> That process included the government's low and late investment in peasant rain-fed agriculture and livestock production, poor infrastructure and limited formal credit . . . .
>
> The government also failed to maintain adequate food reserves, choosing to allow exports instead, under pressure from Sudanese farmers and merchants, and from international banks wanting loan repayments.[26]

Many media are understandably ill-equipped to deal with issues that are often complex and ill-focused.

Given the inherent limitations of most media and the different objectives of disaster mitigation organizations and the news media, many organizations are beginning to recognize that coverage by established news media is not the only means for communicating with the public. Children's Television Workshop's (CTW) International Television Group has spearheaded a new endeavor—its Ecuador Project —reflecting a broader-based approach to disaster preparedness. In cooperation with the Ministry of Education and Culture, the Ministry of Information and Tourism, the National Civil Defense Administration, the U.S. Office of Foreign Disaster Assistance-U.S. Agency for International Development, and Compañeros de las Americas, CTW has formulated and disseminated specific disaster preparedness and prevention instructions not only through Ecuador's cooperating television and radio stations, but also printed on soccer balls, coloring posters, and in coloring books. In addition to reaching communities that may be beyond the reach of mass media, the balls, posters and books appeal more directly to children and provide a more interactive and entertaining educational mechanism.

Other disaster and development agencies have noted the opportunities for disaster management organizations to create and air their own programming on cable television, public broadcasting stations, and satellite television, and to explore alternative formats to news coverage, such as educational or even entertainment programming. The One World Group of Broadcasters has worked with producers in developing countries to create and disseminate its *Developing Stories* series in 18 countries in the developed world in 1992. The U.S. Corporation for Public Broadcasting has also begun exploring ways of working with "public" broadcasters in other countries to share production costs in joint ventures to create new markets for existing programming. FEMA and the American Red Cross have worked together to develop

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[26] International Federation of Red Cross and Red Crescent Societies, *World Disasters Report 1993* 62 (Dordrecht, The Netherlands Martinus Nijhoff Publishers, 1993)

Disaster Dudes, a television show for children providing educational messages about disaster preparedness. During the 1994 Los Angeles earthquake, FEMA distributed information directly to the public as an insert called *Disaster Times* in the *USA Today* newspaper.

Direct agency communications with the public, however, also raise serious issues. In addition to the financial resources and expertise required for effective communications, agency-sponsored communications may distort public perceptions as well. Many relief organizations compete against each other and against other issues and institutions for public support. To attract and maintain that support, organizations seek to draw attention to themselves and to the needs of the developing world. These organizations therefore have a considerable incentive, like the media, to stress negative news about developing countries; to focus on single, dramatic events, like disasters; to suggest simplistic solutions (*e.g.*, give money); and to exaggerate the role of western humanitarian assistance and minimize the importance of indigenous relief efforts.

Consider this example from Peter Adamson, speaking to a meeting of UNICEF's National Committees:

> Some of you may have seen the recent series of advertisements for the Save the Children Fund. These advertisements state, in a headline, that "13,000 children die every day from dehydration—your 20 cents can save this life."
>
> If that were true, then all 13,000 of those daily deaths could be prevented for 13,000 times 20 cents—about $2,500—far less than the cost of this meeting. The annual cost of preventing all dehydration deaths—a third of all child deaths in the world each year—would be about one million dollars—far less than the cost of the *State of the World's Children* report.
>
> What are we saying to the public? They too can do these sums. And eventually, I am sure, cynicism will set in and we will simply not be believed—nor will we deserve to be. For, with the best intentions in the world, we are not telling the truth.[27]

Moreover, although humanitarian and development assistance organizations frequently have considerable resources in developing countries and may have

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[27] Adamson, *supra* note 22

experience in their cultures and languages, the organizations are often unable to draw strategically on those resources to correct western misperceptions. This inability is due in part to the financial instability of many relief organizations which makes strategic, long-term planning difficult. Also, even the largest international relief organizations find themselves overwhelmed with responding to emergencies; planning and executing a thoughtful strategy for better informing the media and the public appears a far lower priority. In addition, many organizations seek to do everything themselves—administer their organizations, raise money, collect and distribute relief supplies, inform the media and the public, and many other disparate tasks. In short, by attempting to do too much, these organizations often lack the resources and the expertise to do all of these tasks effectively. Effective, thoughtful public communications often fall by the wayside.

These issues are increasingly being recognized and addressed by leading humanitarian relief and development organizations. For example, InterAction—a membership association of U.S. relief organizations and a leader in addressing communications issues—requires its members to "respect the dignity, values, history, religion, and culture of the people served by the programs. They shall neither minimize nor overstate the human and material needs of those whom it assists."[28] In January 1995, InterAction hosted a meeting of leading U.S. humanitarian relief organizations to consider whether these standards should be strengthened. Save the Children (U.K.) has also adopted standards for communicating with the public: "The images and text used in all communications must be accurate and should avoid stereotypes and clichés. . . . Attempts should be made where possible to identify and quote people being photographed or interviewed. If they wish to remain anonymous, their request should be honored. Wherever possible, the views and experiences of the people involved should be communicated."[29]

Meetings such as the Yokohama Roundtable and those leading up to publication of *Media, Disaster Relief and Images of the Developing World* have resulted in a variety of specific recommendations to help address the issues faced by both media and disaster organizations. While few are new, they are instructive and noteworthy for the collaborative process from which they emerged. Those recommendations include:

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[28] *InterAction PVO Standards* 5.3 (Washington, D.C : InterAction, 1993).

[29] *Focus on Images* 2, 7 (London· Save the Children (U.K.), 1993)

Strategies for the Media

- *Use news resources more effectively.* The media face the challenge to identify resources that could provide early notification about developing stories; background information; and timely, accurate reports about events in developing countries. Independent journalists or "stringers" could be used more widely. More cooperative ventures among news organizations could make maintaining bureaus in developing countries more economically feasible.

- *Work with relief organizations where possible.* Relief organizations often have the infrastructure within developing countries to help the media identify important issues or emerging trends, give logistical support in reporting those stories, provide background information, and arrange for sources and spokespeople from within the relevant country or countries.

- *Designate and train development journalists.* Reporting on developing countries could be improved by increasing the number of reporters who cover the area and by designating "development correspondents." Media organizations should consider how reporters and photographers who are rushed into a country to cover a story can be better prepared for such assignments, how they can have the greatest amount of time possible "on the scene," how that time can best be used, and what training or information would help editors and other "gatekeepers" within the media evaluate the significance of stories from developing countries and place those stories in a broader news context.

- *Cover initiatives to prevent, anticipate, and respond to disasters.* Media organizations should address disaster prevention and reduction in coverage relating to disasters. Disaster mitigation organizations and the media should identify and communicate to the public specific measures that have either succeeded or failed to reduce the impact of natural hazards.

- *Cover efforts by indigenous organizations and individuals to mitigate disasters.* Reporting should seek to include, to an extent proportional to their importance, relief efforts by indigenous people and organizations or by other developing countries. The media should seek to interview and quote officials from indigenous governments and relief organizations where possible.

- *Provide professional training and review.* Journalism reviews, graduate schools, professional societies, and media critics should play an important role in training journalists in international reporting, critiquing reporting on developing countries, and sensitizing both the media and the public. There are noteworthy examples of high-quality reporting on development issues; these should be noted, rewarded, and used to help train other reporters, editors, photographers, and producers.

- *Expand self-analysis and review.* Media organizations should evaluate their reporting about natural hazards and disaster preparedness, and, where appropriate, to work with disaster mitigation organizations to improve the quality, accuracy and thoroughness of such reporting. The media should also be aware of, and sensitive to, competitive pressures or inadequate resources that might compromise accuracy or thoroughness in reporting.

Strategies for Disaster Mitigation and Relief Organizations

- *Articulate communications strategy.* Each disaster mitigation and relief organization ("relief organization") should publicly articulate its strategy for communicating with the media and the public and the purposes of those communications. Communications strategies, like all activities of relief organizations, should be evaluated regularly to determine their effectiveness, relationship to the organization's goals, and impact. Relief organizations should also regularly evaluate their communications strategies for their impact on public understanding and ethical and professional appropriateness.

- *Expand relationships.* Relief organizations should seek to develop working relationships with the media based on mutual trust and the recognition of differing characteristics, goals and needs. Regular, effective communication among these disparate groups, before, during and after disaster "events" can greatly enhance those relationships.

- *Train organization personnel to work with media.* Relief organizations should provide training, particularly for personnel in the field, on how to work with media to improve the timeliness, quality, and accuracy of reporting about developing countries. These organizations are often well placed to help the media identify and report important stories accurately and sensitively, evaluate the quality of news reports, and seek to correct inaccurate stories or supplement incomplete ones. For example, field offices could

help identify stories warranting press coverage and provide indigenous spokespeople, logistical support, and other assistance to media covering stories in developing countries.

- *Provide reliable, useful information.* Relief organizations should seek to provide reliable information to the media, as early as possible, in a concise and readily understandable form. These organizations should recognize that the media have limited resources, and should avoid overstating the scope of disasters.

- *Identify themes and trends.* Relief organizations should seek to identify and communicate specific themes and messages, both through the mass media and in other alternative forms of communication. Organizations should help link important stories to newsworthy events that are traditionally covered by western media, such as meetings of the World Bank or the International Monetary Fund.

- *Evaluate media content.* Relief organizations should evaluate media coverage for accuracy, quality, completeness, timeliness, and professionalism. Excellent media coverage should be recognized and used to help improve other reporting. Inaccuracies or misperceptions should be corrected through direct contact with the media and reporters involved, letters to the editor, guest columns, counter information, and other means available to relief organizations.

- *Create alternative programming.* Relief organizations should work to facilitate documentaries and other programming that provide a more complete image of developing countries. In particular, organizations should work cooperatively with program producers in developing countries and with the media to create and disseminate programming. New outlets such as cable and satellite television offer considerable potential for airing such programming.

- *Evaluate relief organization communications.* Many relief and development organizations—individually and cooperatively—have adopted standards for their communications with the public. All communications activities should be evaluated according to articulated standards.

C. Organizational Communications and Communication for Scientific Development and Policy Formation

The essential uses of communication within and among disaster mitigation organizations, and between these organizations, scientists, and public officials, have recently become the subject of considerable scrutiny and technological advancement. Relief organizations, like virtually all business, governmental, and academic institutions, have benefitted significantly from the widespread improvement in telecommunications infrastructures and digital equipment. Many disaster-related organizations, however, because of their far-flung activities, need for rapid response, and often limited resources, have been particularly aided by the increased reliability and versatility and decreased size and cost of many of these technologies. A 1992 report on the communications and information resources of the IFRCRCS noted the unusual demands of the Federation its more than 150 national societies, and the dramatic capacity of communications technologies and improved information management to "simultaneously enhance the Federation's individual and collective ability to make more timely and informed decisions and reinforce its position in disaster preparedness, relief and rehabilitation."[30]

Perhaps the most dramatic use of communications technologies within the disaster mitigation community, however, has been in the area of information networks. These networks range from local area networks, linking computers, printers and other peripherals, and telecommunications modems within a single office or among the geographically far-flung offices of a single organization, to advanced, interactive, searchable databases interconnected via direct links, dial-up access, or the Internet.[31] While the Internet provides many types of services, they may generally divided into three categories: electronic mail messages (e-mail), through which one user can communicate privately with another or with a service provider;[32] electronic bulletin boards, where users can post messages for all other bulletin board subscribers to read

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[30] Dale N. Hatfield, *Disaster Communications and Information Management in the International Federation of Red Cross and Red Crescent Societies: A Strategic Assessment* 13 (Washington, D.C.: The Annenberg Washington Program, 1992).

[31] The Internet today connects more than 45,000 separate networks and 25 to 30 million users in more than 100 countries, and is growing at the rate of 750,000 new users per month. The number of business service providers—the bellwether of future growth and expansion—on the Internet has ballooned from less than 100 in 1990 to almost 20,000 as of August 1994. Compuserve, Prodigy, and America Online—the three largest commercial U.S. information network providers, have over 5.4 million subscribers.

[32] The IFRCRCS has begun communicating with its more than 150 national societies in part through Internet e-mail.

and can read and respond to the messages posted by all other users;[33] and on-line services, products, and databases, such as electronic catalogs from which a user can order merchandise, on-line airline reservations, and more than 2,200 searchable databases. This third category may be subdivided between services offering only text and those providing graphics, photographs, video, and sound, as well as text.

Although there are numerous examples of this expanding use of information technologies, including reliance on the Internet in the aftermath of the Northridge and Kobe earthquakes, three are sufficient to help identify both the enormous potential and the significant issues raised by these innovations.

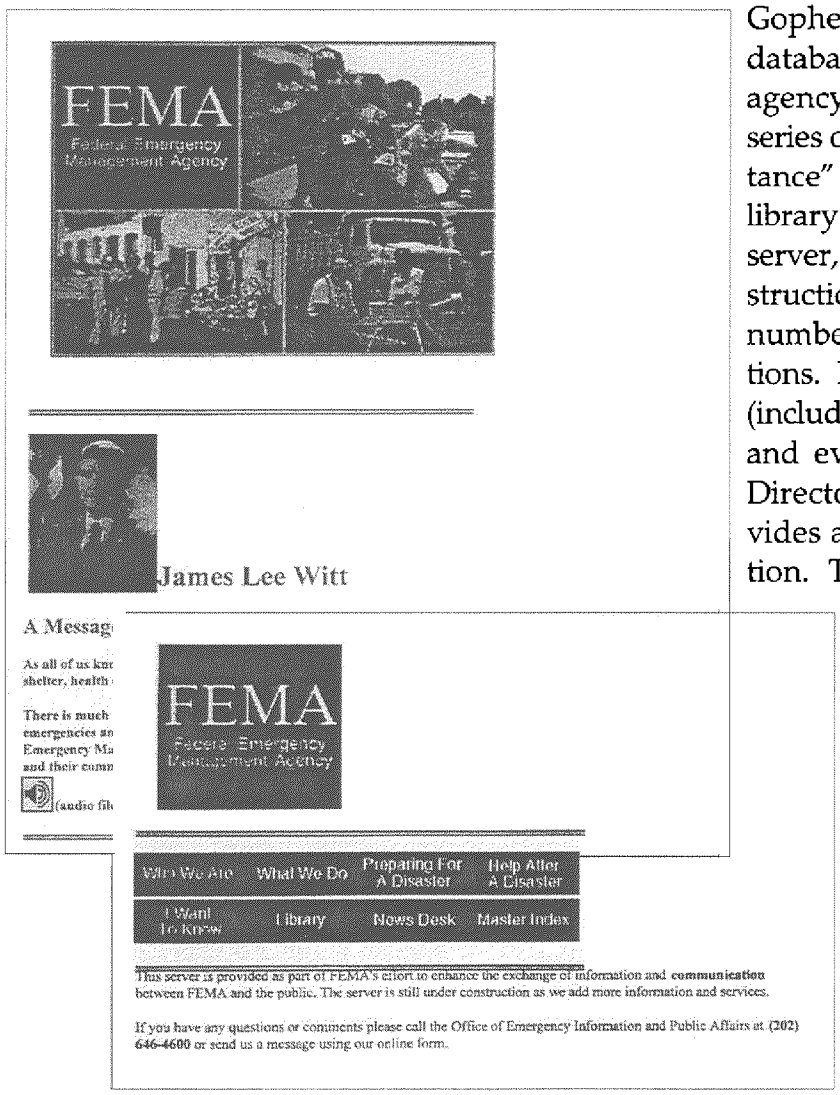
1. Traditional Databases: Emergency Disaster Events Database

One of the earliest databases was created by the Centre for Research on the Epidemiology of Disasters (CRED), located at the Université Catholique de Louvain in Brussels. Funded by the General Administration for Cooperation and Development of the Government of Belgium, CRED works closely with the World Health Organization, WMO, U.N. DHA, IFRCRCS, and the U.S. State Department's Agency for International Development Office of Foreign Disaster Assistance (AID/OFDA). CRED maintains the Emergency Disaster Events Database (EM-DAT), containing data on more than 9,000 disasters from 1900 to the present (most since 1960), in an effort to provide reliable, objective information for vulnerability assessment, policy formation, and research, by governments, disaster mitigation organizations, and academics. EM-DAT data includes onset date, type of disaster, country, continent, affected population, number of dead, injured, and homeless, and estimated economic damage. The data is collected from the U.S. AID/OFDA (33 percent), major insurance companies such as Royale Belge, Munich-Re, and Swiss-Re (18 percent), DHA (16 percent), and other multinational, government, and private organizations, although accurate, comparable data is often difficult to obtain and verify. CRED regularly publishes summary data from the EM-DAT; in addition, the database is accessible at CRED's Brussels office and through the U.N.'s International Emergency Readiness/Response Information System, described below.

[33] At least one of the more than 150,000 Internet-based bulletin boards and discussion groups is devoted to disasters (*i.e.*, clari.news.disaster).

2. Agency-Based Databases: FEMA

The second example of information databases is the server provided by FEMA.[34] Available on the Internet in both graphic (through World Wide Web) and text (through Gopher and Telnet) formats, FEMA's database provides an overview of the agency and its mission, and access to a series of files ranging from "Disaster Assistance" to "Volcanoes" through either a library structure or a master index. This server, parts of which are still under construction, is one of a rapidly growing number that serve three separate functions. It introduces the user to the agency (including a number of color photographs and even a recorded audio message by Director James Lee Witt), and thus provides an important public relations function. The server provides practical information about the agency's services, how to use them, and how to contact the agency. Finally, it provides access to a database of substantive information about natural hazards and disasters. Similar services are provided by most U.S. federal government agencies, including AID/OFDA,[35] many state agencies, such as the State of California's Governor's Office of Emergency Services,[36] the United Nations,[37] the Asian



[34] Internet address: http://www.fema gov.

[35] Internet address: gopher://gopher info.usaid.gov.70/1.

[36] Internet address: http://www.oes.ca.gov:8001/.

[37] Internet address: gopher://gopher undp.org:70/11/unearth.

Disaster Preparedness Center,[38] InterAction,[39] and the Alliance for a Global Community.[40]

3. The Next Generation: HazardNet

The third and most powerful type of electronic information service uses the powerful capabilities of the Internet to combine a wide range of decentralized data resources across the emergency management community. This most advanced type of electronic information system capitalizes on the Internet's capacity to carry large amounts of information, including text, image, and sound files, and to link distant data resources, for example, a database on natural hazards in one country with a collection of digital maps in another.

One of the earliest prototype systems designed to harness the power of the Internet for disaster mitigation was the Emergency Preparedness and Information Exchange (EPIX). Originally based on a series of text menus and available via Gopher, an early information search and retrieval mechanism, EPIX is now available through the World Wide Web, although still limited to text files.[41] A later, similar system, the Disaster Reduction Information Exchange (DRIX), provided access to information on disaster prevention, mitigation, and preparedness. Information provided through DRIX was "intended to assist in policy formulation and planning, statistics gathering, research and awareness-raising that can be used to increase knowledge about and strengthen capacities for disaster prevention, mitigation and preparedness."[42] DRIX contained links to servers maintained by many government and private organizations, such as those identified above.

Whereas the focus of DRIX was on disaster preparedness, the Facility for International Readiness and Response to Emergencies (FIRRE)[43] provides access to information for use in "monitoring, early warning, and alert of possible, incipient or ongoing emergencies and natural disasters, and for the purpose of preparing,

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[38] Internet address: gopher://emailhost.ait.ac.th:70/11/ait.geninfo/adpc

[39] Internet address: gopher //gopher.vita.org·70/11/intl/interaction/iact.

[40] Internet address: gopher://gopher.vita.org·70/11/intl/interaction/alli.

[41] Internet address: http://hoshi cic.sfu ca/~anderson.

[42] Disaster Reduction Information Exchange home page, available through the Internet at: http //hoshi cic.sfu.ca/~ierris/drix.html.

[43] Internet address. http://hoshi.cic sfu.ca/~ierris/firre.html.

facilitating, conducting and coordinating effective and timely international response."[44] Although still under construction, FIRRE presently contains computer links to databases about "Current Emergency Situations" (including disaster situation reports compiled by Volunteers in Technical Assistance), "Humanitarian Assistance" (including a wide range of information about refugees, human rights, emergency relief statistics and supplies, and relief organizations), "Daily News Bulletins and Current Affairs", "Country-Specific Information" (including country profiles from the U.S. State Department and the CIA World Factbook, maps from the World Map Collection at the University of Texas and the Canadian National Atlas Information Service), "Natural Hazards" (including current weather maps and satellite images), and "Monitoring Programmes" (such as the World Food Programme Food Aid Monitor).

In 1994, a number of multinational, governmental, private, and academic organizations and specialists joined together to create a prototype system combining the capabilities of EPIX, DRIX, and FIRRE. The International Emergency Reduction, Readiness/Response Information System (IERRIS) prototype employed advanced telecommunications and computer technologies to provide both a single entry point to the databases of public and private disaster mitigation and relief agencies throughout the world and a data structure that combined field reporting, warnings, and relief status reporting into a coherent whole. As stated in the IERRIS Project Abstract:

> The Project is to enable the actors concerned to: adopt information management procedures that are of common benefit; to work with common and/or compatible information management standards and technologies; collaborate in the development of new information systems and procedures so, as to meet information needs that are not met by existing systems and procedures, and to share and exchange suitable emergency-related information collected for respective institutional needs. This concerted effort will result in major improvements in the quality, specificity and timeliness of information available internationally for early warning monitoring reporting, resource mobilization, and coordination, evaluation, disaster reduction, and the information exchange, reference and referral services related to all these concerns.[45]

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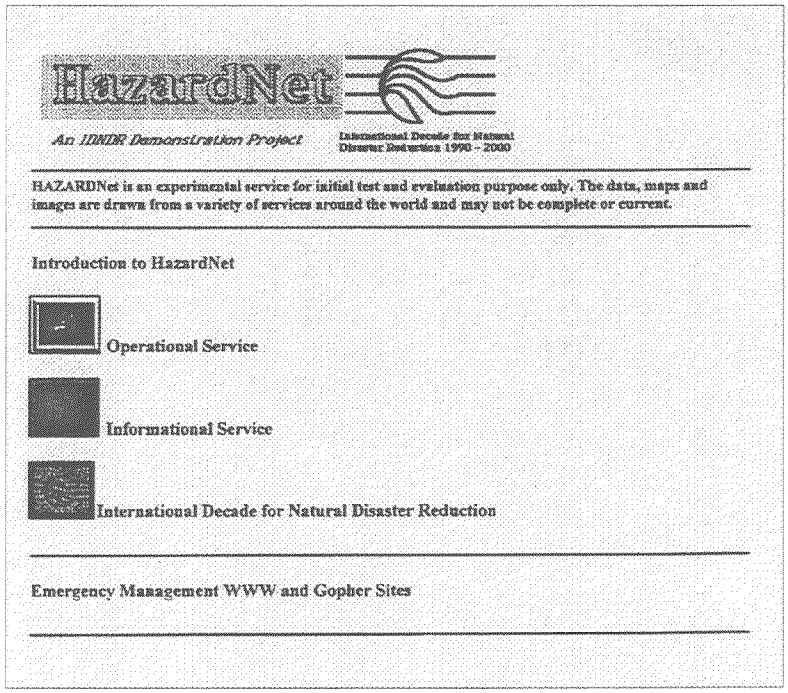
[44] Facility for International Readiness and Response to Emergencies home page, available through the Internet at *id.*

[45] Giles M. Whitcomb, *The IERRIS Project Abstract* (Geneva: United Nations, Sep. 23, 1994).

The IERRIS prototype, based at the Centre for Policy Research on Science and Technology at Simon Fraser University in Vancouver, provided a powerful, easy to use, graphic interface that linked data (including text, hypertext, pictures, video, and audio) relevant to disaster preparedness, monitoring, and response. The prototype expanded the availability of data that is available on-line through government and private databases, making it more convenient and less costly to access, and providing it in a format most useful for further distribution or analysis. These benefits, in turn, create an incentive for more organizations to make their disaster-related information available on-line. The IERRIS prototype has clearly shown the value of such a system and has provided important information to emergency management professionals designing future, interoperable systems. Having demonstrated its effectiveness, the IERRIS prototype was essentially terminated at the end of 1994.



Presently, a consortium of international, governmental, private, and academic organizations is constructing an operational system called HazardNet, building on the IERRIS prototype.[46] Based at the Centre for Policy Research on Science and Technology at Simon Fraser University, HazardNet draws together the ideas and design from all of these prototype systems and attempts to synthesize a single, fully operational system. Like its IERRIS prototype, HazardNet is a collaborative demonstration project of the IDNDR, providing the emergency management community with graphics, text, and video and audio information. The goal of HazardNet "is to enhance the timeliness, quality, quantity, specificity and accessibility of information for persons and organizations world-wide concerned with preventing, mitigating, preparing for or responding to large-scale natural and technological emergencies."[47]

At present, HazardNet offers five services:

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[46] Internet address: http://hoshi.cic.sfu.ca/~hazard/.

[47] An Introduction to HAZARD Net, available through the Internet at *id.*