger, hazards and perils, and focuses on the roots of these disasters, by definition prejudicial to human being, in opposition with events, called environmental, such as pyroclastic flows that result from normal environmental (i.e., volcanic) activity. Case studies of United Kingdom floods, in 2000, and a 2001 El Salvador earthquake are used to demonstrate the vulnerability of humans to disasters. Warning systems and educational tools are evoked to reduce disaster risk.

Issues in disaster relief logistics, medical response and health-care capacity are exposed in Chapters 5–7, by N. Altay, J. Elkholy, with M. Gad-el-Hak, and A. M. Radwan. Chapter 8 (A.F. Ghoniem), 9 (G.D. Bushnell) and 10 (H. El-Askary & M. Kafatos) discuss global warming, the energy crisis, sea-water irrigation and anthropogenic aerosol-related hazards. Chapter 11, by H.J.S. Fernando, A. Braun, R. Galappatti, J. Ruwanpura & S.C. Wirasinghe, is dedicated to tsunami (the plural is without an “s”!): causes and hydrodynamics, with a more detailed study of the tsunami of Banda Ace, 26 December 2004.

Chapter 12, by J.J. Riley, discusses the fundamentals of intermediate-scale dynamics of the upper troposphere and stratosphere. Chapter 13, by G. A. Grell, concerns coupled weather/chemistry modeling. Chapter 14, by R. Saravanan, is devoted to “dynamical” climate prediction with short-term weather forecasts; Chapter 15, by A.S. Zakey, F. Giorgi & J. Pal, presents a discussion of climate extremes within the context of the global-change debate, with a brief review of regional-climate modeling; it focuses on important climate changes and their consequences: floods, dog-days or canicules, hurricanes. One can regret that the remarkable amount of data collected since 1870 by the meteorological institutes of the various European and

American countries are not taken into account, specially regarding statistical studies on frequencies, strength, direction, etc., of these phenomena in the Atlantic and Pacific Oceans. Chapter 16, by R. Rasmussen, A. Dai & K.E. Trenberth, covers the water cycle and the impact of climate change on precipitation. Chapter 17, by T.T. Warner, is devoted to the vulnerability of arid land and deserts (but without any mention of the tragic situations of the Chad Lake and the Aral Sea). Chapter 18, by J. Pudykiewicz & G. Brunet, and Chapter 19, by J. Dudhia, discuss the history and the present of numerical weather prediction. Chapter 20, by A. Mahmood & M. Shokr, and Chapter 21, by W.L. Smith, introduce the International Charter “Space and Major Disasters” and weather-satellite measurements with the general principles of remote sensing and its applications. The charter was established to achieve cooperation among space agencies and space-system operators to deliver data and information to help civil protection, rescue and relief organizations in the wake of disasters. Some typical cases of disaster coverage by the International Charter are described to demonstrate the relationship between space data, service providers and the user communities; this regards the Nyiragongo eruption (17 January 2002), the southern Manitoba (Canada) and northern Minnesota (USA) floods in June 2002, the Galicia (Spain) oil spill (14 November 2002), the southern Asian tsunami (26 December 2004), the French forest fires (2003, 2005), hurricane Katrina (Mississippi, 2005), the Kashmir earthquake (8 October 2005), the Philippines landslide (February 2006), and the central European floods (April 2006). The last chapter (21) reviews how weather-satellite measurements can be used to predict some of these weather-related disasters, and a new geostationary satellite instrument concept is presented.

It follows from the above that the book is for physical scientist, emergency-room professionals and meteorologists rather than for naturalists or geologists (and, more specifically, sedimentologists). This is not surprising considering the background of the authors: all are civil or mechanical engineers, or medical staff. The book is therefore focused on human beings, as shown already on the first pages by the proposed disaster scale, which refers only to human losses; it is interesting in this context that the word “disaster” refers only to human beings, as I. Kelman analyses in Chapter 4.

The book presents also all the results from satellite observations, made since a few years, of natural (also called “environmental”), technological and/or man-made disasters, and suggests how to treat them: classifications, phases, medical response, recovery, statistics and maps. The references are all fairly recent, so that the “time” parameter is not at all taken into account; this implies, unfortunately, that the geological meaning and consequences of floods or hurricanes in the past are not dealt with. The absence of the time parameter thus transforms all natural events in a disaster. The book shows, however, that there are, in addition to terrorism and technical accidents, disasters caused by natural phenomena that, more or less frequent, affect densely populated areas. The best examples are earthquakes, tsunami and tropical cyclones (or hurricanes).

One must not forget that these three events with a very high energy are natural phenomena that are transformed into disasters only because of bad human management (such as the destruction of protective reefs in Maldivian atolls and elsewhere), because of an unsuitable and unfortunate localization of a town on a fault (Agadir, Morocco, for example, or Kobe, in Japan), because of the absence of survey buoys (which was responsible for the disaster caused by the Banda Ace tsunami, even though the Pacific Ocean is already equipped with a survey and surveillance net, although incomplete), or because of government failure, as shown by Cooper & Block (2006) for hurricane Katrina that destroyed Louisiana.

Most of the disasters described in the book are related to future climate change and sea-level rise. These are presented as facts, and not discussed, although recent research has shown that the sea level was higher than nowadays in some parts of the world only some 3000–4000 BP, and that the average temperature seems to decrease in some parts of the world instead of increasing. The concept of the “unique interpretation” is therefore not truly acceptable for a scientific work.

Some scarce new geological informations and illustrations can be found in the book; they concern eolian sedimentation, in the form of desertification (Chapter 10 on Egypt, India and

China; Chapter 17 on China; Chapter 21 on the African Horn) with dust transportation from one continent to another or to an ocean, detected by means of new techniques that allow identification by remote sensing not only of dust, but also of water vapor.

Figures and their captions are not always clear for non-specialist readers: color scales and units are sometimes missing, etc. References are also sometimes missing. As for geology, the legends of the field photos (Chapter 11) are incomplete or not exact (for example, palm trees are said dead (Fig.11.13), but they are actually still in place, straight and alive because of the relatively slow sea-level rise and the absence of winds). A so-called dune deposit (Fig. 11.14) should rather be interpreted as a newly cut cliff in attacked and ablated supratidal Holocene deposits.

The book is meant for the education of engineers, researchers and students in meteorology, climatology, remote sensing and civil care, and for the management in “megapolis” who have to face risks of all kinds. There are, however, obvious omissions, such as analyses of some of the most recent hazards and disasters, such as the mud eruptions as the one occurring now on Java (Indonesia). In conclusion, the book may be useful for students and administrations or government commissions to study disasters and for analysis how to treat them for care and medical urgency, as well as for future management and development of new areas, but it is certainly not the ultimate book on this topic, and for geologists there is disappointingly little news to find.

#### Reference

Cooper, C., and Block, R., 2006, Disaster: Hurricane Katrina and the Failure of Home Land Security: Times Books, New York.

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