X. FUTURE NEEDS

This chapter suggests twenty specific areas of future need relating to public information or public education aspects of disaster prevention and mitigation. They are listed here chronologically, and the volume concludes with some suggestions for meeting these needs.

(1) There is a need to know more about the specific public information requirements of the various kinds and stages of disasters.

(2) The general public should be acquainted with their public information rights and responsibilities.

(3) There is a need to know more about the composition of the various public audiences (both general and special publics) at the regional or local level .

(4) More research is needed into human behaviour under stress in the developing countries most affected by disasters, both for use in those countries and for cross-cultural comparison.

(5) Governmental and other institutional reports on disasters should be available in order to learn from experience.

(6) Public information practitioners should know more about human behaviour under disaster conditions at the regional or local level before deciding on policies.

(7) There is a need to know more about how people communicate at the local level, and how to tap this 'people's network'.

(8) More should be known about the use of radio in times of disasters in disaster-prone countries, and for cross-cultural research to relate these findings to present mass media knowledge.

(9) Guidelines on disaster coverage should be prepared for foreign journalists.

(10) More information can be provided on the public information role of of the police or the military as carried out in various countries.

(11) A methodology should be developed for public education programmes designed to raise consciousness about disasters.

(12) There is a need for three kinds of disaster training in public information/education: general public; particular publics; and the the communicators themselves.

(13) Public information training can be inserted into simulations, seminars and other similar occasions, particularily at the regional or local levels.

(14) Public education trainers should themselves be trained in human relations skills and in practical communication techniques.

(15) More should be known about how the word-of-mouth network functions at the community level in order to help message dissemination.

(16) There is a need to know more about the extended family and community networks for the same reason.

(17) Content and code of messages require testing and also there should be an investigation of the best message strategy for the occasion.

(18) How much of a barrier is mis-information and rumour in the transmission chain at the local level?

(19) There is a need for a standardised objective way of evaluating public information programmes.

(20) Finally, there is an over-all need for more information on the way public information and education is carried out at the present time.

Some of these needs are very general and will only be carried out as more people become aware of them and the opportunities they represent. Others are very specific and might best be met by meetings, seminars or information material, such as the proposed guidelines for foreign journalists. Some could be grouped as subjects for regional or national seminars, in which participants would exchange experience and would issue a report for guidance of others. These would include items (3), (7), (15) and (16), which are concerned with communication networks at the community level and how to use these more effectively; (4) and (6), which are concerned with audience reaction to messages and how to construct more effective dissemination systems; and (8), which is concerned with the use of radio as a dissemination vehicle.

Training offers a special challenge and many opportunities, as suggested in (11), (12) and (13). There is a need for meetings and materials on public education programmes and this implies training for those concerned. Various kinds of training programmes could be offered at national, regional or international levels for members of special publics, including the public information practitioners themselves.

It is possible to envisage regional seminars or even a centralised institution, concerned with public information or public education and training, bringing together human and material resources to bear on disaster prevention and mitigation for those areas most in need.

ANNEX I

The Earthquake Warning System and the Earthquake Public Information and Public Education Programmes in China

Severe earthquakes have occurred throughout China's long history. the 1556 earthquake at Shan-tse, where some 830,000 people lost their lives, may well be mankind's greatest single natural disaster. Major earthquakes struck Hsingtai in 1966, Haicheng in 1975 and Tangshan in 1976. In the latter case alone, fatalities are estimated to have exceeded 650,000.

Earthquake prediction and warning were given high priority following the 1966 disaster. The State Seismological Bureau (SSB), formed within the Chinese Academy of Sciences in 1971, performed a central role in the management and co-ordination of earthquake prediction. Some of the functions of the SSB have now become advisory, or facilitative but the bureau still appears to be the only central organisation having contacts with local and provincial seismological teams, brigades and bureaux.

The provincial seismological units are responsible for all aspects of earthquake studies conducted within their regions, including all levels of observation, data collection and analysis, as well as the issue of earthquake predictions and the dissemination of earthquake information to the people. The slogan 'dual level leadership with the locality in charge' reflects the relationship between the SSB, local governments and the provincial or regional seismological units.

There are seventeen basic seismic stations in China, with some 250 additional regional stations. These, together with research institutes and provincial or regional seismological units, employ 10,000 technical personnel in earthquake prediction and related research. It is estimated that some 100,000 persons are also involved in amateur prediction work.

The goal of this apparatus is to predict earthquakes with magnitudes greater than 5, with an epicentre accurate to within 50 kms., a correct time prediction within 2-3 days, and a correct magnitude within 1 unit. The Chinese have predicted eleven earthquakes to date, although the only successful prediction of a severely damaging earthquake about which there is adequate information is that of February 4, 1975 in Liaoning Province, where the shock was recorded at 7.3 on the Richter scale.

The complex process of decision-making involves amateurs and local political authorities. This may explain in part the acceptance by masses of people of the self-discipline involved in wholesale evacuation at low temperatures in primitive field conditions. Failures of prediction, 'false alarms' and unnecessary evacuations are not publicly reported. Such decisions are the responsibility of local Party committees. Reports have states that there have been 'false alarms' at the amateur prediction points and fewer, but still significant, numbers of 'false alarms' at higher levels leading to evacuation.

However, the Haicheng earthquake prediction and evacuation was a success, and a great loss of life was averted through this prediction and warning system. More than a million people live in the epicentral area and were subject to evacuation. Two-thirds of the communes in the area were badly damaged and half the houses also badly damaged or destroyed. The city of Haicheng, with a population of 100,000 was 30 kilometers from the centre and was completely destroyed.

Enforced evacuation took place at -24°C and people were transferred to primitive field shelters. However, the death toll was remarkably low; estimated deaths were 250-300 in two communes out of a total population of 1.6 million people. Other figures are comparable: in the badly damaged Tiger Village Commune of 35,000 persons, only twenty people were killed.

How does this prediction and warning dissemination system work? On the basis of analysis of historical data about seismic activity (China has 3,000 years of earthquake records) plus observation of ground tilting, the SSB decided that a strong earthquake was probable in the southern

Liaoning Province. A public campaign to keep people informed was started, and an observation network of premonitory effects was established.

Amateur stations normally advise the local seismological office and regional stations of their predictions, based on premonitory anomalies as defined arbitrarily by them. Reports of these amateur point predictions are collated in the county or district seismological office, or at a regional station, or both. These offices advise the local political party committee and the provincial seismological brigade or bureau if they feel there is a strong possibility of an earthquake occurring. The local party committee decides on appropriate measures within its own district. This may result in local evacuations and other precautions, even though an analysis group at a higher level might not agree that such an event is likely.

Approximately the same process occurs at other levels as more widespread data is collated at the provincial level. If a prediction is felt warranted this is passed on to the provincial political body, and also fed back down the network to alert counties and districts within the potentially-affected area. Consultations are held up and down this chain with local decisions, i.e., to construct defences, or to stockpile food or medicine, being taken by local political bodies.

During the Haicheng event, thousands of people were involved in large-scale observation and warning duties. There was a false alarm in December and people were evacuated for two days in cold weather. Towards the end of January, when an earthquake seemed imminent, individual communes and family brigades put up tents and constructed temporary shelters, and organised working groups to help the young, old and disabled.

The Provincial Revolutionary Party Committee was warned by the Liaoning Seismological Bureau on February 4 that an earthquake would occur within three hours. Local measures were taken by the Haicheng-Yingkoo party committees: stores were closed; commune dwellers were ordered to move into outdoor shelters; militia enforced evacuation despite very cold

weather; earthquake news was broadcast over the radio; production teams showed films to those in the fields; those who returned to their homes were forcibly evacuated.

As one writer noted, technically, this was the first major earthquake anywhere in the world to have been adequately predicted. But an even greater achievement is the education of the people to take part in prediction programmes and to accept the disruption to their lives that must accompany any action taken following an earthquake prediction. In this aspect, perhaps, lies the greatest value in involving the people in mass prediction programmes.

ANNEX II

The Hurricane Warning System and Hurricane Public Information and Public Education Programmes in the United States

Hurricanes are a recurring threat to the Atlantic and Gulf coasts of the United States, and occasionally also the Pacific area. The hurricane death toll in the United States, however, has been greatly diminished by timely warnings since the Galveston (Texas) storm of 1900 which took 6,000 lives. However, damage to property continues to rise. Floods from Hurricane Agnes in 1972 caused more than US $2 billion in damages.

Major responsibility at the national level for natural disaster warning is taken by the National Oceanic and Atmospheric Administration (NOAA) of the US Department of Commerce. Long before a hurricane has evolved scientists at NOAA's National Hurricane Center (a National Weather Service forecast office at Miami, Fla.,) have been gathering weather data from NOAA's environmental satellites and research planes, aided by hurricane reconnaissance flights of the US Air Force. Many ocean-going ships routinely report weather at sea to shore-based weather stations and, eventually, hurricanes are picked up on radar by a network of National Weather Service (NWS) tracking stations.

Once the hurricane has been charted, an intricate multi-tiered warning system swings into action, headed by the National Hurricane Center, together with five Atlantic and Gulf coast centers designated as hurricane warning offices (Miami, New Orleans, Washington, Boston and San Juan, Puerto Rico). These units are linked by normal NWS communications, a special hurricane teletype circuit and a hurricane 'hotline' telephone.

Releases are of two types: a hurricane watch issued about 30-36 hours before landfall which alerts coastal residents and authorities to the threat; and a hurricane warning, issued about 12-18 hours before landfall, which indicates immediate action, including evacuation from exposed areas if needed. A hurricane intensity scale of 0-10 is also used.

Numerous agencies other than NWS provide personnel and facilities for dissemination of warnings. The US Coast Guard receives NWS warnings and passes them on to small boats in coastal areas and ships at sea. The US Air Force warns military bases and aircraft in flight.

There are two linked warning facilities: organisational warnings and public warnings. The final components of the hurricane warning system are radio, television and newspapers, as well as the state, county and local agencies participating in the over-all natural disaster warning system.

There are a number of national and area teletype networks operated jointly by the National Weather Service, in co-operation with other government agencies. Some agencies with specialised needs also maintain teletype networks, such as the US Coast Guard network to distribute natural disaster warnings to their individual stations. The news agency wire services, such as Associated Press (AP) and United Press International (UPI), maintain their own teletype networks which also carry weather forecasts to mass media customers.

There are three major elements to organisational warnings:

(a) NWS teletype warning co-ordination system (RAWARC), which transmits hourly radar reports through five circuits;

(b) NWS wire service, which transmits forecasts, watches, weather warnings and meteorological data to the mass media for public broadcast (to be extended throughout the country by the end of 1978);

(c) The Defence Civil Preparedness Administration (DCPA) national warning system (NAWAS), which operates continuously to 1,867 warning points throughout the country. Although primarily intended for attack warning, it can also be used for warnings of major natural disasters.

The actual public warning responsibility lies with the various local NWS offices. There are a number of public warning systems in operation:

(a) A DCPA-managed siren system designed to be used in conjunction with NAWAS as an attack warning but controlled by local authorities and available for natural disaster warnings.

(b) Recorded telephone announcements of various kinds: a local NWS service handling up to 10 calls at a time; a large volume service handling up to 1,000 calls simultaneously through public telephone companies (19 cities have this kind of service at the moment); pre-recorded forecasts and warnings which are installed and operated by telephone companies. Approximately 1,000 such pre-recorded messages are now available which are automatically programmed into the telephone system upon receipt of a coded message from NWS.

(c) NWS also operates a VHF-FM radio system which continuously transmits weather forecasting information, with a tone-alert capability. NWS offices are equipped with transmitters with a 40-60 mile range. Current plans are to expand the network to 320 stations by 1979, and eventually to provide nation-wide coverage forming a natural disaster warning system (NADWARN).

(d) NOAA is currently investigating the feasibility of using communication satellites for natural disaster warnings.

(e) Emergency action notification signals (EANS) can be used by local radio and television stations; these signals can be transmitted locally over individual receivers to give notice of urgent warnings.

(f) DCPA is developing a nation-wide radio communication system for attack and natural hazard warnings (DIDS). Individual receivers for use by the general public are now being tested.

(g) Commercial radio and television stations participate in natural disaster warning on a voluntary basis. These media normally receive information from the NWS wire service or from news agency wire services (or by VHF-FM radio or direct telephone calls from local offices). Stations often broadcast directly to the public weather

bulletins, advisories and warnings as they are received from NWS. In some cases stations have established their own network of 'weather-watchers' and provide on-the-spot observations for their audiences. As of 1976, every broadcaster in the United States is required by Federal Communications Commission (FCC) regulations to have a two-tone emergency broadcast system receiver. The FCC and DCPA have also developed a model plan (Parkersburg Plan) for broadcasters to use in developing their own local emergency plans.

(h) There also exist many other public warning methods used by local authorities: flags used in coastal areas to indicate hurricanes; signs to warn of seasonal hazards (as in the case of fires); sirens used by local civil defence, police, fire and other such agencies; loud-hailers and public address systems; commercial 'MUSAK' systems in public places, etc.

A major public information/public education programme to create hurricane awareness has been pursued for a number of years and has begun to show positive success in terms of reduced injuries and loss of life from hurricanes.

Fig. 6. A typical sign used in the United States of America.

The National Weather Service (under NOAA) has a disaster preparedness organisations with a year-round campaign of publications, films and other audio-visual material which is actively disseminated through local and regional bodies.

This material includes:

Hurricanes, Florida and You: a wall-map which gives the 100-year storm-surge line for the state, a hurricane tracking chart for the area (with city inserts), a list of major hurricanes which have occurred in the state, and a list of safety rules;
Hurricane Warning: a booklet for young children;
Getting Through: a brochure for administrators of institutions;
Survival in a Hurricane: a tiny wallet-sized card giving rules for safety in hurricanes;
The Homeport Story: a fictionalised account of how a community hurricane disaster plan would work;
Hurricane and When a Hurricane Threatens: two informative booklets on hurricanes;
Some Devastating Hurricanes of the 20th Century: illustrated facts and figures;
Hurricane Tracking Chart: which gives distances and meanings for 'hurricane watch' and 'hurricane warning';
Lessons from Hurricane Eloise: 43-slide presentation with notes; and
Hurricane Decision - a 14—min. 16 mm colour film.

At the state level, a thorough and comprehensive hurricane awareness programme is being carried out co-operatively by the Texas Coastal and Marine Council, the Texas Catastrophe Property Insurance Association and the Governor's Division of Disaster Emergency Services.

Hurricane material prepared and distributed in 1977 included:

(1) Hurricane Survival Checklist and Map: a one-page summary of essential survival information; 750,000 copies were distributed in 1977 in English and Spanish through local civil preparedness offices, retail

display stands (mostly in food-chain outlets) and direct mail.

(2) Various public service television tapes (a 10-second animated sequence and a 60-second interview sequence as well as redistribution of earlier tapes).

(3) Sixty 5-minute radio interview tapes.

(4) Several public service newspaper advertisements in English and Spanish (also used by some radio stations).

(5) A newspaper version of the checklist and map brochure for use as a public service material. Newspaper clippings show that this material has been used in some 50 papers totalling over 1 million readers.

(6) Poster for use in schools, also sent to all radio and television stations.

(7) Two media kits (the first of general interest, the second for use at the height of the hurricane season). The media kit includes material produced by this joint programme as well as NWS booklets and brochures.

(8) News releases, leaflets and brochures (all prominently displaying the hurricane awareness emblem).

(9) Slide show.

(10) Presentations at conferences.

Two major publications that have been extensively used include Pictorial Atlas of Texas Coastal Hazards — a 52-page illustrated guide to what has happened in recent hurricanes, and potential disaster situations along the coast such as inadequate evacuation facilities, poorly constructed buildings, flood areas, etc., prepared by Texas Coast and Marine Council; Hurricane on the Texas Coast — a 52-page description of hurricanes which includes chronological data on hurricanes and essential survival information, prepared by the Center for Applied Geosciences of Texas A and M University.

ANNEX III

A list of 23 generalised social science research findings of interest to broadcasters was published in 1973 under the title "What every good news director ought to know about disaster warnings."[61]

News directors and disaster warnings

(1) Any warning message broadcast, especially the early ones, will be accepted at face value only by a minority of the recipients. Most will engage in confirmation efforts for a time.

(2) The more warning messages received by an individual, the fewer the attempts at warning confirmation.

(3) The closer a person is to the target area of a warning, the higher the incidence of face-to-face communication and the larger the number of sources used in confirmation attempts.

(4) Warnings from official sources (police, state patrol, fire department) are more likely to be believed.

(5) Message content per se influences belief. The more accurate and consistent the content of several messages, the greater the belief.

(6) The more personal the manner in which a message is delivered, the more it will be believed.

(7) Belief in eventual impact increases as the number of warnings received increases.

61/ This list was included in a volume entitled Natural Hazards Warning Systems in the United States: a Research Assessment, by Denis S. Mileti, and published in 1975 as a monograph by the Institute of Behavioural Science, University of Colorado, Boulder, Colorado, USA, together with a series of recommendations for broadcasters, 'what to do' and 'what not to do'.

(8) The recipient's sense of the sender's certainty about the message is important to belief.

(9) Message believability is related to what happens in the confirmation process. The response of official sources to questions which call for validation, corroboration, or refutation helps determine believability.

(10) A person is more likely to believe a warning of impending danger to the extent that perceived changes in his physical environment support the threat message.

(11) Persons who see others behaving as if they believe a warning to be valid are themselves more likely to believe the warning.

(12) Past experience may render current warnings less credible if disaster is not part of experience, or more credible if disaster is part of experience.

(13) The closer a person is to the target area of warning, the more rumours he will hear and the less accurate will be his understanding of the character of the events forecast.

(14) Persons do not readily evacuate on the basis of the first warning received, and the number of warnings received thereafter is directly related to evacuation.

(15) As the warning message increases in its accuracy, and/or information about survival choices, and/or consistency with other warnings, and/or clarity about the nature of the threat, the probability of adaptive response increases.

(16) Whether or not a person takes action depends on his belief in the warning message. But even if he believes it, he may fail to take adaptive action due to his misinterpretation of the meaning of the message content.

(17) Evacuation tends to be a family phenomenon. The best way to accomplish evacuation appears to be repeated authoritative messages over broadcast media which stimulate discussion within the family and lead to evacuation (if it is going to happen at all).

(18) Persons receiving face-to-face warnings in a family setting from authorities are more likely to evacuate.

(19) Persons with recent disaster experience are more likely to take protective actions.

(20) The perceived amount of time to disaster impact is also important

(21) Belief that impact could occur at the location from which a person may be about to evacuate is critical.

(22) Older persons are less likely than the young to receive warnings regardless of warning source, and less likely to take protective actions.

(23) Regardless of the content of a warning message, people tend to define some potential impact in terms of prior experience with that specific disaster agent.

For broadcasters: "What to do" and "what not to do"

DO:

(1) Develop and maintain "fail safe" direct communications with the local national weather service office.

(2) Establish emergency electric power generation capability and be certain that it is checked and maintained regularly.

(3) Plan so that your station can meet its broadcast warning responsibilities even under the maximum credible "worst" circumstances (equipment malfunction, personnel absences).

(4) Make sure all announcers know exactly how to handle every type of warning message.

(5) Conduct several "warm-up exercises" at the beginning of each season for seasonal hazards.

(6) For floods, be prepared to give specific information on which blocks or areas are forecast to be inundated.

(7) Make all warning messages as specific as possible and repeat, repeat, repeat!

(8) Make warning messages as personal as possible — personal in content and with well-known and highly respected persons giving the information and advice.

DON'T:

- Give out any information unless you are quite confident of its accuracy.

- Broadcast an occasional warning message interspersed in regular programming if you want listeners to take prompt, protective action.

- Give out general information if there is a possibility of having more specific information to broadcast with adequate lead time. (Early, general information tends to undermine the believability of later, specific information).

- Assume that the listener has heard any of your earlier watch or warning messages.

- Assume that your listeners know what specific protective action to take.

- Forget that some of your listeners are strangers visiting or travelling through the area for the first time.

- Let months and years of freedom from disaster lull you into complacency. Lives depend on your personnel and facilities.

- Underplay or over-emphasize the danger. The best public response comes when specific information about personal danger is presented without going to either extreme.

- Refer to just any random prior disaster event for background material to broadcast while a warning is in force. Have material prepared for a range of past disaster experiences and select the material that is most appropriate for the "up-coming event".

ANNEX IV

Gauging Public Opinion [62]

(1) Opinion is highly sensitive to important events.

(2) Events of unusual magnitude are likely to swing public opinion temporarily from one extreme to another. Opinion does not become stabilised until the implications of events are seen with some perspective.

(3) Opinion is generally determined more by events than by words, unless those words are themselves interpreted as "events".

(4) Verbal statements and outlines of courses of action have maximum importance when opinion is unstructured, when people are susceptible to suggestions and seek some interpretation from a reliable source.

(5) By and large, public opinion does not anticipate emergencies; it only reacts to them.

(6) Psychologically, opinion is basically determined by self-interest. Events, words, or any other stimuli affect opinion only insofar as their relationship to self-interest is apparent.

(7) Opinion does not remain aroused for a long period of time unless people feel their self-interest is acutely involved or unless opinion — aroused by words — is sustained by events.

(8) Once self-interest is involved, opinions are not easily changed.

62/ Cantril, Hadley. Gauging Public Opinion, Princeton University Press, Princeton, New Jersey, USA, 1947.

(9) When self-interest is involved, public opinion in a democracy is likely to be ahead of official policy.

(10) When an opinion is held by a slight majority or when opinion is not solidly structured, an accomplished fact tends to shift opinion in the direction of acceptance.

(11) At critical times, people become more sensitive to the adequacy of their leadership. If they have confidence in it, they are willing to assign more than usual responsibility to it; if they lack confidence in it, they are less tolerant than usual.

(12) People are less reluctant to have critical decisions made by their leaders if they feel that somehow they, the people, are taking some part in the decision.

(13) People have more opinions and are able to form opinions more easily with respect to goals than with respect to methods necessary to reach those goals.

(14) Public opinion, like individual opinion, is coloured by desire. And when opinion is based chiefly on desire rather than on information, it is likely to show especially sharp shifts with events.

(15) By and large, if people in a democracy are provided educational opportunities and ready access to information, public opinion reveals a hard-headed common sense. The more enlightened people are to the implications of events and proposals for their own self-interest, the more likely they are to agree with the more objective opinions of realistic experts.

Changing Public Attitudes [63/]

(1) To accomplish attitude change, a suggestion for change must first be received and accepted. "Acceptance of the message" is a critical factor in persuasive communication.

(2) The suggestion is more likely to be accepted if it meets existing personality needs and drives.

(3) The suggestion is more likely to be accepted if it is in harmony with group norms and loyalties.

(4) The suggestion is more likely to be accepted if the source is perceived as trustworthy or expert.

(5) A suggestion in the mass media, coupled with face-to-face reinforcement, is more likely to be accepted than a suggestion carried by either alone, other things being equal.

(6) Change in attitude is more likely to occur if the suggestion is accompanied by other factors underlying belief and attitude. This refers to a changed environment which makes acceptance easier.

(7) There probably will be more opinion change in the desired direction if conclusions are explicitly stated than if the audience is left to draw its own conclusions.

(8) When the audience is friendly, or when only one position will be presented, or when immediate but temporary opinion change is wanted, it is more effective to give only one side of the argument.

63/ Cutlip, Scott M. and Center, Allen H. Effective Public Relations, 4th edition, Prentice-Hall, Inc. Englewood Cliffs, New Jersey, USA, 1971.

(9) When the audience disagrees, or when it is probable that it will hear the other side from another source, it is more effective to present both sides of the argument.

(10) When equally attractive opposing views are presented one after another, the one presented last will probably be more effective.

(11) Sometimes emotional appeals are more influential; sometimes factual ones are. It depends on the kind of message and kind of audience.

(12) A strong threat is generally less effective than a mild threat in inducing desired opinion change.

(13) The desired opinion change may be more measurable some time after exposure to the communication than right after exposure.

(14) The people you want most in your audience are least likely to be there.

(15) There is a "sleeper effect" in communications received from sources which the listener regards as having low credibility. In some tests, time has tended to wash out the distrusted source and leave information behind.

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