ENHANCING PROPERTY RESILIENCE TO FLOOD: LESSONS LEARNED FROM THE RECOVERY OF FLOODED HOSPITALITY PREMISES

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Flood is one of the main climate-related challenges of this age and to mitigate and adapt to some of its impacts; the importance of learning from the past cannot be overemphasised. Some studies have been conducted on business recovery; but further understanding is needed on how to ensure the resilience of the business premises. This study is a cross-case analysis of the recovery process of three hospitality business organisations. The study involved 9 interviews with key management officials and key actors in the preparatory and recovery process. The interviews focused on the capabilities deployed pre-, during- and post-flood events. The themes that emerged were classified under appropriate headings and discussed concerning disaster phases and the built environment. One of the key findings of the study is the importance of a dynamic approach to stakeholder identification and management for a speedy recovery in a flood risk area. It is important to note that the appropriate accumulation and utilisation of existing knowledge is germane. Indeed, the submissions based on the first-hand experience of the respondents in this study will be very useful for business and property owners.

Keywords: business; flood; property; disaster recovery; resilience; stakeholders

INTRODUCTION

Business properties have a significant role in ensuring social needs and generating revenues to stabilise the economy. In recent years, the intensity and frequency of torrential rain floods have increased resulting in extensive losses to both residential and business properties (Li et., 2018). Flood considerably affect business properties causing disruptions to communities and interrupting the economy's normal functionality and stability (Environment Agency Report, 2018). Providing a significant portion to the economy, business properties generate turnover in billions with an average growth rate of 2.2% since 2008. Therefore, the value of business properties spread over a broader spectrum ensuring both local and national economic prosperity (Xiao *et al.,* 2020). The UK hospitality industry was rated as the 3rd

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biggest employer in 2017 with a 3.2million and 2.8million direct and indirect employment. Further, the sector accounted for £72bn and £86bn direct and indirect gross value contribution to the UK economy (Ignite Economics, 2018). After the 2007 flood, the hospitality industry through the British Hospitality Association had to make a special appeal to the government for the suspension of national insurance, business rates and Value Added Tax. This was to enhance the recovery of affected trades as the physical damage caused among others was anticipated to require many months to remedy (Helen, 2017).

Aside from other implications, delayed recovery of hospitality businesses slows down community disaster recovery as social activities will be on hold and tourist arrivals cannot resume (Hamzah *et al.,* 2012) even when water level has gone down. More than 8000 businesses have been affected by floods since 2007 with records of more than 35, 000 insurance claims per year (Brisibe, 2020). There was a £513 million loss for business property damages during the 2015-2016 winter floods, ranging between £410 million and £616 million paid out by the insurance industry as business claims (Bang and Burton, 2021). The United Kingdom (UK) is continuously affected by floods which impact properties and put the annual costs of flood damage at £ 1.1billion for the whole country (Bang and Burton, 2021). These statistics are a compelling urge to increase the resilience of properties in the UK (Xiao *et al.,* 2020).

Sincerely, numerous studies have been undertaken to investigate solutions and strategies to minimize flood impacts on businesses. However, an in-depth study through first-hand experience of recovery processes in a specific sector such as hospitality will complement existing literature. The hospitality industry's contributions to the UK Gross Domestic Product (GDP) and other indirect contributions to the economy are significant (Oxford Economics, 2015). This will enhance the proactive and preventive efforts of organisations and will influence preparedness planning, control, response, training, and recovery activities for future floods (Xiao *et al.,* 2020). Since each sector has peculiar property and content attributes, it is ideal to explore the resilience planning and recovery experiences of businesses, with a clearer focus on specific sectors. This study aimed to advance knowledge on the flood recovery process of businesses by highlighting tactical capabilities relevant to the process from the perspective of previously flooded hospitality businesses.

LITERATURE REVIEW

Flood resilience of properties is established by implementing various measures which facilitate speedy recovery after flood impacts; it helps minimise disruption and allows business restorations and operations as soon as possible (Ismail and Halog, 2017). Discussions on the use of Flood Performance Certificates (FPC), a certificate showing the flood risk profile of each property, emerged in the United Kingdom to encourage businesses and property owners to embrace flood resilience measures (Akeson and Salzenstein, 2021). This is expected to have several other implications which include tenants having a clearer briefing on the flood resilience ability of assets, and insurance companies making decisions based on the FPC ratings of properties. It is also an opportunity for businesses to consider resilience steps that could be achieved incrementally rather than all at once. All of these would support the spread of the financial burden of flooding over time more easily (Akeson and Salzenstein, 2021) and probably better across stakeholders. Trialling and further considerations are required in terms of overall policy, regulatory and implementation infrastructure for

FPCs (FPC, 2020). Its applicability to businesses also must be further considered. Achieving speedy post-flood recovery involves the deployment of some capabilities across the different phases of a disaster (Figure 1). Technically, capabilities are basic skills, attributes and competencies deployed to achieve a purpose. In the context of flood resilience, capabilities related to physical facilities, institutional relationships, societal coping mechanisms, human knowledge, skills, social relationships, as well as leadership and management. Kunreuther and Useem, 2010) described the overall timeline of disaster risk and what generally needs to be done at each stage (Figure 1).

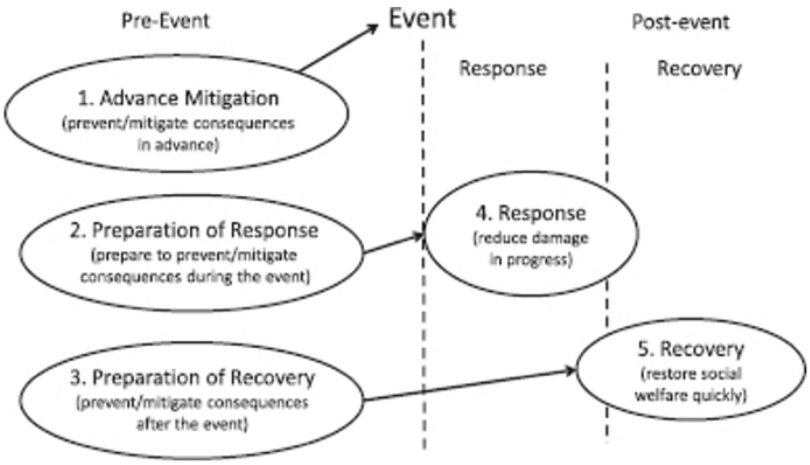

Figure 1: Timeline of disaster risk (Kunreuther and Useem, 2010)

This study explores the flood recovery account of case organisations with a focus on the capabilities deployed or would have been deployed at the different timelines of disaster risk.

METHOD

The qualitative approach was selected for this study because it concentrates largely on words that can be interpreted to understand what happened, the outcome of the occurrence and clear narration of surrounding issues beyond what is contained in the literature. Fellows and Liu (2015) highlighted the capacity of understanding people's opinions and experiences concerning a question of interest through qualitative research. Although Naoum (2019) described qualitative research as being subjective, its subjective tendency does not erode its suitability for thoroughly investigating a phenomenon. To eliminate bias and the influence of subjectivity, interviews were conducted with at least three respondents within the organisations selected for this study and consistency was observed in the submissions. Technically, qualitative research choice is considered to generate rich and deep outcomes, it is a good choice for discovering specific facts and processes (Bryman, 1988). Qualitative research is interpretive and naturalistic; qualitative researchers interpret a phenomenon of interest based on the account of the persons experiencing it (Denzin and Lincoln, 1998). The case study research approach was adopted, and a semi-structured interview was the method of data collection deployed. The interviews focused on the capabilities deployed by the respective organisation's pre-, during- and post-flood events. Thematic analysis was used, it helps in extracting rich findings with limited data loss. Yin (2014) discussed the suitability of the case study research strategy for exploratory, descriptive, and explanatory purposes to answer the question 'what', 'how' and 'why'.

The case study strategy allows a relatively detailed focused evaluation, analysis, and reporting (Yin, 2014). As a result, the approach was adjudged suitable for this study and was adopted accordingly. Multiple case studies guarantee inferences that are more reliable and as well reduce misinterpretation (Yin, 2014). The rationale for selecting the cases includes being in the hospitality business, membership of relevant England's property uses class order E, Suis Generis, C1 (Planning Portal, 2022), possession of previous flood recovery experience, and readiness to participate in the study. The selected hospitability businesses were a guest house, restaurant, and hotel for cases 1, 2 and 3, respectively. The selection of cases in the hospitality business was based on the UK Standard Industrial Classification (SIC) code. According to this code, the three cases are attached to section I i.e., "Accommodation and Food Service Activities".

This section includes the provision of short-stay accommodation and meals and drinks fit for immediate consumption. The amount and type of supplementary services provided within this section still vary but the existing similarity kept them within the same UK Standard Industrial Classification (SIC). Data was collected about each organisation through the interview of individuals as supported by Yin (2014). The individuals involved in the recovery processes were selected in each case for the interviews. The protocol was a set of questions covering pre-event, event/response, and post-event/recovery phases to know 'what' transpired, 'how' and 'why' in terms of capabilities deployed to enhance the resilience and recovery of the business premises. While recovery processes take place at the authority level, flood recovery entails psychologically driven and organisationally demanding work for business owners as they tend to manage their repair and restoration works themselves. Considering this, this study focused on the recovery processes from the perspective of business owners.

Brief on Case Study

Case study 1 (CS1) is a bed and breakfast, overnight lodging establishment often patronised by individuals and groups that do not want to stay in conventional hotels. It is located at Lake District national park in England; it is adjacent to Derwent water and close to River Greta. The property is a semi-detached three-storey edifice built in Lakeland. All bedrooms have en-suite shower rooms, and the kitchen and utility rooms have steel sink units. The business currently has an average turnover of 72,000 pounds per annum (£ 72,000/annum). The property was significantly flooded in 2009, 2012 and December 2015.

Case study 2 (CS2) is a restaurant situated on a waterfront, River Ouse, York, United Kingdom. The restaurant boasts of serving a selection of chicken dinner, burgers and chargrilled steak and others. The Landlord owns the hotel being operated on the upper floors of the property, but the restaurant owners were given the liberty to use and manage the ground floor of the building. The property is an early 19th-century asset. Currently, the restaurant records an annual turnover of about two hundred and fifty thousand pounds (£250,000 per annum). The business was flooded about five times in 2015 due to its closeness to a river that overflows its banks because of torrential rain. The premise consists of an eating area with furniture, a bar, a kitchen, and a store, it was submerged in floodwater up to six feet in December 2015.

Case study 3 (CS3) is a hotel situated in Lake District in the United Kingdom. It is a hotel with over 70 stylish rooms, an en-suite bathroom, a restaurant, a beautiful terrace, and a steam room among other facilities. The hotel has twelve varieties of

room types described based on the view through the window and the size of the room. Before its current operation, the property underwent a major redevelopment and reopened in 2012. A director manages the solely owned hotel as well as the property and the business records around 6 million pounds annual turnover. In December 2015, the business was flooded; this resulted in damage to premises and caused around 7-month closure. The three case studies utilised in this study are at different geographical locations, but they share the attribute of being located close to rivers that do overflow and have contributed to flooding within the past ten years.

FINDINGS

Table 1: Background information of respondents

Case reference	Business type	Interviewees
Case study 1 (C1R1)	Guest House	Property owner/Business owner
Case study 1 (C1R2)	Guest House	Property owner/Business partner
Case study 1 (C1R3)	Guest House	Staff
Case study 2 (C2R1)	Restaurant	Property owner/Business owner
Case study 2 (C2R2)	Restaurant	Business partner
Case study 2 (C2R3)	Restaurant	Staff
Case study 3 (C3R1)	Hotel	Manager
Case study 3 (C3R2)	Hotel	Staff
Case study 3 (C3R3)	Hotel	Staff

The interviews were first analysed within cases and then a comparison was made across the three cases to aggregate the findings and identify good practices.

Case Study 1 (CS1) - Guest House

CS1 is a guesthouse that has experienced significant flooding in the past seven years. After the property got flooded in 2009, C1R1 and C1R2 (the property owners) who are also the business owners attempted to achieve a complete seal around the house. C1R1 said, “The staircase was taken out, all electrical wiring was made to drop down and everywhere was sealed up with waterproof adhesives as much as possible, existing suspended floors were replaced with impermeable concrete slab” - C1R1. CIR2 described the challenges faced while attempting to build a water-proof wall and still comply with building regulation standard that requires the insertion of insulation in walls. The ability of the insulation to absorb water thereby dampening the wall made it unappealing. A damp-proof membrane was inserted into floors, but wall insulation started from a height to prevent the insulation from wicking up water.

C1R1 and C1R3 stated that wooden skirting boards in the property were replaced with tiles and waterproof grouting, and swimming pool adhesives were used for tiles and concrete waterproof floors. Some furniture in the guest house kitchen was raised and some parts were made detachable for easy conveyance to the upper floor during a flood. All the activities were undertaken with due consultation with the loss assessor, the insurance company, and a construction firm. Also, C1R1 and C1R2 reported some challenges with proper installation of doors, cracks on the floor, and installation of insulating material; all these affected the duration of recovery. This emphasises the need to understand community needs (Perera *et al.,* 2017) and for practitioners to effectively deliver their duties within the resilience agenda (Perera *et al.,* 2018). The strategies highlighted above were identified under the “pre-event stage” and subsection of “advance mitigation” as the property has been fortified with advance mitigation measures to enhance recovery. C1R1 stated that the property got flooded in 2009 and this caused the business to remain shut for 51 weeks, and 17 months in 2012, these are part of the losses recorded (Li et., 2018). The property owner (C1R1 and C1R2) then made a significant investment of about £30,000 in waterproofing the

property. Beyond the earlier described resilience and resistance techniques adopted after the 2012 flood, non-return valves were used for water pipes, and sewage pipes and a sump pump fitted with a generator were also installed. These strategies are aligned with the "post-event stage" and subsection of "preparation of recovery" of the disaster risk timeline and help achieve the recovery process in future. It ought to be part of advance mitigation.

The other lessons from the recovery process of the premises include an arrangement with neighbours to support the installation and activation of flood gates and pumps, use of personal funding, a community foundation-funded post-flood survey, and identification of relevant stakeholders as developments emerge - dynamic identification and good network strength. There is always a stakeholder to attend to a need -flood groups, insurance firms, loss adjusters, flood forums, environment agencies, local councils, professionals, etc. This is a strategy to be arranged at "pre-event", the subsection of "preparation of response", deployed at "event" - and "post-event - recovery efforts". Also seen as relevant capabilities are the acquisition of suitable flood resistance facilities, the ability to set up the acquired facility and having it maintained as appropriate.

Undertaking the retrofitting activities and discussing the flood survey implies that the business understands flood risk, has reviewed a flood resilience scheme, and sourced funds for crisis response, a significant need (Davidson *et al.,* 2016). C1R1 submitted that the presence of a flood-proof store is equivalent to having an upper floor in the property and these would help limit the extent of content damage and mess within the property thereby aiding the speed of recovery of the premises. CIR1 and C1R2 emphasised the need for maintenance and post-flood relationships, the need for regular meetings and communication with agencies, professionals and manufacturers for update and post-flood assistance. C1R1 stated that there is a need to keep in touch with flood-related developments in one's community because community decisions affect one's property flood resilience (Ismail and Halog, 2017). C1R1 and C1R3 highlighted the importance of disaster scenario simulation to training and perfection of skills required for setting up flood protection facilities and ensuring that facilities are functioning. Further, insurance was identified as a relevant capability, but its non-availability to businesses through the FloodRe insurance scheme in the UK remains a concern.

C1R1 referenced her organisation's arrangement with neighbours and staff to help protect the premises of the business whenever the need arise. They are permitted to make informed decisions in emergencies without a request for permission from superiors. All members of staff and even neighbours know where necessary keys are, how flood barriers are fixed, how pumps are operated, and the agency to communicate. This is for the "event stage" and subsection of "preparation of response". C1R1, C1R2 and C1R3 identified the need to review happenings after flooding i.e., post-event review, analysis, and management, they also submitted that a crisis response budget is indeed important but might be difficult for a small hospitality business to set funds aside for that purpose, unlike larger ones. Despite deploying a series of resources C1R1 and C1R2 (the business owners) lamented the non-effect of their investment on the market value of the property. The property was dried out and ready for reoccupation within four weeks in 2015, with outstanding limited repair works as against the 51-week closure period experienced after the 2009 flood and 17-month closure after the 2012 flood. This is clear evidence of the effective deployment

of relevant capabilities at the “post-event stage” made possible by "advance mitigation", "preparation of response", and "preparation of recovery".

Case Study 2 (CS2) - Restaurant

Stakeholders in CS2, C2R1, C2R2, and C2R3 were interviewed. The property got flooded about five times in 2015, but it was able to re-open within two days at a time. This was made possible using resistant facilities and resilient construction materials - such as flood gates and waterproof membranes under a stone-cement floor, part of the floor is finished with light brown tiles, the walls are made of stones (stonewalls), and the furniture is low water absorbing wood, plastic and metal chairs are with a cushion while the tables have low water absorbing legs - "advance mitigation", clean-up was easier and drying equipment was mobilised quickly, this is an outcome of well-executed 'preparation of recovery' at the "pre-event stage" - post-event consequences were mitigated.

This is a good practice according to Xiao *et al.,* (2020). Post-event flood-survey was conducted a few times to further prepare the premises for the future. Flood updates are continually monitored and stakeholders such as community groups and agencies are often contacted, referrals are provided by them depending on necessity. The staff members can set up flood defence facilities, and initiate premises protection steps like lifting items off the ground. As part of daily operations, once the river level reaches a level based on updates, premises protection activities are initiated ‘the more we do it, the faster we became’- C2R1. According to C2R3 and C2R1, all employees are updated and have been trained on what to do when warnings that require actions are received. This strategy is well aligned with the “event stage” under the subsection of “preparation of response”. Business savings were utilised to restore the premises, though the facility had content insurance, arranged by the occupant, and property insurance arranged by the property owner, payment does get significantly delayed.

On utility during flood events, emergency lighting comes on to initiate restoration. Cleaning and premises restoration activities were executed by the owner and the staff of the organisation. C2R1 and C2R2 emphasised the advantage of knowing where to source facilities and necessary assistance, their inability to connect with appropriate persons caused more damage to the property during the previous flooding, this delayed business recovery. Recovery is a comprehensive process (Davidson *et al.,* 2016) but the experience will speed up the process. Emphasis was made on the tendency of speeding up the recovery process with the availability of funds for cleaning, repair, and reopening publicity. The respondents stated that reaching out to customers during closure does strengthen a relationship, facilitates a successful return to business and guarantees continuous cash flow for offsetting debt and pre-future flood preparations. Currently, decision-making is still significantly centralised because of the size of the organisation; employees often report almost all activities to the manager, C2R1, C2R1 will then assign duties. This approach could be effective if there is enough time to make flood arrangements, otherwise, it will be counterproductive. Another capability area identified is 'flood safe' or a raised store space to keep some essential items. This aligns with the event stage as well as the post-event stage, it aids speedy recovery.

Case Study 3 (CS3) - Hotel

Respondent C3R1 commended the efforts of fire servicemen, it was recorded that the continual pumping of water away from the property prevented damage to some facilities including the generator. Because of the magnitude of the flood and the non-

resilient construction materials used for the ground floor, significant damage was experienced. The respondents described the magnitude of renovation after the flood as significant. The activity called for the engagement of a loss adjuster, construction company, the insurer of the property, property surveyor, and government agencies among others, aligning with the "post-event stage" but a result of pre-event 'preparation for recovery'. To minimise the impact of future events, during recovery, floodwalls protecting the area as well as the property and drainage system were re-examined. Automatic self-closing airbricks were installed, damp proof membrane and concrete floor were introduced, and the ground floor was finished with ceramic tiles, an approach supported by Xiao *et al.,* (2020).

Reopening publicity was undertaken by sending gifts to selected customers when the premises were still being restored, media rebranding and re-opening events. This was done to encourage pre-booking and it is in line with the need to ensure pleasant future cash flow and general customer management. This is the only way to accrue sufficient resources to finance or offset the cost of installing structural resilience measures to achieve future premises resilience. These strategies align with the "event stage" and "post-event" stage under the subsections of preparation of response and recovery. A careful mapping of the findings from the cross-case analysis resulted in the alignment of capabilities with disaster stages as shown in Table 2. All the themes shown are expected to be ensured at the pre-event stage but deployed at the disaster risk timelines indicated in Table 2.

Table 2: Summary of themes - capability areas utilised at the different disaster risk timelines

SN	Themes	Pre-event	Event/Response	Post-event/Recovery
1	Property flood risk awareness	✓		
2	Analysis and selection of flood resilience scheme	✓		
3	Pre-flood property flood survey	✓		
4	Acquisition and installation of property level flood resilience products	✓		
5	Product maintenance and management arrangements	✓		✓
6	Knowledge of property level flood facility operations	✓	✓	
7	Planning and execution of flood simulation scenario	✓		
8	Customer management and cashflow preservation		✓	✓
9	Insurance administration knowledge			✓
10	Alternative utility and communication systems		✓	✓
11	Flood proof/upper floor storage		✓	
12	Strategic business record management	✓	✓	
13	Governance of disruption at the organisation level	✓	✓	
14	Crisis response budget		✓	✓
15	Decision making without recourse to superior in emergency situations		✓	
16	Clear definition of roles and responsibilities and how it changes in disaster situations	✓	✓	
17	Post event review strategy			✓
18	Dynamic stakeholder identification	✓	✓	✓
19	Comprehensive structural premises resilience measure		✓	

Eleven themes were aligned with the pre-event stage of the disaster risk timeline and fit into Bosher and Chmutina's (2021) non-cyclical disaster timeline perspective. The response stage also includes eleven themes largely covered but not clearly outlined in Whittle *et al.,* (2010) discussion on community recovery lessons. The post-event stage included 7 themes which are largely non-structural recovery capabilities for restoring social and economic welfare, an objective described by Kunreuther and Useem (2010). Dynamic stakeholder identification as a theme is common to all the phases, flood recovery entails a collaborative effort, and this was deployed by the hospitality business.

CONCLUSION

The case studies revealed that both structural measures and a series of other non-structural capabilities are required to achieve business premises recovery. Some of the capabilities would trigger and support decisions, operations, and efficiency of the structural measures. Such includes property flood risk awareness, review for a flood resilience scheme, crisis response budget, dynamic stakeholder identification, among others. As a result, flood performance evaluation of properties will ideally have to exceed physical property attributes alone. Hospitality organisations can learn from the accounts presented.

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