EUROFLOOD* UK EVACUATION STUDY: INTERIM RESULTS

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ABSTRACT

This paper discusses the results of research carried out for the EUROflood project under the Warnings and Intervention Strategies module, which has a major focus on evacuation. This involved undertaking a comprehensive survey of Emergency Planning Officers in the United Kingdom regarding experiences of evacuation as a result of flooding in their areas. Amongst other things, the survey looked at the degree to which areas at risk from flooding had evacuation or emergency plans, the range of plans in existence, who was involved in drawing them up, who was consulted, and how the area at risk was determined. The results reveal that flooding is generally considered to be an infrequent event, and yet on the national scale there is a major flood involving evacuation almost every year somewhere in the UK, more frequently on the European scale. Furthermore, there exists a diverse approach to emergency management in the UK in terms of the role of the emergency planner. This diversity is reflected in the content and detail of plans when looking across regions, undoubtedly influencing the ensuing emergency response, and overall evacuation, be it for flooding or other hazards.

INTRODUCTION

Evacuation is a response strategy (one of several) which can be used as a measure to mitigate flood damage, both tangible and intangible. The trauma of a badly co-ordinated and managed evacuation/rescue can be long lasting and potentially devastating particularly amongst the most vulnerable members of society. In a recent UK flood the very young suffered recurrent nightmares and the elderly suffered confusion and loneliness (supplementary material from the Ove Arup River Tay study, 1994).

> "Having to be evacuated was a strange feeling, being in limbo, so to speak, not knowing how and when we were going to be affected" (Victim of Perth Flooding - January 1993, taken from The Great Flood, 1993)
>
> "An absolute shock", "I cried", "I felt angry" (Victims of the Towyn Flooding - 1990, taken from A Caring Response to On-Going Disaster)

There is no suggestion here that these were particularly badly organised evacuations, neither can the nightmares, confusion and loneliness (as just three of the reported intangible impacts) be attributed purely to the evacuation process. Nevertheless, the evacuation of households, when water has already entered the premises, up to high levels in some instances, can be a traumatic and frightening experience and needs to be handled sensitively.

The EUROflood* Project aims to identify best practice in evacuation processes that can be transferred usefully to other, particularly European situations. Despite our focus here on evacuation, this is not to imply that this is the only measure available to mitigate against flooding. Indeed in many instances, particularly when flooding coincides with other, technological, hazards, sheltering within the premises is the advised option; or "evacuation" upstairs; although this is often not possible or appropriate

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for those living in single storey buildings and ground floor flats.

Evacuation is usually necessary when flooding lasts for a substantial period of time, when there can be serious health and safety risks involved. The difficulties arising from a lack of electricity or heating can also warrant leaving, or evacuating, premises. This paper does not discuss in any detail whether evacuation is always the appropriate measure but concentrates on the **process** leading to this decision.

Evacuation is a complex social process (Sorensen et al, 1987) and has been studied from a number of standpoints in the past, indeed it has been developed into a prominent subject area of its own and thus has attracted much debate. However, most of this research has been undertaken in the United States, focusing on the US (Otway, 1989), which has led to many findings being supplanted into the European context, with little consideration of the cultural, political, historical, geographical and legal differences between the two continents.

Our research is just one small step in attempting to correct this "evacuation myopia" with a specific focus on flooding as a potentially disastrous hazard, of which there has been little recent detailed study either side of the Atlantic.

For the purposes of our study, we have taken **evacuation** as meaning any organised movement of people away from a disaster event, or any potential disaster event, for reasons of safety or protection, for any period of time, and an **evacuation plan** as a strategy for moving people from a place of relative danger to a place of relative safety (Perry, 1985)

METHODOLOGY

As part of the EUROflood Warnings and Intervention Strategies Module, this research element has focused on the responses from a questionnaire sent out to all County and Regional Emergency Planning Officers, or related title, in the UK. This amounted to a total of 74 areas from which 64 replies (approx. 86% response rate) have been received over a period of three months since the beginning of the study in August 1994 (Figure 1).

The questionnaire covered a range of issues concerning flooding, experience of evacuation, existence of plans, contents of those plans, details of who was involved in drawing them up, their availability and use, and some of the issues uncovered in other evacuation studies, carried out principally in the USA.

In some cases the questionnaire was followed up and supplemented by telephone interviews where it was felt that there was further information needed for clarification or if the EPO requested that the questionnaire be conducted in this way. Emergency Planning in the UK has not been seen as a major priority by government particularly since the demise of the threat posed by the Cold War, and Emergency Planning budgets tend to reflect this. This point puts much of what the questionnaire uncovered into context, the context of "parlous financial state of local government" (EPO, pers.comm.) restricting emergency planning departments' feasible workload and scope, and indeed the time available to complete the questionnaire. Although the complex question of finance was touched on, it did not form a central theme to our research in this instance.

The emphasis here on the role of the Local Authority Emergency Planners is not to deny that others, such as the police and other LA departments, also have a major role in the carrying out of an evacuation. However the Emergency Planning Officer is concerned with the planning, preparedness and response (Parker 1991). S/he has the role of co-ordination and management of the response to a disaster, often setting up the emergency co-ordination centre and bringing together all those involved in the response, and ensuring a smooth link between the response during a disaster, and the response after a disaster.

"DEVOLUTION" OF UK EMERGENCY MANAGEMENT

Contacting Emergency Planners around the country, it was soon discovered that even within one member state of the European Union, there was much diversity in who actually had the responsibility of Emergency Planning Officer. In some cases it was a matter of title - other titles included Civil Protection Officer, County Civil Protection Planning Officer, Emergency Manager. In other cases variation was found in the department to which the Emergency Planning Officer (or officer responsible for dealing with emergencies) was attached. Officers were part of the Fire and Civil Defence Authority; the Fire and Rescue Service; the Department for Housing and Environmental Services; and the Chief Executive's Department.

This variation has inevitably led to some difference in interpretation of the emergency management role around the different counties and regions. In some cases this difference of interpretation may well have more to do with the perceived risk of a particular area from any hazard which has determined the department within a local

authority to which an Emergency Planning Officer is responsible.

This highlights a key issue in the emergency management debate, one that is echoed throughout the findings of the questionnaire, whether the devolution of coordination to the County/Regional level has led to the areas having too divergent approaches to emergency management or whether a diversity of approaches is a necessary response to a complex, variable, spatial and institutional situation (Krebs 1992).

National legislation (e.g. The Civil Defence Act of 1949 and subsequent Statutory Instruments) does guide the UK emergency planner through his/her responsibilities at a general level - the requirement that all emergency planning teams have County-wide contingency plans for example - but there is still much that is left to individual judgement. This can obviously lead to expectations differing across the UK in terms of what the EPO provides and what the individual will be prepared to do for himself/herself. The role of the EPO in a flooding incident is a case in point. In some instances s/he may take the lead control in coordinating a response effort, in others s/he may be limited to taking a participatory role. This can cause confusion in the public's perception of who is responsible for what during an emergency, with the result that often the police become the focus of all questions, queries and even criticism.

Perhaps it is not so much the divergent approaches which are at issue here but the national role of central government and the lack of a centralised information-dissemination body, sufficiently well-resourced to pass on lessons learned from a wide range of disasters. Floods are infrequent events and in many regions there may only be one flood during that EPO's employment and thus little opportunity to learn from experience and improve systems. Yet on a national scale there is a major flood almost every year in the UK from which many useful lessons could be learned. As a result of this potential lack of dissemination, there can be duplication of effort, resources and indeed lessons learnt from individual incidents when counties/regions are unaware of reports and exercises that already exist. After all, one of the objectives of comprehensive and integrated emergency management is to use resources more efficiently (Perry, 1985)

More positively, the UK Home Office Emergency Planning College at Easingwold does in many respects resolve this problem with its regular courses, seminars and workshops designed for emergency planners *(eg Introduction to Emergency Management; Rest Centre Management; Civil and Military Co-Operation in Emergencies; etc.)* and library containing reports, plans, books, journal articles, etc. However, the library is far from complete as it is discretionary for individual authorities to submit their incident and exercise reports. There is also the Emergency Planning Society who meet on a regular basis, and the quarterly Civil Protection newsletter, both offering good opportunities to disseminate the lessons learnt from one region to another.

Whilst in theory, the existence of these opportunities is promising, the practice is the often limited due to restrictions on finances and time, with the result that these resources are in general underutilised. In addition it has been reported elsewhere that there lacks the intercourse between researchers and practitioners to support the required policy (Parker 1991).

EMERGENCY EVACUATION PLANS

Our analysis has focused on the evolution, existence and contents of emergency plans which cover evacuation as a result of flooding. There is no national guidance in the UK as to what should and should not be included in an emergency plan, be it an evacuation plan, a flood plan or a generic plan covering a range of emergency events. Indeed the range and combination of plans in the possession of the Emergency Planning Officer varies greatly across the UK.

Some EPOs dispute the usefulness of plans as they fear they will compromise the flexibility required for dealing with the wide range of usually unforeseen problems they have to manage. However, verbal and informal agreements are often made, based on individual personalities. These can disappear with the retirement or departure of the EPO or other member of a coordinating group (Penning-Rowsell et al 1994), a planned response to hazards is a necessity according to White (1974) and it can also be argued that their preparation and use are useful exercises in themselves as individuals formalise and familiarise themselves with the intricate parts and how they function as a whole. The Home Office, in its recently updated report Dealing with Disaster, itself recommends their use for reducing "the likelihood of errors resulting from decisions being taken under crisis conditions" (p.2, 1992).

The responses to the questionnaire showed that 36% of Local Authority areas do not have any kind of plan covering evacuation for flooding, and yet 88% of EPOs admitted that at least part of their area is at risk from flooding (Figure 2). This finding raises a question concerning the factors involved in deciding the type and

level of detail of the emergency plan. The range of plans in existence which would cover evacuation in cases of flooding varied from actual 'flood evacuation plans' (11%), 'flood plans' on their own or together with the 'generic emergency plan' (15%), 'comprehensive generic emergency plans' (23%), and 'generic evacuation plans' (9%) - making direct comparison difficult.

It was hypothesized that those areas that had experienced flooding serious enough to warrant evacuation were more likely to have prepared 'flood evacuation plans'. Over half the EPOs who responded said that their areas had experienced serious enough flooding to warrant evacuation. Yet only 26% had detailed plans. Arguably, the existence of these more specific plans is as a result of a more reactive Emergency Management approach to the inception and preparation of plans, rather than a forward-looking proactive approach. However, in many instances institutional differences and the attitudes and approaches of individual EPOs across the regions may also be a considerable determinant.

This is particularly interesting when comparing flood evacuation plans with plans for other hazards. Whereas 39% of Emergency Planning Departments use technical data** and risk analysis, sometimes supplemented by use of maps, to define their areas at risk from "other" hazards (this includes CIMAH and PIRER sites), only 11% of Emergency Planning departments define their areas at risk from flooding in this way. Moreover, 42% of Emergency Planning departments determine the area at risk from flooding from the extent of previous events, compared to only 9% who do this for other hazards which may require evacuation. It could be argued, however, that historical data on flooding may be more readily available than for other hazards: the Seveso Directive which covers the obligation for public information and for local authorities to hold relevant information on serious chemical accidents (de Marchi, 1991) was passed in 1985, records before then may be incomplete.

The question that arises here is why should such a difference occur. Technical data is used for predicting areas at risk from "other" hazards, but not for areas at risk from flooding, although the technology** for obtaining this data clearly exists within the National Rivers Authority and other organisations (Parker et al, 1995), but is not fully taken advantage of by all Emergency Planning departments. Areas potentially at risk from flooding are more likely to be defined according to previous events rather than areas at risk from other hazards, even when the severity of the risk in question may be comparable or greater. The decision to use technical data to define area at risk is therefore not according to severity of risk.

Considering the lack of guidelines concerning the content of emergency plans***, one might expect to find considerable variability in detail and quality of the plans and the research evidence suggests that this is the case. Variability in content and detail of plans will undoubtedly influence the ensuing response, variability which may have to be accounted for at a national level.

Specific Evacuation Issues

We have collected information on many evacuation issues. For the purpose of this paper, three evacuation issues were chosen from our study, taken from recent literature (DoT 1994) to focus on the content of the relevant plans. These were whether the plan specified where the public should go for emergency accommodation; where they should go to board transport to emergency accommodation; and the route to be taken to drive safely out of a threatened area in their own vehicles.

The results showed wider variability than originally expected. Of the thirty-six County or Regional EPOs who said they had a plan which covered evacuation as a result of flooding, 73% of those plans specified where the public should go for emergency accommodation, 39% specified where they were to go to board transport, and only 20% stated what route should be used to leave the threatened area.

It should be pointed out that several Emergency Planning Officers felt that they had good reason not to cover one or more of these issues in their plans, usually because of the unpredictable nature and location of many disasters. The unpredictability of flooding is perhaps relative to some degree. Certain locations have flooded historically and information is available on approximate extent and recurrence interval. The National Rivers Authority is charged under Section 105 Water Resources Act 1991 (Subsequently outlined in MAFF-DOE Circular 30/92 Development and Flood Risk), to map the areal extent of flood risk for England and Wales and has much information available, although complete coverage at the national level is still a long way off. A number of floods occur, however, for which there is no available information and these are problematic for contingency planning.

** Technical data and technology with reference to flooding is taken as being weather radar, river gauges, telemetry, GIS etc.

*** This excludes rest centre plans, for which guidelines do exist

INVOLVEMENT IN PLANNING

Another issue evident in the US literature on evacuation regarding the development and implementation of evacuation plans, is that of whether those involved in carrying out the plan are in fact the same as those drawing up the plan: does the plan reflect the opinions and benefit from the expertise of all who are involved in an incident, for flooding or otherwise? Our research suggests that in general this problem has chiefly been addressed in the UK, although with some notable exceptions.

When drawing up the plan, the completed questionnaires showed that in most areas a wide range of officials, departments, voluntary agencies and individuals were consulted and invited to comment on the proposed plans. A distinction must be drawn between consultation and active involvement. The emphasis on consultation with the emergency services was quite marked. The police were by far the most frequently consulted body, followed by the emergency services as a whole and then the Fire and Ambulance Services. The Social Services department and the National Rivers Authority/River Purification Boards were also consulted in some cases (10% and 7%, respectively), as was the District or City Council. Local Authority departments which were specified included: Social Services (48%), Education (22%), Roads (11%), Environmental Health (8%), Water (7%) and Housing (4%). Other individual officials consulted in rare cases included Public Transport, Port Authority, Utilities, Industry and the Military.

The fact that only one Emergency Planning Officer consulted the Military was of particular interest, considering the, in some cases, strong role of the Military in recent serious flood events.

The Voluntary Agencies and individual residents consulted also showed a wide, and often imaginative, use of resources. The WRVS and British Red Cross were the most widely consulted of the voluntary agencies, 12% answered "voluntary services" as a whole. Other voluntary organisations included the amateur radio organisation - Raynet (10%), St Johns Ambulance (6%), the 4-wheel drive vehicle owners club (3%), the Salvation Army (3%), the counselling organisation - the Samaritans (2%), the Council of Churches (2%) and the Women's Institute (2%).

Local Residents Organisations and individuals were important consultees in a minority of cases, with retailers, Community Councils and resident representatives consulted. However, 14% of the Authorities admitted that they did not consult anyone other than officials and other departments.

When looking at which agencies and individuals are involved in putting the plan into action, it is of interest to us here to consider only those who were NOT reported to have been involved in drawing up the same plan, rather than list again every agency mentioned.

The evacuation centre/rest centre staff were amongst the few involved in the response phase of an incident, that is, in carrying out the emergency plan, but who were not consulted. Neither were organisations involved with the welfare and care of domestic animals. From past experience some local authorities have recognised that dealing with pets can be problematic during an evacuation and once the evacuation has been completed. Incidents have arisen where the refusal to leave pets behind during an evacuation or the problems caused by the presence of animals in rest centres has been an issue of some concern. Others involved in carrying out the plan, but not involved at the consultation stage were the Health Authority, the DHSS, Town Centre Security Staff, and interestingly the local media.

The media (including local radio, television or newspaper) has a dual role in emergencies in that they both report on an incident to a wider audience and pass on warnings and advice to a more targeted audience (Fordham, 1994). This is a role they play regardless of whether there is an evacuation or not, and a role that has been acknowledged both favourably and unfavourably on several occasions (Kelly et al, 1992; Braer oil spill 1993; Perth floods 1993, pers.comm.). It would therefore seem surprising that the media has not been invited at the planning stage to formally discuss how they might be used to best effect.

CONCLUSIONS

- Floods are infrequent events on a regional scale, but on a national scale this is not the case. Emergency Planning departments could, and should, take advantage of this in terms of cumulative lessons learnt.

- There exists a decentralised approach to emergency management in the UK: a system of regionally diverse roles, descriptions and expectations in the field of Emergency Planning. Despite this, better use should be made of the centralised information source and Home Office training centre in Easingwold and other information exchange opportunities.

- Lack of centralised government guidelines has resulted in a wide range of emergency plans in existence across the UK - Emergency plans covering evacuation for flooding

are not comprehensive and are not prepared according to severity of flood risk. More importantly, emergency plans must not be seen to restrain flexibility: they serve a useful function in reducing error and promoting confidence in judgements.

- This lack of guidance leads to duplication of time, effort, resources and experience across the regions in the UK. This counters a principle objective of comprehensive and integrated emergency management.

- In most areas, a range of officials, departments, and voluntary agencies are consulted when drawing up emergency plans (principally the police and emergency services). However, consultation does not necessarily imply active involvement, and some involved in carrying out the evacuation were still not consulted/involved in drawing up the plan.

- Exclusion of the media from the consultation/drawing up stage of emergency plans appears to be inconsistent with comprehensive and integrated emergency management. Consultation with the media will optimize a dissemination process and mouthpiece, and in doing so, guarantee the media's co-operation.

- Predicting area under risk from flooding tends not to be calculated by use of technical data, instead there is an over-reliance on historical data.

Finally, it is encouraging to see the high response to our questionnaire, just one example of research in the Emergency Management field. An eighty-six percent response rate is notably high. However, what is particularly interesting is that 98% of respondents said they would be interested in participating in a follow-up study, many adding comments on other areas they felt could be covered in the future. Some even took inspiration from the questionnaire to follow-up particular issues in their areas. This response illustrates the interest and intention to learn and improve exists. The question being addressed is how to remove the barriers to this facility.

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Figure 1: Counties and Regions which were represented in the EUROflood questionnaire

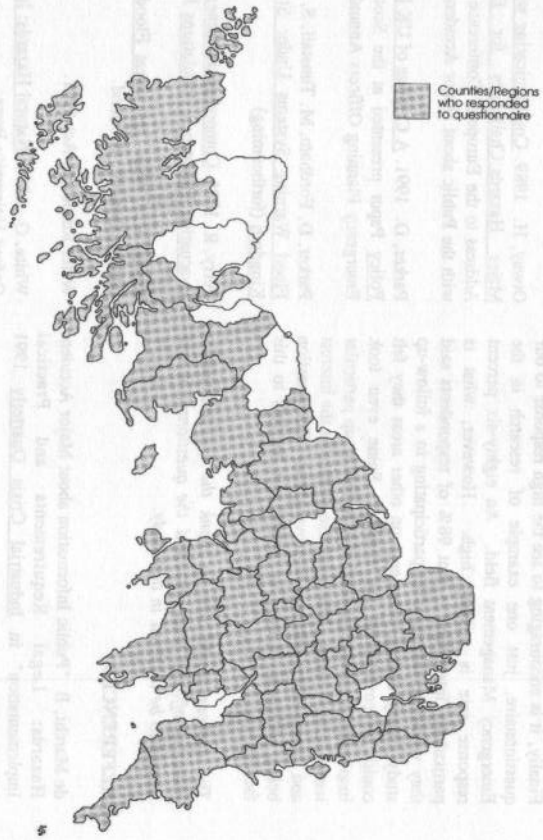

Figure 2: Flood risk and existence of plan covering evacuation for flooding