



# UNIT II

## Hazard Analysis



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## UNIT II

### HAZARD ANALYSIS

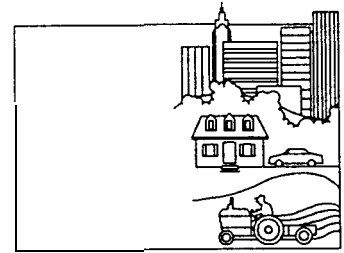
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***After completing this section, you will know how to perform an analysis of your community's hazards, resources, and codes. Your instructor will review the essential ingredients of a hazard analysis, the necessary steps and quantifiable factors to complete an effective analysis according to research by the National Governors' Association, review the Hazard Identification, Capability Assessment, and Multi-Year Development Plan (HICA/MYDP) and its effects on communities, and briefly cover the concepts associated with the Integrated Emergency Management System (IEMS). You will be involved in a hazard vulnerability exercise of your own community. The exercise focuses on potential hazards and other issues, such as preparedness, community attitudes, ordinances, codes, population factors, geographical priorities, response services, and local emergency plans. Your responses will be analyzed from the standpoint of community needs, community resources, legal sources for public policy authority, and the possible effect that changes in public policy will have on a community. The need for a coordinated approach to public policy planning is stressed. Space is provided for taking notes.***

## UNIT II: HAZARD ANALYSIS

### ANALYZING COMMUNITY HAZARDS

Early in 1979, a report was issued by the National Governors' Association (NGA) that reflected a growing consensus--continued fragmentation of emergency preparedness programs was not desirable. The study concluded that an effective hazard analysis must address all hazards--natural, man-made, and attack--and that it should consist of five steps:



- Planning, coordination, and adoption of standardized incident reporting;
- Data identification, collection, compilation, and all-hazard mapping;
- Local, State, regional, and national hazard profile development, with varying jurisdictions contributing to a standardized, interactive process;
- Hazards comparison, using an accepted standardized, interactive process; and
- Cross-hazard evaluation and ranking.

The first step in hazards management should be the understanding of the nature and implications of hazards. Knowing what can happen, the likelihood of its happening, and a general idea of its consequences are vital components for emergency planning. In order to establish effective emergency plans, a community must identify all hazards posing a potential threat and determine the probable effect each can have on people and property.

Two knowledge bases comprise a hazard analysis. The first involves knowledge of the kinds of hazards that are likely to threaten the community; the second is knowledge of the areas, resources, and loss assessment within a community that would result from the occurrence of a hazardous event. When knowledge of hazards is combined with knowledge of their potential effects on the community, the result is the measure of the community's vulnerability. Adequate information about the hazards will enable a community to know how frequently damage from an event could occur, what the damage could be, and which areas of the community could be damaged. When the data for each hazard are combined and analyzed, the community can assign priorities to its emergency management needs (McLoughlin, 1985).

Emergency managers at all levels of government and the private sector need to work toward establishing common terms and definitions for their shared use in preparing **vulnerability** analyses. This would provide a point of commonality for nationwide studies and comparisons as well as enhanced communications and emergency management planning.

The following glossary defines several key terms taken from studies reviewed. At a minimum, it will clarify terminology for the purposes of this course. It may also provide a basis for establishing an acceptable set of terms and definitions for use by the emergency management community.

- ***Elements at Risk*** population, buildings, businesses, civil works; economic activities, public services, utilities, infrastructure, and so forth.
- ***Emergency/Disaster*** event that demands substantial crisis response requiring the use of government powers and resources beyond the scope of one line agency or service.
- ***Hazard/Hazard Agent*** source of danger that may or may not lead to an emergency or disaster and is named after the emergency/disaster that could be so precipitated.
- ***Incidence*** number of disasters or emergencies precipitated by a given hazard or group of hazards during a given historical period.
- ***Local Conditions*** local environmental conditions, such as topography, geology, geography, and so forth, that increase or decrease hazard effects.
- ***Physical Properties of Hazards*** hazard magnitude (such as severity of a hazard measured in terms of wind speed for windstorms or earthshock for earthquakes), rate of onset, frequency, and so forth.
- ***Probability*** number of chances per year or during other time span that a disaster of a certain magnitude will occur.
- ***Risk*** susceptibility to death, injury, damage, destruction, disruption, stoppage, and so forth.
- ***Risk Reduction Measures*** actions taken to minimize or eliminate vulnerability to disasters (such as land use patterns, development planning, and mitigation measures).
- ***Vulnerability*** degree to which population, property, environment, and social and economic activity are at risk.

The evaluation of vulnerability is only one aspect of the complete process emergency managers need to employ to identify and analyze crisis potential and consequences. This complete process involves the systematic identification, investigation, and subsequent analysis of many hazards in terms of the interrelationships of their physical properties, incidence, their probability of occurrence, the vulnerability of the elements at risk, risk reduction measures, and local conditions that affect their impacts.

We suggest that **hazard** analysis better describes this process than does *vulnerability* analysis, and will therefore use the former term to connote the complete process defined above.

### Purposes of a Hazard Analysis

Whatever the individual State emergency policy, an explicit or implicit role of the emergency management operation is to identify potential hazards, suggest appropriate mitigation, preparedness, response, and recovery strategies, and recommend or direct the allocation of resources accordingly. This role is difficult to carry out without sufficient information about hazards and the risks they pose. Without a sufficient hazard analysis, emergency managers tend to apply resources to prevalent hazards and are caught short when unusual emergencies occur.

As demographics shift and technologies grow, as new information becomes available, and as different mitigation and preparedness measures are implemented, vulnerabilities change. Institution of a continuous, comprehensive hazard analysis process would enable emergency managers to track these needs more easily and change their plans accordingly.

Accurate predictions about the time, place, and magnitude of all potential emergencies are nearly impossible to make. Hence, broad-based preparedness, response, and recovery plans always will be needed. The basic questions a hazard analysis must answer are not those relating to predictions, but rather questions such as those in the following list.

- If a hazard develops into a crisis of a given magnitude, how vulnerable would the people and property at risk be in a given area?
- Can we prevent the hazard agent from causing a crisis by taking measures to reduce the potential magnitude of the crisis or by decreasing the vulnerability of people and property? If so, can these measures be taken in a cost-effective manner?

- Can the hazard be prevented or substantially controlled from developing into a crisis, or must we concentrate on mitigating subsequent damage to people and property?
- How do the interrelationships of the hazard, the magnitude, and the vulnerability factors of one potential emergency compare with those of others we face?

A hazard analysis should be designed to answer these questions using hard, objective data to the extent possible. A properly prepared and periodically updated hazard analysis is the emergency manager's primary tool for managing the hazards of the 1980s and 1990s and should

- Enable emergency managers to set priorities and goals commensurate with the degree of local public need for protection,
- Provide descriptive information on every major hazard affecting a given area and a methodology for comparison of vastly different types of hazards,
- Justify management decisions for altering program and staffing assignments that may vary from previous norms,
- Substantiate decisions about resource allocations and justify budget requests thereto,
- Encourage identification of unmet technological and research needs in emergency management,
- Provide tools to raise the level of understanding of public officials to influence the adoption of prevention/mitigation measures and the expenditure of scarce resources to do so, and
- Enable the establishment of a viable national database of hazard, vulnerability and other relevant and comparable information for national Comprehensive Emergency Management (CEM) planning.

The analysis of past incidents and damages alone cannot satisfy the requirements of a hazard analysis because they are only two of several variables to be examined. Performing a hazard analysis is a continuing process that requires the collection and study of data on many variables that play a role in the assessment of each hazard and their cross-comparison and analysis.

### Recommendations

The effectiveness of a hazard analysis depends upon its being performed in the context of CEM; it should address the following factors:

- All Hazards                      Natural, man-made, and attack--both those known to occur and cause damage and those having a reasonable likelihood of occurrence and **damage-producing** effects;
- Four Management Phases              Mitigation, preparedness, response, and recovery--actions taken in any or all of the phases can positively or negatively affect vulnerability of the population and property at risk; and
- All Government Levels and the Private Sector              Each has a separate but interdependent role in disaster management and information and experience to apply to hazard analysis.

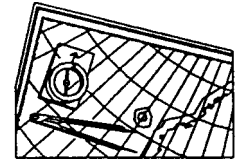
In addition, it should be designed to answer the questions and fulfill the aforementioned purposes. For all hazards analyzed, the following information should be provided:

- Nature and scope of hazards and where they are likely to occur;
- References to secondary emergencies or disasters that can be or have been triggered by a primary event;
- Detailed descriptions of historical events provided as examples of what occurs when a particular hazard develops into an emergency/disaster (scenarios using past real events);
- Historical incidence data, national and/or statewide, including information on hazard severity scales applied to measure the magnitude of the event;
- Location of fixed sites that may pose dangers (such as nuclear power plants);
- Mapping of hazardous zones based on past occurrences or potential events (such as hurricane paths, floodplains, railroads, highways);
- Historical damage data expressed in dollars and aggregated for a period of years or months for a selected number of hazards;

- Suggested mitigation measures; and
- Listings of emergency and disaster declarations issued.

Many States already are actively including some of these items and may only need to identify and strengthen the weaker portions of their current hazard analysis. The use of the following tools also would help facilitate the hazard analysis process.

First, preparation of an all-risk overlay map is useful for orienting and motivating executive and legislative policymakers. It graphically depicts and summarizes State hazard problems and can assist in justifying emergency management resource allocations.



One would start with a large simple map of the State and then make a number of acetate overlays. On each overlay an artist attractively presents, for example, the following data:

- Earthquake risk areas;
- Floodplain areas;
- Hurricane, tornado, and other wind storm “alleys”;
- Landshift and subsidence risk areas;
- Livestock, crop, and forest areas subject to drought, blight, infestation, freeze, contamination, and other adverse conditions;
- Dams--Federal, State, local, private--with those above population centers specially keyed;
- Transportation system--airports, railroads, highways, waterways;
- Mines, with their products and hazard areas;
- Pipelines--crude oil, natural gas;
- Manufacturing plants and refineries--chemical, petroleum, other;
- Toxic substances and low-/high-level radiation dump sites;
- Recurring pollution, epidemic, health problem zones;



- Potential internal disturbance zones--colleges, prisons, ethnic, and racial concentration areas;
- Nuclear power plants--planned, licensed, operating--hydroelectric power plants, electric generating plants, and high voltage transmission lines;
- Strategic military targets--blast, fallout, and combination areas; and
- Recent disaster sites, symbolized.

The State emergency office should have a lot of the material needed and should be able to obtain other necessary update information from the pertinent State officials. The materials these offices provide will be based on a variety of assumptions, scales, and definitions, so care should be taken to sort out the "apples and oranges" therein and develop correct, standardized data.

States may want to consider preparing hazard overlay maps for each county or other sub-State jurisdiction, in addition to making a statewide map.

Second, the institution of a system for consistently documenting incident and damage data for both major and minor emergencies would dramatically assist in tracking trends. Governors should initiate the system by requiring that standardized summary reports on all emergency incidents are to be reviewed and cross-analyzed periodically for management implications.

To accomplish this, the State should develop forms to obtain information from all localities and pertinent State agencies. Then, information collected can be condensed into one-page reports for periodic review by the Governor and others, as warranted.

Finally, a workable methodology and working definitions and terminology must be developed for use in cross-hazard comparison or ranking of unlike hazards. Computer modeling techniques and methods suggested by ABAG, NEMC, Michigan, and NGA, among others, outline ways in which this could be done. It would be very useful to establish a local-State-Federal-private-sector task force to further study the state-of-the-art in cross-hazard comparison/hazard ranking methodologies and recommend a procedure for use nationwide.

Review of the literature suggests that a manageable, realistic, and relatively objective cross-hazard analysis should include five steps:

- Evaluate each hazard by using several initial factors that can be expanded as data become available and methods are fine-tuned;

- Weigh the factors since some may be more indicative of the relative ***hazardousness*** of a hazard;
- Indicate where data for a particular factor do not exist or are insufficient;
- Specify indicators for the factors and assign them standard scales with varying numerical ranges in order to provide objective benchmark measurements for those who are scoring them; and
- Engage several people in the scoring of each hazard as one way of providing some quality control--this is especially true for factors where little information exists and absolute, numerical parameters cannot be developed.

We suggest a minimum of six factors be evaluated in a cross-hazard comparison. They include incidence, hazard severity, probability of occurrence, vulnerability of the elements at risk, risk reduction measures in place, and local conditions. Appropriate factor weights and numerical indicators should be devised by the task force. The methodology then should be pilot-tested by several States and adjustments made to the technique based on practical application.

### **Conclusion**

**These** recommendations are premised on the assumption that more progressive and proactive work is needed in hazard analysis in order to better prioritize the use of emergency management resources. While some may argue that the state-of-the-art practiced by the States is sufficient, improvements always can be made.

Consideration of all CEM elements, inclusion of all information described earlier for each hazard agent, and use of all-risk overlay maps and standardized incident report forms are workable improvements that States can implement now. In addition, development of a cross-hazard comparison and ranking scheme for eventual use by all States will greatly enhance the capability to better manage hazards facing the nation.

**HAZARD IDENTIFICATION, CAPABILITY ASSESSMENT, AND MULTI-YEAR DEVELOPMENT PLAN (HICA/MYDP)**

In order to establish a nationwide database for determining the status of emergency preparedness and the effect of Federal funds on State and local emergency management operations, FEMA developed the Hazard Identification, Capability Assessment, and Multi-Year Development Plan (HICA/MYDP). Designed to be used as a State and local planning tool, this guidance directs local jurisdictions through a logical sequence for identifying hazards, assessing capability to respond, setting priorities, and scheduling activities to improve capability over time.

Both I-HICA and MYDP lay the groundwork for taking necessary actions to improve emergency management capabilities and practices. Once a local jurisdiction has a thorough understanding of its response capabilities and resource requirements, it can focus day-to-day emergency management activities on the specific vulnerabilities of the community.

All local jurisdictions receiving Emergency Management Assistance (EMA)-- financial support from FEMA through State emergency management agencies--are required to complete and submit the HICA/MYDP forms. Local jurisdictions are responsible for giving accurate and complete responses within the time allotted by FEMA and the States. In completing the forms, FEMA encourages jurisdictions to convene a group of local officials involved in emergency management activities to discuss the questions and reach a consensus. This approach serves as a means for getting key officials together to focus on the status of emergency management in a comprehensive, methodical manner.

All State emergency management agencies are required to complete and submit State MYDP forms. State governments coordinate, clarify, and assist in the overall administration of the HICA/MYDP with their local jurisdictions.

The HICA/MYDP process and database provide several uses and benefits.

**Uses**

- Furnish the standard data on hazards and capabilities that emergency management has historically lacked.
- Provide a source of information for program planning, priority setting, budget preparation and justification, and fund allocations for local, State, and Federal governments.

- Encourage long-term planning and strategy development to assure that current activities-contribute not only to meeting the demands of the present, but also to achieving longer-term goals as well.
- Promote more efficient use of resources and better overall program management through careful monitoring and tracking of funds.
- Create another step in the evolution of the all-hazards approach to emergency management which yields significant and measurable improvement in the delivery of emergency management to the public.

### *Benefits*

- Provide local government with an orderly way to improve capabilities.
- Aid local officials in the preparation of applications for funding, reduce duplications in planning, and identify sources of mutual aid.
- Give local government a voice in national policymaking as well as a tool for measuring local capability against national standards and objectives.

### INTEGRATED EMERGENCY MANAGEMENT SYSTEM (IEMS)

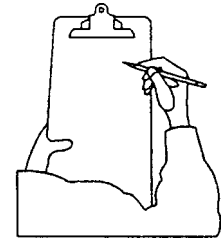
Comprehensive emergency management was validated through reports such as that by the NGA and the creation of FEMA. No longer are emergency planners encouraged to focus on single types of events and to design programs or agencies accordingly. Rather, the life cycle of all types of disasters is to be viewed as the conceptual basis for organization. "Emergency-related activities are clustered into four phases that are related by time and function to all types of disasters" (National Governors' Association, 1979:13). The four phases described in the report define comprehensive emergency management. No longer are the differences among disasters to be emphasized. Instead, common managerial functions applicable to all disasters are to be used for organizational guidance.

To integrate emergency management activities across the spectrum of hazards, FEMA has developed the Integrated Emergency Management System (IEMS). IEMS is a system of many components to serve all levels of government in developing, maintaining, and managing an efficient and cost-effective emergency management capability. It emphasizes the commonalities of emergency functions (for example, evacuation, direction and control, etc.) that exist across all hazards and addresses elements unique to specific types of emergencies.

The **IEMS** approach recognizes that while response to emergencies is the central focus during a disaster, mitigation activities to reduce the degree of risk, preparedness activities to increase the capability to respond, and recovery activities required to return communities to normal are equally important components of an effective emergency management program (**McLoughlin**, 1985). If a community follows the steps outlined in the **IEMS** process, its ability to deal with a wide range of emergencies will be significantly improved, and key officials will be meeting their responsibility to provide for the protection of their citizens.

HAZARD VULNERABILITY EXERCISE

After completing this exercise, you will have a better understanding of how to develop a coordinated approach to formulating public policy based on a review of your community's potential hazards, its resources, and legal authorities. The exercise is based on a form developed by the International City Management Association for use by NETC in another course.



Since this is only a review of potential hazards, you should use the information gained to put in priority order areas needing the most attention and to determine which ones need further in-depth analysis. Such analysis of a community's potential hazards usually is based on past incidents. However, there are many sources of information that can be **applied to** an analysis of potential hazards. When you complete the hazard vulnerability review, you will have enough information to initiate a follow-up to seek out the type of technical data essential to the planning process in relation to your area.

Answer each question you can in the time allowed. Sketch a map of your community, if necessary, to refresh your memory about specific conditions that may affect your community's ability to prepare for and respond to an emergency situation. Jot down notes or questions that may come to mind while you are doing this exercise because several members of each group will be asked to critique the analysis format and content. This will make you aware of some of the factors that must be taken into consideration in order to adequately develop, finance, implement, and maintain a dependable emergency management system.

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1. What types of emergency situations have occurred in your community during the last five years?

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2. Did any of these situations result in an emergency or disaster declaration?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_\_\_

If so, describe briefly.

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3. What are the potential hazards that your community has the highest probability of facing now and in the future? Check all potential hazards and place an asterisk beside those which present the greatest potential threat to your community. (In an actual analysis, a numerical rating system could be used.)

Natural/ Environmental	Industrial/ Technological	Civil/ Political
Severe Weather <input type="checkbox"/> Lightning fires <input checked="" type="checkbox"/> Floods <input type="checkbox"/> Winds <input type="checkbox"/> Drought <input type="checkbox"/> Heat <input type="checkbox"/> Snow <input type="checkbox"/> Hail <input type="checkbox"/> Ice <input type="checkbox"/> Hurricane <input type="checkbox"/> Typhoon <input type="checkbox"/> Tornado <input type="checkbox"/> Other <hr/>	Fire <input type="checkbox"/> Chemical <input type="checkbox"/> Structural <input type="checkbox"/> Other <hr/> Transportation <input type="checkbox"/> Air <input type="checkbox"/> Rail <input type="checkbox"/> Water <input type="checkbox"/> Motor vehicle <input checked="" type="checkbox"/> Pipeline  Utility Services <input checked="" type="checkbox"/> Electricity <input type="checkbox"/> Gas <input type="checkbox"/> Fuel <input type="checkbox"/> Telephone <input type="checkbox"/> Water <input type="checkbox"/> Sanitation	<input type="checkbox"/> Economic emergencies <input type="checkbox"/> Demonstrations <input type="checkbox"/> Strikes <input type="checkbox"/> Riots <input type="checkbox"/> Terrorism <input checked="" type="checkbox"/> Sabotage <input type="checkbox"/> Conventional War <input type="checkbox"/> Biological <input type="checkbox"/> Chemical <input type="checkbox"/> Nuclear Attack <input type="checkbox"/> Direct Effects <input type="checkbox"/> Nuclear Attack <input type="checkbox"/> Fallout <input type="checkbox"/> Radiation <input type="checkbox"/> Other
Geological <input type="checkbox"/> Earthquake <input type="checkbox"/> Volcanic eruptions <input type="checkbox"/> Erosion <input type="checkbox"/> Other <hr/>	Hazardous Materials <input type="checkbox"/> Explosives <input type="checkbox"/> Gases <input type="checkbox"/> Corrosives <input type="checkbox"/> Flammable liquids <input type="checkbox"/> Flammable solids <input type="checkbox"/> Oxidizing substances <input type="checkbox"/> Poisons <input type="checkbox"/> Radioactive material <input type="checkbox"/> Chemical wastes	
Epidemiological <input type="checkbox"/> Human <input type="checkbox"/> Animal <input checked="" type="checkbox"/> Agricultural  Recreational <input type="checkbox"/> Accidents <input type="checkbox"/> Lost persons <input type="checkbox"/> Other <hr/>		

4. Select three hazards for which you indicated a high probability of occurrence in your community.

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What measures exist in your community to mitigate the effects of these hazards?

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What additional mitigation measures could be taken?

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5. What geographic factors, such as man-made or natural boundaries, might make your community susceptible to the occurrence of a disaster?

- Interstate highway
- Rail system
- Airport**
- Marine port
- River
- Natural drainage plan
- Coastal area
- Earthquake faults
- Other



- 6. What factors, man-made or natural, might inhibit activities essential to effective response in your area (for example, bridges, hills, rivers)?

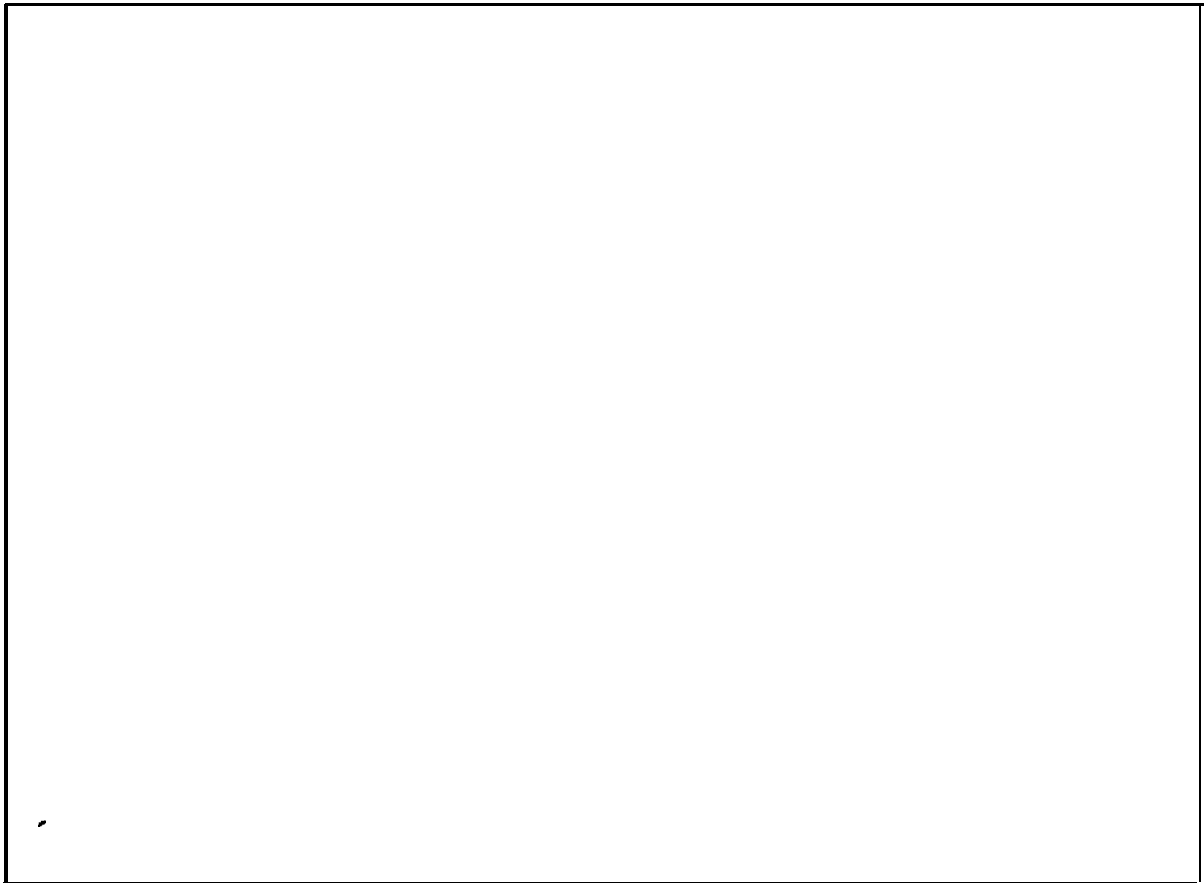
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- 7. What is your area's total population? \_\_\_\_\_  
What is the projected population at the time of the next census? \_\_\_\_\_

- 8. Draw a rough map of your area and pinpoint high population areas. Also indicate commercial and/or industrial transportation routes.



9. Does your community have identifiable population densities that shift daily or seasonally?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

10. Check the following population groups in your area that may need special attention in an emergency situation. Put two checkmarks by those for which you have a greater concern due to the lack of emergency preparedness measures at this time.

Elderly persons

Institutionalized populations

- Jails
- Prisons
- Health care facilities
- Group Homes

Dependent children

- Schools
- Nurseries
- Day care centers

Physically or emotionally impaired populations

Non-English speaking groups (identify those languages for which an interpreter may be needed most often.)

11. Do you know the future land use and zoning plans for your locality?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

If so, summarize.

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Do you know the location of the flood hazard areas as shown on the FEMA Flood Insurance Rate Map of your community?

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12. Are your codes adequate to ensure that future construction does not aggravate existing hazards?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

13. What is the projected industrial growth within your area during the next five years?

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14. What type of underground utilities are at risk?

- Natural gas
- Water
- Electricity
- Telephone
- Sewer
- Other

15. Do you know the route of the main utility lines?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

16. Have you surveyed your area for appropriate emergency shelter facilities if, for any reason, people must be evacuated from their homes?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

17. Has it been determined how many people safely could be assigned to each identified shelter?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

18. Have adequate numbers of shelter management personnel been trained for immediate assignment?

Yes \_\_\_ No \_\_\_ Don't Know \_\_\_

19. Is there currently an emergency management **program** in your area?

Yes \_\_\_ No \_\_\_ Don't know \_\_\_

20. What is the specific legal authority for the emergency management program within your area?

- No legal provision
- State statute
- County code or ordinance
- City code or ordinance
- Charter provision
- Executive order
- Administrative resolution
- Other

21. How many staff personnel are there in the Emergency Management organization?

\_\_\_\_\_

22. Does this organization have any responsibilities other than the local emergency management program?

**Yes** \_\_\_ **No** \_\_\_ **Don't Know** \_\_\_

If so, what do these responsibilities include?

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23. Does the responsibility for overall direction and control of emergency operations shift from one public official (chief executive officer, policy chief, fire chief, public works director) to another, depending on the type of the incident?

Yes \_\_\_ No \_\_\_ Don't Know

24. What major factors, such as administrative support, skillful program management, training, interagency cooperation, or planning skills, contribute to the successful operation of the emergency management system in your area?

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25. What major factors--such as lack of local, State, or Federal funds, personality conflicts, and public apathy--impede its success?

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26. What do you perceive as the level of public support for the emergency management program in your area?

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## GROUP SUMMATION

POLICY QUESTIONS THAT MAY BE  
ADDRESSED THROUGH THE USE OF A  
**HAZARD/VULNERABILITY ANALYSIS**

- What emergencies can you reasonably expect to occur in your community?
- What hazards are the most obvious targets for mitigation strategies?
- What kind of priorities should you set for infrequent, but probable, hazards?
- What kinds of resources will you be expected to have in place or to have access to in order to respond to an emergency?
- What effect will the public's perception of the above have on your community's ability to prevent, respond to, or recover from, the effects of an emergency?
- Will the public's perception of emergency concerns in your community allow you to build an integrated emergency management system that deals with mitigation, preparedness, response, and recovery?

**NOTES**

NATURAL HAZARDS	1. Could this hazard affect your jurisdiction? If yes, answer question 2. If No, go to next hazard. (Mark (X) the appropriate answer.)	2. Is this hazard a significant threat to your jurisdiction? If Yes, answer question 3. and 4. If No, go to next hazard. (Mark (X) the appropriate answer.)	3. Approximately how often does this hazard occur in your jurisdiction? (Mark (X) the appropriate answer.)	4. What is your best estimate of the total population that could be seriously affected by this hazard? Consider peak population if appropriate.
<p>201. AVALANCHE</p> <p>Mass of sliding snow occurs in mountainous terrain where snow is deposited on slopes of 20 degrees or more.</p>	<p>201.1</p> <p>Y N</p>	<p>201.2</p> <p>Y N</p>	<p>201.3</p> <p><input type="checkbox"/> a. Once or more a year.  <input type="checkbox"/> b. Once every 5 years.  <input type="checkbox"/> c. Once every 10 years.  <input type="checkbox"/> d. Once every 50 years.  <input type="checkbox"/> d. Once every 100 years.  <input type="checkbox"/> f. Less than once in 100 years.  <input type="checkbox"/> g. Has not occurred.</p>	<p>201.4</p> <p>Enter a number _____</p>
<p>202. DROUGHT</p> <p>Prolonged period without rain.</p>	<p>202.1</p> <p>Y N</p>	<p>202.2</p> <p>Y N</p>	<p>202.3</p> <p><input type="checkbox"/> a. Once or more a year.  <input type="checkbox"/> b. Once every 5 years.  <input type="checkbox"/> c. Once every 10 years.  <input type="checkbox"/> d. Once every 50 years.  <input type="checkbox"/> d. Once every 100 years.  <input type="checkbox"/> f. Less than once in 100 years.  <input type="checkbox"/> g. Has not occurred.</p>	<p>202.4</p> <p>Enter a number _____</p>
<p>203. EARTHQUAKE</p> <p>Sudden motion of the ground that may result in surface faulting (ground rupture), ground shaking, and ground failure.</p>	<p>203.1</p> <p>Y N</p>	<p>203.2</p> <p>Y N</p>	<p>203.3</p> <p><input type="checkbox"/> a. Once or more a year.  <input type="checkbox"/> b. Once every 5 years.  <input type="checkbox"/> c. Once every 10 years.  <input type="checkbox"/> d. Once every 50 years.  <input type="checkbox"/> d. Once every 100 years.  <input type="checkbox"/> f. Less than once in 100 years.  <input type="checkbox"/> g. Has not occurred.</p>	<p>203.4</p> <p>Enter a number _____</p>



CAPABILITY ASSESSMENT SAMPLE PAGE

400. DIRECTION, CONTROL, AND WARNING.	RESPONSE
415. On the average, approximately how long does it take to notify the following after receipt of a warning from a credible source?  Mark A, B, C, or D for each.  A. Up to 5 minutes B. 6 to 15 minutes C. 16 to 30 minutes D. Longer than 30 minutes 415.01 Key executive officials (e.g., mayors, county board members)?  415.02 Key emergency responders (e.g., police, fire)?	415.01 A B C D  415.02 A B C D
416. During waking hours, approximately what percentage of your jurisdiction's population can be alerted within 30 minutes using all available means of communications?  A. 85 percent or more B. 70 to 84 percent C. 50 to 69 percent D. Less than 50 percent	416. A B C D
417. Do the Alerting and Warning Annex or SOPs to the EOP include provisions for warning the following populations?  Mark Y, N, Or NA for each.	
417.01 Rural and urban populations not covered by outdoor warning devices?	417.01 Y N NA
417.02 Hearing impaired?	417.02 Y N NA
417.03 Institutionalized populations?	417.03 Y N NA
417.04 Non-English speaking population?	417.04 Y N NA

MULTI-YEAR DEVELOPMENT PLAN SAMPLE PAGE

Question Number	Priority (H M L)	Work Period Start Year	Work Period End Year	Total Costs	FFY 199_ Resources Staff Days	Estimates FFY 199_ Costs
415.01						
415.02						
416.						
417.01						
417.02						
417.03						
417.04						

300 - 800. MULTI-YEAR DEVELOPMENT PLAN - RESPONSE BOOK (CPG 1-35a) SAMPLE PAGE

Question Number	Priority (H M L)	Wrk Period		Total costs	FFY 199_ Resources Estimates	
		Start Year	End Year		Staff Days	FFY 199_ Costs

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