

Integrating Needs and Building Capabilities of Disadvantaged People in Local Disaster Plans

Prepared by

Center for Sustainable Community Design
Institute for the Environment
University of North Carolina at Chapel Hill
Chapel Hill, NC

for

MDC
Chapel Hill, NC

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Executive Summary

Disaster plans are vital to creating more disaster resilient communities, especially communities of disadvantaged people who are often marginalized and exert limited influence on plan making. Disadvantaged populations are characterized by a combination of various socio-economic features like old-age, low-wealth, disability, and racial and ethnic minority.

This report is intended to help emergency managers, urban planners, and others who work with disadvantaged populations improve local government disaster plans. We initially discuss how the primary types of disaster plans -- mitigation, preparedness and response, and recovery -- offer practical means that support disadvantaged populations. We then present two sets of guidelines aimed at creating local disaster plans that address conditions, concerns, and build capabilities of disadvantaged populations, including:

- A three-stage sequence of options local governments have in making choices to ensure that disaster plans are designed to support the preferences of disadvantaged people, take advantage of opportunities presented by federal/state programs, and are integrated with other local planning efforts; and
- Six principles that serve as a framework to account for the concerns and capabilities of disadvantaged people in preparing new disaster plans or assessing (and revising) existing plans:
 1. Provide a clear definition of disadvantaged people;
 2. Develop a technically sound and locally relevant fact base;
 3. Account for inter-dependent actions of organizations;
 4. Reveal techniques used to engage disadvantaged people;
 5. Develop clear strategies aimed at disadvantaged people; and
 6. Implement and monitor plans and track progress.

The usefulness of the design options and principles is demonstrated through an assessment of three local disaster plans: *Pitt County (NC) Disaster Plan for Populations with Special Medical Needs* (Pitt County Emergency Management 2001); *Seattle Disaster Readiness and Response Plan* (Seattle Emergency Management 2002); and *Roseville Hazard Mitigation Plan* (Roseville Planning Department 2005). These planning documents represent a range of types of disaster plans. They are considered to be exemplars and thus are useful for deriving lessons about best practices in planning for disadvantaged people. However, findings revealed that these plans do not offer comprehensive examples of model plans as all had several limitations.

INTEGRATING NEEDS AND BUILDING CAPABILITIES OF DISADVANTAGED PEOPLE IN LOCAL DISASTER PLANS

Introduction

Disasters induce sudden, swift, and untold devastation, but there is wide disparity in impacts on individuals and groups due to differences in social vulnerability. Just as physical features of a disaster influence the vulnerability of threatened populations, social features like old age, low wealth, poor health, disability, and race and ethnicity have a strong effect on vulnerability. For the most part, these social features are attached to less access to resources. In the case of lower wealth, the resources are obviously monetary such as income, savings, credit, and insurance. The elderly, the very young and those suffering from health problems have greater dependencies as more of their income is likely to be dedicated to healthcare and other basic needs. The lack of resources is magnified for racial and ethnic minorities who have been subjected to long-term discrimination that is often a precursor to monetary and health related problems, raising the vulnerability of these groups to disasters.

The disaster planning process offers an opportunity to identify needs and build the capability of disadvantaged people to take action to reduce their vulnerability and build resiliency. Local governments are increasingly giving attention to preparing various types of disaster plans. Under the Disaster Mitigation Act of 2000, the federal government requires that all communities enact mitigation plans. States like California, Florida, and North Carolina now mandate or strongly encourage that local governments prepare disaster recovery plans. Both the federal and state governments require communities to adopt various types of emergency preparedness and response plans for a range of disaster events like toxic chemical releases, hurricane evacuation, and sheltering. In the wake of the 2005 Hurricane Katrina catastrophe, which exposed serious deficiencies of U.S. disaster planning in accounting for disadvantaged people, an increasing number of communities are experimenting on their own to address this issue (American Planning Association 2006). Given the increasing weight of public responsibility placed on local disaster planning to save lives, reduce loss of property, and recover from disasters, a framework for guiding local disaster management officials and their communities to address the particular circumstances of disadvantaged people is needed.

This report initially reviews how disaster plans should account for and potentially improve the conditions of disadvantaged populations. Next, we present the primary types of disaster plans, and the options communities have to formulate a plan that fits local preferences and opportunities to reduce the vulnerability of disadvantaged people. We then identify principles for guiding integration of the conditions, concerns, and capabilities of disadvantaged people into disaster plans. Finally, we present case studies

of local disaster plans that demonstrate application of the design options and principles, and then offer recommendations for improving the quality of these plans.

Disaster Plans Applied to Disadvantaged Populations: In Concept

A disaster plan is a statement of intent in dealing with vulnerabilities of communities for any one or combination of four stages in the disaster planning and policy cycle:

1. *Mitigation* involves preventing hazards from developing into disasters altogether, or reducing the effects of disasters when they occur;
2. *Preparedness* involves getting ready to take response actions when a disaster strikes;
3. *Response* involves mobilizing resources and services when a disaster strikes to address the basic needs of the affected population; and
4. *Recovery* involves rebuilding in such a way that takes advantage of post-disaster opportunities to integrate mitigation and improvements in quality of life.

The plan states aspirations, principles of action, and often specific courses of action. Although disaster planning practice has given limited attention to public participation, there is growing recognition that the plan should be formulated through a collaborative process of civic engagement, information exchange, and proposals for action (Haddow and Bullock 2006).

Disaster planning and plans serve several purposes for disadvantaged groups by offering practical means to:

- Provide forums to enable the conditions and concerns of underrepresented people to be raised, studied, and debated.
- Build local commitment among government agencies, non-profits, businesses, and the public to advance equity goals in disaster planning.
- Expand the choices and opportunities for creating strategies aimed at reducing social vulnerability.
- Create a fact base that educates residents, stakeholders, and officials about the vulnerability of disadvantaged populations, opportunities for change, and rationales for strategies and actions.
- Enhance decision making by combining informal knowledge of local people who often know best about the dangers of their particular situation with the best available formal scientific and technical knowledge.
- Coordinate strategies that reduce vulnerability of disadvantaged groups with other community programs aimed at economic development, environmental quality, housing, and infrastructure investments.

In communities with a well-conceived disaster plan, disadvantaged households and neighborhoods are not presumed to be helpless, they are seen as having significant capacity to cope and participate, and less likely to act in isolation in dealing with threats

posed by a disaster. Local governments will know what they will be doing to support disadvantaged people, and the people will know how best to use local government resources to support themselves.

How Different Types of Disaster Plans Support Disadvantaged Populations

The basic types of plans are products of the four stages of the disaster planning cycle -- mitigation, preparedness, response, and recovery. Most communities combine the preparedness and response stages in disaster planning since preparedness activities (e.g., evacuation and shelter planning) are primarily focused on getting ready for disaster response (Lindell, Prater and Perry 2006). Thus, we review how three primary types of disaster plans can support disadvantaged populations: mitigation, preparedness and response, and recovery.

Mitigation Plan

A mitigation plan takes a proactive approach to guiding future land use and development decisions to avoid or at least minimize future vulnerability of human communities to hazards. The plan identifies hazard areas where new development should not take place and potential sites free of hazards that are suitable for development. In locations where hazard areas have significant cultural or economic advantages for development that cannot be foregone, a mitigation plan offers guidance on how to locate new development on the least hazardous parts of building sites, and modify building construction and site design practices so that vulnerability is minimized. The fundamental aim is to anticipate future vulnerabilities and guide daily decision making to achieve long-range mitigation goals.

Since vulnerability to disasters varies among population groups in a community, the fact base, strategies, and implementation elements of a mitigation plan should differentiate such groups. The fact base should specify the number and spatial distribution of different types of households (e.g., low-income, elderly, minorities, disabled, etc.) to accurately represent differences in vulnerability. If disasters struck homogeneous households residing in similar physical structures, the damage inflicted and mitigation needed could be determined by the magnitude of hazard forces. However, disadvantaged households as defined by social features (e.g., income, race, ethnicity) are more likely to live in poorer quality housing that is subject to greater damage (Bolin and Bolton 1986, Peacock et al. 1997). Mitigation strategies should account for differences in the causes of vulnerability among population groups, and support outreach and public participation programs that are sensitive to these differences. A mitigation plan should also include an implementation and monitoring program to ensure strategies are carried out, and the performance of strategies are assessed in terms of achieving mitigation strategies that reflect the conditions, concerns, and capabilities of the community, particularly its disadvantaged people.

Emergency Plan for Preparedness and Response

An emergency preparedness and response plan offers guidance immediately before and after a disaster with the ultimate goal of rapid restoration of normal routines. It should provide a specific program of action to mobilize and coordinate local and outside

organizations and material resources. A hallmark principle of this type of plan is the recognition that disaster conditions are uncertain and can change quickly, and that local people have a significant role to play to enhance the adaptation and improvisation critical for effective disaster response.

The emergency plan should assign roles and responsibilities to various organizations with specific attention given to disadvantaged people. For example, warning and evacuation procedures should not treat local residents as a homogeneous population. While some people may respond to an evacuation warning by local officials, poor and minority groups are more likely to be stranded because they distrust the messenger, misunderstand the message included in the warnings, or may not have the resources to evacuate and find shelter (Lindell and Perry 2004, Peacock et al. 1997, ch. 4). This situation exemplifies the issues (e.g., communication, evacuation, and sheltering) that form the basis of emergency support functions in an emergency plan. Each function should specify how to organize neighborhood networks and resources, agency staff and material, and assign implementation, monitoring and feedback responsibilities to gauge progress on the issues.

Recovery Plan

A disaster recovery plan provides guidance in decision making focused on short-term restoration of basic public services and long-term recovery of the physical infrastructure used by the community. It can be prepared before or after a disaster event. A recovery plan in place before a disaster can best address social inequities when a disaster strikes. Disasters create a sense of crisis that leads to a call for immediate action. This period provides an occasion, a “window of opportunity,” when support for change is high compared to pre-disaster conditions. There is considerable opportunity for breaking old habits and developing more just and equitable communities that address deep-seated and interrelated issues of disaster vulnerability, poverty, and sense of powerlessness among the disadvantaged. But the window stays open only for a short period as pressure builds for a return to normalcy.

Alternatively, recovery plans are often quickly prepared in reaction to a disaster. In this case, plans are more likely to overlook the concerns of disadvantaged groups and fail to integrate recovery with other community goals (e.g., poverty reduction, neighborhood revitalization). These pitfalls can be overcome by preparing a recovery plan before a disaster.

Communities that are ready with a plan will be in a better position to take advantage of the opportunities opened by the disaster. A recovery plan should include a vision, goals, and strategies that maximize opportunities for disadvantaged residents to participate, and promote rebuilding that ensures their safety and improves their long-term quality of life. It should include procedures to assess damages and needs of disadvantaged households, and coordinate external donors to ensure that aid is channeled through grassroots organizations that have well-established ties with disadvantaged groups. The plan should also include indicators that track and compare the recovery of households, businesses, and public services in low-wealth and minority neighborhoods with other neighborhoods.

Three Levels of Design Options for Disaster Plans

While plans vary as products of different stages of the disaster planning cycle, planners and their communities also have options in designing plans. The intent is to create a plan that best supports the concerns and capabilities of disadvantaged people, takes advantage of opportunities presented by federal and state policies, and is integrated with a community's other planning efforts. The three levels are described in the sections below and summarized in Table 1.

Table 1: Options for Creating a Disaster Plan

First-Level Option	Comprehensive Plan for All Groups	versus	Specific Plan for Disadvantaged Groups
Second-Level Option	Specific Stage of Disaster Planning	versus	All Stages of Disaster Planning
Third-Level Options	Specific Location	versus	Communitywide
	Specific Hazard	versus	All Hazards

Level 1

The first-level option is whether the disaster plan will be a separate, stand alone plan focusing only on disadvantaged groups or will be part of plans for the entire community. It might be best to write a separate plan in some situations -- when the threat posed by a hazard is extremely high to the disadvantaged population; when the danger of disasters associated with disadvantaged people is high on the local agenda, as after a disaster event, and there is a special opportunity to forge a commitment to strategies aimed at the circumstances of the disadvantaged; and when the community has no disaster plan or the plan is weak or out-of-date. The stand-alone plan is significant because the concerns important to disadvantaged are often lost in the press of other concerns prioritized by other more influential interest groups. However, the difficulty in making a stand-alone plan is that the concerns of disadvantaged could become isolated from other local plans that normally already have standing in the community as policy guides. These plans focus on hazards, as well as other ongoing community goals and programs (e.g., land use and urban development, social service delivery, health, and economic development). It is usually possible to integrate a stand-alone plan into other plans at a later date.

Level 2

The second-level option is whether the plan will be an integrated comprehensive emergency plan focused on all four stages of the disaster planning cycle or a series of stage-specific plans. Communities should formulate a comprehensive emergency plan because the activities that take place in each stage are often interdependent and require coordination. As noted, preparedness activities are the building blocks for successful response to a disaster and effective short-range recovery activities. Further, mitigation activities can occur before a disaster strikes, but mitigation is also a critical component of

a recovery plan to ensure that future vulnerability is reduced during reconstruction. In some cases, a plan focused on a particular stage is most appropriate -- e.g., if a disaster strikes and the community does not have a recovery plan or the plan is weak and out-of-date, then a stand-alone recovery plan should be prepared. When the press of disaster recovery subsides, the recovery plan could then be fully integrated as an element in a comprehensive emergency plan.

Level 3

Third-level options are whether to focus on explicitly defined hazard-prone areas (e.g., floodplains) or take a more communitywide approach; and whether to address a single hazard or take an all-hazards approach. In most situations, communities should plan for all types of hazards across the entire community. This ensures that no hazard is overlooked and the threat to highly vulnerable populations is understood entirely. In some cases, a specific hazard in a specific location may be the best choice. This is particularly important for a disadvantaged population that may be concentrated in specific location and subject to a particular hazard.

Principles for Integrating Needs and Building Capabilities of Disadvantaged People in Disaster Plans

The intent of the principles is to provide a framework to assist local government emergency managers, planners and their communities, especially those officials working with disadvantaged people, in preparing plans aimed at making communities more disaster resilient. As noted, every local disaster plan brings together a series of choices designed to fit the unique needs of a particular community. Yet, there are principles based on accepted practice for integrating needs and capabilities of disadvantaged groups into disaster plans. It is possible to assess different types of plan formats, specificity, and substantive emphasis.

We derive six principles, listed below, to be considered in producing and evaluating disaster plans for disadvantaged populations. These principles are derived from research and after-action reports on the effectiveness of disaster planning for preparedness response, mitigation, and recovery efforts.¹

1. Provide a clear definition of disadvantaged people;
2. Develop a technically sound and locally relevant fact base;
3. Account for inter-dependent actions of organizations;
4. Reveal techniques used to engage disadvantaged people;
5. Develop clear strategies aimed at disadvantaged people; and
6. Implement and monitor plans and track progress.

These principles and instructions on how to apply them are included in a companion document entitled: *A Guide for Integrating Needs and Building Capabilities of Disadvantaged People in Local Disaster Plans* (available from the Institute for the Environment). The principles are not conclusive. They are intended to provide guidance with user discretion required in their application in particular local circumstances. They offer a starting point, to help local disaster planners to systematically think about how the needs, concerns and capabilities of disadvantaged people should be included in a disaster plan. Given differences in local purposes and circumstances, there may be differences in the applicability of different criteria. Local planners and their communities should modify the criteria to fit their own needs.

Following are definitions of the six principles for evaluating how well disaster plans integrate conditions, concerns, and capabilities of disadvantaged people. The first two principles focus on definition and identification of disadvantaged people, and the quality of the fact base of the plan. The remaining four principles deal address operational activities associated with creating and implementing the plan.

1. Provide a clear definition of disadvantaged populations

A disaster plan should provide a clear definition of disadvantaged populations. Plans that include clear definitions are more likely to specify the needs of disadvantaged populations, and offer strategies that match needs and recognize the capability of disadvantaged people to be a partner in carrying out the strategies. The definition should be tied to one or a combination of social, economic, and health characteristics of a local population. Prominent characteristics include, for example, age, income, gender, race and ethnicity, and physical and mental disability (Lindell, Prater and Perry 2006).

2. Develop a technically sound and locally relevant fact base

A disaster plan should contain a fact basis premised on analysis of the vulnerability of the physical and social factors of the populations at risk (Cutter, Mitchell and Scott 2000). Facts on hazards that are specific and clear, and personalized to specific population groups lead to risk reduction strategies that achieve desired outcomes (Berke et al. 2002, Godschalk et al. 1999). The fact base should be presented in a format that specifies the vulnerabilities of disadvantaged groups rather in formats that simply aggregate vulnerabilities across all population groups. Facts should also be grounded on scientifically and technically derived information, as well as local knowledge derived from the experience that local people have with the physical and social environments in which they live.

A fact base for a disaster plan should consist of two key attributes. First, it should assess the existing vulnerability of populations in a community, major trends that indicate a rise (or decline) in vulnerability, and issues that should be addressed to reduce the vulnerability. In the case of disadvantaged populations, vulnerability should identify the:

- type, potential magnitude, and frequency of occurrence of hazards in a community;

- current and projected future number and location of disadvantaged populations and dwelling units that house disadvantaged people exposed to hazards; and
- current and projected capacity and demands for emergency shelter facilities, transportation, medical and other services for disadvantaged populations.

Second, the plan should use techniques that clarify, explain, and visually illustrate facts that support reasoning for issues defined by local people and strategies derived to address the issues. Key techniques include:

- maps that visually portray findings;
- tables that aggregate data; and
- use of references for data, methods and models.

3. Account for the interdependent actions of organizations

Prospects for successful plan implementation improve if plans are of sufficient scope in recognizing the possible range of interdependent actions of multiple organizations that serve disadvantaged populations. These organizations are internal and external to the community. While outcomes may be similar for all population groups (e.g., disaster awareness, evacuate to safe locations), the types of organizations and aid delivery strategies needed to assist disadvantaged groups are distinct from the general population (see, for example, Pipa 2006). Successful hurricane evacuation of people who do not own a car, requires cooperative actions among a particular set of organizations that are distinct compared to those for people that own a car. Similar distinctions are linked to public shelter, mental health, and housing mitigation and recovery assistance. Research indicates that the scope of interdependent actions needed to address the particular situations of the disadvantaged is often not accounted for in disaster plans (Lindell, Perry, and Prater 2006).

4. Reveal techniques used to engage disadvantaged people

Plans should reveal key participants and techniques used to encourage participation in the process of preparing the plan. Historically, the public has played a limited, if any, role in the development of disaster plans (Haddow and Bullock 2006). As a result, plans are more likely to be disconnected from local conditions and fail because the assumptions about public issues and behaviors are false. Even if disaster planning involved public participation, disadvantaged groups are likely to be underrepresented.² Thus, the planning process should include techniques that encourage involvement of disadvantaged populations and support their participation throughout the process (EMAP 2006). Plans should reveal efforts aimed at building trust among marginalized groups, providing a supportive environment for mutual learning, and promoting the interests of disadvantaged populations (Berke, Godschalk and Kaiser 2006).

From the perspective of empowerment of disadvantaged groups, a disaster plan should specify several features of the plan making process that involved public participation. For example, the plan should:

- Identify participants that are representative of disadvantaged groups, and organizations that serve disadvantaged groups;
- Explain why and extent to which disadvantaged groups were involved; and
- Identify involvement of individuals with formal authority and power (e.g., elected officials, small-business owners, and officials representing local social services, urban planning, and emergency management) to make changes that support disadvantaged groups.

Plans should also include features that explain how participation techniques are aimed at informing disadvantaged people about hazards and sources of assistance, including:

- Set-up a contact registry in the event of a pending disaster;
- Create an information dissemination program;
- Use translators and sign language, and establish call-in hotlines, and media outlets aimed at communicating to disadvantaged populations.
- Technical assistance with creating and interpreting data.

Plans that are effective in explaining how they account for the conditions, concerns, and capabilities of disadvantaged groups and how they inform this population group are more likely to be used frequently and influential in guiding emergency management activities (Berke et al. 2002).

5. Develop clear strategies and tactics aimed at disadvantaged people

Disaster plans rely on strategies and tactics to guide actions in the various phases of a disaster. Strategies are established guidelines to be followed in public and private decisions to achieve a desired outcome. Pre-disaster mitigation and long-term post-disaster recovery phases of a disaster place more emphasis on “big picture” visions of the design and spatial layout of the physical environment as a setting of human activities. Emergency preparedness, response, and short-term recovery phases give more attention to tactics that involve a sequence of activities and reactions. Tactics focus on mobilizing, deploying, and disposing resources to carry out a strategy.

In the case of disadvantaged people, the strategies and tactics included in a plan should be clearly stated and specifically tied to issues raised by disadvantaged populations in an open and inclusive process. They should also be internally consistent with issues wherein each strategy and tactic is clearly tied to the issues raised in the plan that are associated with a disadvantaged population.

6. Implement and monitor to track how plans affect the disadvantaged.

A common failing of disaster plans is the lack of a means to follow through to ensure that adopted plans are actually implemented. If undertaken properly, implementation and monitoring should help to answer questions about the relevance and effects of disaster plans: How did the plan perform? What happened and why? How can the plans be improved? This requires that plans include a strong implementation and monitoring program. A strong program is especially critical for disadvantage populations who often lack the access and technical capacity to track implementation, and the power and

influence to ensure that the course of implementation is consistent with strategies aimed at reducing vulnerability of the disadvantaged. Yet, implementation and monitoring is often either entirely absent or one of the weakest dimensions in mitigation plans (Godschalk et al. 1999), even though it is considered essential to comprehensive emergency management plans (Lindell, Prater, and Perry 2006).

Implementation involves a description of a series of actions to be accomplished across the mitigation, preparedness, response, and recovery phases. Godschalk, et al. (1999) recommend that the program of implementation for a plan should:

- Identify administrative actions for implementing the plan (e.g., conduct a study to identify potential sites for recovery assistance centers that are accessible to disadvantaged, create a contact registry for people with special medical needs, amend the zoning ordinance to include density bonuses for additional affordable housing in non-hazard zones);
- Include a timeline for implementation; and
- Assign organizational responsibility that utilizes organizations serving disadvantaged groups.

Monitoring specifies what should be done to track plan performance in meeting needs and achieving desired outcomes. It involves two activities: assessment of the plan strategies and tactics being implemented; tracking indicators of outcomes; and determining the degree to which desired outcomes are being achieved. A monitoring program should:

- Develop a clear set of indicators to assess progress toward achievement of desired outcomes. For example:
 - number of agencies working with socially vulnerable groups that attend training exercises and have disaster plans,
 - percent of disadvantaged aware of evacuation routes and location of shelters,
 - rate of reoccupation of homes/businesses after a disaster, and
 - number of homes occupied by low income in hazard areas;
- Identify organizations charged with monitoring indicators; and
- Identify a timetable for updating the plan based on results of monitoring changing conditions.

Methods for Application of Design Options and Principles

As noted, application of design options and the principles are relevant in preparing new disaster plans or assessing existing plans. A plan coding protocol was prepared to guide application of the design options and principles during the process of formulating a plan or to evaluate a plan (see *Guide for Integrating Needs and Building Capabilities of Disadvantaged People in Local Disaster Plans* in the appendix at the end of this report). The protocol includes questions about the three levels of design options (see table 1) and the six principles -- figure 1 illustrates a summary 30 items that are arranged under each of the six principles.

A coding scheme can be used to guide an assessment of design option and each principle for a plan. Coding for the design options involves: a) assessing how well the plan focuses on disadvantaged groups (e.g., only disadvantaged or disadvantaged as one group among other groups); b) phases of disaster; c) types of hazards, and d) spatial coverage (specific area or communitywide).

Coding for the principles varies. Items related to definition of disadvantaged people are whether a definition is included (0 = no, 1 = yes), and whether specific types of disadvantaged are specified (0 = no, 1 = yes). Individual fact base items are assessed as: 0 = if item is not mentioned, 1 = if item mentioned, but vague; 2 = if item mentioned, and is specific and detailed. The remaining four operational principles are assessed as: 0 = item is not mentioned, 1 = if item is mentioned, and operational procedures are vague and barely mentioned, 2 = if item is mentioned, and operational procedures are clear and specific. A summary index is then constructed for each of the six principles based on the sum of individual item scores. Figure 2 illustrates how the scores were derived for the monitoring under the implementation and monitoring principle for one of the case study plans that are assessed and discussed later in this report. The sidebar, *Optional Coder Reliability Procedure*, describes an optional scheme to ensure that plan coding results in a high level of accuracy.

Figure 1: Disaster Plan Quality Principles for Disadvantaged Populations

1. Definition of Disadvantaged People

- 1.1 Includes a definition of disadvantaged.
- 1.2 Definition is based on identification of one or a combination of social, economic, and health characteristics of a local population.

2. Fact Base

Vulnerability assessment

- 2.1 Delineates type, magnitude, and frequency of occurrence of hazards.
- 2.2 Includes current and projected future number of disadvantaged people exposed to hazards.
- 2.3 Includes current and projected capacity and demands for facilities and services that support the disadvantaged (shelters, transportation, medical).

Techniques that clarify, explain, and illustrate facts

- 2.4 Includes maps that visually portray location of disadvantaged populations, housing, and facilities that serve disadvantaged.
- 2.5 Includes tables that aggregate data on disadvantaged populations.
- 2.6 Uses facts to support reasoning and explanation of issues and action strategies.
- 2.7 Identifies data sources.

3. Inter-dependent Actions of Organizations

Explanation of internal connections

- 3.1 Specifies procedures to coordinate with local agencies that serve disadvantaged groups.
- 3.2 Arrangements made to organize disadvantaged residents for one or more disaster stages – mitigation, preparedness and response, and recovery.
- 3.3 Sets up center (e.g., emergency response operations, mitigation assistance, recovery assistance) with explicit procedures on roles and responsibilities to serve disadvantaged.

Explanation of external connections

- 3.4 Arrangements made to organize outside volunteers (e.g. converge after a disaster, assist in mitigation).
- 3.5 Specifies coordination with other communities (e.g., mutual aid, evacuation, stormwater management).
- 3.6 Includes procedures that explain resources offered by federal and state agencies.

4. Participation of Disadvantaged Groups

Explanation of involvement of disadvantaged groups.

- 4.1 Identifies participants who are representative of disadvantaged groups.
- 4.2 Explains why the representatives of disadvantaged groups were involved.
- 4.3 Explains the support and involvement of individuals with formal authority to make changes that support disadvantaged groups (e.g., elected officials, social service agency staff, business owners, ministers).

Explanation of participation techniques to inform disadvantaged groups

- 4.4 Establishes contact registry for people with special needs (e.g., handicapped, medical care,).
- 4.5 Disseminates information to disadvantaged groups.
- 4.6 Identifies translators (languages of ethnic groups and deaf)
- 4.7 Sets up emergency call-in hotline that offers different languages.
- 4.8 Arrangements made to contact ethnic radio/TV stations, and other outlets for disadvantaged.

5. Strategies and Tactics

- 5.1 Strategies/tactics included are clearly stated and specifically tied to disadvantaged groups.
- 5.2 Strategies/tactics are internally consistent with issues/goals/objectives linked to disadvantaged groups.

6. Implementation and Monitoring

Implementation

- 6.1 Identifies administrative actions for implementing the plan (e.g., conduct study, seek funding, amend the plan).
- 6.2 Includes a timeline for implementation.
- 6.3 Assigns organizational responsibility.

Monitoring

- 6.4 Includes indicators to monitor progress (e.g., # agencies working with disadvantaged people with disaster plans, % disadvantaged aware of evacuation routes, rate of reoccupation of homes after disaster, # homes occupied by low income people in hazard areas).
 - 6.5 Identifies organizations charged with monitoring indicators.
 - 6.6 Identifies timetable for updating plan based on monitoring results.
-

Figure 2: Illustration of Coding Procedure for Monitoring (see Principle 6B),
Roseville Hazard Mitigation Plan

Coding varies 0 to 2:

Code “0” if the item is not mentioned.

Code “1” if item is mentioned, but association of disadvantaged with a given item is vague; and, if relevant, the rationale for the procedures associated with the item are barely mentioned or not provided.

Code “2” if the item is mentioned, association with disadvantaged is clear and specific; and, if relevant, the rationale for the procedures is specific and detailed.

	<u>Code</u>	<u>Comments</u>
6.4 Indicators to monitor progress (e.g., # agencies working with disadvantaged that have disaster plans, % of disadvantaged aware of evacuation routes, rate of reoccupation of homes after a disaster, # homes occupied by low income in hazard areas).	1	Includes measurable objectives, but ties to disadvantaged are not clear
6.5 Identify organizations charged with monitoring indicators.	2	Clear assignment of organizations charged to monitor by indicator
6.6 Identify timetable for updating plan based on monitoring results.	2	Annual progress reports, and update Plan every 5-years
Total Score	5	

Sidebar: Optional Coder Reliability Procedure

To increase reliability in coding, an inter-coder reliability procedure should be used, as follows:

- A plan is evaluated by two coders working independently. The coders should be professionals with experience in disaster planning.
- Once a plan has been double-coded, an inter-coder reliability score can then be computed. The score is equal to the number of coder agreements for items, divided by the number of agreements plus disagreements.
- Qualitative researchers suggest that a reliability score in the range of 70% is generally considered acceptable (see Miles and Huberman 1994).*

*A reliability score of 82% was achieved for Roseville’s Hazard Mitigation Plan presented in this report.

Profiles of Local Jurisdictions of Case Study Plans

The usefulness of the design options and principles is demonstrated based on an assessment of three local disaster plans: *Pitt County (NC) Disaster Plan for Populations with Special Medical Needs* (Pitt County Emergency Management 2001); *Seattle Disaster Readiness and Response Plan* (Seattle Emergency Management 2002); and *Roseville Hazard Mitigation Plan* (Roseville Planning Department 2005). These planning documents represent a different types of disaster plans that vary based on the stage of the disaster planning cycle and types of hazards.

While these local jurisdictions differ in levels of wealth, ethnic and racial composition, and population size and growth rates, all dealt with significant threats faced by disadvantaged groups. Table 2 illustrates a demographic profile of each place. Pitt County is located in predominantly rural eastern North Carolina. It has a population characterized by low-income and high poverty rates, with a significant black minority population. The City of Roseville, California is located about 20 miles northeast of Sacramento. While the city has a comparatively high income and low poverty rates, there are a significant number of people living below the poverty line (4.9% of the population or 4,820 people) and a comparatively high percent of the population is elderly. Seattle has the largest population among the three jurisdictions and near the national median income and poverty rate, and about one in five of residents who speak English as a second language.

Table 2: Socio-economic Profile of Local Jurisdictions*

	US	Pitt County	Roseville	Seattle
Population		142,570	98,359	569,101
Elderly >65	12.4%	9.7%	14.5%	12.0%
White	80.2%	63.4%	86.0%	70.1%
Black	12.8%	34.1%	1.3%	8.4%
Asian	4.3%	1.1%	4.3%	13.1%
Hispanic**	14.4%	4.2%	11.5%	5.3%
Language other than English	17.9%	6.0%	13.4%	20.2%
Median household income	\$43,318	\$33,734	\$57,367	\$45,736
Poverty	12.5%	17.5%	4.9%	11.8%

*2005 population estimates; 2005 race/ethnic estimates; 2000 language estimates; 2003 income and poverty estimates.

**Hispanics may be any race, so they are also included in applicable race categories.

Source: U.S. Census Bureau. *State and County Quick Facts* (<http://quickfacts.census.gov/qfd/states/37000.html>, updated January 12, 2007)

Because disaster plans rarely address disadvantaged people, our intent was to select plans that represent best practices. Generic plans that do not distinguish between disadvantaged and other groups reveal little about how communities can account for the socially vulnerable in disaster plans. These planning documents are exemplars that are useful for deriving lessons about how plans address conditions, concerns and capabilities of disadvantaged (or socially vulnerable) people in a disaster context. Our aim is to not only identify their strengths, but also their limitations.

Design Options for the Case Plans

As illustrated on Table 3, under the first-level option the *Pitt County Disaster Plan for Populations with Special Medical Needs* focuses only on special medical needs populations. In this case, the threat was considered extremely high to this group. Two flood disasters in the late 1990s raised concern about the county's inability to shelter people with special medical needs and increased commitment to take action to address specific concerns associated with this group. Alternatively, the *Seattle Disaster Readiness and Response Plan* and *Roseville Mitigation Plan* take a comprehensive approach by targeting all local residents. This potentially offers more opportunity for the concerns of disadvantaged groups to be addressed by other established local plans and programs. However, as will be discussed, this approach can lead to loss of attention toward disadvantaged groups and more emphasis on the concerns of other more influential groups.

In the second-level option, the Pitt County and Roseville plans focus on specific stages of the disaster policy cycle, with Pitt County aimed at the preparedness and response stages and Roseville plans centered on the mitigation stage. The Seattle plan addresses all stages of the disaster policy cycle. The multi-stage approach in the Seattle plan enhances prospects for greater integration and coordination of actions across stages.

Under the third-level options, two choices can be made in designing a plan: 1) specific area versus communitywide focus on hazards, and 2) specific versus multi-hazard approach. All case plans take a communitywide approach to hazards rather than focusing on specific locations. In the Pitt County plan, emphasis is placed on addressing a specific set of hazards (flood and wind associated with coastal storms, and ice storms that periodically cut off electrical power) that pose the greatest risk to the special medical needs population. Alternatively, the Roseville and Seattle plans take a multi-hazards approach that affects all population groups. As will be discussed, this distinction may partially explain why the Pitt County plan is more specific and detailed in addressing the concerns of disadvantaged groups under the operational principles (principle 3 – interdependency of actions; principle 4 -- participation; and principle 5 -- strategies).

Table 3: Options for Designing a Disaster Plan

First-Level Option	All Groups	versus	Disadvantaged Groups
-Pitt County			X
-Seattle	X		
-Roseville	X		
Second-Level Option	Specific Stage	versus	All Stages
-Pitt County	X		
-Seattle			X
-Roseville	X		
Third-Level Options	Specific Location	versus	Communitywide
-Pitt County			X
-Seattle			X
-Roseville			X
	Specific Hazard	versus	All Hazards
-Pitt County	X		
-Seattle			X
-Roseville			X

Case Disaster Plan Scores for Each of the Principles

Pitt County Plan

The *Pitt County Disaster Plan for Populations with Special Medical Needs* sets forth an integrated framework for guiding key government agencies, non-governmental organizations, and volunteer groups that have critical human and material resources for delivering care to people with special medical needs (SMN). The plan includes four core elements:

- An up-to-date registry that identifies and prioritizes the evacuation of the SMN population based on urgency for medical care, and procedures for SMN people to get on the registry through call-in, internet, and door-to-door visits by county social service staff;
- A special medical needs “command” center that acts as a community resource for agencies that serve SMN people, and during a disaster event serves as a clearinghouse for SMN populations and coordinates efforts to meet the needs of these individuals;
- Transportation arrangements for the county SMN population not able to evacuate on their own; and
- Special medical needs shelters that provide a range of supplies and facilities for different health conditions, translators in Spanish and sign language, and procedures for organizing volunteer medical practitioners and groups to work at shelters.

Table 4 summarizes the results of the evaluation for each of the principles of plan quality. Overall, the plan scored more than half of the maximum possible score for five of the six principles, while monitoring under the monitoring and implementation principle (principle 6B) had low scores. There are several significant strengths of the plan. It clearly defines disadvantaged people (principle 1) as,

“Individuals who would be adversely affected by the interruption of services such as utilities, transportation, and daily professional care...[and] who would not be able to meet basic needs during a 48-hour period even with the help of family and friends. The level of care for these individuals would be beyond the basic first aid level of care that is available in general shelters” (Pitt County 2001, pp. 5, 6).

Table 4: Pitt County, NC Disaster Plan for Populations with Special Medical Needs

Plan Assessment Principles	Score	Comments
1. Definition of Disadvantaged (max = 2)	2	Clear definition of disadvantaged population tied to specific health and social characteristics
2. Fact base		
A. Vulnerability Assessment (max = 6)	4	Vague verbal description of hazards; current estimates of # disadvantaged people but no projections; detailed current & projected capacity and demands for shelters for SMN population
B. Techniques to Clarify Facts (max = 8)	5	Clearly mapped shelters and emergency operations center, but data on SMN population not aggregated in tabular format; facts used to clearly explain; data sources are mentioned but lack specific references
3. Account for Interdependency of Actions		
A. Internal Connections (max = 6)	6	Establishment of permanent SMN planning committee; local agencies developed consistent disaster plans; emergency command center set up to organize local organizational response to meet needs of SMN people
B. External Connections (max = 6)	4	Specific procedures to organize volunteer nurses and other medical staff; vague reference made to establish mutual aid agreements with other townships and public/private transportation service providers; vague reference to sources of federal/state sources of aid
4. Participation		
A. Involvement of Disadvantaged (max = 6)	4	Members of a permanent SMN standing committee represent organizations that work with disadvantaged; no explanation of why the representatives were involved; organizations that participate have authority to activate plan
B. Techniques to Inform Disadvantaged (max = 10)	7	Clear and specific procedures for SMN people to get on a contact registry; clear explanation of information dissemination SMN program; includes lists of translators (Spanish and sign language) and specifies their roles; sets up call-in hotline; no mention of media outlets
5. Strategies (and Tactics)		Detailed procedures for establishing a contact registry, and

(max = 4)	4	activating emergency command center, health care facilities, and SMN shelters; clear procedures to prioritize risk of different SMN groups for evacuation/sheltering; internally consistent issues, objectives, strategies/tactics
6. Implementation and Monitoring		
A. Implementation (max = 6)	5	Clear assignment of administrative actions, timeline, and organizational responsibility to review plan, train those involved in plan implementation; hold regular meetings to ensure coordinated response actions
B. Monitoring (max = 6)	1	No indicators; no assignment of organizations charged to monitor; mentions that plan will be updated every 6-months

A well-developed fact base for the vulnerability assessment (principle 2A) includes current estimates of the size of the SMN populations and capacities of shelter space, health care services, and staff to meet the demands. Maps of shelter locations and sources of data to formulate the plan are identified (principle 2B). The range of interdependent actions internal to the county are clearly recognized in the plan through the establishment of the permanent SMN planning committee, and a requirement that other local agencies must revise their disaster plans to be consistent with the SMN plan (principle 3A). External connections (principle 3B) are reasonably strong based on clearly defined procedures to organize volunteer medical staff to serve SMN people.

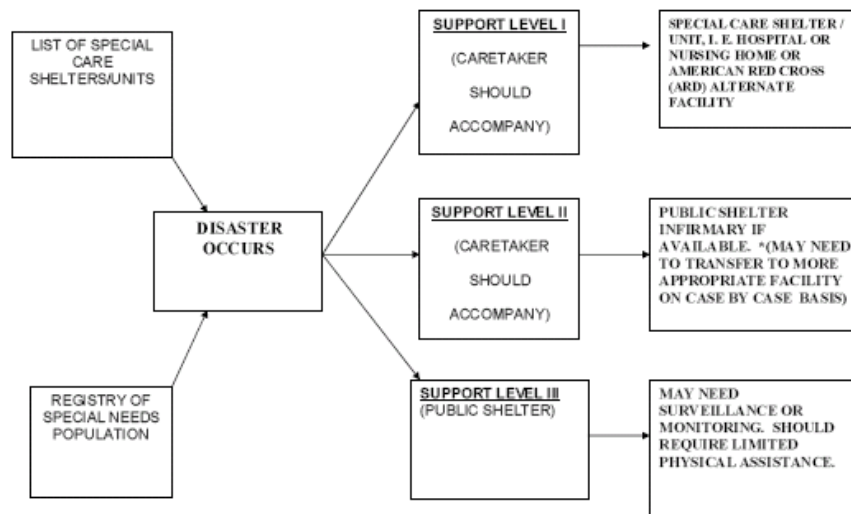
References to public participation in the process of preparing and implementing the SMN plan (principle 4A) are clear and specific. An independent SMN permanent planning committee is a key feature of support of the interests of disadvantaged people. Membership on this core group consists of representatives of agencies and citizens that represent the SMN people in the county. As a result, disaster planning is specifically focused on the SMN population rather than addressing the concerns of this group as well as other competing interests in the county. Multiple techniques are specified in the plans to inform the SMN population (principle 4B), including establishing a contact registry in the event of a disaster, an information dissemination program, contact information to arrange for translators, and procedures for setting up emergency hotlines.

The plan includes clear and detailed strategies and tactical procedures aimed specifically at the needs of the SMN population (principle 5). It includes a process for setting priorities for phased evacuations based on level of threat and determining the level of care needed for different types of SMN populations. Figure 3 offers a clear illustration of this process that is included in the plan. Also, implementation (principle 6A) is quite strong as there is clear assignment of administrative actions and organizational responsibility. Key implementation actions include a timeline to regularly review the plan, regular training exercises to implement and assess the effectiveness of the plan, and regular meetings with the local government agencies and grassroots organizations.

While the Pitt County plan is generally strong, it has a few weaknesses. The most critical weakness is the absence of a monitoring (principle 6B). Indicators to track monitoring of how well the plan is carried out and organizational responsibility for monitoring are not included. Other weaknesses include, for example, the lack of projected future projections

of the number of SMN residents in the county to permit assessment of future demands for shelters (principle 2A), verbal descriptions of hazardous locations that are not mapped (principle 2A), vague reference to mutual aid agreements with other local jurisdictions, and vague explanations of how federal and state assistance can be used to support preparedness and response of the SMN population (principle 3B).

Figure 3: Planning Flow Guidelines for Special Care Shelters and Registries for Special Medical Needs Populations



Source: Pitt County Department of Emergency Management (2001)

Seattle Disaster Plan

The *Seattle Disaster Readiness and Response Plan* provides a comprehensive and integrated framework for guiding Seattle's emergency management system. Key elements of the plan include:

- A review of applicable federal, state, and local policies that assign authority and responsibility for municipal decision making;
- A description of current issues and emerging trends in vulnerability, and planning assumptions (e.g., disasters will severely stress municipal systems, residents are without city services for 3-days);
- A concept of operations that guides inter-organizational coordination, emergency responders to set priorities, and delivery of outside assistance;
- Assignment of policies and responsibilities that guide municipal agencies; and
- Annexes to the plan that specify specific organizational responsibilities and procedures for nine emergency support functions (e.g., recovery, public information).

Another key element that is integrated across all elements of the plan is the Seattle Neighborhoods Actively Prepare program (SNAP 2007). SNAP includes strategies to reach out to diverse populations, including education and preparedness training aimed at building the awareness, skills, and social networks within neighborhoods. All participating neighborhoods are required to create neighborhood-based disaster plans. Figure 4 describes this initiative.

Table 5 summarizes the evaluation findings for the six plan quality principles. Overall, the plan scored well, with three of the six principles scoring more than one-half of the total maximum possible score (principles 1, 2, and 3), and three principles scored half of the maximum (principles 4, 5, and 6). The plan offers a clear definition of disadvantage people (principle 1) based on several types of groups. Recent immigrant populations are considered to be especially vulnerable because “ethnicity creates special communication needs [and]...cultural divergences can cause a combination of hesitancy and confusion in reacting to a danger and in clearly understanding safety precautions” (Seattle Emergency Management 2002, p. 17). Another group includes those “who have physical and mental disabilities, or who are too young or too old to care for themselves” (Seattle Emergency Management 2002, p. 17).

The plan includes a well-developed vulnerability assessment based on 12 hazards, estimates of the number of residents with English as a second language and special medical needs, and identifies facilities that support these disadvantaged populations (principle 2A). Hazards, concentrations of immigrants (see figure 4) and special medical need populations are mapped (principle 2B). Under SNAP, a “Maps for Your Neighborhood” program helps residents prepare maps that illustrate homes that have particular hazards (e.g., gas meter) and residents in need of care (see Figure 5), and are most suitable for neighborhood-based shelters and first aid and communication centers (principle 2B).

Findings for the four operational principles (3-6) are mixed. While the operational principles are clearly evident from a municipal agency perspective, the links to disadvantaged groups are vague. Explanation of coordination among municipal and external organizations (principles 3A and 3B), participation (principles 4A and 4B), strategies (principle 5), and implementation actions (principle 6A) are indicative of a high quality plan, but they are not aimed at addressing conditions, concerns, and capabilities of disadvantaged groups. For monitoring (principle 6B), the plan does not include indicators, but it stipulates that drills and training exercises will be undertaken to assess deficiencies and annually update the plan. The implication of these efforts for disadvantaged people is not evident.

Alternatively, from a neighborhood perspective the Seattle plan is strong. A major strength for disadvantaged people that cuts across all operational principles (3-6) is the presumption that neighborhoods, especially disadvantaged ones, are not helpless and that they are seen as having significant capacity to cope and participate in disaster planning. SNAP includes, for example, clear procedures for mobilizing local social networks to set up neighborhood centers for sheltering, communication and first-aid delivery (principle

3A), and involving and communicating to residents to raise awareness and support for neighborhood disaster planning (principle 4A and B). It also encourages disaster plans with strategies (principle 5) and implementation actions (principle 6A) that fit the needs and build capabilities of neighborhoods as residents are trained and certified to devise and update their own plans.

Figure 4: Seattle Neighborhood Preparedness Plan

The major goal of SNAP (Seattle Neighborhoods Actively Prepare) is to build the capacity of neighborhoods of 25 to 50 homes to work together to can take care of themselves under the assumption that during a disaster residents are without city services for 3-days. For the past decade city emergency management staff have been conducting an outreach education and preparedness training program aimed at building the awareness, skills, and social networks within neighborhoods to create neighborhood based disaster preparedness plans.

The current (SNAP) program adopted in 2006 offers a more streamlined neighborhood planning process than the prior neighborhood disaster planning program. The aim is to encourage more neighborhoods, especially disadvantaged neighborhoods with limited time and availability, to participate. SNAP includes outreach strategies to reach out to diverse populations, including medically fragile, citizens in assisted living facilities, people who are developmentally disabled, low income populations and people for which English is a second language. The city's Office of Emergency Management is forming partnerships with various service agencies to reach special needs populations; agencies such as the American Red Cross, neighborhood district councils, housing authorities, churches, schools, and others. These partnerships are designed to work in tandem with SNAP's capacity building efforts.

The neighborhood training program consists of three steps:

- Getting connected: identify neighbors that want to be involved and choose a neighborhood captain;
- Getting organized: create neighborhood maps of homes occupied by people who need special attention and shelter, and to serve as temporary shelters and first aid centers; as well as create response teams for various activities (e.g., search and rescue, damage assessment; and sheltering).
- Getting confident: conduct annual disaster drills, evaluate and update of neighborhood plans based on lessons learned from drills and actual disasters.

To achieve more widespread coverage of neighborhood training, SNAP uses volunteers from certified neighborhoods as presenters and coaches for helping newly participating neighborhoods to get organized and practice neighborhood drills. The city also coordinates an annual meeting of all neighborhood captains to discuss a training calendar, ways of maintaining momentum and conducting self-initiated practice drills throughout the city.

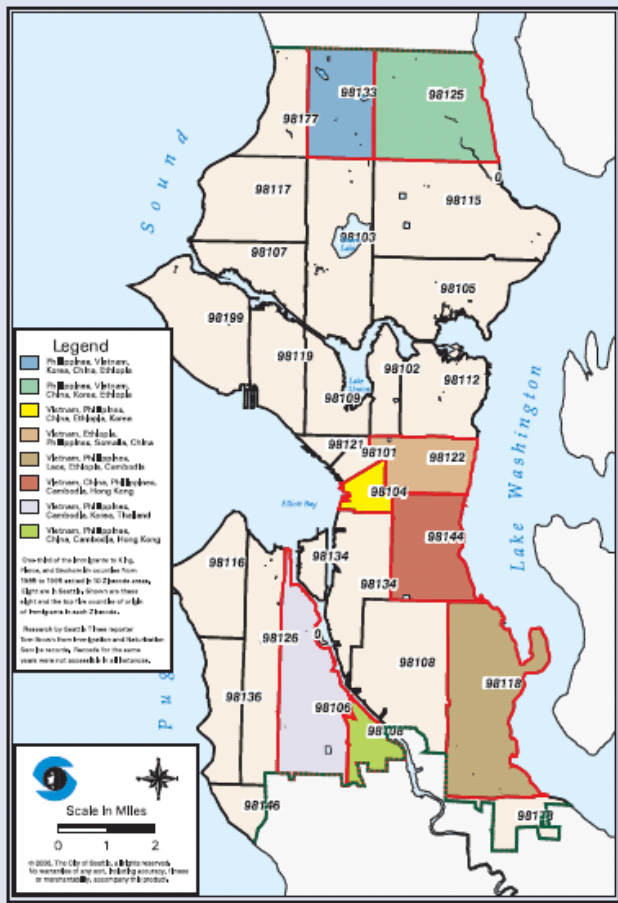
In addition, SNAP staff recognize that some citizens may not have the opportunity or do not want to get involved in the process of officially organizing their neighborhoods. For these people, additional education programs are provided at community forums, churches, social service groups, and other organizations where people gather for social, community and educational programs. The goal is to motivate citizens to prepare, independently or within the social group they choose.

Source: Seattle Neighborhoods Actively Prepare (SNAP 2007)

Table 5: Seattle Disaster Readiness and Response Plan

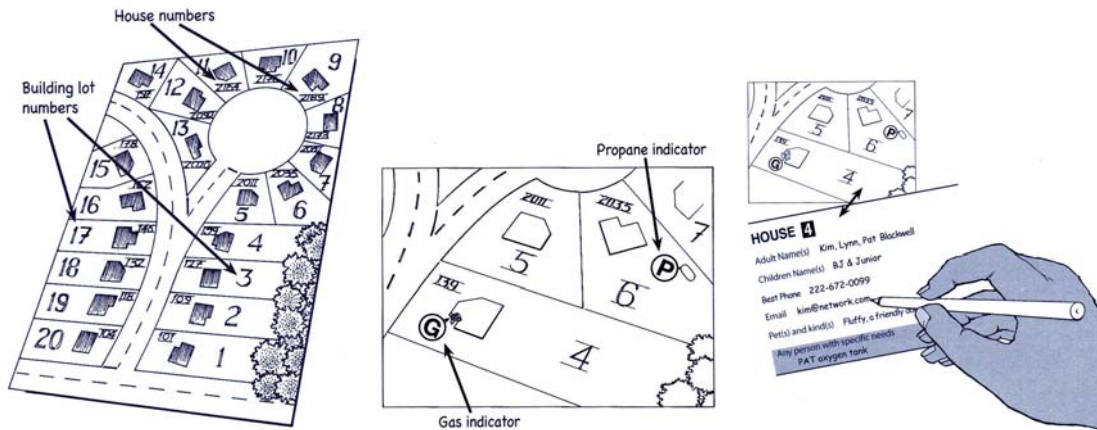
Plan Assessment Principles	Score	Comments
1. Definition of disadvantaged (max = 2)	2	Clear definition of disadvantaged tied to specific social and health characteristics
2. Fact base		
A. Vulnerability Assessment (max = 6)	5	Identifies hazards; rates potential vulnerability by hazard; estimates current number of immigrants and special medical needs population; estimates location and number of facilities that support disadvantaged population, but no estimates of shelter and health care capacity
B. Techniques to Clarify Facts (max = 8)	7	Maps of hazards, concentrations of special needs population, and immigrant settlements patterns; SNAP neighborhood-based maps
3. Account for Interdependency of Actions		
A. Internal Connections (max = 6)	4	Plan has clear procedures for local agency coordination, but no specific focus on disadvantaged; SNAP includes clear arrangements for organizing neighborhood residents, setting up neighborhood response and short-term recovery command centers, and coordinating volunteers at the neighborhood scale
B. External Connections (max = 6)	3	Plan specifies coordination procedures for volunteers, mutual aid agreements, and eligibility for federal/state sources, but links to disadvantaged people is vague
4. Participation		
A. Involvement of Disadvantaged (max = 6)	2	Some participants on city plan committee represent agencies that serve disadvantaged, but link is vague; support of SNAP neighborhoods from city agencies that work with disadvantaged is mentioned, but links are vague
B. Techniques to Inform Disadvantaged (max = 10)	5	No contact registry program for disadvantaged; mentions media arrangements, but not ethnic media; list of translators; call-in hotline in multiple languages; SNAP includes neighborhood-based registry, public information program via neighborhood communication centers
5. Strategies (and Tactics) (max =4)	2	Clear and specific procedures to meet mission, but vague procedures aimed at disadvantaged; inconsistency between facts and strategies/tactics; reliance on SNAP plans for strategies aimed at disadvantaged
6. Implementation and Monitoring		
A. Implementation (max = 6)	4	Clear procedures that specify annual exercises to test city plan, organizational responsibilities, and timelines for plan review, but not tied to disadvantaged; SNAP includes clear procedures for drills, training, and testing neighborhood disaster plans
B. Monitoring (max = 6)	2	No indicators; no assignment of organizations to monitor; plan will be updated annually to identify and address deficiencies

Figure 4: Settlement Patterns of Recent Immigrants



Source: Seattle Emergency Management (2002)

Figure 5: Volunteers sketch streets, building lots, and house numbers in their neighborhoods (left); mark location of earthquake prone gas meters (center); and write down names of those who need extra help during a disaster (right).



Source: Washington Emergency Management Public Education (2006).

Roseville Mitigation Plan

The *City of Roseville Hazard Mitigation Plan* (Roseville Planning Department 2005) was developed to guide and coordinate mitigation activities throughout the city. The executive summary indicates that the mitigation plan “build[s] on a tradition of progressive planning and past mitigation successes” (Roseville Planning Department 2005, p. ES-1). In keeping with this tradition, the plan received the highest score among the 1,049 mitigation plans submitted by local governments that participate in the Community Rating System of the National Flood Insurance Program (see <http://www.fema.gov/business/nfip/crs.shtm>).

The plan includes several major elements:

- A planning process that covers organizing resources and public engagement;
- A risk assessment that identifies hazards, structures exposed to each hazard; and vulnerability to damage by hazard;
- A risk ranking of hazards with estimated impacts on people, property, and economy;
- A prioritized ranking of the proposed mitigation actions that were rated based on locally defined criteria (e.g., legal, political, environmental) to assess feasibility of the proposed actions; timelines for implementation; and lead organizations charged with implementation; and
- A plan maintenance program that includes monitoring achievement of mitigation goals, updating the plan, and ongoing public participation.

Table 6 summarizes the results of the evaluation for each of the principles of plan quality. Overall, the plan scored high with more than half of the maximum possible score for three of the six principles, and one-half the maximum for accounting for interdependent actions and strategies. Participation had a low score.

There are several significant strengths of the plan. It clearly defines disadvantaged people (principle 1) based on several primary demographic characteristics, including income, physical disability, age, race and ethnicity. Roseville’s plan authors express clear commitment to addressing the inequities of vulnerability with language in the plan stating that, “Despite the fact that they often disproportionately experience the effects of a disaster, vulnerable populations are rarely included in the hazard planning process” (p. 6-4), and that the goal in Roseville is to “increase awareness of these differences” (Roseville Planning Department 2005, p. 6-5).

Table 6: Roseville Hazard Mitigation Plan

Plan Assessment Principles	Score	Comments
1. Definition of disadvantaged (max = 2)	2	Clear definition of disadvantaged tied to specific social and health characteristics
2. Fact base		
A. Vulnerability Assessment (max = 6)	5	Risk ranking procedure; flood modeling that augments FIRM maps; estimates current disadvantaged population by socioeconomic and health features; estimates location and number of disaster support facilities, but demand/capacity estimates for disadvantaged not included
B. Techniques to Clarify Facts (max = 8)	6	Clear maps of hazards, but no display of disadvantaged populations/facilities; tables that aggregate data on disadvantaged; clear facts to support mitigation actions
3. Account for Interdependency of Actions		
A. Internal Connections (max = 6)	3	Clear coordination with other local plans and agencies, but no specific focus on disadvantaged; CERT Citizens Corps used to organize residents, but no explicit roles for local organizations to serve disadvantaged people
B. External Connections (max = 6)	3	Coordination of volunteers in community development tied to mitigation, but vague on links to disadvantaged; coordination of regional stormwater and land use, but not tied to disadvantaged; eligibility for federal/state sources for mitigation, but links to disadvantaged are vague
4. Participation		
A. Involvement of Disadvantaged (max = 6)	4	Some participants on plan committees represent disadvantaged; detailed explanation of why representatives of disadvantaged were involved; support of disadvantaged people from city agencies that work with disadvantaged is mentioned, but links are vague
B. Techniques to Inform Disadvantaged (max = 10)	2	No contact registry program for disadvantaged; extensive information dissemination campaign, but no explicit focus on disadvantaged; no mention of translators for ethnic groups and deaf; no call-in phone line with translators; extensive multi-media arrangements, but not ethnic media
5. Strategies (and Tactics) (max = 4)	2	Clear and specific strategies composed of a broad range of mitigation actions, but vaguely aimed at disadvantaged; some inconsistency between issues raised and mitigation actions related to disadvantaged groups
6. Implementation and Monitoring		
A. Implementation (max = 6)	6	Clearly specifies administrative actions for implementing each mitigation action, timeline for implementation, and lead organization responsible for implementation.
B. Monitoring (max = 6)	5	Includes measurable objectives, but not directly tied to disadvantaged; clear assignment of organizations charged to monitor; annual progress reports; plan to be updated every 5 years

The fact base of the Roseville mitigation plan is strong. It goes beyond a vulnerability assessment by including a risk assessment and risk ranking procedure that compares the potential losses generated by different types of hazards (principle 2A). All major hazards are clearly mapped and tables that indicate aggregate totals of different groups (elderly, poor, disabled, and minority ethnic groups) are included (principle 2B). The only weakness is the absence of a map that illustrates the distribution of disadvantaged people (principle 2B). The text clearly recognizes the greater risk that hazards pose to disadvantaged populations,

“Some populations experience greater risk from hazard events not because of their geographic proximity to the hazard but because of decreased resources and/or physical disabilities...people living near or below poverty line, the elderly...the disabled, women, children and ethnic minorities...all experience more severe effects from disasters than the general population” (Roseville Planning Department 2005, p. 6-3).

Although the Roseville mitigation plan is exceptional in recognizing that disadvantaged people are highly vulnerable, the operational functions of the plan (principles 3, 4, 5, and 6) do not differentiate among population groups. Plan inter-organizational arrangements, participation programs, and mitigation proposals are premised on the assumption that the conditions, concerns, and capabilities of the city’s population groups are similar and warrant common solutions. Evaluation results based on these principles reveal that the plan is strong in advancing mitigation for the entire city, but the particular circumstances of disadvantaged people are not given attention.

Coordination arrangements are clearly specified with other local plans to advance mitigation, and with local residents through CERT Citizens Corps (see <https://www.citizencorps.gov/cert/about.shtm>) (principle 3A), as well as for regional stormwater and land use issues, and federal and state aid (principle 3B). However, roles and responsibilities for organizations that specifically serve disadvantaged populations are not included. Several proposed mitigation actions (e.g., flood buyout and relocation program, outreach programs for occupants of flood prone and seismically unsafe building structures) could be directed toward disadvantaged people, but do not contain language that is specifically aimed at disadvantaged people in spatial and non-spatial terms (principle 5).

If it were not for lack of inclusion of specific information about participation of the disadvantaged, the Roseville plan would be score high in citywide public participation. An entire chapter is devoted to explanation of a three-prong strategy -- steering committee, questionnaires, and multi-media approaches -- to include a wide array of stakeholders in the preparation and ongoing implementation of the plan (principle 4A). The plan states that, “A conscious effort was made by the planning team to identify stakeholders within the city...to target through a multimedia public involvement strategy” (p. 3-1). A thorough explanation of a wide range of citizen participation

techniques (e.g., internet, press releases, public meetings, workshops, and a household questionnaire that asked about their risk perception, knowledge of mitigation, and support for mitigation programs) that were used in plan preparation is provided. However, the plan does not specifically discuss how the three-pronged strategy (principle 4A) and specific participation techniques (principle 4B) were used to engage, educate, and build trust among disadvantaged people.

The implementation and monitoring program represents a model for disaster plans and urban plans, in general (Berke, Godschalk, Kaiser 2006), yet there are shortcomings in links to disadvantaged populations. Administrative actions, timelines, and assignment of lead organizations charged with implementation of each administrative action are clearly identified (principle 6A). Monitoring of progress in achieving objectives, timetables for monitoring, and organizational responsibility by type of indicator are clear. However, the objectives used for tracking are not directly linked to the conditions of disadvantaged populations (principle 6B). Monitoring achievement of objectives like “Educate the public...on mitigation...,” and “Retrofit, purchase, or relocate structures in high hazard areas...” (Roseville Panning Department 2005, p. 16-2) does not differentiate between the general public and disadvantaged people.

Conclusions and Implications

This report reviewed the role of disaster plans in reducing social vulnerability. We discussed the options local jurisdictions have when making critical choices in designing local disaster plans tailored account for the conditions, concerns, and capabilities of disadvantaged people. We presented principles that can be used in the course of making and assessing an existing disaster plan to gauge how well plans account for disadvantage populations. We also demonstrated how to apply principles based on an assessment of three case disaster plans.

While the case plans represent promising examples of high quality disaster plans, they had strengths and weaknesses in support of the principles. Findings from the plan evaluation indicate that all plans clearly identified disadvantaged people (principle 1) with definitions based on specific social, economic, and health characteristics. While fact bases (principle 2) on the vulnerability of disadvantaged populations were stronger in the Seattle and Roseville plans than the Pitt County plan, the stronger fact bases were not translated into higher scores for three of the four operational principles. Compared to the Seattle and Roseville plans, the Pitt County plan was more detailed and specific in stipulating coordination arrangements among interdependent agencies that work with disadvantage people (principle 3), public participation programs that raise awareness and empower the disadvantaged (principle 4), and strategies that are internally consistent with issues that are deemed important by the disadvantaged (principle 5). Finally, the Roseville plan offers a model implementation and monitoring element (principle 6) and was the strongest among the three case plans, but this plan as well as the other plans did not include indicators for tracking plan performance that differentiate disadvantaged groups from the general population.

Two reasons may partially explain the stronger fact bases and weaker operational principles for the Seattle and Roseville plans compared to the Pitt County plan. First, the

Pitt County government may have less capability to generate and incorporate technical and scientific information into plans than local agencies in Roseville and Seattle. As noted, compared to Pitt County, Roseville is much wealthier and has a long tradition in planning, and Seattle is a major American city with considerable capability to plan.

Second, unlike the other two plans the Pitt County plan solely focused on disadvantaged populations and hazards that most severely impact this group. Direct and undivided attention toward disadvantaged groups increases the likelihood of sustained attention toward disadvantaged groups throughout the plan making process. It is not easy for the poor and less powerful to come as equals to a planning process usually dominated by more influential interests. Also, agencies (e.g., health, aging, housing) and leaders (e.g., pastors, elected officials) serving socially vulnerable groups may not have disaster planning on their radar. Sole focus on disadvantaged populations gives more opportunity for creating a sense of confidence and a fair chance of being heard which may partially explain why Pitt County has stronger interagency coordination, participation, and strategies aimed at disadvantaged people.

One of the implications of these findings is that local governments with limited capability and resources need greater access to cultural, scientific, and technical information. In the context of working with disadvantaged groups, several steps should be taken. One is improving the understanding of the types of scientific and technical information deemed most important by local agencies that work with socially vulnerable populations. Information should also be formatted in ways that can be readily integrated into information systems that are currently used by local governments. Prior research indicates that the fact base of plans will not be improved unless scientific information is formatted in ways that can be readily incorporated into local information management systems (Brody 2003). Also, local disaster planners need guidance on how to communicate information in ways understood by different types of socially vulnerable people.

Another implication is that communities with limited experience in planning with disadvantaged people should initially create a stand-alone plan focused on disadvantaged groups. A stand-alone plan is significant since the conditions, concerns, and capabilities important to the disadvantaged are often lost in the process when more powerful groups are involved. Once these important features are uncovered and validated, it may be possible to integrate a stand-alone plan into a comprehensive plan at a later date.

In sum, this report explains how local government disaster plans can account for the conditions, concerns, and capabilities of socially vulnerable groups. Options for formulating the plan and principles that serve as guidelines are offered to assess how well disaster plans support disadvantage populations in mitigation, preparation, response, and recovery. The principles are applicable to preparing new plans or updating existing plans. Planners and their communities can exercise discretion and adapt the criteria under each principle to fit local purposes and circumstances.

The ultimate goal is to produce high quality disaster plans that account for socially vulnerable populations. Such plans reflect involvement by socially vulnerable groups in the process of developing a technically sound and locally relevant fact base, choosing most promising strategies for reducing vulnerability, and coordinating public, private and non-profit organizations that serve socially vulnerable groups in order to implement and monitor strategies.

A Bibliography of Useful References

This bibliography provides readers with a brief list of basic references to use in exploring and implementing the guidelines recommended in this report. The authors focused on references a reader can most beneficially turn to first.

Guidelines for Disaster Plans

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Endnotes

¹ Criteria were derived from the following scholarly sources (Baer 1997, Berke et al. 1996, Burby and May et al. 1997, Cooper 2004, Godschalk et al. 1999, Godschalk, Kaiser and Berke 1997, Lindell, Prater and Perry 2006, Wenger, James and Faupel 1980); and after-action assessments in response to the Hurricane Katrina disaster (Farmer 2006, Muniz 2006, Vielman 2005).

² Prior studies of mitigation plans (Copper 2003) and disaster preparedness plans (Lindell 1992) indicate that the plans are weak in giving attention to identifying issues, needs, fact bases, and strategies linked to disadvantaged populations.