

# Northumbria Research Link

Citation: Ingirige, Bingunath and Wedawatta, Gayan (2018) SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. In: The Routledge Companion to Risk, Crisis and Security in Business. Routledge Companions in Business, Management and Accounting . Taylor & Francis, pp. 224-236. ISBN 9781138643109

Published by: Taylor & Francis

URL:

This version was downloaded from Northumbria Research Link:  
<http://nrl.northumbria.ac.uk/id/eprint/35670/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)

# **SMEs DEFENDING THEIR BUSINESSES FROM FLOOD RISK: CONTRIBUTING TO THE THEORETICAL DISCOURSE ON RESILIENCE**

## **INTRODUCTION**

Evidence suggest that flooding has become a significant threat affecting Small and Medium-sized Enterprises (SMEs) in the UK. Previous research has identified vulnerability of SMEs to various disruptions and challenges. Their vulnerability to disruptions arises virtually by definition because of the small scale of their human and financial resources (Bannock, 2005). For instance, research has found that SMEs suffer the most in times of crisis and are the least prepared of all organisations (Ingirige et al, 2008) hence an important proponent in crisis and security of business. Flooding in many forms are expected to further increase in number and severity in future, due to climate change impacts (Environment Agency, 2005; Stern, 2007; Munich Re Group, 2008). Flooding can also cause both immediate and secondary impacts. SMEs can be severely affected not just by the immediate impact but also due to the sometimes ‘slow burning’ secondary impacts. Damage to business premises and resultant temporary and permanent business closures may result in loss of jobs, negatively affecting incomes and further hindering recovery efforts of local communities (Tierney, 2007) affecting the society at large. Such wider economic and social impacts are not normally accounted for in monetary terms; as opposed to direct physical damages in relation to flooding. Therefore, without a coherent strategy it is difficult for policy makers to address the overall consequences of flooding and improve their capacity of managing their risks better. This has become a growing problem and cannot be taken lightly. For example, a recent survey found that the financial cost of severe weather events to have been just under £7,000 on average for each affected SME out of a survey sample of 1199 SMEs in the UK (FSB, 2015). This has necessitated the businesses,

especially SMEs who are said to be highly vulnerable to flooding when compared with larger businesses (Crichton, 2006), to implement various coping strategies in order to defend their businesses from flood risks and better prepare themselves to face the future flood risk. The aim of the paper is to contribute to the theoretical discourse on resilience with specific reference to improving preparedness of SMEs against flood disasters in the UK. Thereby this paper adds to the broader domain of crisis and security of business.

## **BACKGROUND LITERATURE FORMING THE RESEARCH PROBLEM**

Adopting measures to avoid or to control flood disasters and disruption has received much attention from policy makers and scientists in the UK as revealed by the Strategic Defence and Security Review (HM Government, 2010). Due to significant impact on communities during the recent years and resultant public and media attention, flood risk management has emerged as a top agenda item for the relevant policy makers as having a significantly high risk in terms of economic, social and environmental consequences.

The UK Government's view in terms of flood mitigation is not just about blanket solutions such as constructing flood defences in key risk areas, but also to set in motion a strategy of community participation in adopting measures of flood resilience so that the community displays adequate levels of participation in decision making. Within this context, DEFRA's (2011) report is an important landmark as it identifies that communities at risk of flooding should learn to live and adapt to flooding by implementing adjustments to their property rather than relying totally on insurance or the Government to invest in expensive schemes. Despite this policy move, there have not been widespread measures or initiatives that have emerged to implement the policies in practice. Many cities and towns that are at risk of flooding are abundant with SMEs whose existence is central to the survival and vibrancy of communities living in those cities and towns, mainly due to their ability to generate employment (BIS, 2012).

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

From a numerical standpoint, BIS defines an SME as “any enterprise with less than 250 employees” (BIS, 2010). Their vulnerability to various disruptions arises virtually by definition because of the small scale of their human and financial resources (Bannock, 2005). SMEs, have been reported as one of the most vulnerable groups worst affected by the impacts of flooding (Crichton, 2006; Pitt, 2008; Wedawatta et al., 2012). Therefore it is important to investigate resilience measures that will enable SMEs to sustain their businesses. Blackburn and Smallbone (2008) who has reviewed SME behavior widely argues that SMEs cannot be treated as scaled down versions of large businesses. They have unique characteristics that determine how they respond to challenges and opportunities. Hence, it is pertinent to consider SME behavior, challenges and their impacts as unique in comparison with other types of businesses. Herbane (2015) for instance, identifies that in the context of SMEs their ability to respond to any acute business interruption such as that caused by a natural hazard such as flooding is less well understood. Some of the formal managerial tasks such as formal planning is not often the practice in SMEs as such a sudden event that impacts an SME presents them with unique challenges that sometimes can eliminate them completely in the market. For example, the Centre for Economics and Business Research Ltd (CEBR) predicted an additional 2,000-3,000 business failures (in the UK) as a result of the disruptions caused by the heavy snowfall in 2009, with a significant proportion of these coming from the construction sector (McWilliams, 2009).

According to Ingirige et al (2015), as SME owners are often based locally, they are likely to be affected by disasters in two fronts; as business owners and local residents, creating significant psychological stress and trauma. This view is prevalent in many countries and it is valid in most parts in the UK as SMEs dominate many local areas. Since their existence has been established in the local areas for a very long period of time (e.g. local bakeries, snack bars, retail outlets etc.,) it makes it difficult for SMEs to move to another area. Therefore, it is

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

in their interest to increase their ability to be more resilient to flood events. Further, SMEs are an integral component in local community cohesion. As local businesses aiding community connectedness, SMEs can play a significant role in developing disaster resilience and recovery of local communities. For this to happen, it is vital that SMEs themselves are made resilient by integrating DRR in business planning; a practice that is seldom implemented as of now (Ingirige et al, 2015).

Resilience measures to protect from flooding can be grouped into structural (e.g. community flood defences and individual property protection measures) and non-structural (e.g. business continuity measures and adjusting and re-aligning business processes). Structural measures aim to reduce flood risk by controlling the flow of water whereas non-structural measures seek to manage flood risk by building the capacity of people to cope with flooding in their environments (Jha et al, 2012). The Environment Agency has predicted that flood defences managed by them (structural measures) had protected about 100,000 properties from flooding in the case of 2007 summer floods, which affected many parts of the UK (Environment Agency, 2009a). Still, over 55,000 properties were flooded due to that event (Pitt, 2008). The Environment agency still believes that despite increased investment in flood risk management about 500,000 properties will still be left at high risk of flooding by 2035 due to various localised flood situations not covered by the main community flood defences (Environment Agency, 2009b). Surface water flooding, for instance, caused by the combined effect of heavy and prolonged rainfall and extreme ground saturation is difficult to prevent and the community wide structural flood defence schemes, which have been built to resist overflowing of rivers, do not prevent surface water flooding. Therefore, despite the high investment in community based structural flood resilience schemes, it is inevitable that appropriate property level measures at a more micro level are taken to increase flood resistance and resilience of at-risk properties. Furthermore, some of the large community flood defence schemes located on river

banks, and coastal flood defence schemes might not have the flexibility to cater to changing climatic conditions such as sea level rise and the more intense and prolonged rainfall patterns that have been experienced recently in many parts of the world. Flood disasters in the past have shown that some of the older paradigms such as 'flood control' and 'flood defence' sometimes cause more problems than they solve (Ingirige and Wedawatta, 2015; Kelman, 2001). Instead, contemporary researchers argue that the modern communities from a sustainability and resilience point of view are learning to live with rivers (ICE, 2001) and emphasise continuity by 'living with risk' (UNISDR, 2004). This suggests that the current trend is to sustain business continuity despite any imminent threats of flooding rather than finding somewhat easier propositions to relocate.

It is practically very difficult based on expensive large scale structural flood defence schemes to protect every property at risk of flooding as they have been designed to cater to larger regions. Smaller pockets within those regions can therefore still encounter flooding at an individual property level. It is therefore important to study adapting individual properties at risk of flooding utilising products such as door guards, airbrick covers etc., and putting up sand bags to resist the effect of flooding, or by installing resilience measures such as installing concrete floors as opposed to carpets or timber floors so that the property owners can return quickly to the property and continue their respective business can be very important (Environment Agency, 2009a). For small businesses, returning to properties is extremely critical to their survival and sustainability (Wedawatta et al., 2012). This is also the case when looking at the problem from the point of view of local councils whose main motivation is to get the businesses in the area up and running after the flood events to maintain the prosperity and vibrancy of small townships and to promote more footfall in high streets to maintain local economies. Business failure and disruption, due to flooding, can also translate to insurance

claims of very high magnitudes. For instance, in the case of the flooding in 2007, £1 billion was paid to businesses by the insurance industry (ABI, 2008a).

SME property owners can also consider adopting non-structural resilience measures for purposes of business continuity. These could include general measures such as obtaining property insurance and business interruption insurance, business continuity planning advice, and home or flexible working for some of the employees whose work could continue despite the business being affected by flooding (Wedawatta and Ingirige, 2012). Some of these are general measures adopted for the purposes of managing risk and are popular among some commercial enterprises. On certain occasions they are written rules in their business plans. Previous research conducted in this area added a new dimension to this knowledge by investigating specific non-structural measures which are flood risk related and found that some SMEs for instance, signed up for a flood warning system, and a few even carried out a detailed flood risk assessment of their premises etc., (Kreibich et al., 2007; Kreibich et al., 2008; Ingirige and Wedawatta, 2011; Wedawatta et al., 2012). However, these examples are very few and some of the micro sized businesses, which are found to dominate urban cities and towns, lack the necessary awareness, knowledge or the resources to implement any of these measures. According to Ingirige and Wedawatta (2015) in a study done on SMEs affected by flooding in Cockerthorpe in Cumbria found several non-structural measures being adopted. These included reviewing property insurance, relocating vulnerable/ important stock to upper floors, obtaining property insurance, conducting a flood risk assessment on property, storage of stocks/ equipment above floor level. Of these measure 44% of those surveyed opted for reviewing of existing insurance, whilst a small percentage (11% of those SMEs surveyed adopted the strategy of concentrating on storage and stock for the purpose of relocating them. These are non-structural or soft measures that are specific to a business. Due to the experience of facing up to flooding very frequently SMEs tend to modify or adjust some of their strategies from one event to another.

It seems that a small adjustment such as keeping stock at a slightly higher level above the floor seems to have very few takers among the SMEs. Instead they tend to prefer safer options of insurance to recover losses after a flood event rather than trying to prevent flood impacts. Where storage and stock holding is key in a SME (e.g. groceries, cake shops, hardware stores etc.), such minor adjustments could hold the key to minimizing of damage against flooding.

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

Repeated flood events therefore seems to create a somewhat heightened awareness among the SME community with regard to insurance, where they review their existing policies and consider getting alternative policies, amendments to existing policies and new policies such as business interruption. But there was very little consideration of smaller adjustments (such as minor retrofits and business continuity measures) to protect their stock, which can be more cost effective and achieve quick wins as they can be perceived as ‘low hanging fruits’.

Wedawatta et al’s (2014) study also showed that except in the case of a few SMEs, most of the SMEs studied adopted various generic coping strategies that aid business continuity, rather than those that are directly flood related coping strategies. This is confirmed by Crichton’s (2006) study which found evidence of the measures adopted such as obtaining property insurance, having a business continuity plan, using a business data backup system, and obtaining business interruption insurance, which are general risk reduction measures that have been reported as good practice among the business community. Some of the trade organisations advocate these among their private sector counterparts.

Ingirige et al (2015) contributing to the UNISDR’s Global Assessment Report of 2015 found that some countries have already taken the initial steps towards substantially involving private sector businesses in Disaster Risk Reduction (DRR) in general (not just against flood risk but a whole host of other disasters). These trends are likely to require private sector businesses to invest their financial and other resources in risk reduction initiatives (Edo et al, 2014). This is a challenging task unless businesses realise the business case for DRR. Whilst global businesses are now beginning to consider DRR, much of the businesses still do not consider disasters as a major business risk (UNISDR, 2013). However, their willingness to engage with and implement DRR activities is likely to increase following experience of disaster events. Businesses that have been affected by one or more disaster events have been noted as more likely to implement DRR strategies than those without such experience (Kreibich et al. 2010).

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

Whilst larger businesses could be in a position to implement DRR strategies, committing financial and other resources for DRR is likely to be challenging for SMEs. Therefore, policy initiatives will be required to be sensitive to the requirements and capacities of SMEs; which form the overarching majority of private sector businesses in many economies.

IFRC (2013) states that as a rule of thumb for each dollar spent on disaster preparedness, an average of four dollars is saved on disaster response and recovery. Therefore, the preparation phase of a disaster management cycle (see Ingirige, 2016 for a discussion on disaster management cycle) can often equip the SMEs with the appropriate tools to reduce the impact of a hazard later on in the cycle. According to Coffrin et al (2011) the broad preparedness measures cover short-term emergency planning (that includes insurance), hazard warning (e.g. early warning systems as appropriate within the case of SMEs), procedures taken to meet any contingencies (in the form of documentation and guidance) and the stockpiling of any physical supplies (flood prevention products) that can mitigate the impact of flooding.

Any disaster risk reduction cycle, can be customised to the context discussed in this paper on SMEs and their resilience against flood events considering the broader goals of risk reduction. The longer phases of risk and vulnerability assessment and preparedness allow the policy makers and the community to intensify the existing resilience in a cost effective way as pointed out by IFRC (2013). Places such as Cockermouth in Cumbria that have faced repeated flood events can utilize more resources during the phases before a flood event so that there is resilience built up in SMEs against any future flood events. The current awareness on insurance can be further extended with more of a flood specific long term risk management approach by considering both structural and other non-structural measures of coping measures against flooding that can be applied within the appropriate SMEs' contexts. These measures can be part of a broader mitigation and adaptation planning process (during the pre-event stage) to increase the SME capacity to meet the challenges of flooding (during post event stage).

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

The place based model of understanding community resilience to natural disasters considers ‘place-specific multiscale processes’ (Cutter et al, 2008; p602), which are unique to a specific social, natural and built environment of a place. Hence Cutter et al’s model is known as the Disaster Resilience of a Place (DROP) model, which involves not just the location characteristics but also social, natural and built environment specific factors that helps in building up coping measures. Although its primary focus is on understanding community resilience to natural disasters, the model can relate well to understanding of the coping behavior of SMEs as it is a key group within an overall community. The SME coping measures align well on another theoretical aspect according to Cutter et al (2008), which is absorptive capacity. They define absorptive capacity of a hazard such as flooding as “the ability of the community to absorb event impacts using predetermined coping responses”. The preparedness and the risk and vulnerability assessment phase as per the model allows space for the SMEs to develop the predetermined coping responses with a longer timescale given that there is appropriate resource investments and initiatives that add value in the long run. Paton and Hill (2006) for instance identified that resource constraints might inhibit developments of such capacity to cope but maintaining the functions of those SMEs amidst significant disturbances (Paton, 2007) such as a flood is an important consideration for business continuity. Initiatives such as private and public sector collaboration, Government incentives for improvement of both structural and non-structural coping measures of SMEs are some of the examples that might work in building up the coping capacity as well as to ensure business continuity in this instance. Our review of literature suggest that SMEs display unique behaviours when facing flood events and this could be due to the variations in their developed coping measures, which allow them to differentiate their responses against the flood impacts. For example, in studies conducted in Cockerthorpe Cumbria (Wedawatta et al, 2014) we saw wide disparities of flood impacts on individual SMEs although they were located on the same street. Sullivan-Taylor and Branicki (2011)’s argument

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

that no one size fits all in the case of creating resilient SMEs confirms this argument. Further, similarities in terms of the scale of business, and industry sector did not necessarily mean that those SMEs in similar locales, industries etc., displayed similar impact consequences, but rather their impacts / responses were found to be quite a disparate set. It seems that they were in most of the cases dependent on their developed coping measures and how they were able to display resilience against those flood impacts based on their degree of coping. The DROP model therefore can be used to understand the nature of this differentiation in terms of how SMEs face up to flood events. Although the DROP model and the attempt to have a longer preparedness phase seems to be a winning argument most of the time, it is a bleak picture that often emerges in practice. This clearly identifies an opportunity to develop coping measures against flooding, the reality in many parts of the UK tends to suggest just the opposite: a much weaker situation. For instance, the latest FSB (2015) survey identify that out of a sample of 128 SMEs related to the retail sector, 71% experienced cost and prevalence of severe weather impacts over the last 3 years. This was also accounted as a monetary value, which showed that their average cost of the impact was £10,522, which presents a bleak picture in the retail sector. Climate change is set to make things worse for the SMEs in that according to IPCC (2007) and the United Nations Climate Change Conference in 2015 (Paris Summit), identified that there seems to be more widespread extreme weather events in the future. Therefore, it is important to understand what is hindering or preventing the SME coping measures to be developed, as identified in the discussion despite the potential opportunity for them to succeed and perform better in their industry or the sector. SMEs can then better defend their businesses from future flood risk.

The research problem of investigating the barriers for implementing and strengthening the coping measures of SMEs contributes towards the existing resilience discourse that adds a new dimension to the existing literature. This will be best explained by taking a small SME

community such as Braunton in North Devon where the key coping measures against flooding can be investigated.

### **STUDY OF SMES FREQUENTLY ENCOUNTERING FLOODING**

The paper reports on a collection of SME cases conducted in Braunton, North Devon (see Ingirige and Russell, 2015) that developed further value into the developments in coping measures adopted by SMEs. SMEs in Braunton have experienced several flood events during the last few years. Of particular interest were the two recent episodes of flooding once in 2009 and again in 2012. Both events occurred in the month of December with flood water reaching a higher level and remaining standing for a longer period in the 2012 event. This event proved catastrophic to the small businesses in the Caen street in Braunton due to its low-lying locale (Ingirige and Russell, 2015). This winter flood completely overwhelmed the designed standards of an existing flood defence scheme, which was of an indicative standard of resisting a 1 in 100-year flood event. The resultant flood event was not only caused by overflowing of the river but lack of drainage and heavy rainfall combined with high levels of ground saturation during the winter that contributed towards building up of surface water flooding within the area.

Seven SMEs and their representatives were interviewed utilising a SME resilience toolkit produced as part of the Engineering and Physical Sciences Research Council (EPSRC) funded Community Resilience to Extreme Weather (CREW) research project in 2011 (Ingirige and Wedawatta, 2011). The process involved entering the raw data (the transcripts) into Nvivo10 software, which is a powerful tool for analysing qualitative data. The research also investigated views of other stakeholders of the flood mitigation problem facing SMEs. Two representatives one from the Braunton Parish Council and a representative of the Environment Agency in the area were also interviewed. These extended interviews provided a wider policy making angle

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

to the research (Ingirige and Russell, 2015). The SMEs and their business types are given below in Table 1.

PLACE TABLE 1 HERE

All the above interviewees have personally encountered at least 1 flood event during last few years. Hence their level of experience is quite varied and due to the differences in their context, the impacts that they have suffered as a result of flooding was different. For example, in the case of CS2, the business was purchased being fully aware of the previous flood events. CS3 was closed for approximately 8 weeks due to damage to premises after the recent flood event. In the case of CS4 the 2012 flooding occurred during the busiest periods in the year (the Christmas trading period) and they lost approximately 80% of the stock in hand due to the floods. CS5 is located in the lowest part of Caen Street and following the 2012 flooding they were unable to occupy the building for 4 months. The estate agent at that time relocated to their main branch at Barnstaple and continued their business from that branch. However, they incurred a lot of additional costs due to travelling between Barnstaple and Braunton due to property viewings. CS6 was closed for over 6 months due to the recent flood event, but it received assistance from the head office during the period of the closure. CS7 owned both the business and the building and had his insurance excess increased from £500 to £10,000 after the flood event (Ingirige and Russell, 2015).

The main focus of the case studies was to identify how best the local policy makers, action groups or trade organisations can support SMEs (from the point of view of SMEs) to better cope with future flooding. Primarily, the findings revealed the various disparities in the levels of coping among the SMEs. Due to facing of repeated flood events in the area, most SMEs had sandbags in their possession (or at least knew where to get them in an emergency) as the first

resort to a flood response. Similarly some of them possessed proprietary products such as door guards, air brick covers etc., which could potentially be used to prevent the flood waters entering the property. It was found that most of the SMEs tend to overly rely on these basic flood prevention mechanisms without much of an understanding of their degree of vulnerability to a flood. Previous studies have shown that some members of the community living in flood affected areas perceive a ‘sandbag’ coping approach in a very simplistic fashion, without much of a deeper engagement with the likely flood scenario or the context. However, a few of the SMEs had gone a step further and assessed their business and their operations more closely and adopted methods such as moving the stock beyond the previous flood height, special mechanisms to prevent damage to targeted expensive equipment in their business (e.g. the ‘fundus machine and expensive spectacle frames of CS7), special mechanisms and processes of data backup and conducting small scale retrofits to the properties such as raising electrical sockets at a higher level on the walls (CS3). These measures were predominantly of a non-structural nature and had a lot of thought processes behind them being implemented even when there was some element of a structural nature. The SMEs perceived that these measures would allow them to minimise the flood impacts and cope better (For CS7 this made a lot of sense, particularly due to their very high insurance excess). Further methods of support were explored directly with the SMEs and it was found that the guiding principle of support and collaborating with SMEs should be done with the understanding that SMEs are entities having specific needs, and that their levels of preparedness differed substantially. In the SMEs own words what they valued most was more of a “practical and emotional assistance” (see Ingirige and Russell, 2015 for more details) to improve themselves to better prepare for future flood events as they were found to be at different scales in adopting coping measures against flooding. Therefore development of coping measures is something that needs to be carefully planned in a way that is sympathetic to the needs of SMEs.

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

One of the important findings was the consideration that in certain instances it was important that the whole community should pull together to make a difference. For instance, one of the case study representatives identified that flood protection needed to be a collective responsibility of the SMEs. The below comment identifies the sophistication of his understanding of flood resilience

*The only [way] we can be [less] vulnerable would be if we could make this an island of security, which we can't because not everybody has put flood gates up. My next door neighbour hasn't, he doesn't own the building, he possibly can't afford to do it. For whatever reason he does not have any flood gates, which means when water comes in to him it will soak through to my wall"*

Such understanding shows the main barrier sometimes faced by SMEs where a community living in flood affected areas, often fail to pull together. Sometimes this results in some sort of a perceived disincentive to take up or improve the current coping measures and defend their business against flooding. The SME business seems to understand that any measures that they take to cope will not realise in achieving the full value if the community fails to pull together. Therefore, among the SMEs and their disparate sets of coping measures there seems to be some pockets of good practice being followed by SMEs. Such an improved level of understanding compared with some of the basic measures proposed by the majority of SMEs seems to identify different degrees of coping measures among SMEs located in the same area. Paton (2007) terms these measures as indicators of resilience and groups them in a similar fashion. Braunton SME case studies identified barriers to improve the coping measures against flooding and therefore presented a very good opportunity to document the different practicalities faced by

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

the SME community in facing up to the challenges of flooding. Such practicalities, measures and challenges that SMEs face will help documenting good practice across other similar contexts. Considering the fact that Braunton is a typical village where there is a lot of potential to transfer of good practice and learning to other similar areas in the UK as well as other parts of Europe. The Braunton study also adds value as it is in line with the current Government policy of the communities being empowered to learn and live with the flooding so that small businesses are able to develop their coping mechanisms for preparedness and continuity of their businesses.

### **COMMENT ON THE APPROPRIATE APPROACHES UNDERTAKEN**

The study identifies several key issues in relation to the effect of flooding on SMEs and their role in defending their businesses against flooding. Primarily the review of literature identified the key role played by SMEs within a community and how an acute disruptive event such a flood can create a crisis of innumerable proportion. The value that is generated by ensuring that SMEs' disruption is minimized or avoided and their demise is prevented is beginning to get appreciated by policy makers and the Government stakeholders due to the very important role that they play within a community. Therefore, the issue of flooding and its impact on SMEs is gradually getting on to the top of agendas in most societies. As explained earlier new public and private sector joint initiatives (as highlighted in the discussion) have emerged to maintain the sustainability of SMEs in managing their risks of facing up to weather events. As reported, in the UK, the very recent study undertaken by the Federation of Small Businesses, show a grim picture despite several mechanisms and initiatives that are in place. Hence this paper investigates some of the root causes that inhibit SMEs taking up coping measures and adds to the theoretical discourse on resilience on the aspect of the role played by SMEs within a community.

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

First, both the review of literature and the SME case study identified some of the unique scenarios that result on SME flood impact. It is clear that many other factors beyond one's location needs to be considered when discussing the SME flood impacts. The effect of flooding on SMEs would have different impacts based on the type of ownership (tenant or owner occupier), previous flood experience, assistance and support from others, Government incentives, personal motivation etc., The cases in particular demonstrates how SMEs located on the same street will have different impacts. The DROP model therefore can be widely used with additional perspectives or views by reviewing its influence on location specific intensity to cover further aspects.

It was interesting to find some consistency with the FSB (2015) Survey and other survey data re: the risk management approaches adopted by SMEs. Whilst the surveys in general highlight the point that SMEs approaches to risk management were predominantly generic risk management and business continuity approaches, the cases bring out the specific flood relevance in their risk management approaches. Some of the coping measures that were found in our SME cases in Braunton were specifically flood related (e.g. retrofits to premises, elevated storage areas above the flood height etc.). The main reason behind this variation is due to the sampling in the case of the survey and the case study. Whilst the survey in general documented in literature include SMEs in many areas which have wide dispersions in the element of flood risk, the case studies of SMEs in general and the one that this paper reported were generally located in areas that recently encountered flooding. Hence their level of awareness of flood damage and coping measures tend to rely on the very recent flood experience rather than the generic risk management approaches often encountered in surveys.

Whatever the above context (whether generic or specific to flood risk), key barriers seem to exist in SMEs developing and adopting coping measures against flooding. Those SMEs that once or twice faced flood events tend to perceive that flood damage was minimum so no need to prepare. Some of the SMEs are overly optimistic that their businesses are ‘extremely flexible’ and hence they have a natural level of coping against any disaster event and it is only when the disaster is unprecedented that the coping capacity is breached and they are impacted. Hence our findings revealed quite a disparate number of measures and degrees of coping. It is important to note that SMEs do not have resources in abundance to engage in formal managerial activities such as risk management and planning, hence it is important that the support network targets their needs with coping measures in line with their requirements. Therefore, new innovative initiatives such as partnership approaches such as public-private partnerships and other partnership approaches with communities (such as the ones covered under Ingirige et al, 2015) tend to work well with SMEs to develop their coping mechanisms against flooding. The new concept of Area Business Continuity Management developed and piloted by JICA, where a “cooperative approach is undertaken by those who wish to improve capacity for continuity and/or early recovery of businesses in their area in the event of emergency such as natural disasters that affect the entire area” (AHA Centre and JICA, 2015) could be an effective way of promoting business continuity of all SMEs in an at-risk small town like Braunton or Cockermouth. This approach can also help individual SMEs to develop their own business continuity plans in tandem with that for their neighbourhood and benefit from resources allocated towards the Area Business Continuity Plan. Government incentives could be driven to fulfil some of these initiatives. Finally, it is important to note that funding on flood mitigation cannot be just on community flood defences but there should be good measures that will ensure business continuity at individual SME level. Therefore, SME operational patterns, their unique concerns should be communicated well to the emergency

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

response teams well in advance of any anticipated flood events as well as their importance to the community in recovery processes should be emphasized so that flood recovery coordinators can get SMEs back in business sooner for the sustainability of the community.

## **CONCLUSION**

This paper addressed SME flood impacts and their coping measures, which is an important aspect of crisis and security in business. Thereby this research will have an impact on modern society whilst adding value to the overall resilience discourse.

The paper investigated the research problem of why small businesses are often impacted due to natural hazards such as flooding and unable to cope despite their importance within crisis and security in business. The paper explored the existing coping measures of SMEs and what inhibits their developments and what key considerations should guide their developments. First, the researchers' interpretation of resilience and related concepts were reviewed based on extant literature and a case study was discussed to subsequently identify the key issues at a more local level. We then presented our findings on what is seemingly the current outlook within this field.

Accordingly, the starting point of our literature review identified the current coping measures and their degree of development amidst some of the policy making, Government, public and private sector agendas focused on improving risk management in SMEs in many sectors. It was found that there is no crystal ball as such but what is really important is to consider that SMEs are a unique set within business and hence an important aspect within crisis and security studies area. Their uniqueness is often underrepresented in literature, thereby the paper is well positioned to study this area and to contribute knowledge into the overall resilience agenda and discourse. Whilst the conceptual underpinnings helped in arriving at the research problem, the

short case study of Braunton helped in grounding this research within some of the practical SME scenarios that had wide disparities. So the unique SME behaviour could be well positioned both in theory and practice.

The study provided a novel way of representing the unique SME context as the guiding principle to develop the current coping measures of SMEs against flooding as opposed to following of any generic frameworks/models on resilience of businesses. The unique SME behaviours could set up the policy making in this area in the UK and other places in Europe and also in other countries. The Government investments in flood resilience should therefore improve with a better balance in flood protection based on structural and non-structural coping measures, which will be the key to ensure a secure community. Further research in conducting more of an operational study into unique SME behaviours and their orientations when faced with a multitude of natural hazard events can emerge from this research.

## REFERENCES

- ABI (2008). Insurance for Small Businesses: A guide to protecting your business, London: Association of British Insurers.
- AHA Centre and Japan International Cooperation Agency (2015) Planning Guide for Area Business Continuity: Area BCM toolkits – Version 2 Main volume. Jakarta: AHA Centre.
- Bannock, G. (2005) The Economics and Management of Small Business: An International Perspective, London: Taylor & Francis Routledge.
- BIS (2012) Business Population Estimates for the UK and Regions 2012. Sheffield: Enterprise Directorate Analytical Unit, Department for Business, Innovation and Skills (BIS).
- BIS (2010) Small Business Survey 2010. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/32228/11-p74-bis-small-business-survey-2010.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32228/11-p74-bis-small-business-survey-2010.pdf) (accessed on 23/06/2016)
- Blackburn, R. A. and Smallbone, D. (2008) Researching Small Firms and Entrepreneurship in the U.K.: Developments and Distinctiveness, *Entrepreneurship Theory: Theory and Practice*, 32(2), 267-288.
- Coffrin, C., Van Hentenryck, P. and Bent, R. (2011) Strategic stockpiling of power system supplies for disaster recovery, *IEEE*, 1(8), 24–9.
- Crichton, D. (2006) Climate Change and Its Effects on Small Businesses in the UK. London: AXA Insurance UK
- Criss, R. E. & Shock, E. L. (2001) Flood Enhancement Through Flood Control. *Geology* 29(10), 875-878.

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

- Cutter, S.L. et al. (2008) A place-based model for understanding community resilience to natural disasters. *Global Environmental Change*, 18(4), 598-606.
- DEFRA (2011) *Understanding the Risks, Empowering Communities, Building Resilience: The National Flood and Coastal Erosion Risk Management Strategy for England*. London: The Stationery Office.
- Edo, P J M, Morris, D and Puutio, T (2014) *Engaging asia-pacific businesses in disaster risk management*, Bangkok: The Asian Disaster Preparedness Center
- Environment Agency (2009a) *Flooding in England: A National Assessment of Flood Risk*, Bristol: Environment Agency.
- Environment Agency (2009b) *Investing for the future: Flood and coastal risk management in England*, London: Environment Agency.
- Environment Agency (2005) *The Climate is Changing: Time to Get Ready*. Bristol: Environment Agency.
- Etkin, D. (1999) Risk transference and related trends: driving forces towards more mega-disasters. *Global Environmental Change Part B: Environmental Hazards*, 1(2), 69-75.
- Federation of Small Businesses (FSB) (2015) *Severe Weather: A More Resilient Small Business Community*. Retrieved from <http://www.fsb.org.uk/docs/default-source/fsb-org-uk/pressroom/fsb-severe-weather-report-final.pdf> (accessed on 01/06/16)
- Fordham, M. (1999) Participatory planning for flood mitigation: models and approaches. *The Australian Journal of Emergency Management*, 13, 27-34.
- Herbane, B. (2015) Threat Orientation in Small and Medium-Sized Enterprises: Understanding Differences Toward Acute Interruptions, *Disaster Prevention and Management*, Vol. 24 Issue: 5, pp.583-595
- HM Government (2010) *Securing Britain in an Age of Uncertainty: The Strategic Defence and Security Review*. London: The Stationery Office.
- ICE (2001) *Learning to live with rivers*. Institution of Civil Engineers.
- IFRC (2013) *Disasters preparedness saves lives and saves money*, retrieved from <http://www.ifrc.org/fr/nouvelles/nouvelles/common/disasters-preparedness-saves-lives-and-saves-money-61204/> (accessed on 12/07/2017)
- Ingirige, B. (2016) Theorising construction industry practice within a disaster risk reduction setting: is it a panacea or an illusion, *Construction Management and Economics*, 34, 592-607
- Ingirige, B., Amaratunga, D., Kumaraswamy, M., Liyanage, C., Perwaiz, A., Towashiraporn, P. and Wedawatta, G. (2015), *Private investment in disaster risk management, The Global Assessment Report of 2015: Background paper*, UNISDR Publications: Geneva, retrieved from <http://goo.gl/FrZsvh> (accessed on 12/07/2017)
- Ingirige, B. and Russell, R. C. (2015) *Investigating SME resilience to flooding: the Braunton Report*, Retrieved from [www.arcc-network.org.uk/wp-content/pdfs/SME-resilience-Braunton-Dec2015.pdf](http://www.arcc-network.org.uk/wp-content/pdfs/SME-resilience-Braunton-Dec2015.pdf) (accessed on 12/07/2017)
- Ingirige, B. and Wedawatta, G. (2014), 'Putting policy initiatives into practice: Adopting an "honest broker" approach to adapting small businesses against flooding, *structural survey*, 32.2, pp. 123-139
- Ingirige, B. and Wedawatta, G. (2011) Impacts of flood hazards on small and medium companies: Strategies for property level protection and business continuity. *In: Proverbs, D, Lammond, J, Hammond, F and Booth, C (Eds.), Flood hazards, impacts and responses for the built environment*, London: Routledge.
- IPCC (2007) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate*

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.

- Change. In: Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, Tignor, M. and Miller, H. L. (eds.), Cambridge and New York Cambridge University Press.
- JHA, A. K., BLOCH, R. & LAMOND, J. 2012. Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century, Washington, The World Bank.
- Kelman, I. (2001) The autumn 2000 floods in England and flood management. *Weather*, 56(10), 346-360.
- Kreibich, H., Muller, M., Thielen, A. H. and Merz, B. (2007) Flood precaution of companies and their ability to cope with the flood in August 2002 in Saxony, Germany. *Water Resource Research* 43(3), 1-15.
- Kreibich, H., Seifert, I., Thielen, A., Lindquist, E., Wagner, K. and Merz, B. (2010) Recent changes in flood preparedness of private households and businesses in Germany, *Regional Environmental Change*, pp. 1-13.
- Kreibich, H., Seifert, I., Thielen, A. H. and Merz, B. (2008) Flood precaution and coping with floods of companies in Germany In: Proverbs, D., Brebbia, C. A. and Penning-Rowsell, E. (eds.) *Flood recovery, innovation and response*, Southampton: WIT Press.
- Max Lock Centre (2009) *The Built Environment Professions in Disaster Risk Reduction and Response: A guide for humanitarian agencies*, University of Westminster: MLC Press
- McWilliams, D. (2009) Hit from the big freeze will be 2-3 thousand businesses going bust earlier, Centre for Economics and Business Research Ltd, London, available at: [www.cebr.com/Resources/CEBR/The\\_cost\\_of\\_the\\_big\\_freeze.pdf](http://www.cebr.com/Resources/CEBR/The_cost_of_the_big_freeze.pdf) (accessed on 20/06/17).
- Munich Re Group (2008) *Topics geo: Natural catastrophes 2007 - analyses, assessments, positions*. Knowledge series, München: Munich Re Group.
- O'Brien, G., O'Keefe, P., Gadema, Z. and Swords, J. (2010) Approaching disaster management through social learning. *Disaster Prevention and Management*, 19(4)
- Paton, D. (2007) *Measuring and monitoring resilience in Auckland*, Institute of Geological and Nuclear Sciences Limited.
- Paton D and Hill R. (2006) *Managing company risk and resilience through business continuity management*. In: Paton D and Johnston D (eds) *Disaster resilience: An integrated approach*, Illinois: Charles C Thomas Publisher Ltd.
- Pitt, M. (2008) *The Pitt Review - Learning Lessons from the 2007 Floods*. London: Cabinet Office.
- Stern, N. (2007) *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press.
- Sullivan-Taylor, B. and Branicki, L. (2011) Creating resilient SMEs: Why one size might not fit all, *International Journal of Production Research*, 49(17), 5565-5579
- Tierney, K. (2007) *Businesses and Disasters: Vulnerability, Impacts, and Recovery*. In: Rodriguez, H, Quarantelli, E L and Dynes, R R (Eds.), *Handbook of Disaster Research*, pp. 275-296. New York: Springer.
- UNISDR (2013) *Global Assessment Report on Disaster Risk Reduction: From Shared Risk to Shared Value: The business case for Disaster Risk Reduction*. United Nations International Strategy for Disaster Reduction. Geneva, Switzerland: UNISDR.
- UNISDR (2005) *Know Risk*, Leicester: Tudor Rose.
- UNISDR (2004) *Living with Risk: A global review of disaster reduction initiatives*. New York and Zurich: International Strategy for Disaster Risk Reduction
- Wedawatta, G. and Ingirige, B. (2012) Resilience and adaptation of SMEs to flood risk. *Disaster Prevention and Management*, 21(4), 474-488.
- Wedawatta, G., Ingirige, B. and Proverbs, D. (2012) *Impacts of Flooding on SMEs and their Relevance to Chartered Surveyors: Final Report of the Developing Flood Expert knowledge*

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224-236.

in Chartered Surveyors - DEFENCES project. London: Royal Institution of Chartered Surveyors.

Wedawatta, G., Ingirige, B., and Proverbs, D. (2014) Small businesses and flood impacts: the case of the 2009 flood event in Cockermouth, *Journal of Flood Risk Management*, 7(1), 42-53.

Ingirige, B & Wedawatta, G 2018, SMEs defending their businesses from flood risk: Contributing to the theoretical discourse on resilience. in K Engemann (ed.), *The Routledge Companion to Risk, Crisis and Security in Business*. Routledge Companions, Taylor & Francis, Oxon, pp. 224–236.