

Crisis Response Communications: Telecommunications in the Service of Humanitarian Assistance

Hans Zimmermann

Senior Humanitarian Affairs Officer,
United Nations Department of Humanitarian Affairs,
Palais des Nations
CH-1211 Geneva 10
Phone: +41 22 917-3516
Fax: +41 22 917-0023
e-mail: hans.zimmermann@itu.int

Abstract:

The communications technology of today and its applications for emergency telecommunications as well as by the media play an essential role in disaster response. It is however necessary to recognize the limitations set by the vulnerabilities of public networks as well as the regulatory restrictions. Newly emerging technologies, such as the satellite based Global Mobile Personal Communication Systems (GMPCS), will not solve these problems unless sufficient consideration is given to the specific needs of providers of international humanitarian assistance and to the improvement of the regulatory environment. The paper gives an overview of today's possibilities, their limitations and the next steps towards the optimum use of what is and becomes available to disaster managers.

Introduction

There are no exact records about how long it took for the news from the catastrophic eruption of Vesuvius on 27 August A.D. 79 to reach any foreign country. Most contemporaries may actually never have heard of it at all; it has in fact been said that a weekday edition of the New York Times contains more information than an average person was likely to come across in a lifetime even in 17th-century England (1). International (or even nation-wide) mechanisms for organized humanitarian assistance were of course unknown.

On 17 January 1995, when the Japanese city of Kobe was devastated by an earthquake at 05:46 hours (local time), it took only 22 minutes until the first news flash appeared on 327,000 computer screens linked to the Reuters' network spanning 154 countries (2), within less than two hours millions of households on all continents had live pictures on the TV screen in their living room and 4 hours later the first search and rescue teams in Europe, thousands of miles away, mobilized their specialists (3).

Only ten years ago, to communicate while travelling would, in the best case, mean to find a phone booth, and, for the international traveller, to have the necessary foreign coins ready. Truly mobile communication was limited to private networks among specifically qualified holders of radio licences. Then the cellular telephones arrived, first for use inside one country, soon with the

capability for international "roaming", and even the good old pay phones facilitate life for the user: many of them accept international credit cards.

There can be no doubt, we have reached the era of unlimited, real-time information sharing and mobile communications. Why, may one ask, are communications for disaster response still a topic for discussion, when news travel around the globe in minutes and cellular phones provide instant personal communication links? Unfortunately, the reality looks different.

News versus Information

"Media and Communications are not for entertainment only. They are part of all circumstances of life, including tragedy." (4) The famine in Ethiopia in 1984 went almost unnoticed, until a British TV team shocked the world with dramatic pictures. Television reports can mobilize international assistance in an unprecedented way. They influence public opinion, and public opinion influences the decisions of the governments, who are the primary donors for international relief operations. Television time, however, is a precious commodity, and public interest in a disaster does not last long. This observation applies to other mass media: prior to a front page report in the French newspaper "Le Monde", the 1972 Sahel drought had gone practically unnoticed (5). Consequently, funds for the vital continuity from relief to rehabilitation and to development are harder to find than those for initial, most visible, emergency response.

The first images from a disaster site also influence the decision makers in emergency response. Appropriateness of assistance is of equal importance as its rapid deployment, and much information is nowadays gathered from the TV networks. As soon as there is a choice of pictures, the media will give priority to the most dramatic views, whether they are typical or not. In the case of the Kobe earthquake, pictures of damage to relatively few large buildings and structures were predominant, while in reality most of the damage was to smaller buildings. At least partially due to this unbalanced visual information, foreign search and rescue teams, vital for search in collapsed large buildings with spaces in which survivors might be trapped, were mobilized. The impact of the dramatic TV pictures was stronger than the official statement that "no, repeat, no need for international search and rescue teams exists" and that "the Japanese government is not asking for international assistance" (6). Teams arriving in spite of this statement were actually an additional burden on local and regional logistics.

The media primarily serve the public. The journalists' or reporters' penchant for the dramatic element has, as we have seen in the above examples, brought the famine in Ethiopia to the attention of the world, but it has also misled some emergency managers as in the case of Japan. This conflict limits the apparent usefulness of the almost immediate availability of first visual impressions from the site of a disaster. This is one of the reasons, why "there is a love-hate relationship between the media and the relief community" (7).

Super Highways and Footpaths

Highly developed urban environments in industrialized nations are no more and no less disaster prone than remote areas in the poorest countries of the third world. The progress in telecommunications technology is less evenly distributed: In four fifths of the countries in Africa, and also in more than a dozen Asian countries, among them China and India, there is less than one

telephone line per 100 people. In the G-7 countries (Canada, France, Germany, Italy, Japan, UK and USA) there are an average of 51.7 lines per capita. Seventy percent of all telephone lines are in Europe and North America, and one percent in Sub-Saharan Africa (8). Comparative numbers for television sets or internet access (9) give the same picture.

Mobile telephones, an apparent solution for the mobile communications vital to disaster response, depend on the existence of relay stations, the so called cells. Each cell has a capacity for typically only 6 - 30 simultaneous communications and covers an area with a radius of typically between 1 and 5 kilometres. Cells are mostly clustered in urban areas and along major traffic routes (10). In the most recent case of a humanitarian crises covering a wide spread rural area, the Great Lakes region of Africa, cellular phones played but a very minor role and even that was only for those emergency managers who were based in large cities such as Kinshasa or Nairobi. The rural areas, in which the operational activities take place, are not covered by such systems.

Help from the 21st Century Technologies ?

The Hand-held "satellite phones", which the Global Mobile Personal Communication Systems (GMPCS) are expected to make available over the next few years, will overcome the problems of geographical coverage. Depending on the size of the antenna footprint, which depends, inter alia, on the number of satellites used, network overload can not be ruled out. Different from the "orbiting cells" on board the LEOs or MEOs of a GMPCS system, the Inmarsat system, nowadays commonly used in disaster relief operations, is based on only four main footprints, covering up to one third of the earth's surface each. This allows for a large number of simultaneous links over any one satellite. Consequently, a sudden increase of traffic from a disaster affected area has a relatively small influence on the overall traffic volume.

The GMPCS will become valuable tools for disaster response, but unless the economic development in the countries of the third world makes dramatic progress, they will play their role mostly in the hands of the relatively few international disaster managers. All GMPCS systems are based on costly infrastructures. Iridium Inc., which expects to have its first satellites launched in 1997, has 2.65 billion US Dollars committed so far, and expects to conclude an additional long-term credit agreement for 2.6 Billion US Dollars in 1997 (11). Interest and amortization for more than 5 Billion US Dollars need to be covered by the fees collected from the users. Independently of the billing arrangements, which differ from one GMPCS project to another, the necessary amounts will ultimately be needed in hard currency. The situation will be similar to that of inter-African communications of today. It is estimated, that the use of satellite links operated by foreign or international enterprises, deprive the African economy of some 200 Million US Dollars per year (12). The majority of calls from one African country to another are routed through foreign carriers, often through land earth stations located in another continent.

To the Satellite and back

For the providers of international humanitarian assistance, including the United Nations Department of Humanitarian Affairs (UN/DHA) as the coordinator of such activities, telecommunication satellites have become indispensable tools. Following a number of tests since the 1970s (13), they were among the very first users of land mobile terminals of the Inmarsat

Standard A and C type by 1990. By 1995 the five major international humanitarian institutions had more than 250 land mobile terminals in use - and spent more than 25 million US Dollars on the resulting communication fees (14).

Over the past few years, however, it was not only the number of humanitarian crises requiring international assistance which increased, it was also their complexity and their duration. The acute phase of response in the aftermath of a sudden onset disaster, typically a natural disaster such as an earthquake, lasts for days or weeks. During this period, all available means will be mobilized, often regardless of their cost, including the provision of particularly expensive telecommunications links, in particular the use of land mobile satellite terminals. Contrary to this, the response phase in what is defined as a complex emergency is likely to extend over months, if not years, and the cost of telecommunications places a heavy burden on the providers of response, while at the same time resources tend to diminish with the duration of a crisis - not the least because of a loss of interest by the media.

As a result, all partners in humanitarian assistance are increasingly looking for cost saving alternatives for their communication networks. Technology has come to the rescue. Almost unnoticed, in the shadow of the spectacular developments of satellite technology, new modes for data communication lead to a revival of the all-but-forgotten shortwave radio. With an initial investment which is typically lower than the communications fees incurred for a single land mobile satellite terminal with high traffic volume, a shortwave radio station can be installed. As part of a private network, such a link will not cause any further expenditure. With the newly available interconnectivity to private public data networks such as LAN, WAN and the Internet the use of such data links is rapidly increasing.

Where do we go from here ?

The above overview is necessarily incomplete. For special purposes there are special tools such as VSAT ("Very Small Aperture Terminal") satellite links, which allow permanent or semi-permanent long-distance voice and broadband data communications with remote locations, and VHF/UHF networks using repeaters and trunking facilities for local, independent ad hoc networks. Over the next few years we shall see the establishment of GMPCS systems and further progress in data communications is reported almost daily. Competition among operators and service providers will inevitably lead to a drastic reduction of tariffs for satellite based systems. Nevertheless, a consolidated approach by all users of communications for humanitarian assistance is necessary to ensure the application of preferential tariffs for their communications over public networks. In addition, a continuous feedback from this group of specialized users will help the industry to better fulfil the communications requirements of disaster response.

The regulatory environment, however, requires the full attention and support from all partners in humanitarian assistance. The optimum application of available telecommunication technologies for disaster prevention, preparedness and response depends on an international agreement for the facilitation of the trans-border use of respective equipment. In implementation of the respective Resolutions of the International Telecommunication Union (15), the draft for an international "Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations" (16) has been developed. Its adoption by an intergovernmental conference later in 1997 requires the support from all partners in humanitarian assistance. The position of the delegates at this conference depends on the advice their governments receive from their national

telecommunication authorities, and their advice will, in turn, depend on the creation of the awareness for the necessity of such a legal instrument.

The adoption and the subsequent ratification of the "Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations" will be the next decisive step towards the application of telecommunications towards the most noble of tasks: The prevention, and, where such is not possible, the alleviation of human suffering caused by disasters.

Notes:

- (1) Wurman, Richard Saul, Information Anxiety, quoted in Time Magazine, December 9, 1996, p.44
- (2) Reuters Holdings PLC, Annual Report 1995, p.4
- (3) United Nations, Department of Humanitarian Affairs, The Great Hanshin-Awaji (Kobe) Earthquake in Japan, New York and Geneva, 1995
- (4) Statement of Henri Pigeat, President, International Institute of Communications (IIC), at the 1995 IIC annual conference in Osaka, Japan (in: IIC Members Newsletter, Vol.6, No.3)
- (5) Disasters and the Mass Media, Commission on Sociotechnical Systems, National Research Council, National Academy of Sciences, Washington, DC, 1980, p. 17
- (6) United Nations Department of Humanitarian Affairs, Situation Report No.1, Japan - Earthquake, 17 January 1995, in: Annex to (3) above
- (7) Girardet, Eddie, Blaming the Messenger, in: Worldaid Review, Geneva, 1995
- (8) World Communications, ITU et al., Geneva, 1995, p.56, 74
- (9) World Communications (see 8 above), pp. 30, 31
- (10) Wood, Mark, Disaster Communications, The Disaster Relief Communications Foundation, UK, and APCO, South Daytona, Fla., 1995
- (11) Iridium Inc., Iridium Today, Vol.3, No.1, p. 4
- (12) (RTDC/AF-95) (Africa One Document)
- (13) Zimmermann, Hans, The Use of Satellite Telecommunications in Disaster Relief Operations, in: Acta Astronautica, Vol.37, pp.437-446, London 1995
- (14) Strategies Summit, Telecom 95 Forum, Speakers Papers, Geneva 1995

- (15) Resolution No. 7 of the First World Telecommunication Development Conference, WTD-94, Buenos Aires 1994, and Resolution No. 36 of the Plenipotentiary Conference of the International Telecommunication Union, PP-94, Kyoto 1994
- (16) Draft for the Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations, developed by the Working Group on Emergency Telecommunications (WGET), convened by the United Nations Department of Humanitarian Affairs, Geneva, 1995/1996/1997.

An **Annotated Bibliography** on the subject of Emergency Telecommunications and a list of related international and selected national regulatory documents are available from the United Nations Department of Humanitarian Affairs in print and on the World Wide Web, at the URL of the WGET (<http://www.unog.ch/freq/freq1.htm>) and that of the drafters team (<http://www.law.indiana.edu/law/disaster>).

Biographical Note:

Hans Zimmermann is Senior Humanitarian Affairs Officer, responsible for the co-ordination of international humanitarian assistance and in charge of the Secretariat of the Working Group on Emergency Telecommunications (WGET). He frequently represents the humanitarian community and in particular the United Nations in major international conferences and related events; he also regularly writes for publications on humanitarian affairs and telecommunications. Mr. Zimmermann's earlier assignments include longer term posts in countries affected by humanitarian crises, such as Lebanon, Ethiopia, Pakistan, Afghanistan, Iran and Liberia, as well as assessment and evaluation mission to numerous countries. Mr. Zimmermann is a Swiss national, and his academic background is in political science.

Contacts:

Hans Zimmermann
Senior Humanitarian Affairs Officer
United Nations Department of Humanitarian Affairs
Relief Coordination Branch
Palais des Nations
CH-1211 Geneva 10
Switzerland

Phone: +41 22 917-3516
Fax: +41 22 917-0023 / -0208
e-mail: hans.zimmermann@itu.ch
and hans.zimmermann@dha.unicc.org