

# Farmers' search for information during the UK foot-and-mouth disease crisis – what can we learn?

Christine Hagar explores the information needs of a Cumbrian farming community in England during the 2001 foot-and-mouth disease outbreak.

## ABSTRACT

This paper reports on the findings of a study which explored the multiple information needs that faced the Cumbrian farming community in the north-west of England during the 2001 UK foot-and-mouth disease outbreak. Findings highlighted the importance of: changes in information needs at different stages of the crisis, context in which information seeking took place, overlap of information and emotional needs, formal and informal channels of information seeking during the crisis, farmers as information providers as well as information seekers, sense-making approach to information seeking during the crisis, trusted information sources, need for a mix of ICTs during the crisis, ICTs as a catalyst for innovation during the crisis, place and space and new venues and meeting places for communities in a crisis, and providing a local response to a national crisis.

## Introduction

This paper reports on the findings of a study which explored the multiple information needs that faced the Cumbrian farming community in the north-west of England during the biggest foot-and-mouth (FMD) (1) outbreak to affect the UK farming system. The main research questions were: What were the information needs of farmers during the FMD crisis? How did farmers seek information during the crisis? and Why was it difficult for farmers to acquire the information they needed during the crisis? This study also addressed the role of ICTs in the crisis by asking the questions: How did farmers use ICTs to meet these information needs? and How did ICTs support the Cumbrian community during the crisis? A mixed

method approach was used to collect the data which was gathered via semi-structured interviews with farmers and their families, members of the farming community network Pentalk ([www.pentalk.org](http://www.pentalk.org)) and personnel from BBC Radio Cumbria. As well as interviews, data also came from a number of publicly available resources. Triangulation, i.e., drawing on different accounts, produced a fuller interpretation and understanding of the situation, enhancing the ability to address the research questions. Documents (2) gave supporting data to the interviews; insight into the national FMD picture; and reports of events and experiences of farmers in other regions of the UK. Data were analyzed for the types of information farmers needed during the crisis, the sources and providers of information, sources of trusted information, the methods used to access the information, changes in the use of ICTs during the crisis and the impact of ICTs on community building.

## Findings

Results highlighted the importance of:

- Changes in information needs at different stages of the crisis
- Context in which information seeking took place
- Overlap of information and emotional needs
- Formal and informal channels of information seeking during the crisis
- Farmers as information providers as well as information seekers
- Sense-making approach to information seeking during the crisis
- Trusted information sources
- Need for a mix of ICTs during the crisis
- ICTs as a catalyst for innovation during the crisis
- Place and space and new venues and meeting places for communities in a crisis
- Providing a local response to a national crisis

Before discussing each of these issues, it is useful to summarize the characteristics of the FMD for comparative purposes, as no two crises are the

same. Crises are “an interruption in the reproduction of economic, cultural, social and /or political life” (Johnston, 2002, p.123-5). The FMD outbreak was an interruption of all four. It affected the rural economy including agricultural markets, farmers’ channels for communication, and social life, and destabilized the UK Government. The nature and scale of the epidemic was unprecedented in modern farming history. Although, FMD was similar to other crises in having economic and emotional impacts, it was unique in other respects. Unlike many other disasters, the FMD crisis was an animal disease crisis and although not transferable to people, it had a major impact on the lives of Cumbrian farmers. Unlike many disasters, 9/11, the Asian Tsunami or Hurricane Katrina where the length of the crisis event is short, the FMD crisis lasted for over 6 months. It was a crisis that spread and no one knew when it would end. Also unique to the FMD crisis was the simultaneous impact on farmers’ work and home worlds, since these were in the same place.



### Changes in information needs at different stages of the crisis

Farmers’ information needs can be divided broadly into two parts. First, information was required at the different stages of the crisis: at the beginning of the crisis farmers were desperate to know about the origin of the disease; identifying the disease; finding out where the disease was spreading and whose farms had been infected; information on eradication including the slaughter and disposal of animals and, information about cleansing of the farm. Secondly, information was required on the complex system of biosecurity measures (3) introduced by the government.

### Context in which information seeking took place

It is important to recognize the socio-cultural and political contexts in which farmers were seeking information. Farmers live in close-knit communities and are very much an oral community where

information is passed on by word of mouth. Information is acquired from family, immediate farming neighbors and farmers who often live in the same valley. In the socio-cultural context, farmers were physically isolated, their daily routines disrupted, unable to exchange information, gossip and ‘crack’ in their usual meeting places. Farmers’ means of accessing their usual “ecology of sources” (Williamson, 1998) changed. Their normal channels of communication were disrupted from one which was primarily face- to- face to one in which technologies were the main methods of communication. Normally farmers know where to go for their information: they exchange information at auction-marts, at farmers’ discussion groups, in the pub and, in meeting each other during their work. In the crisis this changed; they were seeking information in an environment where many diverse actors, networks and agencies were responding to the crisis.

In a political context, farmers were seeking information in an environment where government disease control measures were complex: policies and strategies were continuously being adjusted to deal with the emerging situation; legal requirements and implementation on the ground were subject to continual change in order to address problems as they developed. Farmers’ information seeking was hindered by the government response, one which was severely criticized for shortcomings in the information gathering and processing and methods of communication (Anderson, 2002). Information from the government was often not forthcoming, was not delivered at the ‘right’ time and at the ‘right’ place and was often contradictory. This study adds to McConnell & Stark’s (2002) work which argues that the management of crisis is often driven by ‘politics’ as opposed to ‘rationality’.

### Formal and informal channels of information seeking during the crisis

When information needs are not being met, in the intense conditions of a crisis people seek information in formal and informal channels. Four stages can be identified in the FMD crisis: 1) the initial stages of the crisis when farmers sought information from informal channels, through friends and neighboring farmers, when information from the government was not forthcoming; 2) as FMD spread and legislation was implemented farmers sought information from the formal channels of government agencies and vets; 3) a return to informal channels as information from the government was lacking, not timely, or contradictory and, 4) desperate for information, farmers resorted to formal and informal channels. One of the major findings of this research is that when formal channels of information do not answer questions informal channels fill the gap. In a crisis, informal channels of information become even more important as people seek information from people who they know and trust. In addition, a two-way exchange happens, as the people seeking information also become the providers of information.

## Sense-making approach to information seeking during the crisis

The findings of this study add to Dervin's sense-making approach in information seeking, as farmers were seeking meaning, an understanding of the crisis, not knowing how the disease spread and why the outbreak had occurred. They wanted to know: Why was the crisis happening? Did it really have to happen? How did FMD spread? Why did one farmer get it and not another? How had the virus got there in the first place?

There were many gaps in the information; it conflicted with earlier information or information from other sources; and it was disseminated and received too late. Farmers were trying to create a narrative that made sense and fill in the gaps of their information needs, by trying to interpret rumor and gossip. The crisis was an extremely emotional time for farmers, and ambiguity was accentuated by the emotional tensions that often made farmers unwilling to accept the facts or consequence. This study highlights that in the extreme conditions of a crisis, making sense of information becomes even more critical. Also, as information is spread via rumor and gossip it becomes exaggerated.

## Overlap of information and emotional needs

While the focus of this research was farmers' information needs, one of the findings of this study was the overlap of social and emotional needs with information needs and vice versa. For example, farmers often began seeking information about how to deal with a particular process and would find themselves seeking information and social support at the same time. Alternatively, when farmers were seeking information they often found themselves being provided with emotional support. This follows Chatman's argument that people cross information boundaries when information is perceived to be critical (Chatman, 1991). As Figley (1985) argues, social support plays a critical role in people's abilities to cope with and recover from disaster. In a crisis, information providers become the providers of social support and those in positions of providing social support become information providers. It is important for this change of roles to be recognized in order to prepare individuals and organizations for future crises.

## Trusted information sources

One of the key findings to emerge in answering the question of why it was so difficult to meet farmers' information needs, was the need for trusted sources of information. In a crisis, trusted information takes on greater significance. Decisions have to be made about which sources of information and which information providers to trust. These decisions were critical as by acting upon trusted information, farmers could shape and influence the nature of the crisis. As distrust of the government intensified, an existing trust divide between farmers and the government intensified. Generally farmers trusted anyone who had a local connection (except local government) and with whom they were

familiar. Further, during a crisis, individuals must deal with information overload, from official and multiple unofficial sources. This increases uncertainty and the difficulty of making decisions about who and what are trustworthy sources of information.

As farmers distrusted much of the information that reached them, this lack of trust led to people making up stories, rumors and gossip. Consequently, much of the information that farmers were seeking and receiving was second- and third-hand. In a crisis, it is difficult to ignore rumors and gossip, as people seek information and explanations. Key questions are, How do we distinguish between rumor and gossip and information, and how do we decide how reliable is the information content?

The information uncertainty of the crisis and need for confirmation that farmers were doing the 'right thing' influenced their patterns of information seeking. Uncertainty brought about a need to compare different information sources. Even though farmers began to distrust the information about infected farms that was published on the Department for Environment, Food & Rural Affairs (DEFRA) website, some still felt the need to continue checking the website. We need to consider: Do people trust face-to-face contexts more than other environments, for example the Internet? This is discussed later in this chapter.



## Need for a mix of technologies

Farmers' use of technologies, and the ability of the technologies to cope with a high demand for information and social support during the outbreak, highlights the need for a mix of technologies to be available in a crisis, and the importance of having multiple responses and multiple supports. A range of technologies is needed to disseminate and communicate information, and different technological choices are needed to accommodate different user communities and user preferences. This study adds to Dutta-Bergman's (2004) argument that users of a medium that satisfies a particular functional need also use other media types to fulfill that need. His notion of channel complementarity suggests that new media forms co-exist with traditional media forms in fulfilling specific communicative functions. In this study, farmers

needed a mix of technologies to meet their information needs and to provide more channels of communication to accommodate users' preferred choice of technology.

At the outset of FMD farmers' access to technologies varied. Few farmers had access to the Internet and others were unable to receive local radio reception. During the crisis, access to technologies was interrupted, as the telephone infrastructure could not cope with the quantity of calls as telephone lines quickly became jammed but access to other technologies, the Internet and e-mail increased. Television may offer significant broadcast capabilities for information, but as this research shows, during the crisis, isolated farmers preferred to use a technology where they could interact and receive an instant response. This mix of technologies in a crisis also needs to be considered in other contexts where there is different access levels to ICTs, for example, in Africa while there are only two telephone lines for every hundred people, there are twenty radio receivers.

The crisis became a catalyst for ICT innovation as alternative means for exchange of information were set up, such as the Radio Cumbria website, interactive radio programs, new help-lines and online diaries. As technologies of memory storage change, cultural understanding of crises may also change. For example, in this research, online diaries allowed the collection of data that helped interpret the crisis, and leave a more permanent and available record for others to read.

One of the major challenges for farmers in their information seeking was assessing the trustworthiness of information. An emerging area of research (Guerra, Zizzo, Dutton & Peltu (2003) focuses on the relationship between technology and trust, asking questions such as: What is the effect of ICTs on trust? What effect does the Internet have on trust? Although there is no definitive research on the impact of different media on one person's trust in another (Dutton & Shepherd, 2003), a key assumption has been that the Internet will undermine trust because it eliminates face-to-face interaction. In the FMD crisis the majority of farmers were in the early adoption stage of using the Internet and were assessing the trustworthiness of the technology. Making this assessment in the context of a crisis made this a complex process.

Trust in online sources can be enhanced by effectively making information accessible on the web and in chat rooms (Ben-Ner & Putterman, 2002). Farmers who had the appropriate skills to interpret online information could enhance their ability to authenticate the value of information, thereby encouraging trust. However, others could be overwhelmed by the mass of information, creating an increased risk of negative outcomes from using the Internet. This raises concerns about the inequalities caused by variations in the skills of different social groups (Guerra et al, 2003), such as farmers. There are strong arguments that trust can be enhanced by making effective use of online social networks available through Internet-based interactions (Ben-Ner & Putterman, 2002), such as the Pentalk Network. (4) Thus, in a crisis it is important for new spaces to be



created where people can exchange information and provided social support.

E-mail gave farmers another medium in which to talk, and enabled the quick dissemination of rumors and gossip. In a crisis, the Internet also allows rumors and gossip to be spread globally (Frost, 2000).

How would ICTs be used in a future FMD crisis? Farmers talk to each other on their cell phones, Internet use is widespread and broadband is more widely available. However, interviews revealed that in another crisis, farmers would still consider the traditional technologies of the telephone and radio to be important. One of the recommendations of the Anderson Inquiry (2002) stated:

*In any future outbreak, the local media should be used to the full. DEFRA should provide tailored information to local radio stations or local newspapers in time for their deadlines, working with the Government Office network and the Government News Network...*

Cohen & Willis (2004) contend that:

*Radio audiences seek out the medium following national trauma as a way in which to help bridge the gap between self and others, local and distant, and to create and identify with interpretive communities of listeners through attention to a unified message (p595).*

During the FMD crisis, local radio was an extremely important source of information and social support for farmers. As Gardener remarked (2003):

*Sometimes looked down upon as the "poor relation" of television, and certainly old-fashioned compared to the Internet, radio today has become the one to watch... portable communication medium, the most widespread and the most economic; proving itself versatile enough to go hand-in-hand with the Web.*

Some argue that radio will remain the most important media for the poor while new media proponents argue that the broadcast monologue will be replaced by the Internet dialogue.

## Place and space and new venues and meeting places for communities in a crisis

This study brings the dimension of a crisis to discussions about place and space. Sproull & Kiesler (1991) wrote of communities brought together by interest rather than geographical co-location. Wellman (2001) writes that the rise of the Internet has resulted in a shift from "place-to-place" communities, in which socialization occurs among families, to specialized online communities. Writings by Rheingold (2002) and Castells (2001) suggest that the idea of place does matter, and that the separation between cyber and geographic places is possibly just a transitional phase that results from the juvenile stage of these technologies.

The FMD crisis certainly created a kind of placelessness, as well as a new place in cyberspace, necessitated as physical meetings became impossible while human contact became essential, and sustainable via the Internet. The farming community is naturally geographically dispersed but at the same time has strong local ties. Yet this move into cyberspace occurred against the background of a very real and immediate attachment to place. The crisis created a greater attachment to place as the impacts of the disease targeted farmers' local, physical region, one that many had farmed as families for generations. Yet it created a detachment from place as farmers were cut off from contact with other farms, family and the rural community, and found refuge in phone and internet connections. The crisis created a strengthened identification with physical place at the same time it denied access to that place, and as new technologies offered placeless interaction.

As a result of the crisis new spaces of interaction developed, and a new sense of community (Bennett et al, 2002; Wall, 2002). Pentalk created a virtual space where farmers formed a 'new' community during the crisis, creating new connections at a local level. Not only did new spaces emerge for social interaction but also new associations were established, e.g., the Pentalk coordinators, when they could, met face-to-face to discuss the development of the network, thereby providing a new dimension to the increasingly restricted movement of the offline community. The offline and online communities were separate but also integrated (Haythornthwaite & Hagar, 2005), each supporting the other.

Along with specialized communities, people also belong to multiple communities: of work, family, interest, practice, etc., some enacted locally, but also globally. Internet connections made it possible for Cumbrian farmers to create and maintain global communities. Pentalk enabled the farmers to extend their work community internationally. Again, paradoxically, the need for international contact was driven by geographically local conditions.

## ICTs as a catalyst for innovation during the crisis

As demonstrated by the Pentalk Network, the Internet can be used to set up a rapid-response website, designed to centralize and aid the control of information flow during a crisis, and providing crisis response updates. The significance of a crisis lies in the fact that it may produce a new fundamental outlook; it can be both a danger and an opportunity. Crises can create imbalanced, disorganized chaos or serve as a catalyst for new and positive changes such as the Pentalk community network described here. This is a particularly interesting study because the Pentalk Network was one of the few positive initiatives to have emerged from the FMD crisis. Pentalk helped contribute to the survival of farming in Cumbria during the crisis and post crisis.

## Providing a local response to a national crisis

The case study of the Pentalk Network gives valuable insight into how a local community responded to a major national crisis, serving a population for whom work and home were in the same place. While further research is needed to fully explore the role of ICTs and the Internet during crises, this case shows that the network serves as more than just an information dissemination mechanism. The Pentalk Network acted as an important resource and site for interpersonal contact, information dissemination, and information discussion, each of which were particularly important during the crisis. Pentalk serves as an example for community leaders and administrators of a successful innovation and a sustainable one.

There is a degree of skepticism about how real some community networking projects are. The major challenge confronting local community-technology installations worldwide is how they can be sustainable in the longer term (Gurstein, 2001). Pentalk, which emerged from a crisis, has become sustainable. When the crisis ended, not only did the network carry on but also it rapidly spread to the whole of Cumbria. The attention paid to the social, cultural and organizational contexts in which the network was developed and used have contributed to this success.

Pentalk's success may be attributable to its focus on the specific needs of the farming community, first by reacting in response to a crisis, and second by continuing to help in ways that directly address community needs. Keeping the scheme purely for farmers and aiming at providing basic skills has contributed to its success. Current training that addresses government demands for online reporting, and a continued focus on farm needs and farm activity, have continued to encourage farmers to become involved. Also important has been the way work has moved from a central organizer to local coordinators, people embedded in the farming

community, and conversant with its needs and members. This provides Pentalk with a base of engaged participants who are close to local needs, and again are responsive to contemporary informational and technology needs.

Discussions have been held with representatives from other counties as to how similar schemes could be set up in other parts of the UK. If networks similar to Pentalk could be replicated in other areas, then the farming community would be in a much better position to deal with a future animal disease crisis, should one occur again. A new space created by Pentalk, called VetCall News has the potential to act as an early warning system should there be another occurrence of FMD. The creation of this online space allows farmers to receive and discuss the latest information online on unusual cases. Thus, Pentalk could help by providing a direct link between farmers and vets in identifying a new outbreak of FMD.

Community networks can play an important role in disseminating information and providing social support in crises. Lessons learned from this study of Pentalk can be implemented by other community networks involved in crisis response.

## Summary

This research adds to crisis theory by analyzing complex information needs in a crisis and by exploring how information needs to be delivered for an effective crisis response. How effectively information is managed and information needs are met during a disaster can have a direct influence on how well the crisis is managed. Information needs to be integrated from a wide range of sources and be coordinated among a potentially large, diverse set of individuals and organizations.

This research also extends information seeking theory by enhancing an understanding of information seeking in a crisis. Studies in library and information

science have highlighted the importance of context in information seeking (Kuhlthau, 1999; Jarvelin & Ingwersen, 2004) and sense-making (Dervin et al, 2003). This study highlights that in a crisis, the physical, social and political environment in which information seeking takes place may change. People have to think of new ways to find information and make sense of information (Dervin, 2003). Information seeking takes place in peoples' close social and professional networks, as local sources of information and local information providers are seen to be trustworthy. In a crisis a two-way exchange of information happens, when information and emotional needs are met by an information provider or an emotional supporter and the person seeking information is the provider of information.

The challenge in a crisis is: the effective delivery of information to many different actors; by officials who need to determine a quick response; by victims who need to know what to do and who may need assistance; by members of the public who want to find out what is happening or offer support and by the media to broadcast news (NRC, 2003).

## Notes

1. FMD is an infectious viral disease affecting cloven-hoofed animals, in particular, cattle, sheep, pigs and goats. FMD spreads rapidly and is serious for animal health and for the economics of the livestock industry.
2. Reports from independent inquiries (non-government inquiries): The Cumbria Foot and Mouth Inquiry (2002), a proceeding which was also transmitted in its entirety by BBC Radio Cumbria ([www.bbc.co.uk/cumbria](http://www.bbc.co.uk/cumbria)); The Anderson Report (2002). *Foot and mouth disease 2001: Lessons to be Learned – Inquiry Report*; The Royal Society Report (2002) and the National Audit Office (2002) *The 2001 Outbreak of Foot and Mouth Disease*; The European



Parliament Temporary Committee on Foot and Mouth Disease (2002).

The Warmwell independent website ([www.warmwell.com](http://www.warmwell.com)) set up at the beginning of the crisis which provides an archive of articles, reports, parliamentary proceedings and commentaries from individuals

The FMD archives of the Penrith Public Library. A collection of newspaper cuttings from local and national newspapers.

Personal diaries and accounts written in local and national newspapers (Plummer, 2001) were particularly useful for relating the farmers' individual daily and weekly stories and for mapping the changes in their needs and responses as the crisis progressed.

Recordings of local radio news reports and program, such as the BBC Radio Cumbria *Nightline* phone-in program broadcast during the crisis.

One interviewee gave access to a unique collection of supplementary data - a collection of documents which they had received in the mail and via fax during the crisis. This female farmer had kept the documents as memorabilia for her grand-children. These documents came mainly from MAFF/DEFRA and included: MAFF/DEFRA newsletters; information leaflets; Public Information Fact Sheets; licenses e.g. for the movement of cattle and for moving silage; instructions for enforcement measures; list of approved disinfectants and local NFU newsletters. This collection was particularly useful and original copies of licenses were seen which farmers had referred to in the interviews. Also the documents from MAFF/DEFRA enabled the content of information sheets to be viewed, instructions etc. described in the interviews and the method by which information was disseminated to farmers. Photocopies were taken of these documents, allowing me to refer to them during my research.

3. Restrictions were imposed on the movement of all animals and carcasses except under license, and on markets, fairs, 'gatherings of animals' and hunting activities. Of particular note was the use of 3km-radius 'protection zones' and 10km-radius 'surveillance' zones' in which there were various restrictions on the movement of animals, people and equipment, as well as on other activities. Complicated licensing procedures were introduced to control animal movements. When farmers requested to move stock, for example for grazing purposes, vets had to issue licenses. The vet assessed where farmers wanted to move the animals and then MAFF/DEFRA approved or disapproved the movement. Another element of disease control was the introduction by farmers, individuals, businesses and organizations (e.g., Cumbria County Council) of disinfectant footbaths or mats, usually situated at the entrance to property.

4. The Pentalk Network was a community network constructed at a time of the FMD crisis with the aid of farmers. It was set up to provide computers and IT training (particularly e-mail and the Internet) for farmers and their families at the height of the FMD crisis. It was clear that farmers needed to become computer literate very rapidly and that, often, they could not afford to buy a computer. They needed to be provided with one and they needed to be taught to use it speedily, in a way that provided them with functional skills. Pentalk supplied re-conditioned computers to farmers free of charge for six months, after which they could buy them for approximately US \$450 or return them at no charge. Initial funding for the scheme came from a start up grant from the UK Learning and Skills Council, which was matched by the Rural Development Programme. Further funding came from the Department for Education and Skills (DfES). A Pentalk office was set up at the Penrith auction mart, which is normally the focus of the farming community. Pentalk served to connect farmers across Cumbria, by providing them with access to the Internet, e-mail and links via their web pages, where farmers could access news and information available from Government and other sources on the spread of the disease.

## Acknowledgements

Special thanks to Ann Risman (Pentalk organiser at the time of the study), Steve Pattinson (Pentalk co-ordinator at time of study), members of the Pentalk Network, the Cumbrian farmers and other people interviewed for this study. May you never have to suffer such a crisis again.

## References

- Anderson, I.** (2002). *Foot and mouth disease 2001: Lessons to be learned – Inquiry Report HC 888*. London: The Stationery Office.
- 
- Ben-Ner, A. & Putterman, L.** (2002). *Trust in the new economy*. HRRRI Working Paper 11-02, University of Minnesota: Industrial Relations Center.
- 
- Bennett, K., Carroll, T., Lowe, P., & Phillipson, J.** (2002). *Coping with crisis in Cumbria: The consequences of foot-and-mouth disease*. Centre for Rural Economy Research Report, University of Newcastle upon Tyne.
- 
- Chatman, E.A.** (1991). *Life in a small world; Applicability of gratification theory to information-seeking behavior*. *Journal of the American Society for Information Science*. 42 (6), 438-449.
- 
- Cohen, E.L. & Willis, C.** (2004). *One nation under radio: Digital and public memory after September 11*. *New Media & Society*, 6, 591-610.
- 
- Dervin, B., Loreman-Wernet, L., & Lauterbach, E. (Eds.)** (2003). *Sense-making methodology reader: Selected writings of Brenda Dervin*. Hampton Press: Cresskill, NJ.

**Dutta-Bergman, M.J.** (2004). *Interpersonal communication after 9/11 via telephone and internet: a theory of channel complementarity*. *New Media & Society*, 6 (5), 659-673.

**Dutton, W.H. & Shepherd, A.** (2003). *Trust in the Internet: The social dynamics of an experience technology*. Oxford: Oxford Internet Institute.

**Figley, C.R.** (1985). *Traumatic stress: The role of the family and social support system*. In C.R. Figley (Ed.), *Trauma and Its Wake* (pp 39-56). New York: Brunner/Mazel.

**Gardener, C.** (2003). Cited In B. Girard (Ed.), *The one to watch: Radio, new ICTs and interactivity*. Retrieved 14 May, 2010, from <http://comunica.org/1-2-watch>

**Guerra, G. A., Zizzo, D. J., Dutton, W.H., & Peltu, M.** (2003). *Economics of trust in the information economy: Issues of identity, privacy and security*. Oxford: Oxford Internet Institute. Retrieved May 14, 2010, from <http://www.oii.ox.ac.uk/resources/publications/RR1.pdf>

**Gurstein, M.** (2001). *Community informatics for flexible networking*. In L. Keeble & B.D. Loader (Eds.), *Community informatics: shaping computer-mediated social relations* (pp.263-283). New York: Routledge.

**Hagar, C. & Haythornthwaite, C.** (2005). *Crisis, farming and community*. *Journal of Community Informatics*, 3. Retrieved 14 May, 2010 from, <http://www.ci-journal.net/index.php/ciej/article/view/246/211>

**OJarvelin, K. & Ingwersen, P.** (2004). *Information seeking research needs extension towards task and technology*. *Information Research*, 10. Retrieved May 14, 2010, from <http://informationr.net/ir/10-1/paper212.html>

**Kuhlthau, C.C., et. al.** (1999). *Special issue: information seeking in context (ISIC)*. *Information Processing & Management*, 35, 723-890.

**McConnell, A. & Stark, A.** (2002). *Foot and mouth 2001: The politics of crisis management*. *Parliamentary Affairs*, 55, 664-683.

**National Research Council** (2003). *Committee on the Internet Under Crisis Conditions. The Internet under crisis conditions: Learning from September 11th*. Retrieved May 10, 2010, from <http://www.nap.edu/books/0309087023/html/>

**Sproull, L. & Kiesler, S.** (1991). *Connections: New ways of working in the networked organization*. Cambridge, MA: MIT Press.

**Wall, M.** (2002). *Online lifeline for farmers*. *Sunday Times* 10th November, 51.

**Williamson, K.** (1998). *Discovered by chance: The role of incidental information acquisition in an ecological model of information use*. *Library and information Science Research*, 20, (1), 23-40.

### About the author

**Christine Hagar, PhD** is from the Graduate School of Library & Information Science Dominican University River Forest, IL 60305. She can be contacted at [chagar@dom.edu](mailto:chagar@dom.edu)

R

# How we can improve the Australian Journal of Emergency Management?

Please go to [www.em.gov.au](http://www.em.gov.au) to participate in the 2010 readers' survey. The survey will open 15 November and close 15 December 2010.



Your suggestions, comments and input are greatly appreciated.