

Natural Disaster Preparedness: Incentivizing Public and Private Sector Collaboration

James L. Morrison¹

Abstract

Based upon an survey of those in mid-management positions in organizations within the manufacturing sector, there is the perception that the CEO maybe disconnected in the planning and implementing of practices to survive a natural disaster. Two issues that became apparent as a result of the study were the need for mobilizing public-private collaboration and for generating a new work culture that engages employees in the planning process at all levels of management. As a result, two new initiatives for enhancing leadership effectiveness in natural disaster pre-event planning are proposed.

Introduction

With recent images of the effects of Hurricane Sandy along the East Coast of the United States and the Oklahoma tornados in the Mid-West, it is evident that natural disasters can strike suddenly anywhere and at any time. According to Wahlstrom (2012), in April 2012 alone, 32 tornadoes were reported in Kansas, Colorado and Texas, while four major winter storms impacted the mid-Atlantic and Eastern United States earlier in the same year. In November 2012, a 6.6 magnitude earthquake rocked British Columbia. Since 1980, there have been 151 weather disasters in the United States with economic losses exceeding \$1 billion each. (Government Accounting Office, 2013).

¹ University of Delaware

Super storm Sandy cost the American economy at least \$75 billion in terms of property damage and commercial (business income) losses (Carper, 2014). A natural disaster is defined here as a sudden calamitous event that is the result of atmospheric and other geological imbalances that threatens the viability of an organization and is characterized by the disruption of operations, confusion, and even death of employees.

The magnitude of the destruction of property resulting from natural disasters has become enormous. According to the United Nation's Office for Disaster Risk Reduction (2013), economic losses from disasters worldwide have been approximately \$2.5 trillion since 2000. Whether a fire, flood, hurricane, tornado or earthquake, the consequences of such events can be significant not only for an organization but also a surrounding community. The ability of organizations to recover quickly from a natural disaster directly benefits not only employees but also their families, friends, and customers. Thus, it is time to determine if the leadership utilized by the CEO of today's companies is supportive for enhancing natural disaster preparedness.

According to research reported by Tierney, Lindell and Perry (2001), much attention has been devoted to analyzing natural disaster preparedness on the part of individual households and that of government. However, the private sector has been largely ignored. In a study of leadership effectiveness in natural disaster preparedness completed in 2012, we gained some insight as to the degree the CEO has prepared workers to anticipate tasks to be undertaken that will be helpful for surviving an ordeal of significant magnitude. In this regard, as supply chains for organizations become more global in structure, the issue of natural disaster preparedness becomes more complex possibly requiring a radical change in strategies adopted by their CEOs.

Framework for Analyzing Natural Disaster Preparedness

According to Drabak (2001) and Bankoff (2004), natural disasters such as earthquakes, hurricanes or volcanoes are not only difficult to predict but also can result in shutting down an organization totally, whether a non-profit, for profit, or public entity. Although natural disasters are generally perceived as having a low probability of occurring, they nevertheless pose a major threat to the survival of an organization (Jackson & Dutton, 1988; Shrivastava, et al., 1988).

What is extremely troublesome is that employees in organizations typically have little time to respond rationally to a catastrophic event unless they have been prepared beforehand. (Quarantelli, 1988).

Drabak (2001) describes preparedness as a process of pre-event planning to address complications that are likely outcomes of a natural disaster, such as: (1) loss of key personnel; (2) conflict over authority and decision-making; (3) loss of operational capacity; (4) supply chains interrupted; (5) disruptions to the personal and economic welfare of worker families; and (6) destruction of surrounding community infrastructure. Moreover, natural disaster preparedness goes well beyond protecting internal company operations, thus increasing the complexities surrounding the designing of systemic practices for addressing impacts from a catastrophe.

Hutchins, Annulis, and Gaudet (2008) point out that researching natural disaster pre-event planning generally has been an overlooked area in the field of organizational leadership. In their view, past research has primarily been on post-event occurrences and learning from an analysis of the consequences of such catastrophic events. Correspondingly, they point out that natural disaster pre-event preparedness needs to be enhanced in terms of attention to and resources allocated by the senior leadership. Gathering information about the current process used by senior leadership for putting plans into place that result in a better prepared organization to survive a natural disaster is the focus of this analysis.

Study Conducted

In 2012, a study was conducted that collected data from those most affected by the occurrence of a natural disaster; in this case, managers who have responsibility over daily operations. The purpose of the study was to gain insight as to how those in mid-management positions perceived the effectiveness of the CEO in overseeing organizational preparedness in regards to natural disasters. The CEO is generally observed as the key player in getting anything done in an organization. This research attempted to gain access to the perceptions of those in mid-management positions in organizations specifically in the manufacturing sector. In this regard, manufacturing is an extremely important sector in the American economy.

Statistics from the National Association of Manufacturing (2009) reveal that the interruption in the production of goods is likely to result in devastating consequences to the livelihood of millions of workers and consumers. Manufacturing supports an estimated 17 million jobs in the U.S.—about one in six private sector jobs. Nearly 12 million Americans (or 9 percent of the workforce) are employed directly in manufacturing (National Association of Manufacturers, 2009).

Sample Used

Using the American Business National Data Base (2012) of 50,000 managers, a random sample of 1000 managers was selected. The sample for the study was 120, representing 12 percent return. Being an online survey, the rate of return was expected to be in this range. In terms of the region of the country, the sample was well distributed throughout the country with 54 managers from coastal states (those bordering either the Atlantic or Pacific Ocean or the Gulf of Mexico); 24, from North Central States (those in the Northern ½ of the Country); and 34, from South Central States (those in the Southern ½ of the Country).

Validity and Reliability of Online Survey

The survey instrument was submitted to a panel of 9 managers situated in manufacturing based companies in the Delmarva peninsula. These individuals were employed in companies located in New Jersey, Delaware, and Maryland. After getting feedback from them, revisions were made on the survey instrument. Based on this process, the data gathering instrument was determined to have content validity. A Cronbach Reliability Test (1951) was performed in which a coefficient of .87 was calculated, which is well above the .70 generally required for determining survey reliability. The resulting instrument consisted of 20 questions of which those 10 pertaining to the topic of this manuscript have been delineated in Table 1 and Table 2 along with the mean scores of responses of the 120 managers in the sample.

Statistical Procedure Utilized

Using a 5-point rating nominal scale to collect data, the Kruskal-Wallis nonparametric independent samples test was conducted to determine if the region of the country in which the CEO was located had impact on the approach used in natural disaster preparedness.

Due to the fact that there were few responses in the strongly agree and strongly disagree categories, responses to the 5-point scale were regrouped to +1 to signify agree or strongly agree; 0, for no opinion; and -1, for disagree or strongly disagree. By grouping responses into three categories, a sufficient number of responses was generated for statistical measures to be calculated.

Overview of Data Collected

Based upon the overall mean scores of perceptions of managers as to the effectiveness of their CEO in overseeing natural disaster preparedness planning, there appears to be general disagreement that their senior leadership has been effective in this regard. (Table 1) Using a rating scale where +1 indicated CEO being effective, -1, ineffective, and 0, no opinion, the overall calculated negative means indicated that the managers perceived their CEO as demonstrating ineffective leadership in regards to being proactive ($m = -.34$), to attending to needs of employees and their families ($m = -.48$), to having backup systems to communicate with employees ($m = -.33$), to having effective rescue procedures in place ($m = -.36$), to conducting regular reviews of disaster preparedness ($m = -.34$), and to coordinating strategies with organizations in the public sector ($m = -.05$). However, there was a perception that their CEO had been effective compiling up-to-date information about their organization's natural disaster risks ($m = +.32$). (Table 1)

Table 1: Overall Frequency Distribution of Perceptions of Managers of The Effectiveness of Their CEO Overseeing Natural Disaster Preparedness (N=120)

Survey Items	-1	0	+1	Mean ^a	Var.
Up-To-Date Data on Organizational Risks Compiled	39	4	77	+.32	.874
Regularly Review Natural Disaster Preparedness	70	21	29	-.34	.714
CEO Proactive in Nat. Disaster Planning	78	5	37	-.34	.849
Effective Rescue Procedures in Place	78	7	35	-.36	.820
Have Back-Up Systems to Communicate with Employees	73	14	33	-.33	.818
Attend to Psych., Social, and Fin. Issues of Employees and Their Families	82	13	25	-.48	.672
Coordinate Strategy with Public Agencies	55	16	49	-.05	.871

Note: a: -1 = Ineffective; 0 = no opinion; +1 = Effective

Work Culture. In terms of working environment, there appears to be a lack of engagement on the part of managers in the design and planning for a natural disaster. Managers appear to be outside the planning process with their input limited. They generally perceive their CEO as being ineffective for seeking suggestions from them ($m = -.15$), for conducting a natural disaster exercise ($m = -.54$), and putting together a thorough pre-event planning process ($m = -.38$) (Table 2).

Table 2: Overall Frequency Distribution of Perceptions of Managers of The Effectiveness of Their CEO for Establishing a Work Culture to Engage Them in the Planning Process (N=120)

Work Culture	-1	0	+1	Mean ^a
I have made suggestions directly to senior administrators to enhance pre-event practices.	59	20	41	-.15
I have personally participated in a company natural disaster exercise within the past year.	83	19	18	-.54
I am satisfied with the thoroughness of our current natl. disaster pre-event planning proc.	81	4	35	-.38

Note: a: -1 = Ineffective; 0 = no opinion; +1 = Effective

Region of Country. In analyzing responses of managers by region of country, there were generally, with one exception, no significant differences in perceptions. Using the Kruskal-Wallis Test for independent samples for comparing responses of 50 managers situated in coastal states, 24 in north-central states, and 46 in south-central states (Table 3), there was only one item where there was a significant statistical difference; that being, the perception of having a well-qualified chief natural disaster risk officer in place. In this regard, there was a significantly greater degree of disagreement with this perception of those situated in organizations in a coastal state than the other two regions of the country ($p = .026$). In terms of coordinating planning of natural disaster strategies with public agencies, there was general disagreement that this was occurring. No matter what part of the country the organization was located, there were similar degree of disagreement in this regard.

Table 3: Comparative Analysis of Perceptions of Managers of Their CEO Oversight of Natural Disaster Preparedness by Region of Country (N=120)

Item	Ob. Ex ^c	Ob. Ex.	Ob. Ex.	Mean ^d	T-Stat ^b	df	Signif.
Back-up Communication Systems in Place	-1	0	+1				
1 ^a	32 (30.4)	4 (5.8)	14 (13.8)	-.36	1.585	2	.454
2	16 (14.6)	4 (2.8)	6 (4.6)	-.50			
3	25 (28.0)	6 (5.4)	15 (12.7)	-.22			
Risk Officer in Place							
1	40 (33.8)	3 (2.9)	7 (13.3)	-.66	7.337	2	.026*
2	15 (16.2)	3 (1.4)	6 (6.4)	-.38			
3	26 (31.1)	1 (2.7)	19 (12.3)	-.15			
CEO Proactive							
1	36 (32.5)	2 (2.1)	12 (15.4)	-.48	1.919	2	.383
2	14 (15.6)	2 (1.0)	8 (7.4)	-.25			
3	28 (29.9)	1 (1.9)	17 (14.2)	-.24			
Rescue Proc. In Place							
1	37 (32.5)	2 (2.9)	11 (14.6)	-.52	2.899	2	.235
2	14 (15.6)	1 (1.4)	9 (7.0)	-.21			
3	27 (29.9)	4 (2.7)	15 (13.4)	-.26			
Up-to-date Risk Data							
1	21 (16.3)	2 (1.7)	27 (32.1)	.12	4.649	2	.098
2	7 (7.8)	2 (1.8)	15 (15.4)	.33			
3	11 (15.0)	0(1.5)	35 (29.5)	.52			
Reg. Review of Prep.							
1	32 (29.2)	11(8.8)	7 (12.1)	-.50	2.598	2	.273
2	14 (14.0)	3 (4.2)	7 (5.8)	-.29			
3	24 (26.8)	7 (8.1)	15 (11.1)	-.20			
Coordinate with Public Agencies							
1	26 (22.9)	5 (6.7)	19 (20.4)	-.14	2.855	2	.240
2	12 (11.0)	5 (3.2)	7 (9.8)	-.21			
3	17 (21.1)	6 (6.1)	23 (18.8)	-.13			

Note: a - 1 = 50 Coastal States; 2= 24 North-Central States; 3= 46 South-Central States

b - Kruskal-Wallis Independent Samples Statistical Measure

c - ob = observed; ex – expected

d - -1 = disagree; 0 = no opinion; +1 = agree (Rating Scale)

- significance at the .05 level

Enhancing the Leadership of the CEO

The findings of this study support a proposal that the CEO can be more proactive (1) for creating a work culture where suggestions from others at varying levels of management are sought; and (2) for bringing external organizations, such as governmental agencies and non-profit agencies, together for designing coordinated planning strategies. While the CEO is perceived as being focused on collecting data on organizational risks, that individual appears to be isolated in terms of generating incentives for engaging employees in the process of planning. For example, the findings of this study suggested that managers generally perceive their CEO as being somewhat disconnected from them. One reason could be that CEOs do not pay as much attention to disaster planning since they are preoccupied with shareholder issues and stock value, as well as other daily operational needs. (Augustine, 1995). In this regard, the findings of this study support the conclusion that the CEO is not personally attending to disaster preparedness to the degree that managers would like; and this is in spite of recent tragic events (such as tornadoes, earthquakes, and flooding) over the past several years. Therefore, it may be argued that a new more connected leadership style on the part of the CEO in particular for mobilizing today's workforce for becoming increasingly engaged in natural disaster preparedness planning needs to be undertaken.

It may also be argued that natural preparedness planning needs to go beyond that typically conducted primarily internally. Currently, there appears to be marginal attention on the part of the CEO to coordinate planning strategies with organizations external to operations. Where the private sector is traditionally known for its ingenuity and corresponding innovative efforts for producing new products and services, similar leadership on the part of the CEO may help bring public and private sectors together for designing more effective systematic practices that extend into the community. It is argued here that the time may have come to move the planning process in the private sector into a more collegial effort. In this regard, the CEO must become more engaged in demonstrating leadership that results in collaboration with public governmental agencies or non-profits to develop more integrative approaches to natural disaster preparedness--rather than planning and acting alone in isolation.

Call for New Public Policies

Therefore, since managers in this study perceive their CEO as generally being somewhat aloof in their planning efforts associated with preparing employees for surviving a natural disaster, a new process needs to be initiated that is broader in scope and reflective of the interdependency among organizations and surrounding communities. In this regard, an enhanced holistic strategic planning process may need to be generated. The new challenge appears to be how to bring organizations in the private, public and non-profit sectors together when in the past there has been a natural tendency to remain internally focused.

In this regard, as an outcome of their research, Dahlhamer and D'Souza (1997) suggested that direct intervention by government may be necessary to raise the level of natural disaster preparedness among business leaders in particular. They suggested the possibility of having businesses receive tax breaks for engaging in natural disaster preparedness planning activities. However, it has been over a decade, and there continues to be very little effort in attempting to implement this aspect of new tax policy. Natural disaster preparedness in the private sector continues to lag as reinforced in this research. In order to provide momentum towards a new tax incentive policy, it may be time for the central administration at the Federal level to hold a national conference by bringing together CEOs to engage in designing an appropriate tax policy along these lines. Through such a conference held in Washington, DC, and with the presence of the President, it would give visibility to an important issue that is currently costing billions of dollars at each event. Since organizations in the private sector are directly connected to the infrastructure of the community in which they are located, relying on local utilities to supply water and electricity, using roadways to move products and services, and referring to local emergency personnel to assist those in need, it seems feasible that the CEO should take an active role in the planning process.

In order to motivate CEOs to attend such a national conference, it can also be argued that an alternative approach to generating interest in a more holistic planning process is a new public policy that initiates a tax penalty for those organizations in the private sector that do not design integrated plans with local public officials and leaders in the non-profit sector.

The dilemma associated with current public policy is the effect of rewarding reward communities for not coordinating their prevent planning efforts since the Federal government provides funds (or low-cost loans) to rebuild infrastructure, commercial facilities, and family residences. Therefore, communities that are subject to vast destruction can be significantly upgraded by using by Federal tax dollars. In order to remedy this unintentional subsidy attached to the rebuilding of such communities, it seems reasonable that a new public policy be instituted whereby those leaders of organizations in the private sector who avoid taking on this preparedness responsibility are subjected to a tax penalty that results in providing funds to support the renovation of communities in which they are located. Such an option may be part of the debate for incentivizing CEOs to attend a national conference to design a policy that they would find acceptable. Being part of the planning process is better than sitting on the sidelines for these CEOs since the outcome of a new tax policy can be a positive incentive or negative one. In this regard, they could have input as to what direction they would like their Federal government go.

The irony is that the data collected from this study revealed that although CEO is perceived as effective in compiling current information on an organization's natural disaster risks, he or she is perceived as being less involved in leading oversight practices in general. Therefore, it is concluded here that a revolutionary approach may be required to both change (1) the work culture within organizations in the private sector to enhance employee engagement as well as (2) the operating style of senior leaders for developing more comprehensive holistic plans to mitigate the horrendous effects of a sudden natural disaster

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