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Office of Critical Infrastructure Protection and Emergency Preparedness

Bureau de la protection des infrastructures essentielles et de la protection civile

Scoping of Issues Concerning Risk Reduction to All Hazards in Canadian Non-Urban Communities

Acknowledgments

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Executive Summary

Studies of emergency preparedness often focus on urban centres despite the fact that non-urban communities make up a significant proportion of the Canadian population. The purpose of this project was to conduct exploratory research and collect preliminary information about emergency preparedness issues in rural communities in order to lay a foundation for future research.

A review of the literature on the risks and hazards of Canadian society reveals the following:

- the number of human fatalities due to major disasters has been declining even though Canada's population has been increasing;
- there is an increased susceptibility to all hazards due to the continual accumulation of societal wealth and personal belongings (when a major natural or technological disaster occurs in today's society, the impacts, principally in economic terms, are more severe than ever before);
- the diminishing capacity of infrastructure to withstand extreme environmental events causes increased susceptibility;
- the varied spatial distribution of non-urban communities makes them prone to different types of risks and hazards;
- an underestimation of low frequency hazards is common in non-urban communities;
- economic resources, equipment supply and service, and trained and organized personnel are inadequate in non-urban communities.

Research

A group of 20 stakeholders involved in emergency preparedness (attendees of the first annual conference of the Canadian Emergency Preparedness Association, Manitoba Chapter) identified a number of emergency preparedness issues. These were used to develop a survey asking respondents to identify real or perceived hazards threatening their communities. The survey was administered to 91 non-urban communities across Canada. Thirty-seven completed surveys were returned.

Major Findings

From the data collected, five generalizations about non-urban communities' perceptions of hazards can be made: power or electrical failure is a common concern and therefore it is considered a risk to all communities; a good proportion of agriculture and forestry-based communities perceive spill from the transportation of hazardous materials to be a risk to their communities; agricultural communities are concerned about severe weather-related hazards such as flooding, blizzards or tornadoes; the threat of forest fire is not confined to forestry-based communities; flooding appears to be location-specific.

The five most important emergency preparedness issues identified by the participating communities are a reliance on volunteers for emergency personnel, the size of a rural community, a lack of economic resources to cope with hazards, the underestimation of low frequency events and hazards, and inadequately trained or organized emergency personnel.

Non-urban communities identified several gaps in their emergency preparedness and mitigation, including a lack of public education and communication, a lack of responsible organization and mobilization, a lack of both human and capital resources, as well as a lack of public participation and informed decision-making. Communities also agreed that long-term perspective planning is necessary.

Recommendations

The topic of emergency preparedness is large in scope. In the future, it would be useful to limit the investigation to communities of common interest, such as ones based on geographic profile or economic function. Surveys should be prepared in various languages in order to increase responses from different communities.

As part of this project, a community resource kit was developed for non-urban communities to guide them through the process of identifying hazards, assessing risks and determining risk management strategies. Next steps could include piloting the community resource kit in a selected number of rural communities to test its usefulness.

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1.0 Introduction

The investigation of mitigation, preparedness, response and recovery issues pertaining to emergency situations traditionally tends to focus on large urban populations. As a result, less information is available regarding the mitigation and preparedness components of the emergency cycle in non-urban populations; the understanding of the processes in such communities may also be relatively poor.

Non-urban communities comprise a significant proportion of the Canadian population; their role and contributions to the economy are vital for the sustainability of our society. In terms of the magnitude, duration, areal extent, and loss related to emergencies, these populations may, in fact, be more vulnerable than urban populations. In view of the need for filling in these gaps, this report is aimed at the development of a process that could be employed to explore the issues related to reducing risk of all hazards within the non-urban communities of Canada.

This report is organized in four parts. The first part contains the background, along with a review of the existing literature. Patterns in risks and hazards of Canadian society in general are reviewed. Current approaches to defining rural areas are then examined, followed by determining hypotheses concerning all hazards of non-urban communities. The second part has three sections that focus on initial issue identification, validation of issues and the presentation and analysis of survey findings. The third part offers a risk assessment framework specifically for non-urban communities. In the final part, a resource kit for adoption and use by non-urban communities is attached.

2.0 Review of the Literature

Risk reduction to all hazards in both urban and non-urban areas is a broad area of research and public policy formulation. All types of hazards and risks include those that stem from our cultural and technological progress and from our interaction with nature. An exhaustive survey of literature on these issues would require a large and longitudinal research contingent; only the most important aspects pertinent to the Canadian context are reviewed here. A review of the generalized background of the state of risks and hazards of the Canadian society at large is presented, followed by a focussed assessment of the current literature on issues of risks and hazards of non-urban communities to natural, technological and other human activity related hazards. A bibliography of the available literature is attached in Appendix A.

2.1 Issues and Trends in Risks and Hazards of Canadian Society

The general issue of risk to individuals in the environment in Canada was comprehensively evaluated almost two decades ago by R.E. Munn (1982) as the general editor in a research publication. The volume attempted to calculate and review risk probabilities of the Canadian population by examining mortality rates, disease incidence, shortening of human life, hospital admission rates and number of days absent from work or school. Similarly, loss of money, property and interruption of public commerce or service were measured to estimate risk to “goods”.

By examining eleven case studies, mostly related to human-induced, voluntary and involuntary risks, the study concluded that society has become safer and healthier over time (McCullough and Burton, 1982). However, the investigators found inconsistency in Canadian risk management practices. In the present report, due to changed conditions and social concepts of risk and hazards, only major environmental hazards, with a focus on sudden, catastrophic events whereby people face involuntary risk of losing life, being injured and/or losing property and resources, are stressed.

The number of human fatalities due to major disasters has been declining.
Although Canada's population has been increasing during the post-depression era, the number of people killed in major disasters has been declining gradually over time. The Canadian National Report (RSC and CAE, 1994) cites that in the last three centuries, the country experienced (until 1994) 63 major, weather-related disasters resulting in about 14,600 deaths, with 11,560 deaths being of a maritime-nature. The number of maritime disasters per half century appears to have been between seven and ten, with the number of fatalities per disaster dropping significantly.

There is an increased susceptibility to all hazards due to continual accumulation of societal wealth and personal belongings. As our present Canadian modern society is progressing steadily economically and technologically - characterized by increasing efficiency - our risk to varied kinds of hazards in day-to-day affairs is being addressed and modified. Nonetheless, in the area of both society-nature interface and technological and cultural advancement, a paradox of our modern society is apparent. When a major natural or technological disaster occurs in today's society, the impacts, principally in economic terms, are more severe than ever before.

Smith (1996) and Hewitt and Burton (1971), in their attempts to explain why and how a natural disaster takes place, assert that human sensitivity to environmental hazard can be expressed as a function of the variability of geophysical or biological elements and the degree of societal tolerance. When the variability in the environment exceeds the established tolerance norm, a hazard occurs, threatening resources and lives. Relative to the recent historical past, more people with more personal belongings live in this country, and most of them live in areas that are susceptible to nature's perils. Canada's Gross Domestic Product (at factor cost, 1992 $ constant) has increased from 646 billion in 1994 to 721 billion in 1998 (Statistics Canada, 1999). The trend between 1989 and 1996 in average family income after tax (at 1996 $ constant) also has revealed that it has remained steady, at the 45 thousand dollar level. The overall trend in accumulated wealth of our society at large and in personal belongings is indicative of a steady growth since the 1970s (Economic Council of Canada, 1988; 1991). Thus, when hazards strike our society and, simultaneously, the environmental parameters such as magnitude, duration or intensity, surpass the so-called established threshold norm, the scale and magnitude of socioeconomic loss rises to staggering figures. The cost of weather-related disasters in Canada, covered by the federal disaster assistance payments and insurance industry, increased from less than five hundred million during the 1983-87 period to more than 1.5 billion for the 1993-97 period, and to 2.3 billion in 1998 alone (ICLR and EPC, 1998).

A multidimensional population distribution causes varying disaster impact; it also makes mitigation, preparedness, response and recovery difficult and challenging. Recent workshops across Canada on mitigation of natural hazards have revealed that in addition to the above

feature, the following major trends could also be attributed to the increased vulnerability of society to natural hazards (ICLR and EPC, 1998). From the total of the 30 million people in the country, more than 14 million live outside large urban centres, which includes both rural and small urban centres. This pattern is indicative of a complex spatial distribution of dwellings, as today more people live closer together near large urban centres, and they are sparsely distributed in agricultural and resource communities (Beaujot, 1991). Geographically widespread disasters, such as flooding, forest fires, ice storms, droughts, massive power outages or possible computer and network failures, thus impact a considerable proportion of the population who are sparsely located. In addition, as a large segment of the population chooses to live in close proximity to urban amenities but outside urban core areas with a preference for the non-urban "quality of life" (Rosenberg and Moore, 1988), intensive extreme natural events are affecting more people, property, assets, infrastructure and other resources than our previous generations.

Diminishing capacity of infrastructure to withstand extreme environmental events causes increased susceptibility. Infrastructure in Canada historically evolved, on the one hand, to service populations and regional economies that are spatially widespread, connecting communities that have been producing grains and other cash crops, metals, minerals, and other primary goods, processing fish and fish products, and logging and processing forestry products. On the other hand, it was also geared to provide service to concentrated populations in relatively larger industrial and administrative cities. As most of this infrastructure is nearing the end of its designed life, and simultaneously, depopulation from many of the rural and resource communities caused failing renovation and capacity modification, the threshold capacity of our infrastructure to withstand extreme environmental events has been diminishing.

Statistically, the atmospheric hazards are increasing. Throughout the 1980s and 1990s, Canada in general has experienced warmer seasons relative to decades of the mid-20th century. As well, severity and frequency of extreme weather events faced by Canadian communities have been on the rise. In 1998 Canadians spent more than three billion dollars to repair damage caused by extreme weather (ICLR and EPC, 1998). Increasing frequency and severity of weather events have generated higher socioeconomic loss and damage and required massive recovery costs. Although there is no conclusive evidence on the specific regional impact of a warmer planetary regime, the increasing frequency and severity of weather events generate higher socioeconomic loss and damage.

Considerable progress in preventing and mitigating human activity induced and technological hazards has been accomplished, but a participatory policy and action program may be needed to improve conditions in vulnerable non-urban communities. Legislative and technological modifications and interventions have improved our vulnerability of loss of lives to all types of hazards. For example, the formulation and enactment of the *Emergency Preparedness Act*, *Transportation of Dangerous Goods Act*, the *Pest Control Products Act*, the *Radiation Emitting Devices Act*, several federal-provincial bilateral plans and provincial acts and plans have proven their effectiveness in reducing threats from an impending major event, as well as recovering from major disasters (McCullough and Burton, 1982; RSC and CAE, 1994). An excellent example of this is the Canada-Manitoba Agreement on Red River Flood Disaster Assistance in 1997, which complemented Canada's Disaster Financial Assistance Arrangements and the Manitoba Disaster Financial Assistance Policy. However, recent disaster

experience suggests that in order to make the first responders and local communities and governments more aware, responsible and accountable with respect to their participation and involvement in the risk, disaster and emergency policy and program decision-making is crucial (Buckland and Rahman, 1999; Haque, 1999).

2.2 Defining Rural

In developing a taxonomy of non-urban communities, the first step is to define "non-urban community". In this report, non-urban means rural or rural and remote. As stated earlier, Statistics Canada's census definition of rural areas is "sparsely populated lands lying outside urban areas" (Statistics Canada, 1997). Urban areas are defined as having "minimum population concentrations of 1,000 and a population density of at least 400 per square kilometre, based on previous census population counts" (Statistics Canada, 1997). Therefore, rural refers to those areas that either have a population concentration of less than 1,000 or a population density of less than 400 per square kilometre. In some cases, a rural community will exhibit both characteristics. The Organization for Economic Co-operation and Development (OECD, 1994) has defined "rural communities" as having "a population density less than 150 persons per square kilometre." The OECD has used census-consolidated sub-divisions to represent communities. The building blocks for population living in (census) "rural" areas are enumeration areas. Therefore, a "community" can be a small village or a whole municipality, since these are built from enumeration areas.

The Statistics Canada census definition of rural meets the criteria established for this study. A rural community would have a population of less than 1,000 and have a density of less than 400 per square kilometre.

In order to develop a taxonomy of non-urban communities as related to its utility within the emergency context, geographic and economic classification criteria are explored. Geographic criteria of non-urban communities include province/territory and distance from urban centre. The province or territory within which a community lies is very important in the planning phase of emergency preparedness. Provinces and territories share emergency and non-emergency organizations, as well as legislation, which can affect a community's emergency planning process. Provinces and territories also have identified common hazards due to their geographical location.

Another geographical variable is distance from the nearest urban centre. Communities that are a greater distance from urban centres have unique issues relating to emergency mitigation and preparedness, as they are generally a longer distance from (some) essential services. Communities that are geographically isolated may have to use modes of travel such as only air to reach the nearest urban centre. In an emergency situation, this could mean reliance on helicopter ambulances or other forms of emergency transportation that may not be available in the community. Requesting such transport from an urban centre that is over 1,000 kilometres distant will cause a delay in emergency response.

The economic function of a community is another important factor in classifying rural communities as related to emergency mitigation and preparedness. Communities with the same economic function may face similar emergency issues or be most vulnerable to similar hazards.

In our preliminary research, we identified five types of main economic bases: agriculture, mining, forestry, fishing and tourism. Ideally, if the scope of a research project were large enough, emergency issues could be framed based on a combination of geographical, economic and other criteria. The census definition of rural can be used to obtain a list of non-urban communities from Statistics Canada. Another variable that relates to emergency issues is culture. Communities with cultural identifiers, such as Indian Reserves, have unique issues related to the emergency cycle. Indian Reserves are a type of census sub-division, and a list of these types of communities can also be obtained from Statistics Canada.

2.3 Issues and Hypotheses Concerning All Hazards of Non-Urban Communities

Despite the considerable size and proportion of population residing in non-urban communities, systematic knowledge and an understanding of their vulnerability are limited. According to a recent census count of Canada (i.e., 1996), nearly one-quarter (specifically 22.1%) of the population is found to be residing in non-urban or "rural" communities (Chart 1.1, Table 1.1) as they are broadly defined by Statistics Canada. In this report, non-urban is used as a synonym of the census definition of "rural" areas. In general terms, "rural areas are sparsely populated lands lying outside urban areas" (Statistics Canada, 1997). A total of 6.4 million people live "outside urban areas", which is defined as having a "minimum population concentration of 1,000 and a population density of at least 400 per square kilometre, based on the previous census population counts" (Statistics Canada, 1999). All territory outside urban areas that includes agriculture, mining, fishing, logging, northern and other resource and recreational communities is considered under the broad category of "rural".

The Canadian National Report (RSC and CAE, 1994) has attempted to comprehensively examine the aspects of risk assessment, mitigation activities, warning, and international cooperation on natural disasters in Canada, illustrating proneness to different types of hazards. The report asserts that for risk assessment, which generally involves both an evaluation of the "physical exposure" in terms of their frequency, severity and location, and an examination of "human vulnerability" (life and property), there exists a clear bias towards the former component in the country. Thus, although the aspects of geophysical and biological characteristics of natural hazards are well-researched and well-institutionalized, because of the lack of due attention to detailed vulnerability assessment of non-urban areas in particular, little is known on the pertinent issues and problems.

Chart 1.1

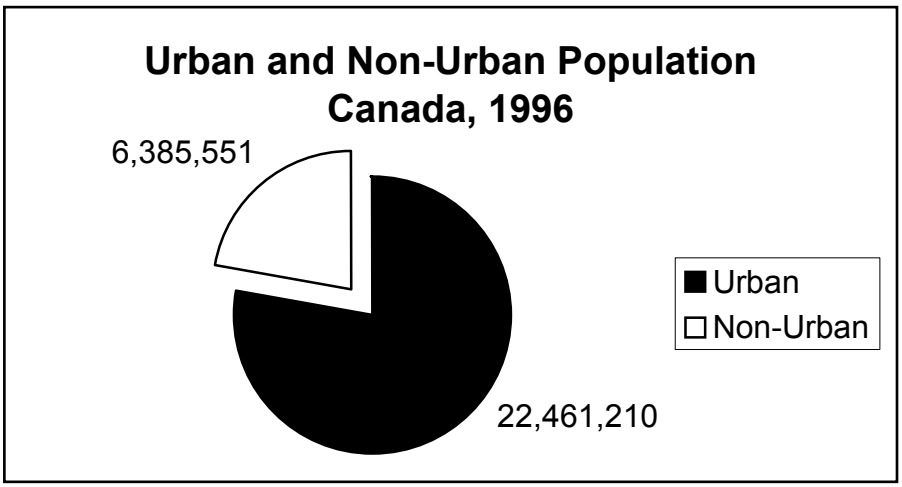

Table 1.1 Urban and Non-Urban (Rural) Population Counts, for Provinces and Territories [1996 Census (100% Counted Data)].

Province/Territory	Urban		Non-Urban		All Areas Population
	Population	%	Population	%	
Canada	22,461,210	77.9	6,385,551	22.1	28,846,761
Newfoundland	313,819	56.9	237,973	43.1	551,792
Prince Edward Island	59,460	44.2	75,097	55.8	134,557
Nova Scotia	497,858	54.8	411,424	45.2	909,282
New Brunswick	360,421	48.8	377,712	51.2	738,133
Quebec	5,597,625	78.4	1,541,170	21.6	7,138,795
Ontario	8,958,741	83.3	1,794,832	16.7	10,753,573
Manitoba	800,063	71.8	313,835	28.2	1,113,898
Saskatchewan	627,178	63.3	363,059	36.7	990,237
Alberta	2,142,815	79.5	554,011	20.5	2,696,826
British Columbia	3,057,388	82.1	667,112	17.9	3,724,500
Yukon Territory	18,447	60.0	12,319	40.0	30,766
Northwest Territories	27,395	42.5	37,007	57.5	64,402

Source: Statistics Canada, 1996

The magnitude of deaths and property loss are less in non-urban communities; however, their "vulnerability" to all hazards may be greater than larger urban centres. Precise statistical data on loss of human lives due to all hazards are available from Health Canada, while estimates of economic, social and other losses are based on numerous assumptions and limited observed or counted data. Still, certain comparative patterns between the large urban and non-urban communities are apparent. Blaikie et al.'s (1994) concept of "vulnerability" can be applied to the Canadian context to explain the hypothesis that the magnitude of deaths and property loss are less in non-urban communities, but their vulnerability to all hazards is greater than larger urban centres. The term "vulnerability" refers to "the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist, and recover from the impact of natural hazard. It involves a combination of factors that determine the degree to which someone's life and livelihood is put at risk by a discrete and identifiable event in nature or in society" (Blaikie et al., 1994: 9). The impact process of the 1998 Ice Storm in terms of its spatial distribution is a case in point. The storm, which struck Quebec, Ontario and parts of the Maritimes, impacted rural communities more severely than the urban centres. This impact was reflected in the fact that the rural communities were without electricity for longer periods relative to larger urban centres, resulting in prolonged suffering in non-urban locations (Swiss Re Canada, 1998).

The lack of necessary infrastructure, economic resources, equipment, and trained and organized personnel make non-urban communities poorly prepared to cope with the prevailing and potential risks of natural and other hazards. With respect to Canadian northern communities, the Canadian National Committee for the IDNDR has reported that emergencies that beset distant communities impose "higher levels of hardship and uncertainty than is the case in the southern parts of Canada. As they have grown rapidly from small trading posts to established settlements, many northern communities are singularly ill-equipped to respond to emergency conditions on their own" (RSC and CAE, 1994: 80).

Urban bias in hazard mitigation, preparedness, response and recovery decision-making processes is a perceived notion and concern of non-urban communities. In his study of preparedness and response to the 1997 Red River Valley flood, Haque (1999) notes that many of the rural communities of the Valley argued that they were flooded because water was diverted to save the City of Winnipeg. The Farlinger Commission reviewed these actions and found that the floodway is not being operated in strict conformance with the 1984 published program of operation. Furthermore, the Klohn-Crippen study (Klohn-Crippen Consultant Ltd., 1998) revealed that the effect of the operation of the floodway system in 1997 did in fact raise water above the "natural" level, and the operation influenced water levels as far south as Ste. Agathe. These findings allowed Manitoba Natural Resources to lift the $100,000 limit on compensation (Redekop, 1998).

Currently, property coverage by insurance is available for events such as tornadoes, windstorms, hailstorms, major rainfalls and earthquakes. Comprehensive crop insurance coverage is also offered, in part by state-run monopolies and private industry. Since many widespread natural and other disasters, such as floods and tsunamis, and in British Columbia, landslides, are not covered by insurance, and since many natural disasters frequently strike non-urban communities, the communities rely on provincial and federal assistance to recover (RSC and CAE, 1994). Processes involved with financial compensation are often time-consuming due to resource constraints, location and distance constraints of disaster-affected areas, resulting in prolonged suffering of evacuees and victims and reducing their resiliency.

Varied spatial distribution of non-urban communities makes them prone to different types of risks and hazards. The spatial distribution of the non-urban population is varied, concentrated along the St. Lawrence River Valley and sparsely distributed along the coastal regions of the maritime provinces and British Columbia, the Prairies of the west, and northern resource and First Nations communities. In a detailed research on population distribution and its dynamics in Canada, Roderic Beaujot (1991) suggests that geography plays an important role in regional settlement, economy and livelihood, and uniqueness. The populated areas in the country involve a long, narrow band along the border with the United States. Even at that band, it is interrupted twice, once by the Canadian Shield and once by the Rocky Mountains.

The susceptibility of non-urban communities to natural and human-induced risks and hazards is not similar in terms of their genesis, types and communities' preparedness and response systems. Out of a total 6.4 million non-urban population in the country as a whole, 3.3 million live in the rural areas of only two provinces, namely Ontario and Quebec. Most of them reside along the St. Lawrence Valley. Table 1.2 indicates that Ontario has 28.1% and Quebec has 24.2 % of the total non-urban population of Canada (Statistics Canada, 1999). A survey of various types of natural hazards during the last decade reveals and verifies the specific vulnerability of different regions of the country to these threats. It may be worth citing some examples from the Canadian National Report and recent experiences to illustrate this assertion concerning regional variation in all hazards and risks.

As a northern country, Canada is characterized by marked variations between seasons, leading to numerous potential hazards. Winter storms usually generate heavy precipitation, severe cold conditions, strong winds and blowing snow in all regions. In brief, intense systems strike the Atlantic Coast, severe blizzards frequently pass over the Prairies and Arctic, strong storms strike

the British Columbia coast, spring storms dump heavy snow over Alberta, and lake-effect storms produce heavy snow in many regions, including in the Great Lake basin. An example of the catastrophic winter weather disasters was the January 1998 Ice Storm that affected the corridor extending from Kingston to Ottawa to Montréal to the Montérégie area south and east of Montréal, and on into New Brunswick. Five days of freezing rain, in the range of between 50 and 100 mm, caused massive power outages. At the peak of the disaster, more than 200 Quebec communities declared a disaster; 1.3 million residences affecting 3.2 million people were without power; 57 Ontario communities declared a disaster; and in Eastern Ontario, 1.5 million people were without power (EPC, 1999).

Table 1.2 Distribution of Non-Urban Population by Provinces and Territories
[1996 Census (100% Counted Data)].

Province/Territory	Population	%
Canada	6,385551	100.0
Newfoundland	237,973	3.7
Prince Edward Island	75,097	1.2
Nova Scotia	411,424	6.4
New Brunswick	377,712	5.9
Quebec	1,541,170	24.2
Ontario	1,794,832	28.1
Manitoba	313,835	4.9
Saskatchewan	363,059	5.7
Alberta	554,011	8.7
British Columbia	667,112	10.4
Yukon Territory	12,319	0.2
Northwest Territories	37,007	0.6

Source: Statistics Canada, 1996

Significant losses of urban properties due to hailstorms are frequent in the western part of the Prairies and in the foothills of the Rocky Mountains. Some examples are : the storm of September 7, 1991 in Calgary, Alberta, costing in the order of $450 million; the July 28, 1981 hailstorm in the same city caused more than $150 million in damage; and the May 25, 1978 hailstorm in Winnipeg, Manitoba, which was also accompanied by severe winds and caused $20 million in damage. In addition to these losses, millions of dollars of crops are also lost due to heavy, localized hailstorms. The common hail area is in the continental interior, and particularly in central Alberta's "hailstorm alley", to the lee of the Rockies and the southernmost part of Saskatchewan, east of Cypress Hills.

Similarly, the extended region from the foothills of Alberta to the Maritime provinces is vulnerable to tornadoes. In recent decades, the worst tornado disaster occurred in Edmonton, Alberta, on July 31, 1987 causing 27 deaths and $350 million in damage, of which $250 million was insured. In the case of severe tornadoes (F3 or stronger), the return period is five years for southwestern Ontario, implying that a disastrous tornado can be expected in the populated area of the province once every five years.

Drought hazard in Canada is also region-specific, as most locations west and east of the Prairies receive an annual precipitation in excess of 600 mm. In the Palliser Triangle, which extends from southern Alberta through Saskatchewan and into the southwest corner of Manitoba, drought has been a historically persistent and pervasive problem for farming communities. Throughout the late 1970s and 1980s, severe droughts struck the Prairies, and consequently, in 1979, total production of principal field crops in western Canada declined 15%. In 1983, production declined by 7.5% and in 1984 by 9.6%. In 1988 it declined by 24% from 1987 levels and resulted in a direct production loss of $1.8 billion. Losses in net farm incomes were 76% in Saskatchewan and 60% in Manitoba compared to 1987.
Most Canadian populated areas are at risk of flooding, and widespread floods could devastate non-urban communities by their sheer intensity and prolonged duration. The most recent such devastating flood was the 1997 Red River Valley Flood, when water rose to the highest level it had been in nearly 135 years, while the cost of flood responses, damages and associated expenditures climbed to more than $500 million (Farlinger et al. 1998). Altogether, more than 19,000 people were evacuated from rural Manitoba and 8,900 from the City of Winnipeg. In terms of loss of human lives, the most catastrophic flood was the one associated with Hurricane Hazel in 1954, which resulted in 79 deaths. Similarly, a rainstorm-led flood at Slave Lake, Alberta on July 6, 1988, resulted in damages of about $31 million.

Both specific and cumulative risk assessments of non-urban communities may help increase awareness and participation in prevention and mitigation measures. Besides their vulnerability to specific types of hazards, the non-urban settings of population settlement are also subject to cumulative hazards vulnerability. For instance, from March 28 to April 15, 1998, many rural communities in Ontario and Quebec were affected by spring flooding. The resource base of many of these communities was also severely damaged by the January 1998 Ice Storm (EPC, 1999). Similarly, many of the Prairie communities, particularly those located in river valleys and along floodplains, are subject to cumulative natural and other hazards which include floods, droughts, hailstorms, blizzards, tornadoes, road-spills, derailment of railway locomotives and power outages. Risk assessments of smaller communities from a scientific and policy perspective, which involves both the physical properties of extreme and disastrous events and an evaluation of the vulnerability of life and property to hazard-related losses, are incomplete. Although independent and isolated surveys and research programs have made significant contributions to study frequency, severity, and location of hazards in recent decades (RSC and CAE, 1994), a comprehensive and cumulative risk assessment information inventory has not yet been attempted. A comparable approach can be seen in the Canadian Land Inventory program.

Underestimation of low frequency events and hazards is common in non-urban communities. Due partly to the lack of the above-stated knowledge and information inventory on potential risk and all types of hazards, most non-urban communities are either unaware or have a poor understanding of their cumulative and specific risks. The level of denial of the risks is higher in the case of low frequency events as the dwellers have little or no experience of such events. A “cognitive dissonance” process is at work here, with people rationalizing that “it never happened here, and hence it will never occur here”. Because of such perceptual and behavioural characteristics, many community leaders, such as Reeves and Mayors, had difficulty mobilizing the councillors and residents to take precautionary measures to cope with the impending 1997 Red River Flood (Martens, 1998). Similarly, the authorities failed to act on

warnings that the village school of Kangiqsualujjuaq was situated at the bottom of a mountainside where avalanches were highly probable (International Committee of the Fourth International, 1999). Most rural, non-urban communities are therefore ill-prepared, poorly equipped and have inadequate numbers of trained and organized personnel to prevent and mitigate hazard events and loss.

Economic resources, equipment supply and service, trained and organized personnel are inadequate in non-urban communities. As stated earlier, due to lack of awareness, initiative and economic resources, many non-urban communities do not possess the necessary logistics and equipment to cope with disasters and emergencies. Such a state of poor preparedness often leads to undesirable human and property loss. For instance, the Kangiqsualujjuaq village was not prepared with an ambulance to respond to emergencies, and it was suggested that "several of the nine who perished in the avalanche would have survived had they been transported by ambulance" (International Committee of the Fourth International, 1999). The local governments in municipalities and territories mostly rely on volunteers, and thereby lack the required training and upgrading of emergency service workers. In the 1998 avalanche disaster in Kangiqsualujjuaq, the village had two nurses and one doctor. Some of the residents have had medical training, but more qualified and trained personnel could have addressed the emergency more effectively (Nunavik.Net, 1999). A bibliography is attached as Appendix A.

3.0 Scoping of Non-Urban All Hazards Risk Reduction Issues

The purpose of this project was to conduct exploratory research, collecting preliminary information from key stakeholders across the country to lay a foundation for future descriptive and representative research. The scope of this research project was restricted to identifying and validating emergency preparedness issues with rural communities.

3.1 Initial Issue Identification

The initial identification of issues began with a group of about 20 stakeholders involved in emergency preparedness. Stakeholders attending the first annual conference of the Canadian Emergency Preparedness Association, Manitoba Chapter, were invited to participate in a facilitated discussion of non-urban emergency management issues. Participants were asked two sets of questions, with the first set related to the identification of non-urban risks and hazards:

- What types of serious hazards (both natural and technological or non-natural) usually affect non-urban communities?
- What are non-urban communities' other risks, related to both natural and technological hazards?

The questions in the second set were:

- What are the main mitigation issues for non-urban communities?
- What are the main emergency preparedness issues for non-urban communities?

In response to the questions on mitigation and preparedness, participants from the conference identified a number of issues. These issues were used as the benchmark for the development of a questionnaire that was designed for administration to non-urban communities across Canada. Respondents were asked to identify real or perceived hazards that threatened their communities, and they were asked to validate the issues identified in Winnipeg, as well as identify additional issues that faced their communities.

3.2 Validating Issues: Research Approach

Provincial and territorial associations involved with municipal or emergency preparedness issues were asked to provide researchers with the survey sampling frame. They were asked to suggest a list of six communities using the criteria below. When some provinces or territories did not respond, researchers identified up to six non-urban communities using the following three selection criteria:

- Size (population of less than 1,000 or density of less than 400 per square kilometre);
- Geographic location; and
- Economic function.

The questionnaire was administered primarily via fax, with a small number of questionnaires electronically mailed to community representatives. A cover letter accompanied the questionnaire to assure respondents of the confidentiality of their responses. Researchers conducted a large number of follow-up phone calls to individuals who had not returned their completed questionnaire by the due date. In addition, the deadline for accepting completed surveys was extended to allow some respondents sufficient time to return their responses. The survey instrument and cover letter are attached as Appendix B.

The pre-test of the questionnaire was conducted with six individuals involved in emergency preparedness in Manitoba, as selected from the list of contacts developed from the Winnipeg session. The feedback from those respondents was used to improve the questionnaire. There were multiple responses to the question that asked for the community's economic function or base, typically defined by Statistics Canada as the "primary industry". Also, the number of responses vary from question to question (i.e., the sample may not equal 37, the total number of completed surveys), as there were no responses to several questions.

3.3 Research Findings

A total of 91 surveys were administered to selected non-urban communities. Of that number, 37 completed surveys were returned. An additional four respondents declined to participate in the survey. The total number of 43 of 91 surveys represents a return rate of 47.3%. The response rate (37 completed surveys) is 42.9%. The findings presented below include responses from the 37 completed questionnaires.

3.4 Community Characteristics

In order to fit within the taxonomy of rural communities described previously, the population of a community was required to be less than 1,000 or have a population density of less than 400 per square kilometre. Although in the questionnaire communities were asked to indicate their current population, researchers decided to use 1996 Census data to ensure that the population count was consistent with the population density, i.e., the same year was used for both figures. Communities reported populations in all ranges (<250, 251-500, 501-1,000, 1,000+). More than 61% of responding communities had a population size of more than 500. Over one-third cited a population range of 251-500. The population size self-reported by responding communities is presented in the table that follows.

Table 1.3 Population Size of Responding Communities

Population Range	Frequency	Percentage
Less than 50	0	0
51-100	1	2.7
101-250	0	0
251-500	13	35.1
501-750	3	8.1
751-1,000	10	27.0
More than 1,000	9	24.3
No response	1	2.8

Note: Percentages are rounded to the nearest tenth.

Distance of sample communities from an urban centre (with more than 1,000 population) varied considerably. Approximately 24% of them are located within 100 kilometres of the closest urban centre, while 13.5 % of responding communities reported that the closest urban centre was more than 300 kilometres distant. Reported distances from the closest urban centre are provided below in Table 1.4.

Table 1.4 Distance from the Closest Urban Centre

Distance in kilometres	Frequency	Percentage
Less than 100	9	24.3
101-200	5	13.5
201-300	4	10.8
More than 300	5	13.5
Not applicable or adjoining	2	5.4
No response	12	32.4

Note: Percentages are rounded to the nearest tenth.

Communities were asked about another identifier – economic function or "primary industry". One community did not respond to this question, while many other communities identified three or four economic functions (multiple response). Agriculture was cited 41.7% of the time as the economic function, while both forestry and tourism were each cited 22.2%. The following table provides information on responding communities and their economic function(s).

Table 1.5 Economic Function (Multiple Response)

Economic Function	Frequency	Percent N=36
Agriculture	15	41.7
Forestry	8	22.2
Tourism	8	22.2
Fishing/Hunting	7	19.4
Government	5	13.9
Mining	4	11.1
Energy	2	5.6
Manufacturing	2	5.6
Other	3	8.3

Note: Percentages are rounded to the nearest tenth.

Community characteristics—size, economic function and geographic location—are summarized in tabular form in Appendix C.

3.5 Hazard Identification

Communities identified hazards organized in five categories: natural/environmental, industrial/technological, transportation, social and public health. Responding communities most frequently cited hazards in the natural/environmental category. Hazards in the industrial/technological category were also frequently cited. Power failures were the most frequently cited of all hazards in all categories. Transportation hazards, such as those involving recreational and road vehicles, received a large number of citations, followed by social and public health hazards, in that order. A tabular representation of hazard by category can be found in Appendix D.

From the data collected (see Table 1.6), four generalizations about communities' perceptions of hazards can be made. They are:

- Power or electrical failure is a common concern among the communities surveyed. Therefore, it is considered a risk to all communities.
- A good proportion of agriculture and forestry-based communities perceive spill from transportation of hazardous materials to be a risk to their communities.
- Agricultural communities expressed concern about severe weather-related hazards, such as flooding, blizzards or tornadoes.
- Threat of forest fire is not confined to forestry-based communities.
- Flooding appears to be location specific.

Table 1.6 Hazards by Economic Function of Community, Frequency and Percent.

Economic Function	Natural / Environmental Hazards		Industrial / Technological Hazards		Transportation Hazards		Social Hazards		Public Health Hazards		Total # of Responses
	#	%	#	%	#	%	#	%	#	%	
Forestry	17	44	10	26	9	23	0		3	8	39
Fishing / Hunting	14	41	11	32	5	15	1	3	3	9	34
Agriculture	31	42	21	28	16	22	3	4	3	4	74
Energy	3	30	5	50	2	20	0		0		10
Tourism	14	38	10	27	8	22	1	3	4	11	37
Mining	8	40	4	20	7	40	0		1	1	20
Government	9	41	6	27	5	23	1	5	1	5	22
Manufacturing	3	60	1	20	0		0		1	20	5
Other											
Construction	3	60	0		2	40	0		0		5
Service	1	20	3	60	1	20	0		0		5
Port of Entry	1	20	0		4	80	0		0		5
Totals	104		71		59		6		16		256

Note: Numbers have been rounded.

A significant level of concern (with 40 or more percent) with natural/environmental hazards was expressed by the communities that listed any of the following as their economic foundations: forestry, fishing/hunting, agriculture, mining, government, manufacturing and

construction. Communities with an economic base of service industries (60%) reported that they are seriously concerned with technological/industrial hazards (60%). Fifty percent of communities with an energy-based economy also expressed concern with hazards in the industrial/technological category. Communities of most types of economic function indicated a high level of concern for natural/environmental hazards.

3.6 Major Issues in Emergency Preparedness

Responding communities have identified several major issues, as described below in Table 1.7.

Table 1.7 Issue Identification by Non-Urban Communities

Emergency Preparedness Issue	Yes		No		N=
	#	%	#	%	
Top Five Issues					
Reliance on volunteers for emergency personnel	34	92	3	8	37
Size of rural community	28	80	7	20	35
Lack of economic resources to cope with hazards	26	74	9	26	35
Underestimation of low frequency of events and hazards	24	67	12	33	36
Inadequately trained (experienced) or organized emergency personnel	22	59	15	41	37
Important Identified Issues					
Not well prepared to mitigate and prepare for health related emergencies	21	60	14	40	35
Lack of equipment supply and service	21	64	12	36	33
A need for assessment of risks	16	47	18	53	34
Inconsistencies between communities as to whether an emergency plan or manual was in place and kept current	14	41	20	59	34
Not well organized volunteer structure	14	39	22	61	36
Lack of communication between members	14	39	22	61	36
Lack of plan/partner with other agencies such as RCMP, utility companies, etc.	9	26	26	74	35
Additional Identified Issues					
Lack of concern by government departments (low population, remote, isolated community)	1				1
Mitigation (removal of old structures that pose a hazard)	1				1
Loss of trades people (electricians, welders, engineers, etc.)	1				1
Need public education/awareness and preparedness	1				1

Of considerable concern to non-urban communities is the reliance on volunteers for emergency personnel. In communities with a small population base, it can be difficult to find a sufficient number of trained and experienced volunteers to prepare for and handle large emergencies. One community aptly commented on the dual or multiple roles of a volunteer: "The mayor is also pumper operator, the fire chief may be an ambulance driver, the fire captain is also the ferry boat operator, while the town manager is Emergency Coordinator and firefighter."

It can also be difficult to assign a volunteer to a leadership position with a high level of responsibility. In many non-urban communities, volunteers do all the necessary work to keep plans up-to-date and to organize disaster exercises, for example. Furthermore, volunteers must indicate some level of commitment by devoting time and energy to undertake training to ensure their skills are upgraded on a regular basis.

Communities of a small population base not only have limited human resources, but they also often experience a lack of economic resources. In some communities, there is a shortage of emergency equipment, and in others that might have the equipment, there is a lack of financial capacity to keep that equipment maintained. As well, training personnel and coordinating community awareness and response at a multi-agency level place a financial strain on many communities.

3.7 Mitigation and Preparedness Actions

Communities were asked to identify their main emergency preparedness and mitigation actions. Responses were varied but fell into a number of major themes. Some communities reported that they need to conduct some work in the identification of all possible hazards. Initiative is being taken in several communities in this regard. Relatively aware and active communities have undertaken proactive programs for emergency preparedness, including the formation of a community plan, training emergency personnel and volunteers, and building organizational capacities. One community's slogan is "plan, train, practice, plan, train, practice…"

Seven communities indicated they were actively engaged in a multi-agency approach to emergency planning and preparedness, involving the local hospital, RCMP and industry. Some communities commented that they held annual table top discussion exercises and that their emergency management committees attended regular meetings. Emergency preparedness training at Arnprior assisted one community in dealing with hazards and emergencies.

However, many communities, particularly smaller ones, lack the community enthusiasm required for undertaking appropriate actions for risk reduction and preparedness for impending hazards. Size of community is a factor when a smaller rural community perceives itself as competing against a larger one for resources. One community commented that they had "one fire truck pumper and one ambulance… other than that, we fly by the seat of our pants in an emergency".

Community priorities vary considerably. It is recognized that local initiatives cannot be realized without external assistance, particularly in the area of human resource and/or emergency personnel development. Several communities attempted to link to provincial and

federal programs to cope with and/or minimize risks. A trend of mutual assistance with and between communities to efficiently use regional resources is apparent.

Overall, a trend of a reasonably high level of awareness of general risks and their associated response is registered among the responding non-urban communities. Awareness of rare events, however, is generally low. Due to the absence of a well-grounded organizational structure at the community level (i.e., mostly run by volunteer services), which is compounded by the lack of appropriate and adequate equipment, all hazards risk reduction modes and methods are not coherent in the country. However, willingness of sample communities to participate in regional and national level dialogue on pertinent issues is high, as expressed in their comments in the questionnaire.

3.8 Gaps in Emergency Preparedness and Mitigation

The main problem area identified by responding communities is that often non-urban communities cannot meet the required critical threshold to address risk reduction issues. Lack of "economies of scale" is therefore a major problem area. In addition, bias to larger urban centres is further recognized as a gap in macro-level planning. Communities identified several other gaps in emergency preparedness and mitigation:

- Lack of public education and communication hampers community level responses;
- Lack of responsible organization and necessary mobilization results in weak preparedness;
- Lack of both human and capital resources is commonly recognized;
- Public participation and informed decision making are lacking
- Long term perspective planning is necessary.

3.9 Additional Observations

Respondents were asked some questions about the community's level of activity in emergency response planning. Ninety-two percent (33 of 36) indicated that their community leaders were aware of the risks and hazards. Sixty-five percent (22 of 34) indicated that the community has an up-to-date emergency plan, and 67% (24 of 36) responded that the community is aware of and involved with the plan. Seventy-nine percent of respondents indicated that their community does not have any risk assessment/hazard analysis tools. Most respondents (91%, or 32 of 35) indicated that they wanted to continue to participate in the dialogue on rural emergency preparedness issues initiated through these project activities. The contact list is attached as Appendix F.

3.10 Lessons Learned

A number of lessons were learned throughout the process of conducting this research. It has been a challenging task to engage communities in a topic of this magnitude on a national basis. In the future, it may be easier to limit an investigation into emergency preparedness issues of non-urban communities in Canada, engaging communities of common interest, such as ones based on geographic profile or economic function, as the first step in developing a national

framework. Based on responses to the questionnaire, there is a need to further refine some questions.

Future research efforts would require that the individual responding to a survey is representing a single community (one town, one village, one rural municipality, one reserve). Of the six test questionnaires administered, four were completed by individuals who represented a single community, be it a town, reserve or rural municipality. The data from these four are included in the aggregate data and the research findings. However, two of the questionnaires were completed by someone who represented a number of communities within a larger organization, and it was decided that data could not reasonably be included in the aggregate results.

Population density figures for the responding communities were obtained from Census Canada 1996. It was found in the survey findings that one community surpassed the population size of 1,000 required to qualify as a rural community. It could not be confirmed that the population size of over 1,000 was the result of demographic growth since 1996 or discrepancy in statistical reporting.

In order to obtain more responses from French-language communities, a French version of the questionnaire could have been prepared. Furthermore, the questionnaire could have been prepared in a number of Aboriginal languages to elicit more response from Aboriginal communities. Finally, the scope of the research was to identify and validate emergency preparedness issues with rural communities, so the survey sample was kept small. The conclusions reached should not be considered representative of the nation as a whole.

4.0 Risk Assessment Framework

Risk assessment methodology is succinctly outlined in *Risk Assessment of Environmental Hazards* by Robert Kates. He suggests that it has three distinct parts: recognition of the hazard (hazard identification), measurement of its threat (risk estimation), and understanding the social meaning of these hazards (social evaluation).

4.1 Hazard Identification

Hazard identification inquires what the threats are to the community. Hazard identification uses past experience and existing knowledge to determine what constitutes a future threat. The methodology includes an examination of what hazards have occurred, where they have occurred, what kind of damage resulted, and the magnitude of that damage. Steps in hazard identification include developing a community profile that examines key areas that are susceptible, such as floodplains or poorly constructed housing. It also identifies industries, community facilities, distribution of the population, transportation network, geography and climate that may be contributing factors.

4.2 Risk Estimation

Risk estimation involves the likelihood of the occurrence of an event, as well as the nature of the consequence. It includes intuition of the locals, in which the local community members

may be able to predict when another event may occur, based on past experience. Risk estimation also involves quantification through probability estimates.

4.3 Social Evaluation

This part of risk assessment examines the resources of the community. It assesses what steps the community must take in order to deal with the hazard. It asks how the community is prepared, and it asks what resources are available to cope. This section involves looking at both logistics and infrastructure, namely what and who the resources are. It also involves benefit-risk and cost-benefit analyses.

5.0 A Resource Kit for Non-Urban Communities

The risk assessment model discussed above was used as a guide for developing a community resource kit for non-urban communities. The three steps outlined in the model were expanded to include additional processes in risk assessment. The community resource kit involves a six-step process.

Hazard Identification
- Identifying potential hazards
- Mapping the community and hazards

Risk Estimation
- Consulting the community through conducting surveys
- Estimating risks

Social Evaluation
- Assessing community resources and response capacity
- Developing a community hazard profile

The purpose of the community resource kit is to help guide non-urban communities through the process of identifying hazards, assessing risks, and determining risk management strategies. This tool is intended to be a "flexible framework", and additional information may be added as necessary. The community resource kit contains a series of worksheets, a community survey and a framework for a consultative process that could be used by non-urban communities to address emergency preparedness and mitigation issues. The community resource kit is designed to engage both community leaders and community citizens in the planning process. The steps in the consultative process are explained in a workbook intended to assist community leaders in implementing the framework. The community resource kit and workbook are attached as Appendix G.

6.0 Next Steps

From the activities of this research project, next steps could include a piloting of the community resource kit with a selected number of rural communities to test its usefulness. Communities may be selected on the basis of common geographical characteristics, or a common economic base.

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Appendix B - Questionnaire and Cover Letter

Issues Concerning Risk Reduction to All Hazards in Canadian Non-Urban Communities

1. What is the population of your community?

   Less than 50 _____
   51 – 100 _____
   101 – 250 _____
   251 – 500 _____
   501 – 750 _____
   751 – 1,000 _____
   1,000 or over _____

2. Do you consider your community or the community with which you work to be a remote community? If yes, how far is your community from the closest urban centre? [Urban = 1,000 plus]

   _____km

3. What is the primary industry of your community or the communities you work with?
   - ☐ Forestry
   - ☐ Mining
   - ☐ Agriculture
   - ☐ Fishing
   - ☐ Other (please specify) _____

4. What role do you play in emergency management? _____

5. Which of the following hazards affect or could affect your community? (*A hazard is defined as a source of danger, a chance event or accident.*)

Natural/Environmental Hazards

☐ Avalanches	☐ Wild fires	☐ Blizzards
☐ Crop disasters	☐ Heat wave	☐ Droughts
☐ Flooding	☐ Ice storms	☐ High winds
☐ Fog	☐ Sea and lake surges	☐ Landslides
☐ Hail storms	☐ Tidal waves (tsunami)	☐ Severe thunderstorms
☐ Hurricanes	☐ Cold wave	☐ Tornadoes
	☐ Earthquakes	

Industrial/Technological Hazards

- ☐ Dam failure
- ☐ Explosions
- ☐ Hazardous chemicals
- ☐ Gas line breaks
- ☐ Mine/Cave-in
- ☐ Nuclear reactor accidents
- ☐ Power failures
- ☐ Sabotage (deliberate acts of destruction)
- ☐ Sewer breaks
- ☐ Structural collapse
- ☐ Water line breaks
- ☐ Telecommunication breakdown
- ☐ Fuel storage depots
- ☐ Computer system failures

Transportation Hazards / Accidents

- ☐ Rail
- ☐ Ship
- ☐ Ice jams in shipping lanes
- ☐ Road/Vehicle
- ☐ Transportation of hazardous material
- ☐ Boating accidents (including Seadoos)
- ☐ School bus
- ☐ Recreational vehicles (including snowmobiles)
- ☐ Closure of critical transportation routes
- ☐ Air (large/small)

Social Hazards

- ☐ Bombs and bomb threats
- ☐ Riots
- ☐ Arson
- ☐ Strikes
- ☐ Civil disorders
- ☐ Family conflict
- ☐ Hostage taking
- ☐ Political dissension
- ☐ Vandalism
- ☐ Missing persons

Public Health Hazards

- ☐ Aquatic disease epidemics
- ☐ Human epidemics
- ☐ Animal disease epidemics
- ☐ Massive food poisoning
- ☐ Plant/Crop disease epidemics
- ☐ Water contamination
- ☐ Food shortage

Additional Hazards

_____ _____ _____

_____ _____ _____

6. What do you feel are the top 5 hazards (natural, non-natural or technological) that affect your community or the communities that you work with?

1. _____
2. _____
3. _____
4. _____
5. _____

7. Are community leaders aware of the risks/hazards? Yes ☐ No ☐

8. Does your community have an up-to-date emergency plan? Yes ☐ No ☐

9. Is the community aware of and involved with the plan? (e.g., active committee) Yes ☐ No ☐

10. The following are some of the issues related to rural emergency preparedness that have been identified. Are these issues valid in your community?

Underestimation of low frequency of events and hazards	Yes ☐	No ☐
Lack of economic resources to cope with hazards	Yes ☐	No ☐
Lack of equipment supply and service	Yes ☐	No ☐
Inadequately trained or organized emergency personnel	Yes ☐	No ☐
Not well prepared to mitigate and prepare for health related emergencies (*Mitigation is defined as any deliberate action to minimize disaster impact and losses.*)	Yes ☐	No ☐
Reliance on volunteers for emergency personnel	Yes ☐	No ☐
Not well organized volunteer structure	Yes ☐	No ☐
Lack of communication between members	Yes ☐	No ☐
A need for assessment of risks	Yes ☐	No ☐
Size of rural community (Smaller communities lose out to larger communities in terms of resources and capacity to mitigate and prepare for disaster.)	Yes ☐	No ☐
Lack of plan/partner with other agencies such as RCMP, utility companies, etc.	Yes ☐	No ☐
Inconsistencies between communities as to whether an emergency plan or manual was in place and kept current	Yes ☐	No ☐

Are there any other issues?

_____

_____

11. What are the main actions that your community has taken to minimize future disaster impact and losses?

_____

_____

_____

_____

_____

_____

12. What do you feel are the main gaps in emergency preparation and mitigation in your community?

_____

_____

_____

_____

_____

_____

13. Does your community/organization have any risk assessment/hazard analysis tools? Yes ☐ No ☐

    If yes, would you be willing to share it with us?____

14. Do you want to continue to participate in this dialogue on rural and remote emergency preparedness issues? Yes ☐ No ☐

WESTARC

March 2, 2000

Dear Community Representative:

Brandon University is currently working on a research project related to emergency management in non-urban communities. The primary objective of this project is to develop a tool that non-urban communities could use to identify risks and risk management strategies for all hazards related to their communities.

We have begun the initial identification of issues related to risk reduction in non-urban communities. We are now in the process of validating these issues and identifying other issues that may have been missed. Our goal is to start a dialogue with members of rural communities and individuals who work with emergency issues in rural communities.

Your community has been selected to take part in this project. Enclosed is a copy of the survey. It will ask you questions about:

- The characteristics of your community;
- Potential hazards in your community; and
- Issues related to rural emergency preparedness.

Completing the survey should take 10 to 15 minutes of your time. Your responses are confidential, and only aggregate results will be reported.

In order to ensure that rural and remote communities' views are represented, we ask that you or an appropriate representative of your community complete the questionnaire and return it via **fax at (204) 729-9090**. We would appreciate receiving your completed questionnaire no later than Monday, March 13, 2000.

If you have any questions or concerns about the survey, please feel free to contact Beth Peers at (204) 571-8551 or Elicia Funk at (204) 571-8556. We thank you for taking part in this important project.

Sincerely,

Beth Peers

WESTARC Group Inc.
Jeff Umphrey Centre • Brandon University • Brandon MB R7A 6A9
Phone (204) 571-8550 • Fax (204) 729-9090
E-mail westarc@brandonu.ca
Website www.brandonu.ca/westarc

Appendix C - Community Matrix

Community	Size			Economic Function	Geographic Location	
	Population		Density (96 Census)		Province	Distance from Urban Centre
	Self-reported	96 Census				
Fraser Lake (Nadleh Whuten)	1,000+	1302	344	Forestry, Mining	British Columbia	160 km
Keremeos	1,000+	933	455	Agriculture	British Columbia	50 km
Radium Hot Springs	251-500	395	69	Forestry, Tourism	British Columbia	300 km
Nain	1,000+	1069	12	Fishing, Government	Newfoundland	402 km
Ramea	501-1,000	1224	658	Fishing	Newfoundland	17 km
Trinity	251-500		23	Tourism, Manufacturing	Ontario	
Wha Ti	251-500	392	10	Government	Northwest Territories	
Norman Wells	501-1,000	627	5	Energy	Northwest Territories	700 km
Mulgrave	501-1,000	935	54	Fishing	Nova Scotia	
Doaktown	501-1,000		37	Forestry, Tourism	New Brunswick	100
Mount Stewart	251-500	315	380	Agriculture, Fishing	Prince Edward Island	25 km
Georgetown	501-1,000	716	431	Forestry, Fishing, Manufacturing	Prince Edward Island	15 km
Igloolik	1,000+	936	9	Government	Nunavut	1,000+ km
Clyde River	501-1,000	554	35	Fishing/Hunting	Nunavut	1130 km
Carmacks	251-500	349	19	Forestry, Mining, Tourism, Government	Yukon	180 km
Pelly Crossing (Selkirk First Nation)	251-500	216	6	Forestry, Mining, Government, Construction	Yukon	300 km
Eastend	501-1,000	622	245	Agriculture, Tourism	Saskatchewan	34 km
Saltcoats	501-1,000	545	404	Agriculture	Saskatchewan	

Community	Size			Economic Function	Geographic Location	
	Population		Density (96 Census)		Province	Distance from Urban Centre
	Self-reported	96 Census				
Leroy	251-500	456	439	Agriculture	Saskatchewan	
Spiritwood	501-1,000	973	356	Agriculture, Forestry	Saskatchewan	
Brome	251-500	290	25	**No response**	Quebec	
Irma	251-500	442	381	Agriculture, Energy	Alberta	
Glendon	251-500	403	169	Agriculture	Alberta	46 km
Coutts	251-500	355	291	Agriculture, Port of Entry	Alberta	100 km
Barry's Bay	1,000+	1088	369	Forestry, Tourism	Ontario	
Merrickville-Wolford	1,000+	989	244	Tourism	Ontario	
Winkler	No response	6397	392	Agriculture	Manitoba	
RM Rhineland (including Town of Altona)	1,000+	4145	5 (RM)	Agriculture	Manitoba	Adjoining
Bissett	251-500	N/A	N/A	Forestry, Mining, Tourism	Manitoba	250 km
Little Black River First Nation	501-1,000	N/A	N/A	Forestry, Manufacturing	Manitoba	35-40 km
LGD Pinawa	1,000+	1806	15	Research (Service)	Manitoba	
Pine Dock	<250	N/A	N/A	Fishing	Manitoba	250 km
Shoal Lake (Town and RM)	1,000+	1487	3	Agriculture	Manitoba	50 km
RM Victoria	251-500	1405	2	Agriculture	Manitoba	
Churchill (Reserve and RM)	1,000+	1370	26	Agriculture, Tourism	Manitoba	400 km
Winnipeg Beach	501-1,000	641	334	Tourism	Manitoba	
RM Edward	501-1,000	789	1	Agriculture	Manitoba	43

Appendix D - Hazards by Classification

Hazards by Classification

Natural/Environmental		*Industrial/Technological*		*Transportation*	
31	Blizzards	37	Power failures	30	Recreational vehicles
31	High winds	28	Water line breaks	30	Road/Vehicle
30	Ice storms	28	Sewer breaks	26	School bus
24	Severe thunderstorms	26	Telecommunication breakdown	25	Transportation of hazardous material
22	Flooding	21	Hazardous chemicals	23	Closure of critical transportation routes
22	Cold wave	17	Fuel storage depots	20	Boating accidents
22	Wild fires	17	Computer system failure	19	Air (large/small)
21	Hail storms	15	Gas line breaks	17	Rail
17	Fog	14	Explosions	7	Ship
16	Heat wave	13	Sabotage	4	Ice jams in shipping lanes
16	Tornadoes	10	Structural collapse		
14	Droughts	7	Dam failure		
12	Crop disasters	1	Nuclear reactor accidents		
9	Earthquakes	1	Mine/cave-in		
7	Sea and lake surges				
4	Landslides				
4	Hurricanes				
3	Avalanches				
2	Tidal waves (tsunami)				
Social		**Public Health**		**Other**	
30	Missing persons	31	Water contamination	1	UFO landing
29	Family conflict	19	Animal disease epidemics		
28	Vandalism	19	Human epidemics		
23	Arson	13	Plant/Crop disease epidemics		
10	Strikes	12	Massive food poisoning		
8	Hostage taking	10	Food shortage		
8	Bombs and bomb threats	9	Aquatic disease epidemics		
3	Political dissension	1	Pesticide spraying		
2	Civil disorders				
2	Riots				
0	Terrorism				
0	Sabotage				

Appendix E - Hazards by Economic Function of Community

Economic Function	Community 1	Community 2	Community 3	Community 4	Community 5	Community 6
Forestry	• Railway accident • Highway transport accident • Severe fall weather • Hazardous chemicals • Wild fires	• Wild fire • Hazardous material spills • Flood • Explosion • Power failure	• Winter power outage • Flooding • Wild fires • Hazardous materials spill in community boundaries • Earthquake	• Wildfire • Tour bus highway accidents or school bus • Truck accident on highway with hazardous goods, being transported to mine sites • Cold wave with power failure • Earthquake or incident with mass casualties	• Fires • Drought • Power Failure • Water/Sewer Breaks	• Industrial – mining, possible cave-in • Water – float plane, boating accidents • Road – gravel road, highway accidents • Power failures due to forest fires, ice storms, blizzards • Drinking water contamination
	Community 7	**Community 8**				
	• Forest Fire • Health epidemic • Gas or Propane explosion • Severe thunderstorm – tornado • Ice storms – blizzards	• Water Contamination • Fire • Chemical spill on highway (hazardous wastes, etc.) • Ice storms (weather-related problems) • Explosions				
Energy	**Community 1**	**Community 2**				
	• Oil and Gas • Loss of heat and power • Forest fire • Air emergency • Cold	• Electrical failure • Road/Rail accidents • Gas line breaks • Water line breaks • Fire				

Economic Function	Community 1	Community 2	Community 3	Community 4	Community 5	Community 6
Agriculture	• Flooding • Dangerous goods in transit • Forest fires • Landslide/avalanche • Blizzard / massive snowstorm	• Global warming, i.e. sea level effects • Removal of forest for blueberry production, potato farms • Pesticide effects on ground water • Pesticide effects on fish, streams • Erosion of farmland, silt in streams, rivers	• Flooding • Crop disasters / Drought • Missing persons • Road / Vehicle accidents • Power failure	• Fire • Water breaks • Chemical spills • Power failures • Sewer breakage	• Weather-related disasters • Power/gas failure • Public health issues • Road hazards	• Fires • Drought • Power failure • Water / Sewer breaks
	Community 7	**Community 8**	**Community 9**	**Community 10**	**Community 11**	**Community 12**
	• Electrical failure • Road/Rail accidents • Gas line breaks • Water line breaks • Fire	• Fuel transportation • Fuel storage depots • Air – surrounding community transportation • Power failures • Bombing of Cold Lake Air Base	• Port of Entry – main trucking/rail exchange with USA • Trains – carry all sorts of tank cars full of all types of fuel. • Trucks – carry all sorts of cargo including dynamite/other hazards • Mix of tourists/RV's in above • Bad weather area – highway ice, blizzards, etc.	• Transportation of dangerous goods Road/Rail • Tornadoes • Blizzards • Power failure • Arson	• Winter storms • Summer storms • Floods • Motor vehicle Accident with mass casualties (school bus) • Dangerous goods accident (on the road, rail or at storage facilities)	• Blizzards • Ice storms • Transportation of hazardous material • Power failures • Rail and highway accident
	Community 13	**Community 14**	**Community 15**			
	• Blizzards • Severe thunderstorms • Power failure • Water line breaks • Droughts	• Weather – cold – blizzard • Weather – cold – winds • Airplane crash • Telecommunications • Power outage	• Tornado • Ice storm • Drought • High winds • Chemical spill			

Manufacturing	**Community 1**	**Community 2**			
	• Forest fire • Health epidemic • Gas or propane explosion • Severe thunderstorm – tornado • Ice storms – blizzards	• Flooding • Ice storms • High winds • Hurricanes • Blizzards			
Mining	**Community 1**	**Community 2**	**Community 3**	**Community 4**	
	• Railway accident • Highway transport Accident • Severe fall weather • Hazardous chemicals • Wild fires	• Winter power outage • Flooding • Wild fires • Hazardous materials spill in community boundaries • Earthquake	• Wildfire • Tour bus highway accidents or school bus • Truck accident on highway with hazardous goods, being transported to mine sites • Cold wave with power failure • Earthquake or incident with mass casualties.	• Industrial – mining, possible cave-in. • Water – float plane, boating accidents • Road – gravel road, highway accidents • Power failures due to forest fires, ice storms, blizzards • Drinking water contamination	
Government	**Community 1**	**Community 2**	**Community 3**	**Community 4**	**Community 5**
	• Plane crash • Oil spill • Major industrial Explosion (propane/gas leaks at storage) • Electric power Blackout (long term) • Blizzard or massive snowstorm	• Fire • Electrical disruptions	• Blizzards • Power failures • Transportation accidents • Family conflict • Animal disease	• Winter power outage • Flooding • Wild fires • Hazardous materials spill in community boundaries • Earthquake	• Wildfire • Tour bus highway accidents or school bus • Truck accident on highway with hazardous goods, being transported to mine sites • Cold wave with power failure • Earthquake or incident with mass casualties

Service	Community 1					
	• Plane crash • Oil spill • Major industrial Explosion (propane/gas leaks at storage) • Electric power Blackout (long term) • Blizzard or massive snowstorm					
Fishing / Hunting	**Community 1**	**Community 2**	**Community 3**	**Community 4**	**Community 5**	**Community 6**
	• Plane crash • Oil spill • Major industrial explosion (propane/gas leaks at storage) • Power failure • Blizzard	• Major fire (industrial and/or residential) • Electric power failure • Ship disaster in harbour or nearby coast • Major explosion and oil/chemical spill • Major water main break	• Flooding • Forest fires • Natural gas • Oil spill • Shipping	• Global warming, i.e. sea level effects • Removal of forest for blueberry production, potato farms • Pesticide effects on ground water • Pesticide effects on fish, streams • Erosion of farmland, silt in streams, rivers	• Flooding • Ice storms • High winds • Hurricanes • Blizzards	• Blizzards • Power failure • Human epidemics • Air craft crash • Civil disorder
	Community 7					
	• Air disaster • Power outage • Forest fire • Weather					

Tourism	Community 1	Community 2	Community 3	Community 4	Community 5	Community 6
	• Anything related to schools • Water-related (recreational or natural) • Any troubles with the Seniors' House	• Weather – cold – blizzard • Weather – cold – winds • Airplane crash • Telecommunications • Power outage	• Flooding • Crop disasters / drought • Missing persons • Road/vehicle accidents • Power failure	• Ice • Snow • Tornado • Communications failure	• Industrial – mining, possible cave-in • Water – float plane, boating accidents • Road – gravel road, highway accidents • Power failures due to forest fires, ice storms, blizzards • Drinking water contamination	• Water contamination • Fire • Chemical spill on highway (hazardous wastes, etc.) • Ice storms (weather-related problems) • Explosions
	Community 7	**Community 8**				
	• Wildfire • Hazardous materials spills • Flood • Explosion • Power failure	• Winter power outage • Flooding • Wild fires • Hazardous materials spill in community boundaries • Earthquake				

Economic Function	Community 1	
Construction	• Wildfire • Tour bus highway accidents or school bus. • Truck accident on highway with hazardous goods, being transported to mine sites • Cold wave with power failure • Earthquake or incident with mass casualties	
Port of Entry	**Community 1**	
	• Port of Entry – main trucking/rail exchange with USA • Trains – carry all sorts of tank cars full of all types of fuel • Trucks – carry all sorts of cargo including dynamite/other hazards • Mix of tourists/RV's in above • Bad weather area – highway ice, blizzards, etc.	

Appendix F - Contact List

Community Contacts

The non-urban communities on this contact list indicated interest in continuing the dialogue on rural emergency preparedness issues initiated through these project activities.

Community	Contact	Mailing Address
British Columbia		
Fraser Lake		Box 430 Fraser Lake BC V0J 1S0 (250) 699-6257 (Tel) (250) 699-6469 (Fax)
Keremeos		Box 160 Keremeos BC V0X 1N0 (250) 499-2711 (Tel) (250) 499-5477 (Fax)
Newfoundland		
Nain	Vicki Williams	Box 59 Nain Labrador A0P 1L0 (709) 922-2842 (Tel) (709) 922-2295 (Fax)
Ramea	Wilfred Cutler	Box 69 Ramea NF A0M 1N0 (709) 625-2280 (Tel) (709) 625-2010 (Fax)
Northwest Territories		
Wha Ti	SAO Thomas Matus	General Delivery Wha Ti NT XOE 1P0 (867) 573-3401 (Tel) (867) 573-3018 (Fax)
Norman Wells	SAO Steve Armstrong	Box 5 Norman Wells NT X0E 0V0 (867) 587-2238 (Tel) (867) 587-2678 (Fax)
Nova Scotia		
Mulgrave	Sam Murray	Box 129 Mulgrave NS B0E 2G0 (902) 747-2243 (Tel) (902) 747-2585 (Fax)
Bridgetown	Bill Hamilton	Box 609 Bridgetown NS B0S 1C0 (902) 665-4637 (Tel) (902) 665-5011 (Fax)

Prince Edward Island		
Mount Stewart		(902) 676-2881 (Tel) (902) 676-2881 (Fax)
Georgetown		(902) 652-2924 (Tel) (902) 652-2701 (Fax)
Nunavut		
Igloolik, Hamlet of	Henry Boychuk	(867) 934-8940 (Tel) (867) 934-8757 (Fax)
Clyde River, Hamlet of	Johnathon Palluq	(867) 924-6220 (Tel) (867) 924-6293 (Fax)
Yukon		
Carmacks		(867) 863-6271 (Tel) (867) 863-6606 (Fax)
Pelly Crossing - Selkirk First Nation		(867) 537-3331 (Tel) (867) 537-3902 (Fax)
Saskatchewan		
Town of Eastend	Debbie	(306) 295-3322 (Tel) (306) 295-3571 (Fax)
Town of Saltcoats	Gilbert Courchesne	(306) 744-2352 (Tel) (306) 744-2212 (Fax)
Quebec		
Sawyerville		(819) 889-2252 (Tel) (819) 889-2252 (Fax)
Brome		(450) 243-0489 (Tel) (450) 243-1091 (Fax)
New Brunswick		
Village of Alma		(506) 887-6123 (Tel) (506) 887-6124 (Fax)
Doaktown		(506) 365-7970 (Tel) (506) 365-7111 (Fax)
Alberta		
Village of Irma		(780) 754-3665 (Tel) (780) 754-3668 (Fax)
Village of Glendon		(780) 635-3807 (Tel) (780) 635-2100 (Fax)
Village of Coutts		(403) 344-3848 (Tel) (403) 344-4360 (Fax)

Ontario		
Village of Merrickville-Wolford	Wayne T. Kirby	(613) 269-3095 (Fax)
Municipality of Temagami		(705) 569-3421 (Tel) (705) 569-2834 (Fax)
Village of Barry's Bay	Robert J. Norlock	(613) 756-2747 (Tel) (613) 756-0553 (Fax)
Manitoba		
Winkler	Henry Derksen, Fire Chief	(204) 325-4340 (Tel) (204) 325-4438 (Fax)
Town of Altona R.M. of Rhineland	Bob Stoesz, Emergency Coordinator	(204) 324-6494 (Tel)
Bissett	Susan Spinder, Councillor	(204) 277-5249 (Tel) (204) 277-5217 (Fax)
Springfield	John Holland, Reeve	(204) 853-7452 (Tel) (204) 853-7523 (Fax)
R.M. of Edward	Mallo Clark, Councillor	(204) 649-2240 (Tel)
Town of Winnipeg Beach - Public Works	Jim Chic, Superintendent	(204) 389-2698 (Tel) (204) 389-2863 (Fax)
R.M. of Piney	Murray Machet, Reeve	(204) 437-2353 (Tel) (204) 437-3045 (Fax)
Little Black River First Nation	Charlie Black, Councillor	(204) 367-4411 (Tel) (204) 367-2000 (Fax)
Hollow Water First Nation	Garf Bushie	(204) 363-7201 (Tel) (204) 363-7201 (Fax)
Pinawa - LGD	Sandy Campbell, EMO	(204) 753-8323 (Tel)
Aboriginal & Northern Affairs	Ken Vipond, E.P.O.	(204) 677-6788 (Tel)
Pine Dock	Mark Dann, Councillor	(204) 276-2084 (Tel) (204) 276-2181 (Fax)
Manitoba Conservation Natural Resource Officer	Dwayne Strate	(204) 734-3429 (Tel) (204) 734-3733 (Fax)
Grandview	Wayne Banting, EMO	(204) 546-2893 (Tel)
Town of Erickson	Vic Waddell, Councillor	(204) 636-2480 (Tel) (204) 636-2516 (Fax)

Shoal Lake	Neil Gamey, EMS Educator	(204) 365-2457 (Tel)
R.M. of Victoria	Valerie Walker, Emergency Coordinator	(204) 526-2423 (Tel) (204) 526-2028 (Fax)
Churchill	Robert Munro, Emergency Service Supervisor	(204) 675-8356 (Tel) (204) 675-2285 (Fax)
Hamiota	Ed Brether, Economic Development Board	(204) 764-2876 (Tel) (204) 764-2671 (Fax)
	Cam King, Manitoba Association of Native Fire Fighters	202-286 Smith St. Winnipeg MB R3C 1K4 (204) 949-9061 (Tel) (204) 949-0075 (Fax)

Appendix G - Community Resource Kit

Hazard Identification and Risk Assessment Workbook

Introduction

This Hazard Identification and Risk Assessment Workbook is the result of a research project entitled *Scoping Of Issues Concerning Risk Reduction To All Hazards In Canadian Non-Urban Communities.*

The purpose of the Workbook is to guide non-urban communities through the process of identifying hazards, assessing risks, and determining risk management strategies. This tool is intended to be a "flexible framework", in that participating communities are encouraged to add any other relevant information. Members of your community's emergency planning team should complete the workbook. *It is not intended to be completed by one person working alone.*

The Hazard Identification and Risk Assessment Workbook involves the following six-step process:

- Identifying potential hazards,
- Mapping the community and hazards,
- Conducting a community survey,
- Estimating risks,
- Assessing community resources and response capacity, and
- Developing a community hazard profile.

Each step has an accompanying worksheet that is designed to direct your emergency planning team through the process needed to complete the workbook.

HAZARD DEFINITIONS - NATURAL/ENVIRONMENTAL HAZARDS

Avalanche
Mass of sliding snow.

Blight/Infestation
An adverse environmental condition caused by disease, weather, or insects

Blizzard
A period of rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility.

Cold wave
Prolonged period of very low temperatures.

Drought

A water shortage caused by a deficiency of rainfall, generally lasting for an extended period of time.

Earthquake

A shaking or trembling of the crust of the earth caused by the breaking and shifting of the rock beneath the surface.

Flooding and erosion

The overflowing of rivers, streams, drains and lakes due to an excessive rainfall, rapid snowmelt or ice. The flooding and erosion of shoreline areas caused by high water levels, storms surges, or winds.

Hail storm

Condition where atmospheric water particles form into lumps of ice that fall to the earth.

Heat wave

Prolonged period of very high temperatures.

Hurricane

Large cyclonic storm accompanied by high winds, extreme rainfall, and storm surge.

Ice and sleet storms

A storm that generates sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage.

Landslides

A mass of sliding mud or rock.

Sea and lake surges

A rise in water level caused by wind or tides.

Severe thunderstorm

A storm accompanied by severe winds and lightning.

Tornadoes

An intense rotating column of wind that extends from the base of a severe thunderstorm to the ground.

Tsunami

A very large ocean wave caused by an underwater earthquake or volcano.

Wild fires

An uncontrolled fire in grasslands, brushlands, or forested areas.

HAZARD DEFINITIONS - TECHNOLOGICAL/INDUSTRIAL HAZARDS

Dam failure

The collapse or failure of an impoundment that results in downstream flooding.

Hazardous material incident (fixed site)

Hazardous material incident – Fixed site: An uncontrolled release of hazardous materials from a fixed site capable of posing a risk to life, health, safety, property or the environment.

Industrial accident: A fire, explosion, or other severe accident involving hazardous materials at an industrial facility that results in serious property damage, injury, or loss of life.

Nuclear power plant accident

An actual or potential release of radioactive material at a commercial nuclear power plant or other nuclear facility, in sufficient quantity to constitute a threat to the health and safety of the off-site population.

Structural fires or explosions

A fire, of any origin, that ignites one or more structures, causing loss of life and/or property.

Subsidence (mining)

The lowering or collapse of the land surface caused by natural or human-induced activities that erode or remove subsurface support.

Infrastructure failure

The failure of critical public or private utility infrastructure resulting in a temporary loss of essential functions and/or services.

Transportation Accidents

An incident involving passenger air, rail, highway, or water modes of travel resulting in death or injury.

Transportation of hazardous material

An uncontrolled release of hazardous materials during transport capable of posing a risk to life, health, safety, property, or the environment.

HAZARD DEFINITIONS - SOCIAL HAZARDS

Civil disturbances

A public demonstration or gathering, or a prison uprising that results in a disruption of essential functions, rioting, looting, arson, or other unlawful behaviour.

Family Conflict

An incident of domestic violence or other similar conflicts.

Terrorism/Sabotage

An intentional, unlawful use of force, violence, or subversion against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political, social, or religious objectives.

HAZARD DEFINITIONS – PUBLIC HEALTH HAZARDS

Epidemic

A widespread outbreak of contagious disease.

Worksheet 1: Identifying Hazards

Part 1

The following list of hazards has been provided to help you identify the specific hazards that may affect your community. Definitions of each hazard can be found at the back of the workbook. Check off any hazards that could possibly affect your community. Also list any additional hazards.

Natural/Environmental Hazards

[ ] Avalanche
[ ] Blight/infestation
[ ] Blizzard
[ ] Cold wave
[ ] Drought
[ ] Earthquake
[ ] Flooding
[ ] Fog
[ ] Hail storm
[ ] Heat wave
[ ] High winds
[ ] Hurricane
[ ] Ice and sleet storms
[ ] Landslides
[ ] Sea and lake surges
[ ] Severe thunderstorm
[ ] Tornadoes
[ ] Tsunami
[ ] Wild fires

Industrial/Technological Hazards

[ ] Dam failure
[ ] Hazardous material incidents (fixed site)
[ ] Land cave-in (Mining) **could also be classified under natural*
[ ] Nuclear power plant accidents
[ ] Structural collapse
[ ] Structural fires or explosions

Infrastructure failure

[ ] Computer system failure
[ ] Electric power failure
[ ] Natural gas line breaks
[ ] Sewage disposal or treatment failure
[ ] Telecommunication (telephone, microwave towers) breakdown
[ ] Water line breaks/failures

Transportation Hazards/Accidents

[ ] Air transportation accidents (including areas within flight paths of airports)
[ ] Closure of critical transportation routes
[ ] Highway/road transportation accidents (including school bus)
[ ] Rail transportation accidents
[ ] Recreational vehicle accidents (including snowmobiles)
[ ] Water transportation accidents (including Seadoos)

Transportation of hazardous materials

[ ] Rail
[ ] Pipeline
[ ] Waterway
[ ] Highway/roads
[ ] Port
[ ] Air

Social Hazards

[ ] Civil disturbances (strikes, riots, demonstrations)
[ ] Family conflict
[ ] Missing persons
[ ] Terrorism/sabotage (hostage taking, bomb threats)

Public Health Hazards

[ ] Animal disease epidemics
[ ] Food shortage
[ ] Human epidemics
[ ] Water contamination
[ ] Mass food poisoning

Additional Hazards

Include any hazards that affect or could affect your community which are not previously listed.
[ ]
[ ]
[ ]
[ ]
[ ]

Part 2

This part of the worksheet will help you to determine which of the identified hazards are significant to your community. Insert your identified hazards from part one of this worksheet into the first column and complete the following table. At this stage the information will be quite general. It will be used to help you identify which hazards to include in your community survey and which to examine in more detail.

Identified Hazard	**What is the likelihood of this hazard occurring?**	**Would there be damage or loss of property?**	**Could any person be injured or killed?**	**Do you consider this hazard to be significant?**
e.g. Avalanche	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No

Identified Hazard	**What is the likelihood of this hazard occurring?**	**Would there be damage or loss of property?**	**Could any person be killed or injured?**	**Do you consider this hazard to be significant?**
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No

Identified Hazard	What is the likelihood of this hazard occurring?	Would there be damage or loss of property?	Could any person be killed or injured?	Do you consider this hazard to be significant?
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate [ ] High	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No
	[ ] Low [ ] Moderate	[ ] Yes [ ] No	[ ] Yes [ ] No	[ ] Yes [ ] No

Worksheet 2: Mapping your Community and Hazards

A map of your community and its hazards is an excellent tool for helping to assess your community's vulnerability to hazards. Your community map should include the locations of specific hazard areas, critical facilities, and any special areas.

Specific hazard areas could include:

- flood plains,
- hazardous material sites,
- gas lines, and
- avalanche areas.

Critical facilities in your community could include:

- police stations,
- fire stations,
- hospitals,
- shelters,
- utility areas,
- schools, and
- roads and bridges.

Special areas could include areas with a large elderly population, for example.

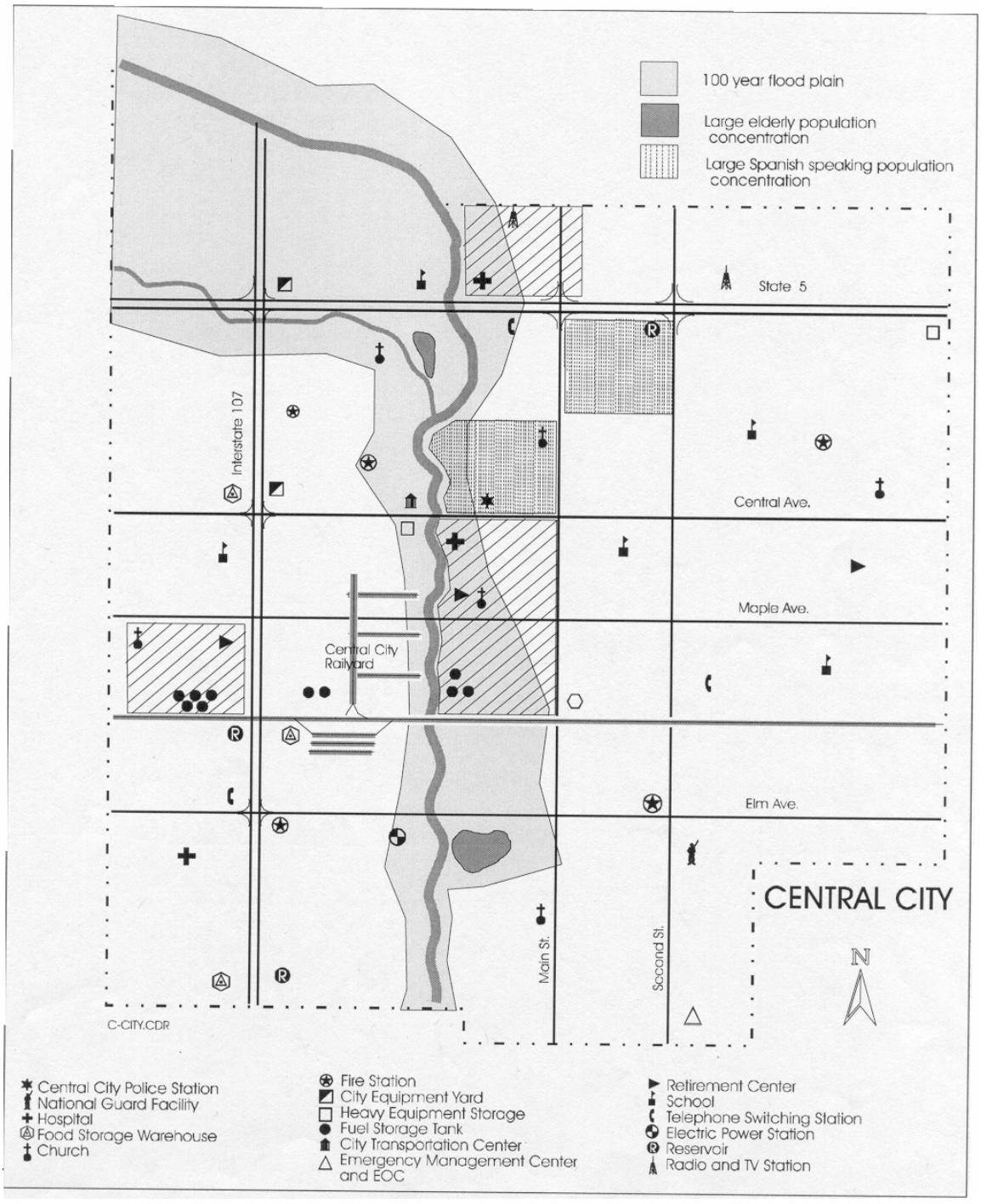
You may also want to include general land use (developed versus undeveloped) and the location of any large employers. This will help you to estimate costs related to hazards affecting each area.

How you decide to create your map will be dependent on the skills and resources available in your community. The following are some different ways to create your community hazards map:

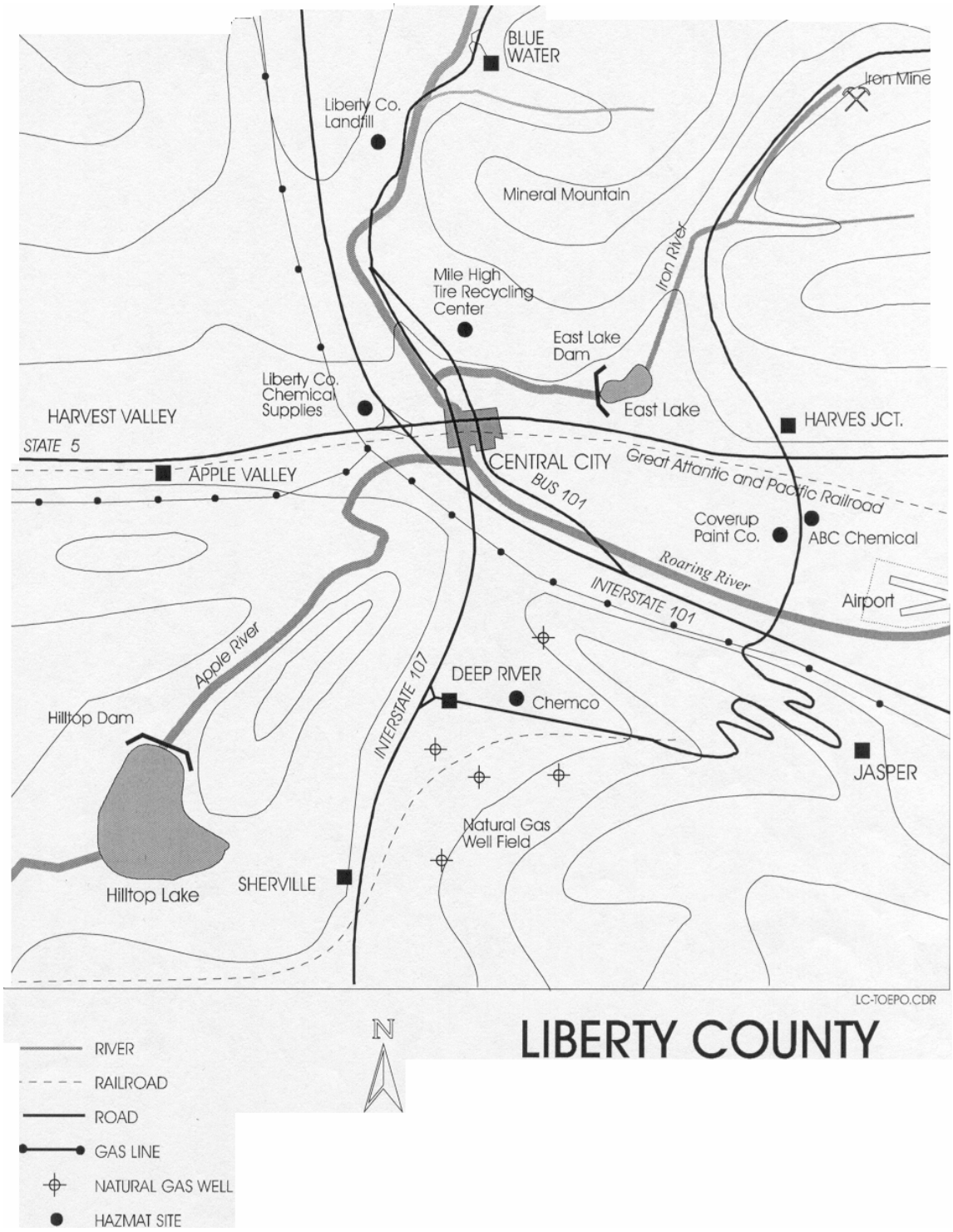
- hand draw,
- create using a computer graphics program such as Corel Draw,
- overlay hazard areas, etc. onto an existing community map, or
- use GIS mapping technology.

Two sample maps have been included to help guide you in creating your own community and hazards map.

(*name of community*) Profile Map



(*name of community*) Hazards Area Map



Maps courtesy of Michigan Department of State Police Emergency Management Division

Worksheet 3: Consulting the Community

A survey is a system for collecting information to describe, compare, or explain knowledge, attitudes, and behavior.

(Fink, *The Survey Handbook*, vol. 1, p. 1).

As hazards affect the entire community, it is important to involve as many people as possible in the emergency management process. Involving a broad cross section of interested individuals and organizations is an excellent way of collecting ideas and suggestions and ensuring that the community will view future hazard mitigation activities as relevant to their needs. Furthermore, strength in numbers will increase the chances for lasting accomplishments.

Surveys can be very effective tools. They allow you to not only collect valuable information, but also to establish a connection and encourage involvement among citizens. You can customize your survey to extract valuable opinions and ideas from a wide assortment of members of the public. You may also reach people who may not have otherwise been involved in your effort.

Part 1: Editing the sample survey

The survey included with this resource kit is intended as a sample only. You may wish to add, delete, or edit the questions to make it relevant to your community. It is important to ask questions to determine community members' perceptions of the hazards in the community, and how they perceive emergency preparedness. Here are some suggestions for editing the survey:

- Keep the questions clear, understandable and free from jargon or technical language.
- Write the questions in a conversational, friendly fashion.
- Avoid leading language.
- Pre-test the questions to satisfy the above criteria.
- Revise the questions if necessary.
- Design your survey for easy tabulation and analysis.

The survey not only serves the purpose of gathering information but it can be an excellent way of keeping the public involved. Ask survey respondents if they would like a copy of survey results, which could be summarized in a brief fact sheet. The questionnaire could be used to develop a mailing list for a newsletter or other important communication.

Part 2: Conducting your survey

A representative, unbiased sample of the target population is needed for credible results. This sample could be the entire community or be taken from a particular group. The survey can be easily modified to use with businesses or other special groups within your community. These individuals and businesses may have different perceptions of risks, but they are valuable members of your community and it is important to foster their involvement. There are many ways to conduct a survey. The sample survey included in this worksheet is designed to be mailed out to community members. It could be inserted into an existing mail out such as water

bills or property tax bills. When deciding how to conduct a survey you must consider variables such as cost, available resources and staff or volunteer time.

The following are some questions to consider before conducting your survey.

- Who will be surveyed?
- How will the surveys be sent out?
- How will the surveys be returned?
- Who will analyze the data?
- How will the data be analyzed?
- Is a computer available to assist with handling the data?
- How many people should be surveyed?

The more responses to a survey, the more accurate results will be. When considering how many people should be surveyed, it is important to consider response rates. Mail out surveys generally have a response rate of about 20%. Remember, a survey is only representative of the community or group if it is a true random sample. If this is not possible, the information can still be useful and informative and an excellent way to keep people involved and connected to the project.

Part 3: Analyzing the data

The method used to analyze the data from your community survey will depend entirely upon the style of the question. Survey questions will produce responses that are either narrative or numerical. Narrative responses (for example, question 4 in the sample survey) are stated in the respondent's own words. These responses are recorded word for word, and then analyzed to determine if there are any trends or common themes in comparison to other respondents. Numerical responses may be obtained from ranking questions, Likert scale questions (for example, question 6 in the sample survey), or checklists. These types of questions are most often analyzed using statistics or frequency tables. When analyzing data it is important to code each returned survey with a letter or number, in order to ensure confidentiality.

If you wish to consult a useful resource for additional guidance on how to conduct surveys, the volumes in *The Survey Kit* are very useful. The nine volumes help you to prepare and conduct surveys, as well as analyze the results. Surveys can be used to collect information by asking questions using a number of methods, by telephone, fax, email, in-person or by post.

Sample Community Survey

Opening paragraph or cover letter

The opening paragraph or cover letter informs the respondent about the survey. It states the purpose of the survey (in this case to determine their perceptions of hazards), ensures confidentiality, and indicates approximately how much time it will take to complete the survey. It also indicates how to return the survey, either by fax or mail (or another method, depending on your situation). You will need to provide the return address or fax number, and phone numbers of people to contact if they have any questions.

1. Based on your experience, which of the following hazards would affect you the most?

Example: (List hazards which were identified in Worksheet 1)

[ ] Blizzards
[ ] Hail storms
[ ] Cold wave
[ ] Droughts
[ ] Gas line breaks
[ ] Hazardous materials
[ ] Rail accidents
[ ] Boating Accidents
[ ] Bombs
[ ] Arson
[ ] Water Contamination

Are there any additional hazards you are concerned about?

[ ] _____
[ ] _____
[ ] _____

2. How are you notified of a hazard?

[ ] Non-governmental organization
[ ] Volunteer groups
[ ] The local Emergency Management Officer
[ ] Friends, relatives, neighbours
[ ] Radio
[ ] Television
[ ] Newspaper
[ ] Telephone
[ ] Other, please specify:_____
_____

3. In your opinion what do you consider the most critical facility or item in the aftermath of a disaster?

[ ] Water supply
[ ] Sewage
[ ] Shelters
[ ] Fire fighting capacity
[ ] Roads
[ ] Police services
[ ] Hospitals/clinics
[ ] Wharf
[ ] Electricity
[ ] Public works
[ ] Community centres
[ ] Airstrip
[ ] Fuel supply
[ ] Other, please specify:_____

4. What hazard has affected you (directly or indirectly) in your present community?

Event:_____

When:_____

How:_____

5. What did this event cost you, in terms of time and money?

_____
_____
_____

6. The following statements involve emergency preparedness. Please answer all statements as they relate to your community.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
There is an underestimation of rare events and hazards.	1	2	3	4	5
There are sufficient economic resources to cope with hazards.	1	2	3	4	5
There is sufficient emergency equipment and services.	1	2	3	4	5
There is adequately trained or organized emergency personnel.	1	2	3	4	5
My community is well prepared to handle health related emergencies.	1	2	3	4	5
My community loses out to larger communities in terms of resources and capacity to mitigate and prepare for disaster.	1	2	3	4	5
My community offers sufficient education about potential hazards.	1	2	3	4	5

7. Do you have any additional comments?

_____

_____

_____

_____

_____

8. Would you like a copy of the survey results?

[ ] Yes [ ] No

If yes, please provide the following (optional):

Name:

_____

Address:

_____

Telephone:

_____

Thank you

Include a thank you note at the end of your survey. Thank the participant for filling out the survey, and indicate that his or her responses will be used to formulate a community emergency preparedness initiative.

Worksheet 4: Estimating Risk

In this worksheet you will rank the hazards in terms of risk to your community. Insert the hazards that were identified as significant from Worksheet 1 into the first column of the table on the next page. Also include any additional hazards as identified from the community survey. Use the survey results and the community hazards map to assist you in completing this worksheet. Complete the rest of the table using the ranking scales provided below. *A high ranking indicates that you are more vulnerable to that hazard.*

Ranking Historical Occurrence

Rank the likelihood that the event will occur in your community during the next 10 years.

Ranking Number	Description
0	None
1	Poor
2	Fair
3	Good
4	Very good

Ranking Property Damage

Rank the amount of property damage that could be experienced from this hazard. (We have provided example dollar amounts, please adjust them to describe the cost of damaged property in your community.)

Ranking Number	Description	Example
0	None	<$1,000
1	Minimal	$1,000-$10,000
2	Moderate	$10,000-$50,000
3	High	$50,000-$100,000
4	Very High	>$100,000

Ranking Injury and Loss of Life

Rank the number of people who may be injured or killed as a result of this hazard.
(Insert numbers appropriate to your community. You may want to consider using percentages.)

Ranking Number	Description	Example
0	None	0
1	Minimal	1-10
2	Moderate	11-50
3	High	51-100
4	Very High	>100

The values achieved in the final column (Total) will be used to determine which hazards are top priorities. *A higher number indicates that you are more vulnerable to that risk.*

Hazard	**A. Historical Occurrence**	**B. Property Damage**	**C. Injury and Loss of Life**	**TOTAL**
	Rank the likelihood that this event will occur in your community during the next 10 years.	*Rank the amount of property damage that could be experienced from this hazard.*	*Rank the number of people who may be injured or killed as a result of this hazard.*	*Add columns (A+B+C)*
e.g. Avalanche	1	1	1	3
e.g. Blizzard	4	1	1	6

Hazard	**A. Historical Occurrence**	**B. Property Damage**	**C. Injury and Loss of Life**	**TOTAL**
	Rank the likelihood that this event will occur in your community during the next 10 years.	*Rank the amount of property damage that could be experienced from this hazard.*	*Rank the number of people who may be injured or killed as a result of this hazard.*	*Add columns (A+B+C)*

Hazard	**A. Historical Occurrence**	**B. Property Damage**	**C. Injury and Loss of Life**	**TOTAL**
	Rank the likelihood that this event will occur in your community during the next 10 years.	*Rank the amount of property damage that could be experienced from this hazard.*	*Rank the number of people who may be injured or killed as a result of this hazard.*	*Add columns (A+B+C)*

Worksheet 5: Assessing Community Resource and Response Capacity

Part 1: Community Resource Capacity

Complete the following checklists to determine what resources are currently available in your community, which resources you may need to acquire, and which you may need to develop.

Public education is listed first because it should be one of the top priorities when assessing the preparedness of a community. People need to be trained in what to do in an emergency; they need to be informed and educated. If an emergency occurs and the public does not know what steps to take, panic may arise. In that case, all the physical resources of the community will be useless, unless people know how to use them. It is imperative that community leaders take the initiative to educate and inform the public, and to develop an effective emergency management team.

Public Education

[ ] Flyers
[ ] Pamphlets
[ ] Posters
[ ] Presentations
[ ] Public meetings
[ ] Public service announcements
[ ] Public TV programs
[ ] School education programs
[ ] Senior education programs
[ ] Videos
[ ] Web sites

(The following lists are courtesy of Campbell King, The Stirling Associates, Winnipeg, MB)

Communications

[ ] Amateur radio
[ ] Cable TV
[ ] Cellular phone
[ ] Citizen's band radio
[ ] Computers
[ ] Fax machines
[ ] Fax modems
[ ] Internet access
[ ] Marine radio
[ ] Megaphone
[ ] Newspapers
[ ] Pagers
[ ] Portable AM/FM radios
[ ] Portable TVs
[ ] Pay phones
[ ] Radio stations
[ ] Satellite phones or pagers
[ ] Scanners
[ ] TV stations
[ ] VHF radios

Facilities

[ ] Animal shelters
[ ] Arena
[ ] Band hall
[ ] Banquet hall
[ ] Bed and Breakfast
[ ] Boats/Ships
[ ] Café
[ ] Camping facilities
[ ] Camping grounds
[ ] Churches
[ ] Community hall
[ ] Cottages
[ ] Curling rink
[ ] Day Care centres
[ ] Detention cells/Prisons
[ ] First aid stations
[ ] Hotels
[ ] Institutions
[ ] Meeting halls
[ ] Military facilities
[ ] Mobile canteen
[ ] Mobile homes/Trailers
[ ] Motels
[ ] Parking garages
[ ] Private residential schools
[ ] Railway sleeper cars
[ ] Recreation centre
[ ] Recreation facilities
[ ] Refrigeration facilities
[ ] Restaurants
[ ] Rinks
[ ] Schools
[ ] Seniors' residences
[ ] Sewage treatment plant
[ ] Sheltered workshop
[ ] Shopping complex
[ ] Special care facilities
[ ] Stadium
[ ] Tents/Tarps
[ ] Trailer courts
[ ] Trailer rental facilities
[ ] Trailer sales facilities
[ ] Water treatment plan

Facilities-Medical

[ ] Ambulance-Fixed wing
[ ] Ambulance-Four wheel drive
[ ] Ambulance-Helicopter
[ ] Ambulance-Land
[ ] Ambulance-Marine
[ ] Ambulance-Snowmobile
[ ] Clinics
[ ] First aid stations
[ ] Funeral home
[ ] Hazardous materials decontamination centre
[ ] Hospitals-Beds/Services
[ ] Laboratories
[ ] Mortuary
[ ] Personal care home
[ ] Public health centres
[ ] Trauma centre
[ ] Veterinary hospitals

Resources-Human

Medical

[ ] Candy stripers
[ ] Community health workers
[ ] Crisis centre workers
[ ] Dentist
[ ] Doctors
[ ] Emergency medical tech.
[ ] First aiders
[ ] Health care aides
[ ] Licensed practical nurses
[ ] Mental health worker
[ ] Natural healer
[ ] Physiotherapist
[ ] Psychiatrist
[ ] Psychologist
[ ] Public health nurse
[ ] Registered nurses
[ ] Suicide prevention workers
[ ] Veterinarians

[ ] Churches
[ ] Community committees
[ ] Police
[ ] Firefighters
[ ] Catering services
[ ] Coroner

Service Clubs

[ ] Red Cross
[ ] Kiwanis
[ ] Lions Club
[ ] Jaycees
[ ] Knights of Columbus

Miscellaneous.

[ ] School board
[ ] Trade/Professional
[ ] Volunteer organizations

Resources Physical

Construction Supplies

[ ] Acetylene welding
[ ] Arc welding
[ ] Chains
[ ] Electric wire
[ ] Fencing
[ ] Generators
[ ] Hardware
[ ] Jack hammers

[ ] Jacks
[ ] Ladders
[ ] Plywood
[ ] Portable heating equipment
[ ] Power saws
[ ] Sand/Salt
[ ] Sand bags
[ ] Tarps/Vapour barrier
[ ] Winches

Farm Equipment

[ ] Animal shelters
[ ] Corrals
[ ] Feed
[ ] Livestock trailers

[ ] Loading ramps
[ ] Stoneboat
[ ] Tractor

Food Supplies

[ ] Convenience stores
[ ] Grocery stores
[ ] Restaurants
[ ] Wholesalers

Resources-Physical (continued)

Fuel Distribution
[ ] Mobile trailers
[ ] Rail cars
[ ] Tanker trucks

Hazardous Materials
[ ] Chemical storage facilities
[ ] Fuel storage tanks
[ ] Manufacturing facilities
[ ] School laboratories

Office Supplies
[ ] Air conditioning/Heating
[ ] Batteries
[ ] Clips
[ ] Computers
[ ] Desks and chairs
[ ] Flip charts and tape
[ ] Lighting
[ ] Paper/Pencils/Pens
[ ] Photocopier
[ ] Photography equipment
[ ] Staplers
[ ] Video equipment

Public Work
[ ] Backhoes
[ ] Bulldozers
[ ] Cable TV
[ ] Cranes
[ ] Drilling equipment
[ ] Electricity
[ ] Explosives
[ ] Fork lift
[ ] Garbage truck
[ ] Grader
[ ] Hoist
[ ] Loader
[ ] Mixer
[ ] Natural gas
[ ] Propane
[ ] Rollers/Packers
[ ] Sewage truck
[ ] Sewers
[ ] Skidders
[ ] Snow plow
[ ] Telephone
[ ] Water delivery truck
[ ] Water services

Rescue Equipment
[ ] Air bag lifts
[ ] Airport rescue truck
[ ] Animal rescue truck
[ ] Aquatic rescue
[ ] Blankets
[ ] Emergency medical kits
[ ] Fire truck
[ ] Flashlights
[ ] Floodlights
[ ] Generators
[ ] Hazard suits
[ ] Heavy rescue truck
[ ] Jaws of life
[ ] Night vision equipment
[ ] Rescue truck
[ ] Search and rescue team
[ ] Tow truck
[ ] Trauma kit
[ ] Turnout gear (Firefighters)

Transportation

[ ] All terrain vehicles
[ ] Ambulance
[ ] Animal trailers
[ ] Airplanes
[ ] Barge
[ ] Boats/canoes
[ ] Bombardier
[ ] Buses - commercial
[ ] Buses - school
[ ] Buses - private
[ ] Cars
[ ] Dog teams
[ ] Dump trucks
[ ] Flat bed trucks/Trailers
[ ] Four wheel drives
[ ] Handivans
[ ] Heliports
[ ] Horses
[ ] Hovercraft
[ ] Marina
[ ] Medical vans
[ ] Mobile canteen
[ ] Pickups
[ ] Ports/Harbours
[ ] Refrigerator trucks
[ ] Railways
[ ] Snow cats
[ ] Snowmobiles
[ ] Swamp buggies
[ ] Taxis
[ ] Tankers
[ ] Tow truck
[ ] Trailers
[ ] Vans

Additional Resources

Does your community have:

[ ] An emergency management plan?
[ ] Emergency funding sources?

Part 2: Community Response Capacity

In this part you will rank your community's ability to respond to an emergency. The higher the value in the Total column, the more prepared your community is to respond to the hazard. *The lowest number indicates the highest need for attention.*

This response capacity is divided into two categories:

- Physical Resources. This section asks: *What are your resources?* It includes monetary resources, materials (ambulances, machines, firefighting equipment), and technology.

- Human Resources. This section covers your preparation as a community. It asks: *Who are your resources?* This may include service clubs, institutions, emergency management officers, police, firefighters, etc.

We recognize that some resources may overlap, and be applicable to both the physical and human resource sections (for example, 911 operators). It is up to your discretion where to place these resources.

Ranking Ability to Respond

Use your answers from Part 1 of this worksheet to assist you in completing the table on the next page. Use the following ranking scale.

Ranking Number	Description
0	None
1	Poor
2	Fair
3	Good
4	Very Good

Hazard	Ability to Respond		Total Add columns A+B
	A. Physical Resources	**B. Human Resources**	
	What is the state of your available physical resources?	What is the state of your available human resources?	
e.g. Avalanche	2	1	3
e.g. Blizzard	3	3	6

Hazard	Ability to Respond		Total Add columns A+B
	A. Physical Resources	**B. Human Resources**	
	What is the state of your available physical resources?	What is the state of your available human resources?	

Hazard	Ability to Respond		Total Add columns A+B
	A. Physical Resources	**B. Human Resources**	
	What is the state of your available physical resources?	What is the state of your available human resources?	

Worksheet 6: Developing a Community Hazard Profile

The community hazard profile is the foundation upon which all emergency planning efforts in the community is built. Preparing the community hazard profile is the first step towards building an effective emergency management program. It is a compilation of all of the previous steps and it allows emergency managers to set priorities and goals for resource allocation as well as response, recovery and disaster minimization activities prior to an incident occurring. These decisions are the cornerstone of your community's emergency management program, and should guide all decisions pertaining to community emergency management activities.

In developing your community hazard profile, all of the prior activities come into play. To complete this step you need to use the information from your community survey, community and hazards map, risk estimation, and resource and response assessment.

Your community hazard profile should include a page describing the demographics of your community and a page for each significant hazard.

The community demographics page should include descriptions relating to:

- a demographic breakdown of the population,
- key industries in the community,
- present and future land uses and development patterns,
- the transportation network,
- key community facilities, and
- any other information relevant to the community's existence.

A good community profile will answer the following questions:

1) Who are we?
2) Where are we located?
3) What do we do?, and
4) When do we do it?

The profile of each hazard should include:

- A description of the hazard,
- An explanation why your community is vulnerable to this hazard,
- The numbers and types of people who could be affected by this hazard,
- An assessment of the special response considerations relative to your community's ability to respond to this hazard, and
- Resources needed to respond to this hazard.

You may also want to include a community map for each hazard.

Next Steps

Now that your community has thoroughly explored its hazards and the areas where it is most vulnerable, you should now know where to concentrate your emergency planning and mitigation activities. ***Mitigation refers to any deliberate actions to minimize disaster impact and losses*** (e.g. dugouts as mitigation for drought, maintenance of railway tracks, applying for funding to build a dike to ensure against future flooding). Each hazard identified as a priority should be examined in depth in order to determine planning and mitigation alternatives.

A. Identify available options

When examining your available options you have three main choices: you can do nothing about the hazard, you can plan how to respond to the hazard, or you can plan actions to prevent or limit the disaster impact of the hazard (mitigation). We recommend that you implement a combination of planning response to the hazards and suitable mitigation activities.

B. Develop a mitigation plan and implementation process

The first step in your mitigation effort is to identify and define community goals and objectives. Your goal may be to "protect public health and safety". Your objective would be the specific strategies or implementation steps to attain the identified goal. Plans and actions based on clear goals and objectives are more likely to succeed in meeting the community's needs. This is where your community survey results become very important.

Once you have identified and prioritized your goals and objectives, you can explore alternatives for solving problems related to your identified hazards. Regional or provincial emergency organizations can assist you in developing an in-depth mitigation plan. You may want to explore the option of developing joint mitigation plans with surrounding communities who face similar hazards or risks.

C. Include the mitigation plan into the community's strategic planning process

Your mitigation plan should not only discuss specific mitigation alternatives, but should also outline public involvement activities. The political leaders and public need to agree upon the direction of your community plan. The mitigation plan should be included in local policy, which will establish and impact the future direction of the community's development processes and practices.

D. Communicate to community inhabitants and other institutions

Since hazard mitigation benefits the whole community, it is beneficial to get as many citizens as possible involved in planning, designing and implementing hazard mitigation strategies. The value of public involvement lies in sharing responsibility with those who will strongly influence the success or failure of the mitigation effort.

To guide your mitigation efforts and involve citizens in your mitigation plan development and implementation processes, you may wish to form an advisory committee. Membership in the advisory committee should be broad-based, including people directly affected and those with a more general interest. The committee could be gathered using an appointment process, but all meetings should be

public and well announced. The primary functions of this advisory committee would be:

- To provide general direction to professionals by assisting in decision-making.
- To inform the general public about progress being made.
- To lend their skills to the effort, whether it is technical expertise, political support, financial assistance, etc.

The following are some additional public involvement techniques:

- meetings
- Web page
- surveys
- letters to the editor
- newsletters
- school programs
- interviews
- media coverage
- public service announcements
- posters and flyers

Conclusion

The steps involved in this process were intended to assist community leaders in implementing the framework that is developed in consultation with community members. It is hoped that this series of worksheets has been helpful to your community as it prepares to identify potential hazards and assess risk.