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DEALING WITH DISASTER IN THE 21<sup>ST</sup>  
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## **DEALING WITH DISASTER IN THE 21<sup>ST</sup> CENTURY**

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Celebrating a 60<sup>th</sup> anniversary requires some acknowledgment of a past as well as some directions for the future. In looking both ways, it might be appropriate to quote Shakespeare that “The Past is Prologue.” That might be useful but it will not be particularly accurate. Some of the factors involved in disasters in the 21<sup>st</sup> Century will have no prologue, no easy derivative from the past. In the future, some of the things we will be dealing with will be quite different situations and scenarios than we had in the 20<sup>th</sup> Century.

Certainly, we can point to rather universal social changes which have affected the world in the last 60 years and which will continue into the new millennium: the decline of command economies and the movement toward market economies; the decline of authoritarian political structures and the movement toward more democratic forms; the emergence of new family patterns and changes in the status of women; the increase in the dominance of mass media and other forms of information technology and the globalization of popular culture. All of these changes have profoundly affected the nature of emergency planning. Pre-World War II emergency planning was oriented toward protecting dependent classes such as women and children. Today, a woman is likely to be an emergency planner and children to be useful even as unskilled labor. Too, the media has often assumed the role of declaring disaster in the place of a government declaration. In recent years, Bob Geldorf and a BBC commentary were able to declare a disaster in Africa, defining chronic conditions of extreme poverty as disaster. Such a declaration lead to “volunteer” work of much of the worldwide rock community, including Michael Jackson. Too, with political arguments to decrease the role of government, there is an increasing effort on the part of businesses to have governments cover economic losses from disaster. And with the worldwide 24-hour media coverage, everyone can view disasters around the world along with their evening meal. All these changes in the 20<sup>th</sup> Century have presented problems for planning an emergency response, but they may be simple compared with the future.

## **DIFFERENT PROBLEMS FOR THE MILLENNIUM**

In thinking about the future, let me try to limit my topic. I am not going to talk about certain situations, in part, because of their complexity. I will ignore issues of terrorism, which have garnered considerable recent attention. Conflict situations have quite different causes even if they have some of the same consequences as disaster. Nor will I discuss what some agencies call complex disasters: that amalgam of war, poverty, corrupt and conflicting governmental factions which have become a major concern for many international agencies.

Here I want to concentrate on two factors to project into the 21<sup>st</sup> Century- first, changes in industrialization and technological development, and second, future population changes, especially urbanization. Changes in technology will change the nature of threats people face which lead to disaster. New technologies, in and of themselves, and in interaction with traditional, more “natural” threats, will present certain disaster issues in new and demanding ways. Population changes, especially urbanization, will change the nature of vulnerability, exposing more people to new and old threats. This will create new issues and problems for dealing with disaster.

## **OLD AND NEW THREATS**

Many of the following factors are already apparent at the end of the millennium.

New technologies lead to new threats. Words which are now part of the common vocabulary, such as Bhopal and Chernobyl, illustrate the recent past and suggest other unknowns in our future.

New technologies lead to new disaster related problems. Issues of contamination, radiation exposure, toxic clouds, etc., all point to new issues to deal with where new skills and resources are necessary.

Traditional threats can be enhanced by technological threats. Modern floods now create

a number of hazardous materials situations. Earthquakes fracture community lifelines, creating loss of power, gas leaks and transportation accessibility.

New technologies often create impact far from its source. Chernobyl is one obvious example when the West German government paid 100 dollars in compensation to farmers and reindeer herds in Northern Sweden were contaminated.

Traditional threats may be enhanced by previous attempts to mitigate effects. Many contemporary floods seem to have increased their spread and intensity. In part this is due to earlier attempts intended to reduce the threat. Dams and levees now channel flow rather than diffuse it. Drained wetlands, which previously caught overflow, can no longer serve that function. Straightening channels and dredging often reduce the barriers to unencumbered flow.

New technologies often lead to unanticipated consequences. Often certain disaster effects have far reaching consequences. One example recently occurred when a cancer treatment machine was abandoned in a junkyard in Goiania, Brazil. The machine released cesium 137 and, by radiation contamination, four persons died and 44 were seriously affected. To avoid the stigma of radiation contamination, 100,000 persons underwent examination and over 8000 were given formal certificates attesting to the fact that they were not contaminated. The reasons for the certificate were that hotels outside the region refused to lodge persons from the community; buses and planes refused to transport them and doctors refused to take new patients without that certificate. Tourism to the area fell 40 percent and half of the value of the state's export, primarily agricultural products, were lost the first month. Even textiles and clothing made in the community lost up to 40 percent of their value. (Patterson, 1988) The stigma, of course, stemmed primarily from media accounts of the incident.

A second example suggests that the increasing dependence on computer technology has the potential to magnify sets of problems. Many organizations are dependent on computer based systems to provide data and information. Thus: It is presently estimated that more than 85% of the largest firms in the US are totally or heavily dependent on computer technology and that, on average, a business would lose 25% of its daily revenue after the sixth day of it system breakdown, while this figure is close to 40% for the financial, banking and public utility industries. (Pauchant, Mitroff, Weldon and Ventolo, 1990:254)

Incidents of problems relating to outages are becoming more frequent. For example, a fire disabled a major Bell Telephone switching center in the Chicago area. As a result of its link to both voice and data communication for over half a million customers in six metropolitan suburbs and the fact that the center was an aggregation point for other major telecommunications links, the outage affected the normal operations of dozens of banks, hundreds of restaurants dependent on reservations, three large catalogue sales companies headquartered in the Chicago area, about 150 travel agencies, most of the paging systems and cellular telephones in the affected area, and hundreds of businesses located in the area or others not located in the affected area but conducting business with those that were...At present, a conservative estimate for the business losses and the repair costs of the accident are set at \$200-\$300 million. (Pauchant, Mitroff, Weldon, and Ventolo, 1990: 244)

## **URBANIZATION AND POPULATION CHANGES**

Not only will we have a continual stream of new technologies, some dangerous and some benign, but the human community will be configured in different ways than it has been in the past. For the first time in world history, the population will be predominantly urban. And much of that urban growth will be in large cities. By 2025, there will be 639 urban areas with over a million population. And there will be continued growth of mega-cities; 22 cities will have over 10 million population and 14 of these will be in areas we now call underdeveloped.

Some population changes will bring more and more people into areas with traditional high risks. For example, by 2000, 75 percent of the U.S. population will live within 10 miles of the east, west, and gulf coasts. The west coast is seismically active and the east and gulf coasts are vulnerable to hurricanes. (In fact, 64 of the 90 largest cities in the world are located in seismic zones.) The concentration of urban slums may be especially problematic. Urban slums, especially in less developed countries, are often located near the dirtiest, most labor intensive processing plants which have moved from developed countries to be near sources of cheap labor.

These changes in the location and concentration of the populations will have implications for mounting an emergency response. It is quite possible that the urban bureaucracies which have emerged to

deal with routine urban problems may have great difficulty in dealing with the non-routine which is disaster. Such bureaucracies tend to be rigid and detached when flexibility and innovation may be needed. (This may be especially true in countries which have centralized and/or command style of political structures.)

In addition, urbanization also means heterogeneity. In other words, the urban areas are composed of a variety of quite different sub-cultures. One measure might be language usage. For example, in the city of Los Angeles, the population speaks some 82 non-English languages and constitutes over 100 different ethnic and cultural groups. Within this diversity, groups may have different views of the utility of certain types of protective action. They may utilize quite different media sources. They may have quite different assumptions about family structure and functioning. In addition to population homogeneity, much disaster planning has traditionally assumed the normative family pattern to be parents and children. And of course, not all people have families or homes.

In addition to urban concentration, other population and life style changes could be important. In many developed societies, one of the more positive changes is the increased ability to use and enjoy leisure time. This means that the tourist industry, catering to this new ability, has developed, building new facilities in scenic disaster prone areas. In many resort areas, the tourist populations might be 50 times the local population and, in general, they are not knowledgeable about local risks or possible protective action. (Drabek, 1994) Leisure time created by pensions often encourage elderly citizens to move to better climate, often quite disaster prone areas.

Other population changes can be important. In most developed societies, the percentage of persons over 65 is increasing. For example, before the middle of the next century, it is estimated that perhaps a quarter of the population of Japan will be over 65. There is some research which suggests that older persons are more susceptible to injury but, in addition, have unique medical needs and decreased mobility which will require special consideration. On the other hand, in many developing countries, the concentration of children in the age distribution will require different attention.

In addition to location and distribution changes in the population, there may be other implications. For example, traditionally, emergency planning has centered on the local community as the

responding unit. Unfortunately, the distribution of risk seldom corresponds to existing political boundaries. In addition, even in instances where local communities develop mutual aid agreements to insure assistance, many contemporary events produce a spread which does not correspond to the geography of mutual aid. Too, the nation state which has traditionally been the social unit with ultimate responsibility for disasters, may be increasingly irrelevant. Perhaps that observation is not necessary when there are activities, such as the European Union, which attempt to deal with the inherent weakness of nation states. Disasters are seldom contained by national boundaries. The point here is that the governmental units which have traditionally had disaster responsibility may not be the most meaningful ones for the future.

## **DISCUSSION**

Perhaps I have drawn too stark a picture for the 21<sup>st</sup> Century, especially in predicting certain negative technology changes. The prediction of the exact course of technology is very risky. Recall that Marconi suggested that his invention, radio, would most likely be used in ship to shore communications. And Thomas Watson, long time President of IBM, indicated that he could see little home use for computers. On the other hand, it would still be prudent to be skeptical of those who assure us that the technology they advocate (or sell) is risk free. You should remind then that we already had such assurances for the Titanic and Chernobyl. And those who advocate risky technologies should be made to bear some of the social costs which accompany that technology.

Certainly today, it is easy to become pessimistic as week after week the media informs us of the new risks we face. The last several weeks in the U.S., there has been a concern raised for the allergic reactions peanuts can have for certain children. Some schools have already banned peanut butter from their lunchrooms. Such action strikes at the heart of a major American value of having peanut butter and jelly for lunch and might lead to malnutrition among a sizeable segment of the younger population. I would expect that, in time, such risks would find their proper context. Recently in re-reading Titmus (1950), it was apparent that there was considerable fear and anxiety in London in the 1940's in anticipation of the possibility of bombing. I also remember, in the early 60's seeing Beyond the Fringe in

London. There was a sketch of an older couple, after hearing the warning, discussing quite calmly whether to have tea before or after they went to the shelter. The London audience laughter suggested that this adaptation to risk had become routinized and was a realistic portrayal of their own experience. I certainly do not wish to suggest that necessarily the future will bring more risk than our ancestors faced. My grandfather used to tell me stories of running into bears in his travels in rural Ontario. The only bear I've heard of lately as a threat are those in the financial markets.

Certainly, one of the advantages we have going into the 21<sup>st</sup> Century is that we know a great deal more about emergencies, thanks to the cumulation of research in the past and to the commitment of persons, many in various government positions, whose operational experience provide knowledge and experience useful for the future. Over time, emergency planning and response has become a continuing responsibility of local and national governments. This commitment is, of course, still rare in developing countries and for many countries making the transition from past policies in Eastern Europe. (One result of the differences in attention is to contrast the number of casualties created by Hurricane Georges - 3 in the U.S. and over 300 in the Dominican Republic.)

Too, there has been a healthy change in approach in emergency planning away from the notion of "protecting dependent people" to enhancing the capacity of people to solve disaster related problems. There is a change away from the notion of "command and control" to the notion of cooperatively solving community problems.

There are other encouraging trends. One of them is what might be called the "professionalization" of the status of emergency manager. This means that at various levels of government and in some businesses there are positions which have been created to think and plan about the consequences of disaster. That role is an integral and critical part of the day to day operations of that community or organization. Those who occupy those positions need to develop knowledge and skills and to accomplish what various colleges and universities have developed curricula to train such individuals. Professional associations have developed that are concerned with standards and training opportunity. The role now has career opportunities rather than periodic opportunities.

In addition, there are innovative programs, many on their beginnings, which might provide useful

ideas for the future. In the U.S., supporting an emphasis on mitigation, the Federal Emergency Management Agency selected seven communities for pilot projects to build disaster resistant communities. By providing seed money for 5 years, and some Federal guidance, each of these communities were to develop mitigation activities and strategies to meet local needs. They were to build community partnerships; to identify hazards and community vulnerability; to prioritize risk reduction strategies and to develop communication strategies to educate the public. If that effort is successful, it will be applied in other communities. In other countries, experimental programs touch on other dimensions. In New Zealand, a separate cabinet level position has been created for emergencies. And one of the initial policies is that no Federal assistance will be given for recovery unless the community can show pre-disaster mitigation efforts. These communities are asked to prioritize their risks and to make estimates of the potential losses they can absorb.

Certainly, one of more important changes has been the effort to gain greater involvement of segments of the community which, until recently, have been unconcerned or perhaps uninvolved in thinking about the consequence of disaster. It is gratifying to see that businesses are now beginning to think about "continuity." The same trend is occurring in the U.S. and in recent years, the Disaster Research Center has been looking at issues of business disruption. (See for example, Tierney and Dahlhamer)

There is one part of the research that I want to mention here. Do not treat your business as an isolated entity away from its community context. Community wide mitigation efforts which contain damage and reduce lifeline failures make businesses less vulnerable and more resistant to operational delays. If impacts at the broader community level can be reduced, businesses will benefit. As an example, in the 1993 Midwest floods in the U.S., the Des Moines water works was flooded and over 250,000 customers were without water for 11 days. Approximately 80% of Des Moines businesses were affected and nearly half were forced to close. Damage to the water works totaled 14 million, while business interruption costs were estimated at \$200 million. The city moved to protect the water supply and such collective efforts are more important than the individual actions of specific businesses to limit their own individual losses. Concern for overall community planning is perhaps that most critical task to

deal with business disruption.

Finally, what I have said here is only a momentary glance to the future. The concern for the consequences of disaster can never be justified in making a cost benefit analysis. Ultimately, attempts to deal with disaster must be argued on the basis of humanitarian values rather than economic ones. To be concerned with reducing the chaos and trauma of human communities was often a lonely activity in the past and those who make up the Institute of Civil Defense and Disaster Studies deserve our appreciation in their search to make life more bearable for all of us.

Note

Many of the ideas in this paper were derived from discussion with my colleague, E. L. Quarantelli. I thank him without citing him.

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