Technological Forecasting & Social Change 80 (2013) 1674–1702

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

Plans never go according to plan: An empirical analysis of challenges to plans during the 2009 Victoria bushfires

Richard Oloruntoba *

Newcastle Business School, Faculty of Business and Law, Social Science Building, The University of Newcastle, 1 University Drive, Callaghan, NSW 2308 Australia

ARTICLE INFO

Article history:
Received 26 December 2011
Received in revised form 24 November 2012
Accepted 7 December 2012
Available online 22 February 2013

Keywords:
Disaster logistics
Black Saturday
Emergency and disaster planning
Disaster operations management
Victorian bushfires
Wildfires

ABSTRACT

Uncertainty is a major challenge for emergency, disaster and public safety decision-makers when planning and preparing for disasters and when executing plans. This research explores unexpected challenges to the Victoria State disaster plan before and during the "Black Saturday" Australian bushfires of 7 February, 2009 that significantly contributed to the scale of the disaster in which 173 persons perished. The article adopts Barry Turner's sequence model of intelligence failure to frame the empirical analysis. The article is based on content analysis of publicly available data and information complimented with face to face interviews of public-sector and non-government organization (NGO) emergency and disaster managers in Victoria. The research found inadequacies in strategic planning and in the appreciation of the community risk scenario in the response of public-sector disaster managers to the heat wave in the days preceding the bushfires. It also found failures in warning, command and control due to loss of sense-making and information difficulties on "Black Saturday" itself. The article suggests strategies that disaster and emergency response managers, planners and local authorities may consider in bushfire preparedness and response planning.

1. Introduction

For over 200 years rural fire-fighters, land managers, land owners, foresters and workers have every summer been confronting the threat of bushfires worldwide [1], and indeed bushfires, emergencies and other disasters have been the subject of high quality scientific research in the U.S, and around the world for over 55 years [2]. Bushfire studies have been approached from a range of disciplines and perspectives such as: planning and foresight methodologies; community vulnerability and risk; environmental change and management; urban and regional policy; chemistry, physics and fire behavior; forestry and eco-system management; incident management and response [3]; organizations in crisis; organising and co-ordination in crisis response; human behavior as well as personal safety decision-making [4].

For example, Keely et al. draw major lessons about wildfires and wildfire complexity in the context of southern California. They conclude that: the majority of large fires in southern California occur in the autumn under the influence of Santa Ana windstorms; young fuels such as young chaparral stands and fuel treatments are not reliable barriers to the rapid spread of fire; drought contributes to high dead fuel loads and long distance spotting; the remote wilderness areas of rugged terrain make access difficult which in turn results in anthropogenic ignitions being low, and stand age and fuel loads being high [2]. Keely et al. also argue that human factors such as untreated private properties and mountain homes built of highly flammable materials contribute to the complexity of managing wildfires.

Other studies have highlighted features of emergency coordination and decision making in response organizations. For example, Chen et al. examined the role of emergency coordination in response to crisis, its complexity, and the dynamic interdependencies amongst actors, resources, information and decision-making [3]. They discuss features of

* Tel.: +61 2 49217114; fax: +61 2 49216911.
E-mail address: Richard.Oloruntoba@newcastle.edu.au.

0040-1625/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.techfore.2012.12.002

emergency events such as the high risk of negative consequences if emergency decisions or coordination decisions are slow, inadequate or ill-informed. They also highlight the complexity involved in the coordination of response to crisis. Coordination complexity results from the vast network of tasks to be undertaken, resources to be allocated, multitude of actors to cohesively work with as well as the embedded interdependencies amongst actors [3]. Finally, Chen et al. highlight the challenges of limited and/or inaccurate information, decision-making under conditions of threat and uncertainty, limited resources, short-time windows, high risks and the unpredictable development of unfolding events [3].

Uncertainty and prediction is made more challenging by the complex nature of the tasks that must be carried out in crisis and emergency planning and response [4]. Many important tasks are loosely formulated and directed to ill-defined or possibly conflicting ends, and they often lack unequivocal criteria for deciding when the tasks have been accomplished. Often, such decision-making complexity is resolved by creating small areas of certainty that can be handled more easily [5]. At other times such complexity is simplified into a more precise form that ignores characteristics that are unstructured, "messy", difficult to specify or non-quantifiable. Such simplifying assumptions result in what has been termed a framework of "bounded rationality" [6–8].

Other authors have also analyzed the failure of role structure and sense-making in groups. For example, Weick examined the disintegration of role structure and sense-making in a small group of forest fire fighters in his case study of the Mann Gulch forest fire disaster in Montana [6]. The case study provided insights into why minimal organizations lose their sense of meaning and unravel when stressed by sudden external threats, in the Mann Gulch fire disaster case, when the small group of fire-fighters was met by sudden danger of unexpected fire.

In Europe, Xanthopolous in his investigation of the 2007 and 2009 Greek bushfires concluded that lessons of the 2007 fires were not being learnt, and as a result bushfire disasters are recurring [9]. He raised the issues of: fires initially being underestimated and therefore not fought aggressively; citizens' indifference to fire prevention and suppression efforts due to what he termed an "urban mentality;" and ageing populations who are physically unable to prepare for or fight bushfires. Xanthopolous also highlighted: an over-reliance on aerial fire suppression assets and neglect of ground based resources; reduced use of forest biomass for animal feed and energy production; and poor fire-fighting tactics [9]. Hence, there is a multinational abundance of available scientific research on bushfires.

Nevertheless, changing climate associated with rising global temperatures is expected to result in an increase in droughts thereby raising the bushfire risk further, likewise floods that may increase the growth of plant biomass around the world [10,11]. Coleman analyses the disaster databases maintained by the Centre for Research on the Epidemiology of Disasters (CRED) and by Emergency Management Australia. He found an exponential growth in disaster frequency that is largely due to an increase in traditional hazards such as bushfires in developed countries. He called for more empirical research to further understanding of such bushfire disasters [12]. As a result of the noted environmental, social, technological, organizational and human risks; and given the rising frequency, intensity, scale and impact of bushfire disasters, this article explores challenges to and inadequacies in plans and planning in the "Black Saturday" bushfire disaster in Australia. This helps us better understand some of the issues, causes and development of such large, slow-onset disasters in general. The research is further justified given that over 300 separate large fires and over 1000 smaller fires were burning simultaneously on "Black Saturday", with over 50% of the Murrindindi Shire council area of Victoria being under fire in spite of ample cyclical and seasonal bushfire experience in the State of Victoria [13].

The article adds to the abundant extant literature on large slow-onset natural disasters, bushfires, and "Black Saturday." The research differs from other published "Black Saturday" articles through the adoption of Turner's (1976) model on the organizational and inter-organizational development of disasters and the sequence model of intelligence failure for the analysis of the origins of disasters [7,8]. Turner's (1976) model is adopted to frame the empirical analysis [7,8]. The article explores and analyses the reasons for failures in foresight, warning, command and control and drastic departures from the disaster plan. It analyses how those failures contributed to the high level of mortality in the disaster in spite of early indicators of dangerous conditions in a prolonged incubation period [7,8]. As a result of this important consideration, the article:

- Explores significant challenges to planning, mitigation, communications and response that helped make "Black Saturday" a sizable disaster; and
- Discusses implications of such challenges for disaster planning and plans.

The scope of this empirical analysis includes: plans, planning, mitigation and response including the process of early warning, the communication and dissemination of that warning; and evacuation and operational decision-making. The study concludes by identifying broader implications while suggesting potential strategies for more effective emergency and disaster planning.

The rest of the paper is structured as follows: in Section 2, a description of Barry Turner's (1976) model is provided [7,8]; in Section 3, a historical overview of major Victorian bushfires from 1851 to 2009 is provided to highlight prior Victorian experience with bushfires as well as a discussion of the institutional and constitutional structure of emergency and disaster planning and management systems in Victoria. Section 4 comprises a discussion of the method and data collection techniques that was utilized to conduct the research, and the background to the "Black Saturday" case study. Section 5 comprises the empirical analysis and discussion of the findings of the research using Turner's (1976) model as an analytical framework [7,8]. The article concludes in Section 6 with concluding remarks about potential implications of such challenges for emergency and disaster planning and management worldwide.

2. Barry Turner's model

Turner's sequence model of intelligence failure seems useful in framing the analysis and discussion of the "Black Saturday" bushfire disaster [7,8]. Turner's sequence model is particularly useful because it pays particular attention to the series of events and features preceding a disaster unlike