

SME Resilience to Extreme Weather Events: Important initiatives for informing policy making in the area

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Abstract

Enhancing the resilience of local communities to weather extremes has gained significant interest over the years, amidst the increased intensity and frequency of such events. The fact that such weather extremes are forecast to further increase in number and severity in future has added extra weight to the importance of the issue. As a local community consists of a number of community groups such as households, businesses and policy makers, the actions of different community groups in combination will determine the resilience of the community as a whole. An important role has to be played by Small and Medium-sized Enterprises (SMEs); which is an integral segment of a local community in the UK, in this regard. While it is recognised that they are vital to the economy of a country and determines the prosperity of communities, they are increasingly vulnerable to effects of extreme weather. This paper discusses some of the exploratory studies conducted in the UK on SMEs and their ability to cope with extreme weather events, specifically flooding. Although a reasonable level of awareness of the risk was observed among the SMEs, this has not always resulted in increased preparedness even if they are located in areas at risk of flooding. The attitude and the motivation to change differed widely between SMEs. The paper presents schemas by which the SMEs can identify their vulnerability better so that they can be populated among a community of SMEs, which can be taken forward to inform policy making in this area. Therefore the main contribution the paper makes to the body of knowledge in the area is a novel way to communicate to SMEs on improving resilience against extreme weather, which will inform some of the policy making initiatives in the UK.

Keywords: Extreme Weather Events, Flood risk, Resilience, SMEs

1. Introduction

The world in recent years has seen a number of Extreme Weather Events (EWEs) causing large losses of life as well as significant economic losses. As a result, cumulative economic and social costs of extreme weather related events have been increasing significantly. For instance, the number of major floods in Europe has risen from one per year between 1900 and 1974 to 15 a year between 1993 and 2001 (Dlugolecki, 2008). The UK is no exception to the effects of flooding and many parts of the country have recently faced extensive damage due to its effects. According to the Pitt Review and the Environment Agency, flooding of 2007 affected 48,000 homes and about 7,000 businesses in the UK and caused damage to the value of approximately £3 billion (Pitt, 2008, Chatterton et al., 2010). Flood risk in the UK is expected to further increase in the future, mainly due to the impact of climate change (Evans *et al.*, 2004). Costs of flooding, consequently, are also expected to further escalate, with significant consequences for world economies (Stern, 2007).

The devastation caused by flooding is felt mostly by the immediate local communities. As a local community consists of a number of community groups such as households, businesses and policy makers, the actions of different community groups in combination will determine the resilience of the community as a whole. Small and medium-scale enterprises (SMEs) constitute a significant portion of the UK business community. In the UK, more than 99% of private sector enterprises fall within the category of SMEs (BERR, 2008). They account for more than one half of employment creation (59%) and turnover generation (52%) (BERR, 2008), and are thus considered to be the backbone of the UK economy. However, they are often affected disproportionately by natural hazards when compared with their larger counterparts (Tierney and Dahlhamer, 1996, Webb et al., 2000, Alesch et al., 2001) due to their increased vulnerability. The aim of the paper is to assess the vulnerability of small businesses to extreme weather events and then to explore the SME awareness and their ability to cope with extreme weather events. The paper then presents schemas by which the SMEs can identify their vulnerability better so that they can be populated among a community of SMEs, which can be taken forward to inform policy making in this area.

2. Vulnerability of SMEs against extreme weather

It is argued that SMEs by their very nature have not got access to large financial and human resources. As a result they have limited opportunities to recover from any adverse condition and their ability to turnaround their business quickly from a loss making one to a profit making one. Further, a significant majority of SMEs are based amongst the rural population and their operations are fundamentally linked to the prosperity of local communities (Bannock, 2005). Therefore SMEs both individually as well as in networks and communities may be hit disproportionately hard (Finch, 2004) when faced with extreme weather events. In addition, as most of the SME owners live in the same properties as their businesses they are often hit twice by EWEs; as local citizens and as business owners (Runyan, 2006). Therefore the economic argument to reduce the vulnerability of SMEs is getting stronger in many industries and contexts. The vulnerability of SMEs could also be dependent and sensitive to the specific industry to which it belongs. For instance, Morris (2010) presents examples of industry based variations on SMEs when faced with extreme weather from the South West of England.

According to Morris (2010), the agricultural sector is directly vulnerable to changes in the climate and the wet weather in the summer of 2004 caused a major financial damage on the sector. The food and drink sector on the other hand may be affected by long term weather trends. Whilst severe flooding caused increased risks to water and Transportation infrastructure in the recent times in the UK, restricted availability of water could cause problems throughout the production and manufacturing processes (Sussman and Freed, 2008). Morris (2010) also shows how the construction sector has become increasingly vulnerable due to extreme weather events due to a number of direct and indirect effects such as muddy site conditions, disruptions to the transport infrastructure and damage to key infrastructure (such as drainage). Sussman and Freed (2008) also point out that certain construction processes may be negatively affected by extreme summer temperatures, while design standards may need to be upgraded as the climate changes.

3. Research method

This research had an exploratory phase and a detailed reflective phase. During the exploratory phase an exploratory survey was carried out with SMEs to gauge the awareness of extreme weather events and their uptake of coping measures against extreme weather events. During the reflective phase this paper reports of 2 cases where SMEs faced extreme weather events and the appropriateness of their coping measures.

4. Awareness and adoption of Resilience measures

Across SMEs there is a lack of knowledge and awareness of the potential impacts of extreme weather, with many SME managers and decision-makers not realising how vulnerable their businesses are. To test this phenomenon a questionnaire survey was carried out with the assistance of the Federation of Small Businesses (FSB) in London, UK. The SMEs chosen belonged to the Greater London area in the UK and they belonged to many industries / sectors. Out of the questionnaires distributed we received 140 usable questionnaires for our analysis and their relevant industry representations were as follows (see Figure 1).

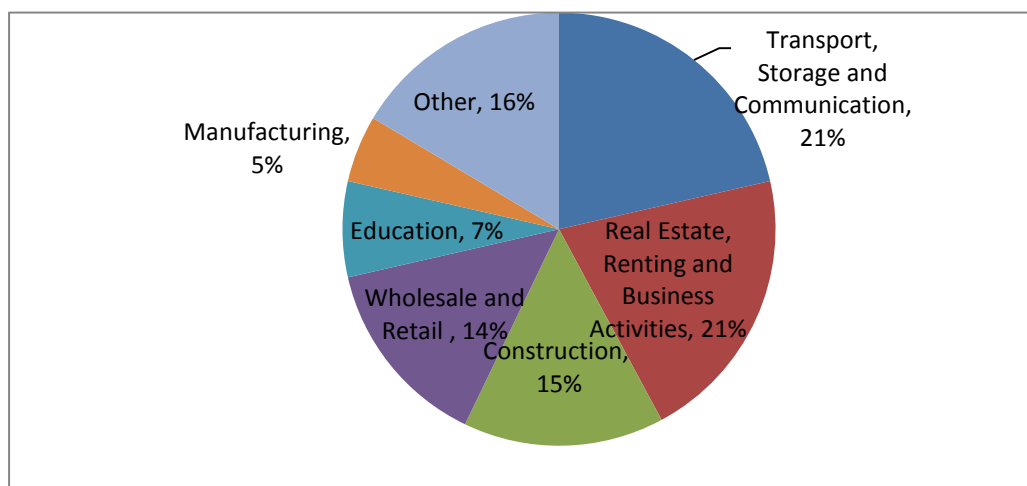


Figure 1: The composition of 140 SMEs surveyed and their industry representations

Out of the 140 SMEs surveyed approximately 60% have faced an extreme weather event situation during 2005 – 2009. The types of extreme weather events that they have faced are as follows (see Figure 2).

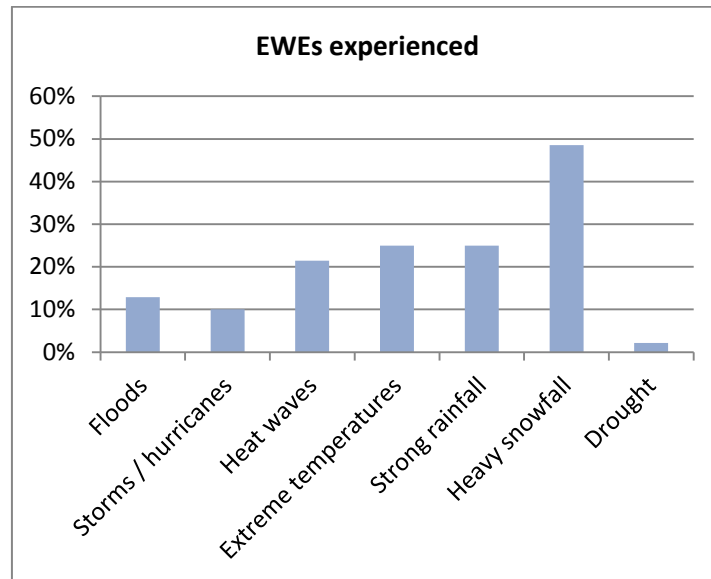


Figure 2: Types of extreme events experienced by SMEs.

Out of the businesses that experienced EWEs, 84% have been impacted negatively. However, not many have implemented coping measures for any extreme weather events. Their position with regard to adopting of coping measures against extreme weather is as follows.

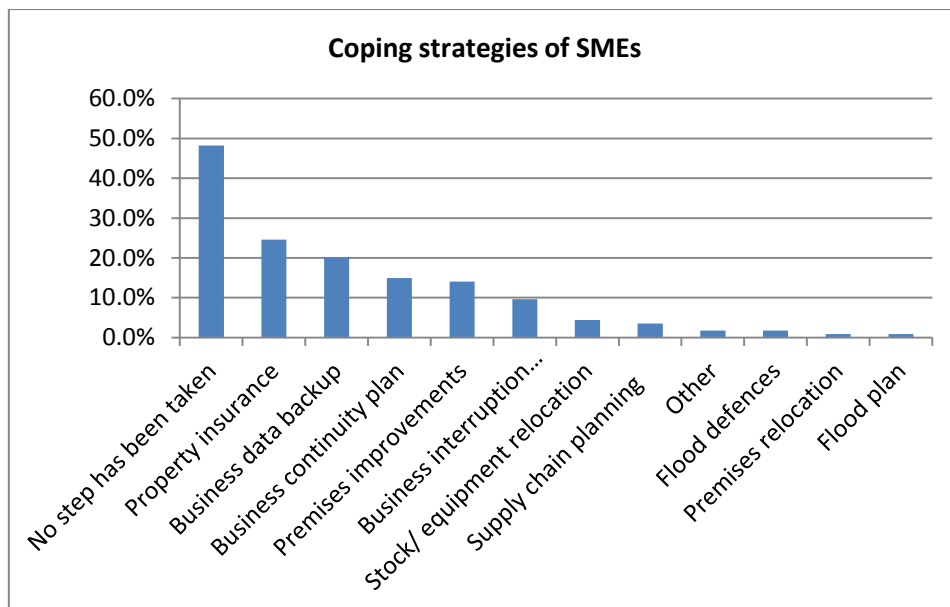


Figure 3: Coping Strategies of SMEs

As shown in Figure 3 nearly 50% of the SMEs did not employ any coping measures and those who adopted any measures were very few. We then looked at SMEs who have on previous occasions faced some negative consequences due to extreme weather (mainly flooding). Figure 4 shows the coping measures adopted by SMEs who faced negative consequences.

<i>Property level coping mechanisms</i>		<i>Other strategies for business continuity</i>	
<i>Premises improvements</i>	19%	<i>Business data backup system</i>	23%
<i>Stock / equipment relocation</i>	7%	<i>Business continuity plan</i>	17%
<i>Flood defenses</i>	3%	<i>Reviewing property insurance for EWEs</i>	14%
<i>Relocation of business premises</i>	1%	<i>Business interruption insurance</i>	9%
		<i>Planning and contingency measures for supply chain disruptions</i>	6%

Figure 4: Coping measures adopted by SMEs who faced negative consequences due to extreme weather events in the past

Although the survey sample is small, at a very early stage of this exploratory research, it presented us with interesting results to take this research initiative forward. Based on the questionnaire survey analysis, we could argue as follows.

- SMEs have experienced numerous extreme events as shown in Figure 2.
- Experiencing an event had not led them to adopt a broad range of coping strategies against such events (as indicated in Figure 3)
- Where the SMEs developed new coping strategies, these were an extension of their existing approaches for risk management/ transfer rather than radical approaches to minimise the impacts of future EWEs (as indicated in Figures 3 and 4, the very low take up of coping measured despite being affected by an extreme weather event in the past).

The reflective phase that is next undertaken will further analyse some of the coping measures taken by SMEs and their appropriateness. The schemas will then be introduced to communicate to the SMEs and their networks of the importance of reacting against extreme weather event risk amidst the consideration of other factors that are pertinent to the specific SME business context.

5. Reflective analysis and discussion

The schemas that are introduced have been adopted based on Johnston (2011), where climatic trends, events, impacts and consequences (to the business) is represented in a way that makes it easier to draw an easy link between the risk of a weather event and the consequences to the business. The

interviews that are reported in this paper were conducted with 2 SMEs. SME 1 is an interior decorator (with less than 10 employees) and SME 2 is a retail grocery again with less than 10 employees. SME 1 has been doing business for the last 4 years and SME 2 for the last 25 years.

SME1 used its business premises for multiple purposes; as a showroom, workplace and to store material and finished products. It was flooded in 2007, within the first year of its inception, and was put out of business for 3 months. Figure 5 shows the main consequences that were created on SME1 by the flood event. As the business already had property insurance cover as well as business continuity insurance cover, some of the damages were recovered from insurance. SME2 has been flooded once in the year 2007 (See Figure 6). This has put it out of business for about 6 months, and has taken about further 2 months to start trading fully. Although the damages were met by the property insurance cover, it has lost income for the entire period it was out of business, and claimed that the business never managed to reach the pre-flood status. However, this has not resulted in any other protection measures being implemented, except for having property insurance which it already had by the time of flooding. Business owner considered that there “is only a limited amount of preventive measures that you can take” against flooding. The business was content with the transfer of risk through insurance, and recognised that it will have to get back to business as quickly as possible if it floods again.

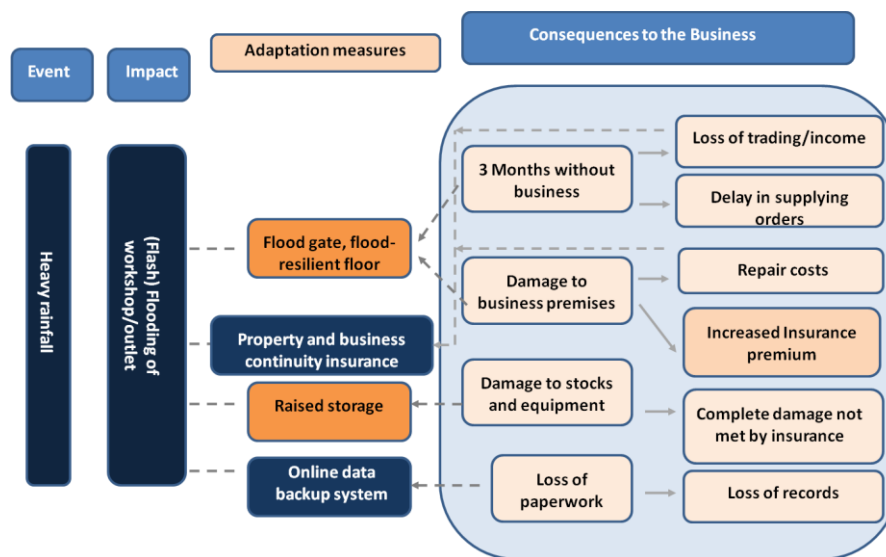


Figure 5 – SME 1 after adopting adaptation measures

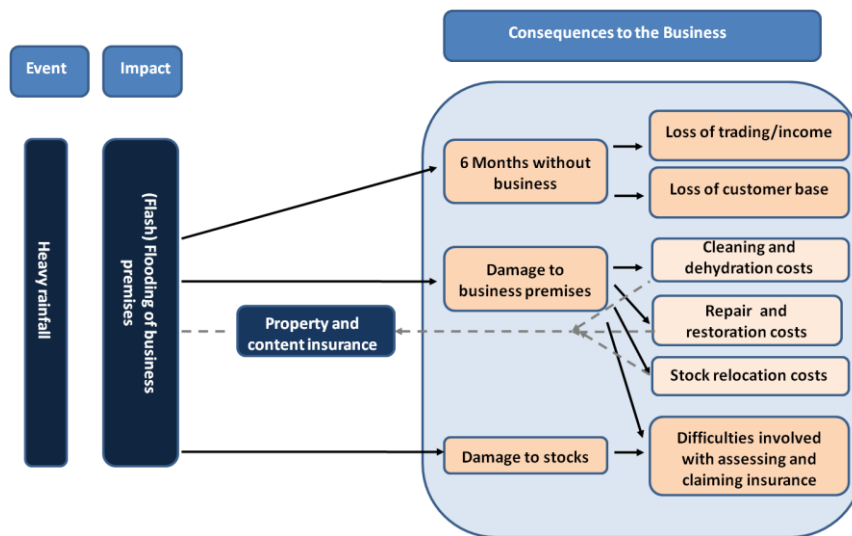


Figure 6: SME 2's consequences of heavy rainfall

6. Conclusion

Both Figure 5 and Figure 6 above were utilised to communicate the effect of extreme weather to the SMEs to demonstrate how appropriate coping measures will eventually have an effect on the business processes of the SMEs. The business benefits will influence the SMEs in this category to take up some of the measures and be able to acknowledge the opportunities and costs of the process. As the questionnaire survey identified the major problem and the barrier in the SMEs' uptake of coping measures against extreme weather events was the lack of motivation due to the complex decision making process involved, the above schema will perhaps enable SMEs and their network partners to implement coping measures more vigorously. These schemas and the broad community engagement strategies for extreme weather events will be further explored during the conference sessions at the resilient cities conference.

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