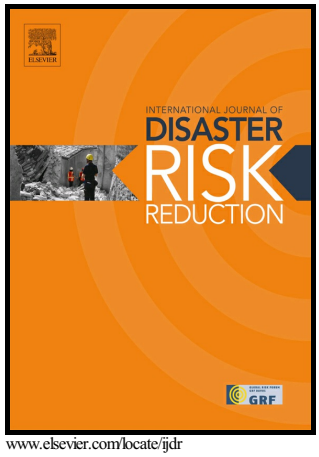
Disaster Management, Crowdsourced R&D and Probabilistic Innovation Theory: Toward Real Time Disaster Response Capability

Christian William Callaghan



www.elsevier.com/locate/ijdr

PII: S2212-4209(15)30069-8
DOI: http://dx.doi.org/10.1016/j.ijdrr.2016.05.004
Reference: IJDRR354

To appear in: *International Journal of Disaster Risk Reduction*

Received date: 15 September 2015
Revised date: 11 May 2016
Accepted date: 15 May 2016

Cite this article as: Christian William Callaghan, Disaster Management Crowdsourced R&D and Probabilistic Innovation Theory: Toward Real Time Disaster Response Capability, *International Journal of Disaster Risk Reduction* http://dx.doi.org/10.1016/j.ijdrr.2016.05.004

Disaster Management, Crowdsourced R&D and Probabilistic Innovation Theory: Toward Real Time Disaster Response Capability

Christian William Callaghan

School of Economic and Business Sciences, University of the Witwatersrand, Private Bag 3, Wits, 2050, South Africa.

Email address: chris.callaghan@wits.ac.za

Abstract

General agreement exists effective disaster management faces constraints related to knowledge sharing and a need for real-time research responses. Extreme case examples of disasters especially vulnerable to these challenges are global pandemics, or disease outbreaks, in which data required for research response are only available after the start of an outbreak. This paper argues the developing field of probabilistic innovation (innovation increasing probability of solving societal problems through radically increasing coordination of volumes of problem-solving inputs and analysis), and its methodologies, such as those drawing from crowdsourced R&D and social media, may offer useful insights into enabling real time research capabilities, with important implications for disaster and crisis management. Three paradigms of disaster research are differentiated, as literature is related to theory offered by post normal science, Kuhnian 'normal science' and Lakatosian 'structural science,' and the goal of achieving real time research problem solving capacity in disaster crisis situations. Global collaborative innovation platforms and large-scale investments in emerging crowdsourced R&D and social media technologies together with synthesis of appropriate theory may contribute to improved real time disaster response and resilience across contexts, particularly in instances were data required to manage response is only available after disasters unfold.

Keywords: Real Time Research Capability; Disaster Management; Probabilistic Innovation; Crowdsourced R&D; Social Media; Crowd-sourcing

INTRODUCTION

The emergence of social media and other recent technological advances has enabled crowd-sourcing (Howe, 2006) to effectively support disaster management efforts, as documented globally, for example, in New York (Hurricane Sandy), the Philippines, Japan (Tierney, 2014) and Haiti (Yates and Paquette, 2011). Crowd-sourcing can provide important support for decision making (Verschoore, Borella and Bortolaso, 2015), including under time pressures associated with crises. Crowd-sourcing and expertsourcing can be effective in managing community engagements and interactions (Woolley, Madsen and Sarangee , 2015), particularly under uncertain conditions. This paper argues the advent of crowd-sourcing and social media technology may support a new era in knowledge management, offering important advances in the development of disaster management theory, and extends theory relating to post normal science ((Funtowitz and Ravetz, 1994), Kuhn's notions of 'normal'