

CHAPTER 14

PUBLIC INFORMATION AND EDUCATION

General remarks

People who have experienced tropical cyclones are usually ready to pay particular attention to any warnings that are issued and to follow the advice that is given, including any instructions for evacuation to safe areas. It is necessary to ensure that all people, not only those with actual experience, have an awareness of the dangers posed by tropical cyclones. Indeed, since memories are apt to fade, the awareness must be kept alive and up to date among those whose experience of a tropical cyclone is not very recent.

Public information and education must therefore be an essential component of disaster preparedness. If the general public is kept fully and constantly informed of the disasters which tropical cyclones can bring, the organization and operation of a disaster-preparedness system would have every chance of functioning smoothly and efficiently. In this context education is the natural complement to the provision of information. An education programme, designed at appropriate levels for children and adults, should impart basic knowledge about the nature of tropical cyclones and the risks involved and about warning services and protective measures. Education programmes should be supplemented by campaigns through the press, radio and television. These campaigns should be made more intensive as a tropical cyclone season approaches and posters and pamphlets in local languages should be displayed and distributed.

An important consideration is that public education and the provision of information should be designed so as to meet local requirements as closely as practicable. In this way the disaster-preparedness organization would have the best prospects of being effective at important times. However, it should not be assumed that educating the public and providing information are of themselves sufficient to ensure that individuals will respond to warnings on the basis of their knowledge. Human response to threats of disaster reveals a very diverse pattern. Warnings must therefore be supplemented as necessary by clear instructions telling the public what it should do. Then, provided the public is educated and well informed about the dangers resulting from tropical cyclones, there can be reasonable confidence that warnings and the accompanying instructions will receive a proper response. The objective is to create a partnership between government and people so that disaster preparedness is recognized as a joint responsibility.

Education

An increasing number of developing countries are recognizing the need for educating the public in a systematic way on the dangers of tropical cyclones and on the value of disaster preparedness. This is particularly noticeable in countries bordering the West Pacific where typhoons occur frequently and cause enormous damage. Recent surveys conducted jointly by the League of Red Cross Societies, WMO and ESCAP have provided information on the current and planned methods of typhoon education. The arrangements in Japan and the Philippines are described briefly below.

In Japan education on disaster preparedness is compulsory in schools and courses are given on safety measures and on orderly, disciplined evacuation of danger areas. The school is an essential starting point for this instruction because Japanese laws and ordinances on disaster countermeasures are based on the concept that primary responsibility rests with the people under the guidance and logistic support of national agencies and municipal authorities.

The general public is provided with interesting and attractive manuals, brochures, posters, maps, etc., and the various agencies arrange lectures and practical training. The material provided is aimed at making the public realize that it bears a large share of the responsibility for disaster preparedness. The concept of individual and group participation is most evident in the flood-defence system in which volunteers drawn from flood-prone areas are trained for active service in times of disaster. The agencies involved in disaster preparedness and relief work also take part in public education programmes as well as training governmental and other officials. Practical instruction plays an important part. For example, in flood-prone areas, flood-fighting exercises are held every year and include such elements as the evacuation of people and the emergency construction of shelters, roads, bridges and coffer dams.

In Japan, the first day of September each year is observed as "Disaster-prevention Day" and numerous activities, including lectures, demonstrations and radio and television programmes, are organized to remind the public of the dangers of typhoons and the associated floods and storm surges.

In the Philippines much work has already been done in providing education to the public but, even so, the need is felt for a much more intensive campaign, slanted specially for young people. The Department of Education and Culture (DEC) and the Weather Bureau (PAGASA) are collaborating in the preparation of courses on typhoons, floods and storm surges for the curricula used in schools and in institutions for adult education and also in colleges for the training of teachers, engineers, etc. The new programmes of typhoon education are being incorporated into appropriate subject areas such as science, social studies, home economics and youth development training. Typhoon education is also being included in adult community assemblies, in further education classes and in parent/teacher meetings. In all these courses lectures and demonstrations are provided by experts from the Meteorological and Hydrological Services, the National Disaster Control Centre, the National Red Cross Society, and so on.

Appendices A and B are the syllabi drawn up for typhoon courses at elementary and secondary levels in schools in the Philippines and may serve as useful examples for the organization of similar courses elsewhere.

It is worth mentioning that education continues to be regarded as of major importance in countries where the organization of disaster prevention and preparedness has reached a highly developed stage. In Australia, for example, the inhabitants of areas which are vulnerable to tropical cyclones are given intensive basic and refresher courses on tropical cyclones, warning systems and action to be taken.

Public information

Public information on tropical cyclones complements and consolidates the corresponding educational programmes and should be provided comprehensively whether the country experiences tropical cyclones frequently or seldom. However, the nature of the information should take some account of frequency but it would be inadvisable to place too great a reliance on all the people having good memories. Indeed, populations change and between cyclone events a lot of new residents may settle in a vulnerable area.

Public information, making full use of the information media, posters, etc., falls broadly into three categories:

- (a) Before the disaster – maintaining public awareness and responsibility;
- (b) The emergency period – from the issue of warnings and while the tropical cyclone is present;
- (c) After the disaster – relief, rehabilitation, further precautions, e.g. against epidemics.

Any country in the early stages of organizing public information programmes would no doubt wish to consult material published by other countries. The following brochures prepared in the U.S.A., Australia, Hong Kong and the Philippines contain much valuable information and guidance:

- (a) "Hurricane (Information and Atlantic tracking chart)", published by U.S. Department of Commerce (ESSA);

- (b) "Cyclones are killers (Your best defence is knowledge NOW)", published by the Commonwealth Bureau of Meteorology, Australia;
- (c) "Typhoon!", published by the Royal Observatory, Hong Kong;
- (d) "When a typhoon strikes", published by the Weather Bureau, the Philippines;
- (e) "A guide in plotting the track of a tropical cyclone", published by the Weather Bureau, the Philippines.

The hurricane tracking chart given in brochure (a) is reproduced as Appendix C. This type of chart, which is also a feature of brochures produced in other countries, is excellent for stimulating the interest and co-operation of the public who, by listening to the warnings issued over the radio, can plot the position of the tropical cyclone and keep watch on its track and forecast movement. As a further example of the contents of brochures, the "hurricane safety rules" in the U.S.A. publication is shown in Appendix D.

The material prepared for public information, whether in the form of brochures, leaflets, posters, or articles in the press, etc., should be pitched at a popular level, making full use of illustrations and other visual display techniques. Cards explaining the action which individuals or families should take should be issued for display in a prominent position in every household. In addition, advice to the public should be recorded on tape so that, as a tropical cyclone approaches, the advice may be broadcast repeatedly from all radio and television stations. The following list gives some examples of topics that might be covered in material prepared for the information of the public:

- (a) Tropical cyclones – a simple, descriptive account of the phenomena and the disasters they bring;
- (b) Devastation by wind, by flood-producing rain and by storm surge;
- (c) Tropical cyclone tracks, frequency of occurrence, areas vulnerable to winds, floods, storm surges;
- (d) Tropical cyclone warnings, how to receive warnings, warning messages and their meaning, keeping track of the present and forecast positions of a tropical cyclone and its intensity;
- (e) Precautions to be taken before, during and after an emergency;
- (f) Natural disaster prevention organization – responsibilities of various agencies;
- (g) Special warnings for shipping, fishermen and aviation.

Other types of information which should be available to the public and clearly understood by the public include:

- (a) Maps showing vulnerable areas, evacuation routes, shelters, assembly points, etc.;
- (b) Visual storm signals displayed prominently and indicating the extent of the danger and its urgency, e.g. approaching, imminent or immediate danger;
- (c) Frequent forecasts and warnings issued by radio and television starting with the approach of an emergency situation. At such times information in newspapers cannot be kept sufficiently up to date and the public should become used to dependence on broadcasts. The messages should be brief and free from any ambiguities.

Information centres should be established at the cyclone warning centres. Here the news media and representatives of disaster agencies can be briefed and radio and TV broadcasts, with experts being interviewed, can be made. Rumours are always rife during storm threats and an information centre provides the best opportunity of correcting them.

After the cyclone has passed, it is important to inform the public about what has happened and what the government is doing to meet the emergency needs of the people. Emergency services include evacuation, rescue, food, clothing, shelter, medical/nursing, rehabilitation and other social welfare services. The public should be kept

informed of the facilities that are being made available and should, at the same time, be advised on the action which they should try to take as families or as individuals so that the administration and the people may work together to overcome their difficulties.

In case the foregoing paragraphs may appear somewhat generalized, it should be stressed that the level and method of imparting information to the public must be acceptable to all, not merely to the greatest possible number. If some of the inhabitants of a locality cannot read, that would present a challenge that must be faced, perhaps by the intensive use of sirens and megaphones and by the provision of community radio receivers permanently tuned to the station which would broadcast warnings and advice. It is also important to remember that the term general public is the aggregate of a large number of groups — children, housewives, farmers, fishermen, office workers, factory workers, etc. — and the special problems of each group must be anticipated and provided for.

Social response

An inquiry into the effectiveness of the storm and flood warning system when hurricane AGNES battered the eastern seaboard of the United States in June 1972 revealed that although a sophisticated weather-intelligence system had been built up, understanding of how to induce appropriate public response was so rudimentary that it could hardly be said to exist.¹ This remark pinpoints a very real problem which has only recently begun to command attention even in developed countries. In a related study (1970)² on hurricane CAMILLE, it was concluded that a fairly large proportion of the population in the highly vulnerable area chose not to leave the area. The same study also revealed that three negative factors influenced the reactions to the warning of CAMILLE: (1) there were important communication problems; (2) there was a serious underestimation, particularly by the stayers, of the potential destructiveness of the storm; and (3) there was evidence of the "spirit of defiance" said to be characteristic of disaster culture.

In many respects, the human response to the threat of danger is the very core of disaster prevention and preparedness. Ultimately, the success or failure of the warning system depends upon its weakest link — man himself. An accurate forecast, a well-designed disaster-preparedness system and all the aids that technology provides count for little if the human response is not geared to the realities of the occasion.

Every tropical cyclone brings forth a crop of stories demonstrating the endless diversity of human reaction to the disaster threat. Age, health, education, family situation, previous disaster experience and many other factors play a role, but a role so complex that no clear-cut pattern of behaviour emerges for general application to future disaster situations.

The dilemma faced by those conveying the warning to the public is how best to convince the population in danger that there is a pressing need to take protective action. Loss of life when storm warnings are disregarded is a consequence of the attitudes and emotions of people. Undoubtedly this is a problem deserving close attention. A number of studies and investigations of the social response to danger have been made in developed countries, notably in the United States; it is suggested that they could profitably be taken into account by the countries to which these *Guidelines* are addressed in the preparation of the public information and education programmes discussed in this chapter. In this context reference is made to the publications listed in the bibliography included in this volume.

Although developing countries will feel that there are many other aspects of the protective system to which their limited resources should first be devoted, the possibility of post-disaster surveys of the response to warnings being carried out by universities, or even by individual sociologists, should not be entirely discounted. Determination of the factors influencing the human response to danger, related particularly to the national culture, has a very real role to play in reducing loss of life and injuries from tropical cyclones. At least the problem should be clearly recognized and efforts made to reduce it to a minimum in designing the public information and education programme.

¹ *The AGNES floods*, a Report for the Administration of NOAA, by the National Advisory Committee on Oceans and Atmospheres, November 1972, Washington, D.C.

² *Citizen's response to warnings of hurricane CAMILLE*, by Kenneth P. Wilkinson and Peggy J. Ross, Mississippi State University, 1970.

APPENDIX A

TYPHOON EDUCATION FOR ELEMENTARY SCHOOLS IN THE PHILIPPINES

<i>Grades I and II</i>	<i>Grades III and IV</i>	<i>Grades V and VI</i>
<ol style="list-style-type: none"> 1. Different kinds of weather affect family living. 2. Wind may be fast or slow; it blows from different directions. 3. The colour, shape and movement of clouds tell the kind of weather. 4. Typhoons destroy houses and bridges; they kill plants and animals. 5. Family members have roles to play before, during and after typhoons and floods. 	<ol style="list-style-type: none"> 1. Certain places lie across the typhoon belt. 2. The speed and direction of the wind affect the weather 3. There are ways of determining the approach of a typhoon without the use of instruments. 4. Typhoons cause floods; floods bring about water pollution, accidents and epidemics. 5. Community members help one another before, during and after typhoons and floods. 	<ol style="list-style-type: none"> 1. The geographical location of a place affects its weather conditions. 2. Weather disturbances come in many forms 3. The PAGASA (Weather Bureau) forecasts the weather. 4. Erosion and landslides are caused by heavy rains and typhoons. 5. Government agencies help families before, during and after typhoons and floods.

Resources:

A. Material resources

1. Weather maps and charts
2. Brochures, pamphlets, leaflets
3. News items and stories
4. Reports and statistics from the DSW, PNRC, Armed Forces, etc.
5. Domestic bulletins
6. Diagrams and illustrations
7. Pictorials and posters

B. Human resources

1. Geographers
2. Weathermen and weather technicians
3. Social workers
4. Volunteers
5. Science educators

APPENDIX B

TYPHOON EDUCATION CONTENT IN THE PHILIPPINES (secondary level)

I. *General information*

1. Characteristics of typhoons, floods and lightning
2. Causes of typhoons, floods, lightning, thunderstorm
3. Signs of approaching typhoons; signals and their meaning
4. International and local organizations/agencies co-operatively engaged in the study of typhoons
5. Filipino values and attitudes pertinent to typhoons, floods and lightning
6. Plotting typhoon paths based on radio announcements
7. Special terms referring to typhoons, floods and lightning
8. Scientific instruments/procedures pertinent to the study of typhoons
9. Socio-economic effects of typhoons
10. Agrometeorology and typhoon modification (weather)

II. *Precautionary measures, before, during and after typhoons, floods and lightning*

1. Role of mass media
2. Role of crisis agencies
3. Role of school officials
4. Role of health officials
5. Role of the different members of the family
6. First-aid measures

III. *Rehabilitation*

1. Government agencies that undertake relief services
2. Rehabilitation schemes, measures
3. How to organize relief operations (private citizens)

APPENDIX D

HURRICANE SAFETY RULES

Hurricane advisories will help you save your life . . . but you must help.

Follow these safety rules during hurricane emergencies:

1. **Enter each hurricane season prepared.** Every June through November, recheck your supply of boards, tools, batteries, nonperishable foods, and the other equipment you will need when a hurricane strikes your town.
2. **When you hear the first tropical cyclone advisory,** listen for future messages; this will prepare you for a hurricane emergency well in advance of the issuance of watches and warnings.
3. **When your area is covered by a hurricane watch,** continue normal activities, but stay tuned to radio or television for all National Weather Service advisories. Remember, a hurricane watch means possible danger within 24 hours; if the danger materializes, a hurricane warning will be issued. Meanwhile, keep alert. Ignore rumors.
4. **When your area receives a hurricane warning:**
Plan your time before the storm arrives and avoid the last-minute hurry which might leave you marooned, or unprepared.
Keep calm until the emergency has ended.
Leave low-lying areas that may be swept by high tides or storm waves.
Leave mobile homes for more substantial shelter. They are particularly vulnerable to overturning during strong winds. Damage can be minimized by securing mobile homes with heavy cables anchored in concrete footing.
Moor your boat securely before the storm arrives, or evacuate it to a designated safe area. When your boat is moored, leave it, and don't return once the wind and waves are up.
Board up windows or protect them with storm shutters or tape. Danger to small windows is mainly from wind-driven debris. Larger windows may be broken by wind pressure.
Secure outdoor objects that might be blown away or uprooted. Garbage cans, garden tools, toys, signs, porch furniture, and a number of other harmless items become missiles of destruction in hurricane winds. Anchor them or store them inside before the storm strikes.
Store drinking water in clean bathtubs, jugs, bottles, and cooking utensils; your town's water supply may be contaminated by flooding or damaged by hurricane floods.
Check your battery-powered equipment. Your radio may be your only link with the world out-

side the hurricane, and emergency cooking facilities, lights, and flashlights will be essential if utilities are interrupted.

Keep your car fueled. Service stations may be inoperable for several days after the storm strikes, due to flooding or interrupted electrical power.

Stay at home, if it is sturdy and on high ground; if it is not, move to a designated shelter, and stay there until the storm is over.

Remain indoors during the hurricane. Travel is extremely dangerous when winds and tides are whipping through your area.

Monitor the storm's position through National Weather Service advisories.

Beware the Eye of the Hurricane

If the calm storm center passes directly overhead, there will be a lull in the wind lasting from a few minutes to half an hour or more. Stay in a safe place unless emergency repairs are absolutely necessary. But remember, at the other side of the eye, the winds rise very rapidly to hurricane force, and come from the opposite direction.

5. **When the hurricane has passed:**
Seek necessary medical care at Red Cross disaster stations or hospitals.
Stay out of disaster areas. Unless you are qualified to help, your presence might hamper first-aid and rescue work.
Drive carefully along debris-filled streets. Roads may be undermined and may collapse under the weight of a car. Slides along cuts are also a hazard.
Avoid loose or dangling wires, and report them immediately to your power company or the nearest law enforcement officer.
Report broken sewer or water mains to the water department.
Prevent fires. Lowered water pressure may make fire fighting difficult.
Check refrigerated food for spoilage if power has been off during the storm.

Remember that hurricanes moving inland can cause severe flooding. Stay away from river banks and streams.

Tornadoes spawned by hurricanes are among the storms' worst killers. When a hurricane approaches, listen for tornado watches and warnings. A tornado watch means tornadoes are expected to develop. A tornado warning means a tornado has actually been sighted. When your area receives a tornado warning, seek inside shelter immediately, preferably below ground level. If a tornado catches you outside, move away from its path at a right angle. If there is no time to escape, lie flat in the nearest depression, such as a ditch or ravine.

**HURRICANE WATCHES MEAN A HURRICANE
MAY THREATEN AN AREA WITHIN 24 HOURS.**

**HURRICANE WARNINGS MEAN A HURRICANE IS
EXPECTED TO STRIKE AN AREA WITHIN 24 HOURS**



CHAPTER 15

TEST EXERCISES IN DISASTER PREPAREDNESS

When plans for disaster preparedness have been drawn up, approved by the government and, over a period of time, implemented, it should not be assumed that a comprehensive organization free from any important defects has been created which can deal efficiently and smoothly with the threats posed by a tropical cyclone or other natural disaster. It is probable that the organization would give a good account of itself in an actual emergency. However, the crucial question is: Would an emergency reveal (a) major weaknesses in the organization that should have been foreseen and provided for, and (b) gaps in the knowledge and training of people with operational tasks to perform? This question should be asked repeatedly because, if it is neglected, the penalty for bad organization and incompetent staff would be paid for in unnecessary losses of lives and much avoidable damage.

It is essential, therefore, that the planning and organization of disaster preparedness be kept under constant review. This task can be undertaken by regular meetings, at various levels, of responsible officials of the numerous agencies involved in disaster preparedness and also by holding exercises in order to test the readiness and efficiency of the organization as a whole or of selected portions of it. Meetings would serve the purpose of putting under close scrutiny the objectives and principles governing the planning and organization of disaster preparedness and would also help to ensure that the lessons brought out in exercises are properly learned and applied. Exercises serve the purpose of putting the organization under trial in a way that is both practical and as realistic as possible.

Regular meetings

One of the points stressed repeatedly is that the success of disaster-preparedness arrangements in an actual emergency depends upon the close co-operation of a large number of agencies and individuals. If this co-operation is lacking, or only partially exists, the system cannot work at its maximum efficiency. This in turn means that lives will be lost needlessly and that damage will be suffered unnecessarily. The nation should realize that overall responsibility is shared by all since, in purely economic terms, the cost of a disaster falls upon the whole country, not only upon the locality which has been directly affected.

These considerations again underline the need for personal contacts between the staff of national agencies carrying responsibilities for any part of the defensive system. In most respects the creation of a national co-ordinating body will provide a mechanism whereby regular meetings to review and revise disaster prevention and preparedness plans can take place and at which common problems may be discussed. It is not, however, enough that there should be meetings from time to time between senior officials representing the national agencies. At such meetings policy matters would be thrashed out and decisions made affecting the organization and operation of the system as a whole. Whilst these are indeed vital functions, something more is required if the staff concerned at a variety of levels are to understand fully the relationship of their own duties to those of their counterparts in other agencies and to the successful fulfilment of the objectives of the system.

It is recommended therefore that a very useful purpose can be served by arranging additional regular meetings in which a wider representation of agency staff at the operational level can be invited to participate. Meetings of this type should at times be of an informal nature, designed to maintain close contact between operational staff. They should take place at regular intervals throughout the year and not solely during the tropical cyclone season. It may be desirable to appoint a convener and, if so, this function could rotate annually amongst the national agencies. Another possibility is for each agency to designate a liaison officer whose task it would be to keep in touch with his counterparts in the other agencies.

Whatever method is chosen — and what is more appropriate in one country may well not be so in another — the important thing is to find a way by which personal contacts can be fostered. Contacts of this nature promote understanding and an appreciation of the value of each part of the total preparedness system. They permit views to be exchanged and suggestions to be made for closer and more effective concerted efforts. In addition, they ensure that each agency is fully aware of the related activities of the others.

Exercises

Any plan related to disaster preparedness should be tested regularly in order that faults in concept and in implementation may reveal themselves and be recognized and also in order to assess the strengths and weaknesses of the various facets of the organization. Exercises can cover a wide range from those involving paper planning with no practical work to those exercises in which a disaster is simulated and everyone concerned with disaster preparedness is called upon to carry out his appointed task. Some examples of types of exercise are the following:

Paper exercises

These exercises can be held in conjunction with meetings of responsible officials and can be devised for national, regional and local levels. This type of exercise would normally begin with the study of a problem paper followed by a few lectures highlighting the main features of the problem to be studied and inviting answers to a number of questions. The people attending the exercise would then split into a number of small syndicates, five or six persons to each syndicate, who would examine the questions and prepare their answers in written form. Finally, there would be a general meeting at which the reports of the various syndicates would be presented and discussed and compared with a set of model answers prepared by the organizers of the exercise.

In exercises of this nature discussion should be completely free. The syndicates would not be in competition but would be sharing a common objective, that is, to find the best solution to the problem being studied.

Communication exercises

As the name implies, the purpose of these exercises is simply to test whether essential contacts can be made in times of emergency. For example, how long would it take to contact all key personnel and have them report for duty at the National Disaster Control Centre (NDCC)?

These exercises could also be used to verify that a warning of a tropical cyclone would reach all intended recipients within a specified time. Exercises could also be run on the basis that certain communications would be disrupted during an emergency and the engineers and technicians would gain practical experience in making alternative arrangements and testing them.

Since communications are so vital, exercises should be carried out frequently and should cover a number of different contingencies so that the resourcefulness of the responsible staff may be given tests of a most exacting nature.

Practical exercises

These exercises, sometimes referred to as “dry runs”, are staged in a simulated disaster so that the effectiveness of personnel and equipment may be tested in an operational environment. Again a wide variety of exercises can be exploited, perhaps starting with destruction in a small locality and gradually increasing the demands on personnel and equipment by enlarging the exercise area to encompass a whole town.

These exercises require a high degree of organization and are best carried out at quiet periods, e.g. at holiday times.

Mobilization exercises

These are full-scale exercises involving the whole preparedness organization, the rescue of people who have agreed to play the part of victims and such features as the clearance of roads, repairs to embankments, evacuation of inhabitants from a locality and so on. This type of exercise could take several months to plan in all its details and therefore could not be held frequently. The public should be fully informed since its co-operation would be indispensable.

Reports on exercises

Each exercise should invariably form the subject of a report which would include recommendations concerning any changes that have been seen to be required. The report should be prepared by experienced officials and should be circulated for comment to all who could contribute constructive advice. The comments might then be circulated as a preliminary step to the convening of a meeting to discuss the exercise and the lessons to be learned.

It might be mentioned that there should be no great surprise if it is found that the planning, conduct and subsequent reporting of an exercise present substantial difficulties. A country in the early stages of developing disaster-preparedness systems would probably seek advice from another country which already had long experience in these matters. The subjects on which advice is sought should include all aspects of exercises.