

**Public Participation in the Emergency Response Phase of
Flooding: A Case Study of the Red River Basin**

by
Jacqueline K. Wachira

A thesis submitted to the Faculty of Graduate Studies in partial
fulfillment of the requirements for the degree of

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ABSTRACT

Emergency flood response is a controversial phase in flood management mostly because there is virtually no public input into important decisions such as evacuation orders. Little attention has been paid to the potential for involving the public more in decision-making in this phase of flood management. The purpose of the study was to investigate whether more public involvement in the emergency response phase would create greater support for government action, minimize uncertainty and dissatisfaction, and improve overall flood management. The specific objectives were to: 1) identify and describe key publics, government agencies, and civic organizations involved in emergency flood response; 2) determine the understanding that the public had of their role in emergency flood response; 3) identify and describe interactions among key participants during the emergency flood response phase; 4) evaluate public involvement practices in the emergency response phase; and 5) develop recommendations to improve public involvement in the emergency response phase of a flood.

A case study approach involving two communities from Canada and the United States in the Red River Basin was used to accomplish the objectives of the study. One community was the village of Rosenort in Manitoba, and the other was the city of Drayton in North Dakota. Data collection methods included document review and semi-structured qualitative interviews.

The results establish that community members in both towns made important decisions regarding how to protect their individual property as well as the community as a whole. They carried out individual activities such as sandbagging, moving furniture to higher ground, and watching pumps to ensure that they continued to run. Communal

activities in Rosenort included the building of neighbourhood dikes in some parts of town, and in Drayton, the building of a plywood wall around the city. Local governments in both jurisdictions made key decisions about the provision and distribution of resources for use in the emergency. They also planned for the evacuation of their communities. There was no input from the general public into these decisions. However, local government officials maintained close links with many community members. Provincial/state government officials and federal agencies played a critical role in providing resources to prepare and respond to the flood. Provincial/state government officials were also responsible for calling the mandatory evacuation of the two communities. This was a key decision that impacted the ability of locals to carry out their response activities, yet was made without public input or input from local government officials. There was also little involvement in the emergency preparedness planning prior to the flood.

The data show that the communities' roles in the emergency response phase are important, and that ways and means need to be found to involve them more in key decisions made during this phase. There are clear opportunities for this to occur during the development of emergency response plans before a flood. There are even opportunities for limited public involvement during the emergency as demonstrated by the Drayton data. Recommendations are made for capitalizing on these opportunities.

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TABLE OF CONTENTS

ABSTRACT.....	I
ACKNOWLEDGEMENTS.....	III
LIST OF TABLES	VII
LIST OF FIGURES	VII
LIST OF APPENDICES	VII
CHAPTER 1: INTRODUCTION.....	1
1.1 GEOGRAPHY AND FLOOD HISTORY OF THE RED RIVER	1
1.2 RED RIVER FLOOD OF 1997	5
1.3 EMERGENCY FLOOD RESPONSE.....	6
1.4 RESEARCH PURPOSE AND OBJECTIVES	8
1.5 STUDY SITES.....	9
1.6 METHODS.....	9
1.7 ORGANIZATION OF THESIS.....	10
CHAPTER 2: FLOODING AND EMERGENCY RESPONSE.....	11
2.1 INTRODUCTION.....	11
2.2 CAUSES OF FLOODING IN CANADA	11
2.3 FLOOD MANAGEMENT IN CANADA	13
2.3.1 <i>STRUCTURAL AND NON-STRUCTURAL MEASURES</i>	13
2.3.2 <i>EMERGENCY GOVERNANCE IN CANADA</i>	15
2.3.3 <i>EMERGENCY MANAGEMENT GOVERNANCE IN THE UNITED STATES...</i>	18
2.3.4 <i>NON-GOVERNMENTAL ORGANIZATIONS (NGOS)</i>	19
2.3.5 <i>ACTIVITIES CARRIED OUT DURING THE EMERGENCY RESPONSE PHASE OF A FLOOD</i>	20
2.4 PUBLIC INVOLVEMENT AND EMERGENCY FLOOD RESPONSE.....	21

2.4.1 DEFINING PUBLIC INVOLVEMENT.....	21
2.4.2 RATIONALE FOR PUBLIC INVOLVEMENT.....	22
2.4.3 PUBLIC INVOLVEMENT IN THE EMERGENCY RESPONSE PHASE.....	23
2.5 SUMMARY.....	28
CHAPTER 3: METHODS	30
3.1 INTRODUCTION	30
3.2 DOCUMENT REVIEW.....	30
3.3 SELECTION OF COMMUNITIES	31
3.4 IDENTIFICATION OF INTERVIEWEES	33
3.5 THE INTERVIEW PROCESS	35
3.6 DEVELOPMENT OF INTERVIEW GUIDE	37
3.7 DATA ANALYSIS	37
CHAPTER 4: COMMUNITY INVOLVEMENT IN THE EMERGENCY RESPONSE PHASE.....	39
4.1 INTRODUCTION.....	39
4.2 TIMELINE OF EVENTS.....	39
4.3 EMERGENCY RESPONSE IN ROSENORT.....	41
4.3.1 BACKGROUND.....	41
4.3.2 COMMUNITY ACTIVITIES DURING THE EMERGENCY RESPONSE PHASE.....	41
4.3.3 GOVERNMENT AND NGO ACTIVITIES DURING THE EMERGENCY RESPONSE PHASE.....	45
4.3.4 OUTCOME.....	48
4.4 EMERGENCY RESPONSE IN DRAYTON.....	49
4.4.1 BACKGROUND.....	49

4.4.2 COMMUNITY ACTIVITIES DURING THE EMERGENCY RESPONSE.....	51
4.4.3 GOVERNMENT AND NGO ACTIVITIES DURING THE EMERGENCY RESPONSE PHASE.....	54
4.4.4 OUTCOME.....	57
4.5 SUMMARY.....	58
CHAPTER 5: IMPROVING PUBLIC INVOLVEMENT IN THE EMERGENCY RESPONSE PHASE.....	62
5.1 INTRODUCTION.....	62
5.2 COMMUNITY INVOLVEMENT IN EVACUATION PLANNING.....	62
5.3 OPPORTUNITIES FOR COMMUNITY INVOLVEMENT IN GOVERNMENT EMERGENCY PREPAREDNESS PLANNING.....	68
5.4 PUBLIC PERCEPTION OF ITS ROLE IN THE EMERGENCY RESPONSE PHASE	71
5.5 PUBLIC INVOLVEMENT IN EMERGENCY RESPONSE PLANNING SINCE THE 1997 FLOOD.....	72
5.6 SUMMARY.....	73
CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS.....	75
6.1 OVERVIEW	75
6.2 KEY PARTIES INVOLVED IN EMERGENCY FLOOD RESPONSE.....	76
6.3 OPPORTUNITIES FOR PUBLIC INVOLVEMENT IN EMERGENCY FLOOD RESPONSE	77
6.4 OPPORTUNITIES FOR PUBLIC INVOLVEMENT IN EMERGENCY PREPAREDNESS.....	79
6.5 CONCLUDING REMARKS.....	82
REFERENCES.....	83

LIST OF TABLES

TABLE 1: DEGREES OF POWER SHARING AND FORMS OF PARTICIPATION.....	25
TABLE 2: NUMBER OF INTERVIEW SUBJECTS.....	35
TABLE 3: EXAMPLES OF COMMUNITY DECISIONS AND ACTIVITIES IN ROSENORT DURING THE EMERGENCY RESPONSE PHASE	42
TABLE 4: EXAMPLES OF COMMENTS MADE BY ROSENORT COMMUNITY RESPONDENTS ABOUT PREPARATION AND RESPONSE ACTIVITIES.....	44
TABLE 5: EXAMPLES OF COMMUNITY DECISIONS AND ACTIVITIES IN DRAYTON DURING THE EMERGENCY RESPONSE PHASE.....	51

LIST OF FIGURES

FIGURE 1: THE RED RIVER BASIN	1
FIGURE 2: THE NEW LADDER OF CITIZEN PARTICIPATION.....	26
FIGURE 3: LOCATION OF THE VILLAGE OF ROSENORT AND THE CITY OF DRAYTON.....	31

LIST OF APPENDICIES

APPENDIX 1: LIST OF DOCUMENTARY SOURCES.....	90
APPENDIX 2: INFORMATION LETTER FOR MANITOBA.....	92
APPENDIX 3: INFORMATION LETTER FOR NORTH DAKOTA.....	94
APPENDIX 4: INTERVIEW GUIDE FOR GOVERNMENT OFFICIALS.....	96
APPENDIX 5: INTERVIEW GUIDE FOR NGOS AND LOCAL GROUPS.....	99
APPENDIX 6: INTERVIEW GUIDE FOR THE PUBLIC.....	102

CHAPTER 1: INTRODUCTION

1.1 Geography and flood history of the Red River

The Red River flows northward from its headwaters in Minnesota to its outlet at Lake Winnipeg in Manitoba, meandering through the flat and fertile valley of the former glacial Lake Agassiz. Its river basin occupies substantial portions of North Dakota, northwestern Minnesota, southern Manitoba, and a very small portion of South Dakota. It covers 116,500 square kilometres (km²), excluding the Assiniboine River Basin, which joins the Red River at Winnipeg (Figure 1).

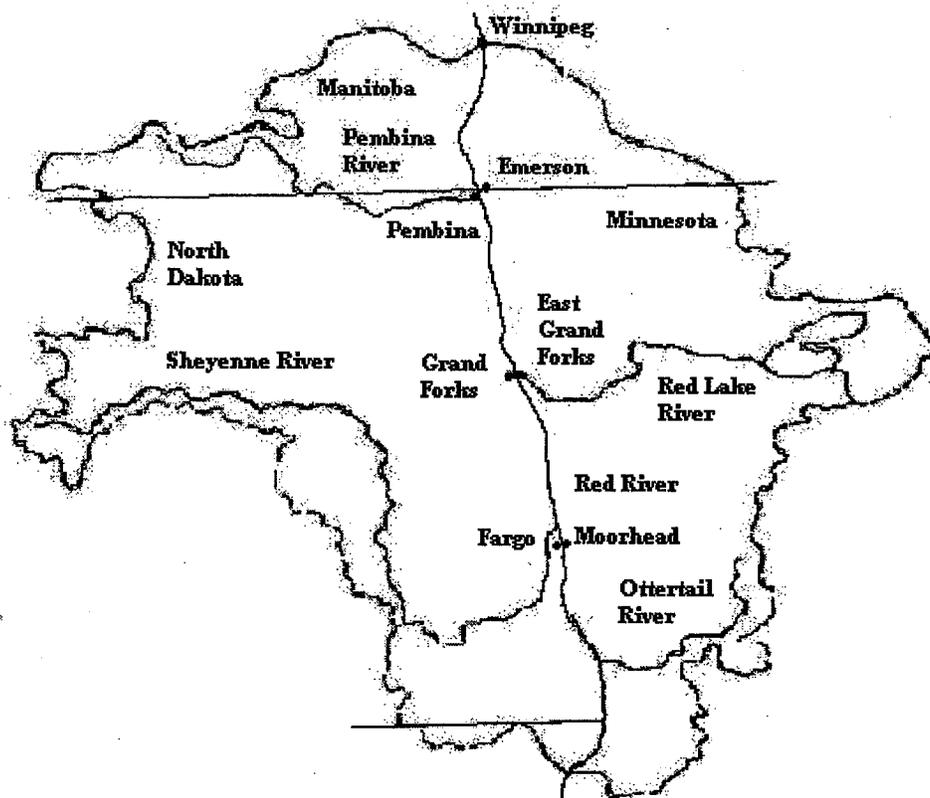


Figure 1: The Red River Basin (Source Krenz and Leitch, 1993)

The Red River Basin is very flat. From Wahpeton, North Dakota to Lake Winnipeg, the river falls by only 70 meters (m) in a distance of 872 kilometres, an average slope of only 0.1 m per km (IJC, 2000). Therefore, during major floods, a very large portion of the valley is inundated.

The Basin has a sub-humid/humid continental climate with moderately warm summers, cold winters, and rapid changes in daily weather patterns (IJC, 2000). Extreme temperature variations are common, with the mean monthly temperatures ranging from -15 degrees to +20 degrees Celsius. Annual precipitation is approximately 50 centimetres (cm) and mostly occurs from April to September, with almost two-thirds falling in May, June and July. The months between November and February are the driest, with precipitation averaging only about 1.3 cm per month.

The climate and the topography of the Red River Basin ensure that it experiences floods regularly. Most flooding occurs after there has been heavy precipitation the previous fall, hard and deep frost prior to snowfall, substantial snowfall, sudden thaws, or heavy rainfall during spring break-up (IJC, 2000). The low absorptive capacity of the basin's clay soil and the presence of ice jams in some parts of the river further exacerbate the flooding situation (IJC, 2000).

There have been several major floods in the Red River Basin in the 19th and 20th centuries. The most notable ones of the 19th century are those of 1826, 1852, and 1861. The most notable ones of the 20th century are those of 1950, 1966, 1969, 1974, 1979, 1996, and 1997. The flood of 1826 was the largest known flood. According to St. George and Rannie (2003), historical accounts and paleoclimatic data show that prior to the flood, the month of April was cold and snowy, and spring unusually late throughout most

of central North America. The 1826 flood was further intensified by heavy rainfall during the rising stage (St. George and Rannie, 2003). The estimated peak flow for 1826 is about 6,370 cubic metres per second (m^3/s), 40% greater than the 1997 flood (St. George and Rannie, 2003). This estimate exceeds the current design capacity of flood protection for Winnipeg, leading to the conclusion that future floods of similar magnitude would break flood defences, and cause great damage (St. George and Rannie, 2003).

The flood of 1950 was significant because for the first time both provincial and federal governments began to formally contribute financially to flood relief restoration (Emergency Preparedness Canada (EPC), 1999). In addition, following the flood, large-scale structural flood damage measures such as the Red River Floodway, the Portage Diversion, and the Shellmouth Dam were constructed to protect Winnipeg. The Floodway is an excavated channel about 46 km long that diverts water in excess of 1620 m^3/s around the city of Winnipeg from south to north. The Portage Diversion, 3.2 km west of the city of Portage, consists of a diked earth channel, a diversion dam, and a spillway dam. It diverts water from the Assiniboine River to Lake Manitoba. The Shellmouth Dam is located at the upper end of the Assiniboine River and consists of an earthfill dam, an overflow spillway, and a reservoir. It provides water storage and controls reservoir outflows to minimize downstream flooding in spring or during summer rainfall flood conditions (EPC, 1999).

The 1969 flood, although minor, was significant in that it was the first flood after the construction of the Red River Floodway. Although there was no flooding in Winnipeg, residents immediately south of the Floodway claimed that it had worsened flooding in their communities (EPC, 1999). This was the beginning of conflict over

perceived inequities in protection that persists until today between Winnipeg residents and non-residents.

The flood of 1974 was similar to the one in 1969. There was heavy tributary flooding as a result of heavy precipitation and rapid snowmelt. In addition to high water levels on the Red River, there was flash flooding on the Morris, Roseau, Rat, Seine, Assiniboine, Pembina, and Boyne Rivers (Bumsted, 1997). More than 2,500 residents in Manitoba were evacuated by the end of the flood. The Red River flood of 1974 is significant because it was one of many flood events that occurred in Canada at the time. For example, in 1973-1974, the Great Lakes experienced high water levels because of a combination of high precipitation and low evaporation. Major storms combined with these high water levels caused severe damage to property on the shores of the Great Lakes (Bruce, 1976). In Saskatchewan, the winter of 1973-1974 was characterized by near-record snowfall, and by the end of winter, several areas reported extremely heavy snow cover (Environment Canada, 2003). Spring runoff from this extremely heavy snow pack resulted in widespread flooding in the Qu'Appelle River basin. The most serious flooding developed in Moose Jaw, Regina and Lumsden, where major damage occurred (Environment Canada, 2003).

These flood events prompted the federal government to initiate the national Flood Damage Reduction Program (FDRP) in 1975. Under this program, federal and provincial/territorial governments (including Manitoba) signed agreements to reduce the possibility of flood damage by discouraging development in flood zones through the withdrawal of mortgage guarantees and other financial measures (Bumsted, 1997). Further details about the FDRP are discussed in Chapter Two.

1.2 Red River flood of 1997

The 1997 flood was the highest recorded in the 20th century. It was caused by heavy snowfall, high topsoil moisture, and a blizzard in April (EPC, 1999). The flooding began in the United States (IJC, 1997). In the towns of Wahpeton, North Dakota and Breckenridge, Minnesota, the Red River crested on April 6th and April 15th 1997 respectively at approximately 6 m, which was almost twice the normal flood level. As the Red River flowed north, other American towns and cities such as Moorhead, Ada, Grand Forks, East Grand Forks, and Drayton were successively inundated by floodwaters.

In 1997, the peak discharge at Emerson (Canada-U.S. border) was approximately 3,681 m³/s, compared with 2,662 m³/s in 1950. At the floodway inlet just south of Winnipeg, the peak discharge was approximately 4,474 m³/s, as compared to 2,662 m³/s in the 1950 flood (EPC, 1999).

In Manitoba, an estimated 1,840 km² of land were flooded when the Red River rose 12 m above winter levels (Warkentin, 1997). The city of Winnipeg and other ring diked communities managed to stay relatively dry, but other communities in the floodplain, such as Ste. Agathe and Grande Point were flooded. Throughout the Red River Basin, homes, businesses, and farmsteads were damaged and destroyed. More than 100,000 people were evacuated, with 28,000 of them from Manitoba.

At the onset of the flood in the United States, about 8,000 head of cattle, hogs, poultry, and sheep died in the floodwaters (IJC, 1997). In Manitoba, approximately 5% of farmland was under water at the flood's peak. Some farmers had to move approximately 2,000 cattle and 45,000 hens to higher ground (Morris-Oswald, 2000).

A variety of hazardous products found their way into the floodwaters. For example,

a fertilizer building near Grand Forks was flooded, and about 4,000 tons of urea and 1,000 tons of phosphate entered the floodwaters. In Manitoba, municipal sewage lagoons in the towns of Emerson, St. Jean, Morris, and Otterburne were flooded.

In the end, the cost of the flood in Canada was estimated to be approximately \$400 million, while the total cost in both Canada and the United States was estimated to be about \$2 billion (de Loe, 2000).

1.3 Emergency flood response

There are three phases of flood management: **planning and mitigation, emergency flood response, and post flood recovery.** The planning stage involves the evaluation of alternative mitigation measures for possible implementation in order to reduce flood damages in a region. Evaluation of these alternatives involves project formulation, understanding the advantages and disadvantages of each alternative, the assessment of project impacts, and the comparison of alternative measures (Simonovic, 1999).

'Preparedness' involves planning and preparation. Planning involves setting the procedures that are going to be used to save lives and minimize damage when an emergency occurs. It includes the establishment of flood forecasting, monitoring and warning systems, evacuation procedures, and public information services. Preparation involves activities carried out in readiness for the flood event and may include activities such as sandbagging, diking, and moving items to higher ground.

'Response' occurs after the onset of a flood event. It is defined as the actions taken to save lives and prevent further damage in an emergency situation. Response may include activities such as evacuation, search and rescue, and the provision of basic

necessities to flood victims. Some preparation and response activities may overlap. For example, sandbagging and diking activities may take place during preparation as well as response.

In Canada, when flooding occurs, the initial responsibility for emergency response lies with the individual (e.g. homeowners and businesses), and the local authority. If local authorities cannot manage an emergency, the provincial or territorial government is called in to assist. Similarly, the federal government may make its resources available upon request, when a province or territory cannot effectively respond to an emergency or if the emergency lies within federal jurisdiction.

As in Canada, emergency preparedness and response in the United States is primarily the responsibility of individuals and local governments. In instances where the disaster exceeds the capabilities of local governments, the state government is usually called in to help. Similarly, if the disaster exceeds the capabilities of the state government, the federal government is called to lend its assistance.

Emergency flood response is a controversial phase in flood management due to decisions made on issues such as evacuation and mitigation. For example, during the Red River flood of 1997, community residents in Manitoba were opposed to mandatory evacuation due to the lack of consultation before the decision was made, the tactics used in the evacuation process, and the subsequent flood damage to their property in their absence (Haque, 2000). Most community members who were evacuated would have preferred to stay and fight the flood (Rasid et al., 2000).

With regard to mitigation, many residents near Winnipeg did not know ahead of time when the Floodway gates would be raised. Many also felt that Floodway operation

impacted water levels upstream. This resulted in inaccuracies in the forecast of water levels, and thus affected their ability to prepare for the flood (Manitoba Water Commission, 1998). This fueled the existing notion of inequity between Winnipeg and non-Winnipeg residents when dealing with flood management issues. Some non-Winnipeg residents who lived in the floodplain felt (and continue to feel) that the floodway benefited the city of Winnipeg and its residents at their expense (Shrubsole, 2001). In the end, the lack of public involvement surrounding government action during the emergency response phase of the 1997 flood created uncertainty and dissatisfaction among floodplain residents (Shrubsole, 2001).

The post flood recovery phase involves actions taken to return the community to normal following a disaster (Alexander, 1993). It includes the evaluation of damages, repairing, replacing, or rebuilding property, and the provision of flood assistance or compensation to victims.

1.4 Research purpose and objectives

The purpose of this study was to investigate whether more public involvement during the emergency response phase of flood management would minimize uncertainty and dissatisfaction, and improve flood management. The specific objectives of the research were to:

- Identify and describe key government agencies, and civic organizations involved in emergency flood response.
- Determine the understanding that the public had of its role in emergency flood response.

-
- Identify and describe interactions among key participants during emergency flood response.
 - Evaluate public involvement practices in the emergency response phase.
 - Develop recommendations to improve public involvement in the emergency response phase.

1.5 Study Sites

Two communities were selected from different jurisdictions (Canada and the United States) in the Red River Valley. One community was the village of Rosenort (Rural Municipality of Morris) in Manitoba, and the other community was the city of Drayton (Pembina County) in North Dakota. Although neither town flooded, they were significantly affected by the flood of 1997, and were evacuated at some point during the emergency. Chapter Three provides a detailed description of the two communities and how they were selected.

1.6 Methods

The research design was a qualitative comparative case study approach comprised of two components. First, secondary data were collected by reviewing relevant literature from sources such as libraries, non-governmental organization (NGO) records, news media accounts, and government agency files and records. Second, semi-structured interviews were conducted with key informants from NGOs, government officials (from federal, provincial/state, municipal/county, and city levels), local community groups, and individuals on both sides of the border. Finally, the data were analyzed using QSR N4 computer software, and the results of the analyses were verified by comparing them to

the raw data and the literature. Again, Chapter Three provides a detailed description of the research methods.

1.7 Organization of Thesis

The thesis is organized into six chapters. Chapter One covers the general introduction, states the purpose and objectives of the research, and outlines the general methods used to acquire and analyze the necessary data. Chapter Two provides a description of flooding and flood management in Canada, and emergency response governance in Canada and the United States. Chapter Two also includes a review of the literature on public participation and emergency flood response. Chapter Three provides an in-depth description of methods used to conduct the research, and also includes a description of the study area. Chapter Four presents the results, and Chapter Five discusses these results. Chapter Six presents conclusions and recommendations based on the study results.

CHAPTER 2: FLOODING AND EMERGENCY RESPONSE

2.1 Introduction

Flooding is an important natural process that plays a vital role in the maintenance of floodplains and shoreline ecosystems (de Loe, 2000). It occurs when the volume of water in a river exceeds the capacity of the river channel, or when higher than normal water levels inundate low-lying areas along lakes or coastal shorelines (Environment Canada, 1993).

Humans have historically occupied floodplains because of the benefits associated with such occupancy. These include access to fertile farmland and access to water for transportation, drinking, and sewage disposal (Alexander, 1993). However, human occupancy of floodplains has interfered with natural systems and ecological processes (Environment Canada, 1993). It has led to the draining and filling of wetlands (which act as natural sponges that hold water back and release it gradually), and turned flooding into a hazardous phenomenon (because flooding puts lives and property at risk) (de Loe, 2000).

2.2 Causes of flooding in Canada

Flooding in Canada can occur at any time of the year and for various reasons (Environment Canada, 1993). For example, in British Columbia, melting snow and heavy rainfall are the major causes of flooding. One of the most serious floods in the province occurred in 1948, when heavy rainfall caused the Fraser River to overflow its banks. The flood caused millions of dollars in property damage, and severely disrupted the economy of the province (Day, 1999).

In Ontario, flooding is caused by snowmelt, spring rainfall storms, summer

thunderstorms, tropical storms or hurricanes, and ice jams. The most severe flooding on record occurred in October 1954 when Hurricane Hazel passed through the Toronto area causing the deaths of 81 people and leaving 4,000 people homeless (Environment Canada, 1993).

In the Great Lakes region of Ontario, flooding is caused by fluctuations in water levels due to seasonal changes in weather conditions. These fluctuations can lead to shoreline flooding especially when they occur in association with storm events. For example, a storm on December 2, 1985 raised water levels on Lake Erie and caused considerable flooding in the surrounding areas (Lawrence and Nelson, 1999).

In Quebec, heavy rainfall is one of the major causes of flooding. For example, torrential rains caused the Saguenay Flood disaster of 1996, in which approximately 1,718 homes were destroyed or damaged and 16,000 people were evacuated (Fung et al., 1998). In Manitoba, flooding is mainly associated with the Red River Basin. As mentioned earlier, some of the causes of flooding in the Basin are heavy precipitation in autumn, hard and deep frost prior to snowfall, sudden thaws, or heavy rainfall during spring break-up.

Estimates of total annual financial losses due to flooding in Canada are not available because of reporting and accounting problems. However, damages associated with particular events provide some insight. For example, costs associated with the 1996 Saguenay flood in Quebec are estimated to be \$800 million (Grescoe, 1997); and as mentioned earlier, costs associated with the Red River flood of 1997 are estimated to be \$400 million. These numbers underscore the need for effective floodplain management.

2.3 Flood management in Canada

2.3.1 Structural and non-structural measures

Flood management measures include structural and non-structural measures. Structural measures can be divided into flood control works and flood protection works (Askew, 1991). Flood control works include dams and reservoirs, and channel diversions. Dams and reservoirs are used to capture runoff and release it gradually. Some examples of dams and reservoirs used to control floods in Canada include the reservoirs on the Bridge and Stave Rivers in British Columbia and the Shellmouth Dam on the Assiniboine River in Manitoba. Channel diversions such as the Portage Diversion in Manitoba and the Nechako River Diversion in British Columbia, redirect all or part of river flow away from threatened areas (de Loe, 2000).

Flood protection works include dikes and levees. These are used to protect specific parcels of land, especially in already developed floodprone areas (de Loe, 2000). For example, in British Columbia, dike construction has been the historic method of containing floods in the lower Fraser Valley (Environment Canada, 1993). In Manitoba, the Winnipeg diking system, which consists of earth dikes and pumping stations, is used to protect property from floodwaters (EPC, 1999).

Non-structural measures to reduce or prevent flooding include a range of activities aimed at keeping flood-vulnerable development out of floodplains and shorelines. These activities include the flood proofing of vulnerable structures, the physical relocation of houses and other structures from the floodplain to safer areas, and the application of land-use controls such as zoning (de Loe, 2000).

An important example of a land-use control strategy used to prevent flooding in

Canada is the federal-provincial Flood Damage Reduction Program (FDRP) (briefly discussed in Chapter One). Flood events across Canada in the early 1970s (particularly in 1974), caused extensive damage. This signified to the federal government that a new strategy in dealing with flood reduction was needed. As a result, the FDRP was conceived in 1975 under the Canada Water Act (Environment Canada, 2003). The FDRP represented an important change in strategy from an ad hoc structural response to flooding, to a more comprehensive strategy that focused on prevention (Environment Canada, 2003).

The FDRP had three primary objectives: (1) to reduce loss of life and suffering; (2) to reduce escalating disaster assistance payments to victims of flooding events; and (3) to decrease the need for costly structural flood control works (Environment Canada, 1993). These objectives were to be met through a cost-sharing programme of floodplain mapping, followed by the designation of areas vulnerable to flooding. At the heart of the programme were agreements established between the federal government and participating provincial/territorial governments, which discouraged development in flood-prone areas and withheld disaster assistance from new development in designated areas (Shrubsole, 2000). Local governments were encouraged to zone land uses on the basis of flood risk. All provinces except Prince Edward Island and the Yukon Territory signed FDRP agreements with the federal government, and succeeded in mapping and designating 265 flood risk areas in 780 communities (de Loe and Wojtanowski, 2001).

Some of the benefits of the FDRP included protection of wetlands, natural areas, wildlife habitats and environmentally sensitive areas. In addition, there was improved administration of zoning in hazard areas (de Loe and Wojtanowski, 2001). One criticism

of the FDRP was that it was not effective in preventing development in flood-prone areas. Furthermore, people received disaster assistance even after building on areas that had been designated as high risk (de Loe, 2000). In the end however, the benefits of the FDRP outweighed its criticisms, making the decision of the federal government to end the program in 1999 unfortunate (de Loe and Wojtanowski, 2001).

2.3.2 Emergency governance in Canada

Definitions of an emergency in Canada vary across jurisdictions. At the federal level, there are four types of national emergencies: (i) public welfare, (ii) public order, (iii) international, and (iv) war. Public welfare emergencies include severe natural disasters or major incidents such as flooding, that affect public welfare, and are beyond the capacity or authority of a province to handle (EPC, 1997). In Manitoba, emergencies are defined as situations or conditions that require prompt action to prevent the loss of life, harm to the health, welfare, or safety of people, and damage to property or the environment (Government of Manitoba, 1997).

Emergency preparedness policies and programs in Canada are based on two pieces of federal legislation: the *Emergency Preparedness Act* and the *Emergencies Act* (Government of Canada, 1988). The Emergency Preparedness Act calls for effective emergency preparedness and co-operation between federal and provincial governments in order to ensure safety and security of Canadians during national emergencies. The Emergencies Act (1988) empowers the federal government to provide safety and security to Canadians during national emergencies.

The Office of Critical Infrastructure Protection (OCIPEP), formerly known as Emergency Preparedness Canada (EPC), is the federal agency established by the

Emergency Preparedness Act (Haque, 2000). This agency coordinates and facilitates emergency preparedness activities within and between federal departments and agencies, and among the federal and provincial governments. OCIPEP also outlines the chain of responsibility in Canada's emergency response system. Responsibility for an emergency begins with the individual. If the individual cannot cope, then the municipal government steps in to assist. If and/or when the local authority cannot manage the emergency, the provincial or territorial government lends its assistance. Similarly, the federal government makes its resources available when requested by the province or territorial government. OCIPEP also provides emergency preparedness training to officials from all levels of government and to private industry, and maintains a 24-hour monitoring and information centre for disasters through the Government Emergency Operations Centre (Haque, 2000).

Apart from OCIPEP, another key agency involved in the emergency response phase is Environment Canada (Government of Canada, 2002). Environment Canada consists of four branches: the Environmental Protection Branch, the Canadian Wildlife Service, the Meteorological Service of Canada, and the Water Survey of Canada. With regard to the emergency response phase, the Environmental Protection Branch maintains a 24-hour reporting telephone for receiving reports of emergency incidents of federal government interest. It also assesses any implemented remedial measures in order to ensure that federal environmental protection requirements are being met.

The Canadian Wildlife Service provides advice for assessing and mitigating the damaging effects to migratory birds and their habitats. The Meteorological Service of Canada is responsible for matters relating to weather, ice and sea conditions. During an

emergency, the Service may provide routine and special weather forecasting services to emergency response organizations. The Water Survey of Canada provides stream flows, water levels and flood forecasting information.

Most provinces and territories also have their own legislation that deals with emergency management issues. For example, in Manitoba, the Emergency Measures Act gives reeves and mayors the authority to declare an emergency within their local area. It also assigns to local governments the task of creating emergency preparedness and response plans (Government of Manitoba, 1997). However, when local governments make these plans, they are not required to share them with the community.

Provincial emergency planning in Canada is led by provincial emergency measures organizations (EMOs). For example, the Manitoba Emergency Measures Organization (MEMO) is responsible for coordinating flood response activities among provincial departments and agencies, and among the provincial, local and federal governments and individuals. MEMO also coordinates damage claim assessments and communicates with the federal government about their share of the recovery costs (EPC, 1999). MEMO works closely with the Water Resources Branch of the Manitoba Conservation Department, which is responsible for local flood planning and management.

Another important provincial department involved in the emergency response phase is the Manitoba Inter-Agency Steering Committee on Emergency Social Services (ESS). ESS promotes co-operation and communication among social service organizations (Haque, 2000). Membership includes representatives from MEMO, OCIPEP, Human Resources Development Canada, and the Canadian Red Cross. ESS ensures that important services such as shelter, food, clothing, registration, and inquiry are provided in

the event of an emergency.

2.3.3 Emergency governance in the United States.

As in Canada, emergency preparedness and response in the United States is primarily the responsibility of local and state governments (North Dakota State Commission, 2002), and if the disaster exceeds the capabilities of local and state governments, the federal government is usually called in to assist. In North Dakota, there are two major agencies involved in emergency governance at the local level: the Local Division of Emergency Management, which is responsible for preparing and maintaining local emergency operation plans, and the Local Water Resource Districts, which are responsible for building levees, disseminating information, and coordinating with recovery personnel from the Federal Emergency Management Agency (FEMA).

At the state level, several agencies are involved in emergency governance, but the two major ones are the Division of Emergency Management (DEM) and the North Dakota State Water Commission. DEM provides a state-wide system for effective mitigation, preparation, response, and recovery from natural disasters. The North Dakota State Water Commission provides assistance with flood control, and co-ordinates and disseminates emergency information. Other agencies involved in emergency response are the National Guard and the Department of Health. The National Guard mainly assists with evacuations, while the Department of Health provides information on disease control, food safety, maternal and child safety, waste management, and water quality (North Dakota State Commission, 2002).

The Federal Response Plan (FRP) facilitates the delivery of all types of federal response assistance to states (U.S. Environmental Protection Agency, 2002). In this plan,

FEMA is the lead agency that assists state and local governments in the coordination of mitigation, preparedness, response, and recovery activities. Another important agency under the FRP is the U.S. Army Corps of Engineers. It is responsible for providing emergency support with public works and engineering. For example, the Corps may provide emergency power, restore critical public services and facilities such as water supply, and construct levees and dikes. Apart from FEMA and the Corps of Engineers, some of the other federal agencies involved in emergency response are the National Weather Service and the U.S. Department of Agriculture. The National Weather Service forecasts the weather and provides information on hydrologic conditions. The Department of Agriculture provides emergency food assistance to those forced from their homes, logistical and transportation support to FEMA, and Federal Crop Insurance (North Dakota State Commission, 2002).

2.3.4 Non-governmental organizations (NGOs)

NGOs are also involved in the emergency response phase in both Canada and the United States. An NGO is a not-for-profit organization, publicly incorporated and registered in the country of operation. It may operate at a local, regional, or national level, without statutory ties to a provincial/state, territorial, or federal government (Newton, 1999).

NGOs often play a critical role in the response and recovery phases of an emergency. In the response phase, they typically provide food, shelter, and clothing. In the recovery phase, they raise funds and provide trauma and stress counselling. Some examples of NGOs that were involved in the Red River flood of 1997 include the Canadian Red Cross, the American Red Cross, the Mennonite Disaster Service, and the

Salvation Army (Newton, 1999).

2.3.5 Activities carried out during the emergency response phase of a flood

There are a number of actions that take place in the emergency response phase of a flood. One of the first actions to be carried out is the activation of local emergency plans and procedures. Local emergency plans provide guidance on what to do in an emergency (Griffith and Vulpitta, 2002). For example, the plans may provide:

- The names of those who should be notified for various types of emergencies.
- Written policies that designate a chain of command, and list the names and job titles of the people responsible for making decisions, as well as monitoring response actions, and recovering back to normal conditions.
- Community evacuation procedures, including designated reception communities outside the affected areas, and procedures for accounting for evacuees.

Some of the actual on-site actions carried out before and during a flood include the following:

- Building of temporary dikes (usually earthen or sandbag) to protect property from floodwaters.
- Evacuation of citizens to designated reception communities that provide assistance such as food, shelter, and clothing.
- Shutting down of utilities and services in evacuated areas.
- Search and rescue operations carried out by the Royal Canadian Mounted Police (RCMP) and/or the National Guard, if required. The RCMP/National Guard also maintain regular patrols of all property in flooded areas.
- Removal of grain, livestock, fertilizer, and chemicals from flood threatened areas.

- Installation of 24-hour emergency telephone lines.
- Provision of daily flood forecasts and information on water levels and flows (in order to enable people to respond accordingly).

Many agencies are involved in one or more aspects of the above activities. Therefore, there has to be co-ordination among these agencies. In Canada and the United States, an Emergency Operations Centre (EOC) is usually activated to co-ordinate response activities at the site. The EOC allocates resources, integrates and communicates information to all those involved (government and relief agencies, other communities, and the public), and acts as a media contact.

2.4 Public involvement and emergency flood response

2.4.1 Defining public involvement

There are numerous definitions of public involvement in the literature. According to Petts (1999), the majority of these definitions emphasize that in democratic societies, individuals have the right to be informed, to be consulted, and to declare their opinions on issues that concern them. Roberts (1995) maintains that the key difference among these definitions is the degree to which the public is able to influence, share and control decision-making. For example, he describes public involvement as both consultation and participation. Consultation involves the sharing of information and negotiating with the public to bring about better decision-making, and participation is essentially including the public in the decision-making process.

Connor (1972) describes public involvement as “a systematic process which provides an opportunity for citizens, planners, managers and elected representatives to share their experience, knowledge and goals, and combine their energy to create a plan

which is technically sound, economically attractive, generally understood and accepted by most of those affected by it, and is thus politically viable.”

2.4.2 Rationale for public involvement

Public involvement brings public values and social objectives into decision processes that tend to be mainly analytical (Delli Priscoli, 1989). When experts involve the public, they gain access to information and understanding that they did not previously have (Higgelke and Duinker, 1993). This enables them to define problems more effectively, to identify a variety of solutions that will be socially acceptable, and to create a sense of ownership with the resulting solution (Mitchell, 2002). Involvement of the public also reduces the level of controversy associated with an issue by providing forums that emphasize compromise and consensus-based decisions (Roberts, 1995; Diduck, 2004). All of this results in the reduction of conflict, uncertainty, and dissatisfaction with the decisions that are made.

Others view public involvement as a means of learning. For example, Daniels and Walker (1996) maintain that by participating, people learn that in order to find a mutually acceptable solution to a problem, they have to rise above their personal interests. Olsen (1982) cited by Ochteau (1999), states that participation conducts a vital educational purpose, teaching people to be informed, interested, and to maintain a sense of control over their own lives as well as show concern for the broader community. Pateman (1970) maintains that a participatory approach in decision-making is a learning experience with which participants can acquire the skills for effective decision-making.

It is important to recognize that public involvement does take time and money, particularly during the initial stages of planning and analysis as compared to top-down

approaches which have little or no involvement of the public (Rosenberg and Korsmo, 2001). However, it is argued that these initial costs can often be offset later in the process because they help minimize costs and delays associated with conflict over an issue. For example, public involvement may prevent costly and time-consuming legal challenges by the public to regulatory approvals (Diduck, 2004).

2.4.3 Public involvement in the emergency response phase

The conventional wisdom on public involvement in emergency response is that it should be limited, due to the potential risk to human life (Department of Environment, 2000). However, little is known about public involvement in the emergency flood response phase to support this convention.

Most of the literature on public involvement in disaster management tends to focus on the planning stage and not on the emergency response phase. The main theme in the literature about the planning stage is that the planning process educates the public about natural hazards and what is feasible to do about them (Godschalk et al., 1998, Johnson, 1998, and Hunt, 1999). This knowledge is important because it affects the quality of emergency preparedness, response, and ultimately, the resilience of the affected public in the face of a disaster (Haque, 2000).

The literature (Buckland and Rahman, 1999; Haque, 2000; Shrubsole, 2001) does say that conflict and dissatisfaction often mar the emergency flood response phase. In Manitoba, for example, there exists a "culture of conflict" over emergency response issues such as mandatory evacuation and the operation of the Floodway (Shrubsole, 2001). One of the reasons for this conflict stems from the "command-and-control" approach that has been used to make these types of emergency management decisions

(Haque, 2000). The approach ignores the key stakeholders in the emergency response phase: the public.

The “command-and-control” approach is also problematic because it gives insufficient attention to key elements of public participation (Mitchell, 2002). The first of these is breadth of participation. The idea is to have multiple publics, active and inactive publics, and stakeholders involved in the decision-making process. This way, the risk of ignoring important values, interests, and issues, which affect community level decisions, such as the decision to take a certain action during a flood, is minimized.

The second key element is degree or level of participation. This refers to the extent to which managers and their key publics share decision-making power. Arnstein's (1969) ladder of citizen participation is an example of a model that describes different levels of public involvement in decision-making. The ladder identifies eight levels of involvement and the associated degrees of power sharing (Table 1). The bottom rungs on the ladder, which include manipulation and therapy, are characterized as nonparticipation, and are described as public relations exercises designed to educate citizens and gain their support (Mitchell, 2002). The middle rungs are forms of tokenism, which involve informing (one-way flows of information from managers to citizens), consultation (citizens are given a voice but this voice is not necessarily heeded), and placation (citizens provide advice but do not participate in decision-making) (Diduck, 2004). The top rungs, referred to as forms of citizen power, include partnerships, delegated power, and citizen control. Citizen control involves the highest degree of citizen participation (Arnstein, 1969).

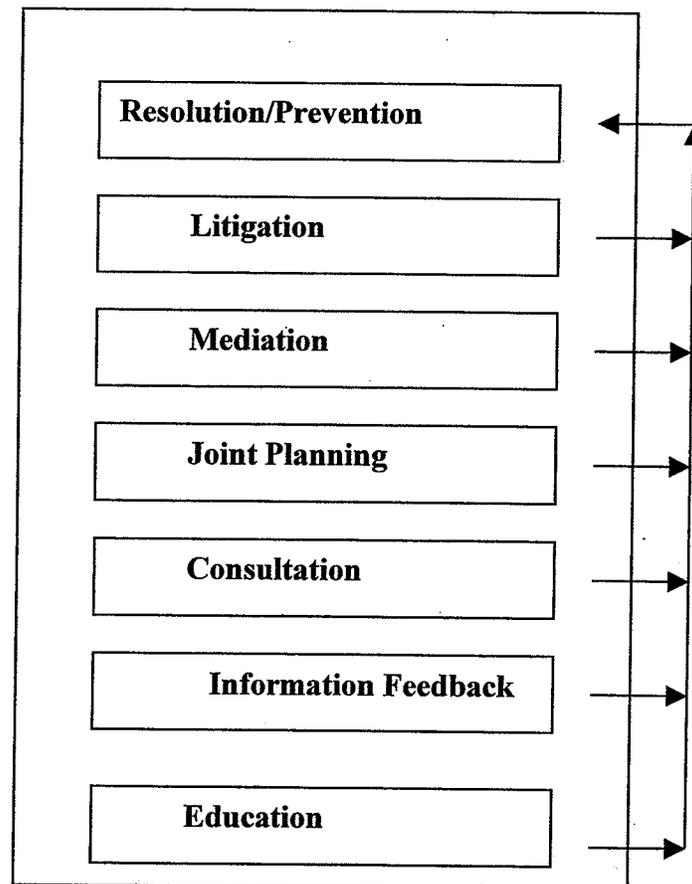
Table 1: Degrees of power sharing and forms of participation (Arnstein, 1969)

DEGREE OF POWER SHARING	FORMS OF PARTICIPATION
Citizen power	Citizen control
	Delegated power
	Partnership
Tokenism	Placation
	Consultation
	Informing
Nonparticipation	Therapy
	Manipulation

Arnstein's model signals to decision-makers that the degree of public participation in decision-making is a critical consideration that affects the public's perception of the meaningfulness of their participation.

Arnstein's model has some limitations which even she has acknowledged (Connor, 1985). For example, citizen power is not distributed as neatly as displayed by the rungs on the ladder. In addition, eight rungs may not adequately cover actual situations in the real world. Supplementing Arnstein's view, is a model designed by Connor (1985) termed "the New Ladder of Citizen Participation" (Figure 2). The objective of this model is to provide a systematic approach to preventing and resolving public controversy about all types of policies, programs and projects, irrespective of whether they are in urban, suburban, or rural settings, and whether the government or private sector is undertaking them.

Figure 2: The New Ladder of Citizen Participation (Connor, 1985)



In the Connor model, there is a cumulative relationship between rungs on the ladder. For example, with regard to the Education rung, it is important to provide people with knowledge before an issue arises. When parties have a sound information base, they may have more understanding and acceptance for a proposed project or policy. The Information-Feedback rung comes into play when parties affected by a proposed change show that they do not understand it or accept it. Information about the proposed change is then dispersed while at the same time, people's opinions on the proposal and its alternatives are solicited. Consultation is employed when education has not generated informed support by the parties involved, or when an information-feedback program has

failed to generate understanding and acceptance of a proposal. If necessary, this process continues until the Resolution rung is reached. The point of the model is to have a successive continuum of involvement, with each higher rung building on the lower one.

A third key element found in the literature on public participation is the timing of participation. This examines the point at which key publics are brought into the planning and decision-making process. Most public participation in resource management occurs at the operational level when decisions are being made about day-to-day activities. However, Smith (1982), Diduck (2004), and others suggest that public involvement should also occur at the normative and strategic stages of planning when key issues such as the definition of problems, the identification of goals, and the assessment of alternative ways of achieving these goals are tackled. The earlier the involvement occurs, the more influence the public could have on these issues, consequently avoiding or reducing conflict later. However, during the emergency response to a flood event, these three stages (operational, normative, and strategic) of decision-making are often foreshortened.

The fourth key element deals with participation techniques such as 'information-out' methods (advertisements, technical reports, and public meetings), 'information-in' mechanisms (public hearings, focus groups, and interviews) and facilitating techniques such as group process, mediation, and interest-based negotiation (Mitchell, 2002). Techniques that involve interaction and communication, such as group process and mediation, are often associated with high degrees of participation (Diduck, 2004). Therefore, participatory approaches to community involvement in decision-making should emphasize techniques that involve continuous exchange. Such exchanges are

particularly important during a flood event when lives and property are at stake. However, the norm seems to lean towards 'information-out' techniques only.

In Canada, many applications of participatory approaches to resource and environmental problems can be found in environmental impact assessment processes, round table processes such as the Manitoba Consultation on Sustainable Development Initiative (COSDI), and the Model Forest Program (The Canadian Model Forest Network, 2002). However, there is a gap when it comes to the application of participatory approaches to emergency flood response. In light of this gap, this study investigated why participatory approaches have not been applied to decision-making in emergency flood response, and if these approaches could improve emergency response to floods if they were applied.

2.5 Summary

Flooding is a fact of life in Canada. Along the Red River, the disastrous flood of 1997 was neither an unforeseen nor an unprecedented event. In fact, a flood of the same magnitude or larger could occur in any year (IJC, 1997). Given this possibility, the emergency flood response phase is critical because it is during this phase that authorities make decisions that affect the ability of the public to prepare for and respond to a flood. However, the literature suggests that there has been limited public involvement in emergency response decision-making. This lack of public involvement has led to conflict during the emergency response phase.

Public involvement can reduce controversy in resource and environmental management issues, and improve decision-making. Public involvement provides a forum in which compromises and consensus-based decisions can be reached, consequently

minimizing potential conflict among stakeholders and authorities. It is therefore worthwhile to consider greater breadth, higher degrees, and earlier interactive techniques of public participation, in the emergency flood response phase.

CHAPTER 3: METHODS

3.1 Introduction

The purpose of this research was to obtain from the public, NGOs, and government agencies in two different jurisdictions, their views on public involvement in emergency flood response. Thus, the research design was a qualitative comparative case study which entailed two components. First, secondary data were collected by reviewing documents from various sources. Second, primary data were collected from interviews with selected individuals, NGOs, and government agencies involved in the emergency response phase of the Red River Flood of 1997.

Data were analyzed by synthesizing key ideas from document reviews and interviews using QSRN4 data analysis software program (Hult, 1996). Common themes were extracted from this synthesis in order to draw conclusions and make recommendations on public involvement during emergency flood response.

3.2 Document Review

A comprehensive document review of literature was conducted on public involvement, public involvement in emergency flood response, emergency governance in Canada and the United States, and the Red River Flood of 1997. This entailed looking through library documents, NGO records, news media accounts, and government agency files and records (Appendix 1). For example, a report of the Manitoba Water Commission presented an independent review of provincial actions taken during the 1997 flood. This provided important background of flood management issues in Manitoba. Articles in newspapers such as the Winnipeg Free Press and the Valley News & Views (a local newspaper in Drayton) provided accounts of the flood. The purpose of the document

review was to identify key emergency response actions, the public's reaction to these actions, and any documented public involvement in the flood of 1997. In addition, the Internet was used to search government agency web sites for any other relevant information.

3.3 Selection of Communities

In order to consider in some detail the role of the public in emergency flood preparation and response, and in potential future participatory activities, a comparative case study was conducted of two rural communities from both sides of the border in the Red River Valley. One community was the Village of Rosenort (Rural Municipality of Morris) in Manitoba, and the other was the City of Drayton (Pembina County) in North Dakota (Figure 3).

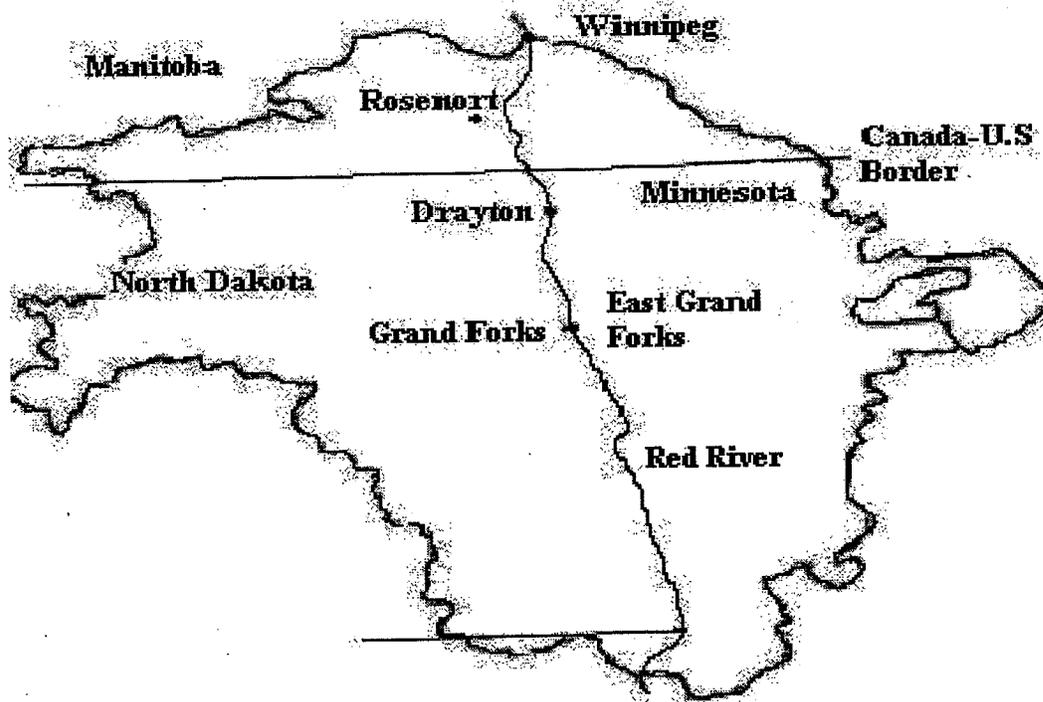


Figure 3: Location of the Village of Rosenort and the City of Drayton

The Village of Rosenort was selected from many other communities in Manitoba for several reasons. First, it was significantly affected by the 1997 flood. While the exact percentage of land area flooded in Rosenort is not documented, it is known that 61 percent of the land area in the RM of Morris was flooded (Tait and Rahman, 1997). Second, the community is relatively free from the influence of daily rural-urban commuters, thus maintaining its rural status (Buckland and Rahman, 1999). Third, the availability of background information about the flood of 1997 in Rosenort was important in setting the context for the study. Various studies have been conducted on flood management issues in Rosenort. For example, a study by Buckland and Tait (1999) examined community-based disaster management in the communities of Rosenort and St. Jean Baptiste during the flood of 1997. Some of the issues covered by Buckland and Tait included the cultural background of the communities, community social and economic characteristics, and the provincial-community partnership in flood management. Fourth, Rosenort is less than an hour from the City of Winnipeg and thus is easily accessible. Access to the community was important because of time and financial considerations.

The reasons for selecting the City of Drayton were similar to those pertaining to Rosenort. First, the flood of 1997 significantly affected Drayton. The flood crested at about 14 m, 1 m higher than Drayton had experienced before (Jensen, 1997). Not only were flood levels very high, but there was also a huge amount of water spread out over the surrounding countryside. The river at Drayton was nearly 16 km wide (Jensen, 1997). Second, nearly everyone who was involved in the flood of 1997 still resided in the city, making the task of locating interview participants easier. Third, the City of Drayton is also less than two hours from the City of Winnipeg, making it easily accessible.

3.4 Identification of Interviewees

The interview subjects were divided into three main groups: government officials, NGO officials and the public. Government officials consisted of Canadian and American officials from federal, provincial/state, and local levels. At the federal level in Canada, one official was interviewed from each of the following agencies: OCIPEP, the RCMP, and the Canadian Armed Forces. At the federal level in the United States, one official was interviewed from each of the following agencies: FEMA, the United States Corps of Engineers, and the National Weather Service.

At the provincial level, two officials were interviewed, one from MEMO, and the other from the Manitoba Conservation-Water Branch. At the state level, two officials were interviewed, one from DEM, and the other from the North Dakota State Water Commission (SWC).

At the municipal level in Manitoba, the Reeve of the Municipality of Morris was interviewed, and at the county level in North Dakota, the emergency manager of Pembina County was interviewed. There was one more level of government in North Dakota: the city level. At this level, the mayor of the City of Drayton was interviewed.

The reason for limiting the number of officials to be interviewed was to ensure that the scope of the interviewees was not too broad and cumbersome. The purpose of interviewing government officials was to get a clear understanding of the policies and procedures involved in the emergency response phase of the 1997 flood, to identify activities carried out during the flood and how (if at all) the public was involved, and to determine the willingness of the government to involve the public in emergency response.

NGOs consisted of the Canadian Red Cross, the American Red Cross, and the Salvation Army. Interviews were conducted with one official from the Canadian Red Cross, one official from the American Red Cross, and one official from the Salvation Army from each side of the border.

It is important to note that both government and NGO interview participants were initially identified through their web sites. These initial informants led to other informants through the snowball sampling technique (Babbie, 1998). This technique is a nonprobability sampling method for identifying individuals through recommendation or suggestion by other individuals in the study. The snowball sampling technique was used because it simplified the task of locating government and NGO representatives who were involved in the 1997 flood.

The public (in Manitoba and North Dakota) consisted of local groups and community members. With regard to local groups, interviews were conducted with two local groups from each community, a church group and a community service organization (a fire station in both cases). Interview participants were identified by going door to door and requesting interviews. These participants lived inside the village/city as well as on the outskirts of the village/city. Interviews were halted when 10 individuals from Rosenort and 10 from Drayton had been identified. This was to ensure a sample that was sufficiently representative but not too large.

The purpose of conducting interviews with NGOs, local groups, and individuals was to better understand their role in emergency response, to find out what activities they carried out in response to the flood of 1997, to determine some of the problems they

encountered, and to determine how (if at all) these problems could be rectified. In total, 40 participants were interviewed, 20 in Manitoba and 21 in North Dakota (Table 2).

Table 2: Number of Interview Subjects

Interview Subjects	Jurisdiction	
	Manitoba	North Dakota
Government Agencies	Federal Agencies	Federal agencies
	OCIPEP 1	FEMA 1
	RCMP 1	US Corp of Engineers 1
	Canadian Armed Forces 1	National Weather Service 1
	Provincial Agencies	State Agencies
	MEMO 1	DEM 1
	Water Branch 1	Water Commission 1
	Municipal Agencies	County Agencies
	Reeve 1	County Manager 1
		City Mayor 1
NGOs	Canadian Red Cross 1	American Red Cross 1
	Salvation Army 1	Salvation Army 1
Local Groups	Church Group 1	Church Group 1
	Fire Department 1	Fire Department 1
Individuals	10	10
Total Number of Interview Subjects	20	21

3.5 The Interview Process

The interviews began by presenting the participants with an information letter (Appendices 2 and 3). This information letter outlined the objectives of the research, what participating in the research would entail, and the approximate length of time that interviews would take. The information letter also stated that there was ethics approval

for conducting the research. The researcher's telephone number, as well as the telephone numbers of the research advisor and the University of Manitoba ethics office, was provided in case participants had concerns.

Semi-structured in-person interviews were conducted with the identified interview participants (Jackson, 1988). This type of interview method involves interaction between the respondent and the interviewer, and is guided by a general plan of inquiry (otherwise known as the interview guide) (Babbie, 1998). The interview is in essence a conversation (between the interviewer and the respondent) directed by the interviewer (Babbie, 1998). This interview technique encourages rapport and increases the response rate if additional interviews or information are required later (Hult 1996; Jackson 1988). It also allows the interviewer freedom to explore questions in detail (Hult 1996; Jackson 1988).

A major disadvantage of in-person interviews, as compared to both telephone and mail surveys, is that they are more costly and time consuming (Chadwick et al. 1984). However, in-person interviews have higher response rates than mail surveys, because mail surveys may not reach the potential respondents (Jackson, 1988). Telephone interviews on the other hand, produce relatively high response rates but the questions and response categories must be kept simple since they are presented orally (Jackson, 1988).

During the interview process some unforeseen circumstances arose. An adaptive approach was used to deal with these circumstances (Nelson 1991). For example, there were situations where interview participants lived too far away for trips to be made to meet them. There were also other situations when the interview participants were only available for short periods of time. In both these cases, telephone interviews were conducted, instead of in-person interviews. For this research, telephone interviews were

conducted with the Mayor of Drayton, and with an official from each of the following agencies: the North Dakota State Water Commission (SWC), FEMA, the United States Corps of Engineers, and the National Weather Service. Therefore, a total of 5 telephone interviews were conducted.

3.6 Development of Interview Guide

As mentioned earlier, the purpose of the research was to obtain from the public, NGOs, and government agencies, their views on public involvement in emergency flood response. Interview guides (Appendices 4, 5, and 6) were used to obtain this comprehensive information from respondents. Interview guides outlined the major questions or subject areas that would be addressed in the interviews, but the exact questions and sequence were determined in the interviews themselves (Chadwick et al. 1984). This ensured that the focus remained on the predetermined topics and issues, while at the same time allowing the interview to remain conversational and free to probe into unanticipated circumstances and responses (Babbie and Rubin, 2001).

The questions in the interview guides were based on underlying themes found in the literature on public participation such as timing, breadth, and degree of participation. During the interviews, notes of participants' responses and any other observations made were taken down and transcribed later.

3.7 Data Analysis

Data analysis involved reducing or segmenting the collected data into categories or patterns that explained the data (Miles and Huberman, 1984). In the first step of this process, interviews were transcribed with a word processor. The resulting text was coded using category labels (Merriam, 1998). Coding is a process of attaching codes to

individual words, groups of words, sentences or paragraphs in order to give meaning to data so that they can be analyzed (Punch, 1998). In this study, data were coded using category labels derived from the literature and from responses to interview questions. The QSR-N4 qualitative analysis software program was used to perform this step in data analysis. The program also helped organize text in order to facilitate interpretation activities such as annotating, and comparison of noteworthy segments of data. In the second step of data analysis, the coded data were segmented and sorted into groups that had similar themes or concepts (Merriam, 1998). The QSR-N4 software program was used again to perform this task. Theme identification was an iterative process. The themes that emerged from the data can be found in Tables 3 and 5.

The third step of data analysis involved summarizing and making conclusions about the data. Conclusions were verified by comparing them to the raw data. Finally, these conclusions were used to develop recommendations about public involvement during the emergency flood response phase.

CHAPTER 4: COMMUNITY INVOLVEMENT IN THE EMERGENCY RESPONSE PHASE

4.1 Introduction

The goal of this chapter is to identify and describe emergency preparation and response activities carried out by government, non-government, and community members during the Red River flood of 1997. The chapter begins by providing a timeline of events surrounding the emergency response phase and then describes emergency preparation and response activities in the Village of Rosenort, and the City of Drayton.

4.2. Timeline of events

Throughout the month of February 1997, forecasters had been predicting serious flooding in the Red River Valley. The blizzard of April 5th and 6th signalled the beginning of this flood. It caused record snowfall over most of the Red River Basin. For example in Winnipeg, 58 cm were recorded, and as much as 90 cm fell in North Dakota (Rannie, 1998). In Manitoba, the blizzard was followed by about a fortnight of cold and very little snowmelt, delaying the runoff process. In North Dakota, warm temperatures set in very quickly after the blizzard, generating an outstanding amount of runoff. When warm temperatures finally set in Manitoba, it meant that snowmelt was now occurring simultaneously over the entire Red River Valley. The tributaries of the Red River were almost at their peaks as the main flood crest from North Dakota arrived in Manitoba.

After the blizzard, flood estimates of peak flows were adjusted 0.6-0.9 m above the 1950/1979 level (Rannie, 1998). Flood preparations, which had begun in March, now intensified. The province formally requested the assistance of the Canadian Armed Forces on April 10th, and the first soldiers sent in were about 300 Manitoba based infantrymen and reservists (Winnipeg Free Press, 1997). Flooding in North Dakota began

the following week, and reached its peak in Fargo on April 18th, and in Grand Forks on April 21st –22nd. Grand Forks received unprecedented discharge, with the river cresting at 16 m, about 8 m above flood stage (Broderson, 1997). At this time, 90% of East Grand Forks' (8,700 residents) and 75% of Grand Forks' (52,000 residents) had been evacuated (Broderson, 1997). On April 24th, government officials began to allow people back into the driest areas of town to visit their homes and begin the cleanup process.

With the catastrophic flooding in Grand Forks and the subsequent evacuation of the city, the province of Manitoba declared a general State of Emergency on April 22nd. Although voluntary evacuation had begun earlier in some areas, on April 23rd, the Provincial Government Flood Management Task Force recommended mandatory evacuation. The Task Force had been set up in April in part to identify potential emergency situations and communicate them to MEMO, the City of Winnipeg, and municipalities. It was headed up by the Water Resources Branch, with representatives from the City of Winnipeg, the University of Manitoba, the Canadian Armed Forces Engineering Division, Manitoba Hydro and Acres-Wardrop engineering consultants (Haque, 2000).

On April 27th, MEMO issued orders for the mandatory evacuation of the valley (towns and farmsteads alike) south of Winnipeg, and by April 30th, 17,000 people had been evacuated (Rannie, 1998). On May 1st, the Red reached its peak in Winnipeg at 7.5 m. Evacuees began returning to some regions on the margins of the flooded area between May 3rd and 5th. However, there were still large volumes of water that had not receded after flood peak. These delayed re-entry into most communities and homes near the river (Rannie, 1998). Most evacuees of the city of Winnipeg were permitted to return by May

15th, and by May 20th, the citizens of Rosenort were resettled in their community (CBC, 1997). However, by August 2nd, there were still 3000 evacuees in the Manitoba side of the Red River Basin waiting to return to their homes (CBC, 1997).

4.3 Emergency Response in Rosenort

4.3.1 Background

The village of Rosenort is part of the rural municipality (RM) of Morris, in southern Manitoba, and is surrounded by a ring dike. It has a population of about 600 (McCauley, 2003). Rosenort is administered by the rural municipality government (RM of Morris), which consists of elected councillors and a Reeve. Its main economic base is the steel manufacturing industry, which produces items such as augers, grain bins, and truck boxes (Government of Manitoba, 2003).

During the Red River flood of 1997, 61 % of the land area in the RM of Morris flooded (Tait and Rahman, 1997). It is also estimated that 16.9 % of houses in the RM were damaged by floodwaters (Buckland and Rahman, 1999). Rosenort did not experience any significant flooding mainly because the community ring dike was able to hold floodwaters at bay. Any flooding that occurred inside the dike was primarily basement flooding. This occurred as a result of lack of power to run pumps.

4.3.2 Community activities during the emergency response phase

To determine the extent of community involvement in response to the Red River flood of 1997, respondents were asked to recall the type of activities that went on in their community. They identified the on-site activities listed in Table 3, which were categorized into three groups: activities that involved local group decision-making (i.e. church groups and community service organizations, in this case the local fire

department), activities that involved neighbourhood decision-making, and activities that involved individual decision-making. These groups were further categorized into whether they occurred as the flood approached or during the flood itself.

Table 3: Examples of community decisions and activities in Rosenort during the emergency response phase

Emergency Response Activities		
Types of Decisions	As the flood approached (preparation)	During the flood (response)
Local group decisions	<ul style="list-style-type: none"> • Sandbagging activities. • Provision of facilities (e.g. church basement and fire hall) for community use. 	<ul style="list-style-type: none"> • Building of sandbag and earthen dikes. • Patrolling and maintaining dikes. • Alerting residents of evacuation order.
Neighbourhood decisions	<ul style="list-style-type: none"> • Planning and procurement of supplies such as sandbags, earth, and dike building equipment to build neighbourhood dikes. 	<ul style="list-style-type: none"> • Building of sandbag and earthen dikes. • Patrolling and maintaining neighbourhood dikes.
Individual decisions	<ul style="list-style-type: none"> • Moving furniture to upper levels of house. • Moving farm equipment, farm animals and grain to higher ground or out of town. • Repairing and reinforcing dikes already in place. 	<ul style="list-style-type: none"> • Patrolling and maintaining dikes. • Manning of pumps. • Cooking for family members, friends, and others. • Evacuation activities (e.g. disposal of perishable food items, and shutting off electric power, and notifying authorities of one's destination). • Procuring rescue equipment.

With regard to the "local group decisions" category listed in Table 3, some community respondents were involved in emergency response activities as members of local church groups and community service organizations. Some of these groups included the Rosenort Fellowship Chapel and the Rosenort fire department. The Chapel provided its facilities (basement to be more exact) to be used for feeding volunteers. In addition to this, members of the congregation were involved in sandbagging activities around the community. The fire department's hall was the emergency operations centre (EOC) for Rosenort before evacuation. It was staffed by volunteers from the community. People

called the EOC to get information on where and how to procure resources such as boats, as well as to obtain updates on the flood situation. Representatives of the fire department were involved in sandbagging activities around the community, and also patrolled the community and advised people to evacuate.

The “neighbourhood decisions” category refers to activities carried out on a neighbourhood scale. Some community respondents described how members of their neighbourhood decided to build a dike around their block during flood preparation.

We held a meeting of our street block to plan how to best protect it from floodwaters. After discussions, we decided to build a dike around our neighbourhood. We built-up the dike by moving a lot of dirt. Later on, the RM came in and reinforced it. After evacuation, two people stayed behind to watch over the dike and watch over people’s homes. [Rosenort respondent #7]

We started preparing for the flood by building dikes. One of the things that we did was to meet with our neighbours and decide to build a temporary dike around the neighbourhood. We paid for all the supplies and built-up the dike ourselves. [Rosenort respondent #1]

We prepared by sandbagging and building up the dike around our house by 3 feet. In addition, we met with our neighbours and decided to build up a dike around our block for extra protection. [Rosenort respondent #5]

Although there are no specific examples to quote, neighbourhood meetings generally consisted of discussions on the procurement of supplies such as sandbags, earth, and dike building equipment. They also consisted of discussions on who was going to pay for these efforts. During the flood, members of the neighbourhood self-organized to patrol the dikes to ensure that they did not break.

The “individual decisions” category refers to preparation and response activities carried out among individuals, with the help of their families and friends. As the flood approached, individuals described a host of preparation activities outlined in Table 3. These included activities such as sandbagging around their homes, moving furniture to

the upper levels of their houses, moving farm animals, equipment, and grain out of town or to higher ground, and repairing and reinforcing dikes that had been previously built.

During the flood, community respondents described response activities such as patrolling and maintaining their dikes, watching pumps to ensure that they continued to function, and cooking for family members, friends, and others that were assisting in response efforts. Table 4 lists some of the comments made by community respondents regarding some of the preparation and response activities described above:

Table 4: Examples of comments made by Rosenort community respondents about preparation and response activities.

- *Preparation for us involved a lot of sandbagging. We also moved furniture from our basement to the main floor of our house. [Rosenort respondent #1]*
- *We lived outside the dike, so we did a lot of sandbagging around our house. We moved furniture upstairs. We also transferred our vehicles and our children's musical instruments out of town to friends' homes. We kept track of what was lost during the flood and the cost of those things. Eventually we had to evacuate to our friends' house in Niverville. [Rosenort respondent #2]*
- *Me, my children, and friends hauled dirt and made sandbags to reinforce the dike around the house. We cleaned out our basement and the main floor. Some of the things that were cleaned out were taken upstairs and others were taken out of town to friends' homes in Winnipeg and Winkler. After my wife and I left town, my two sons-in-laws stayed back to run the pumps. [Rosenort respondent #3]*
- *We mainly prepared by sandbagging and building up the dike around our house. We also cleaned out the basement and put things on the main floor. We hauled grain out of town. I also cooked at the local restaurant for volunteers and for the military who were helping out in the community. [Rosenort respondent #5]*
- *We cleaned out cupboards on the main floor of our house and moved furniture to the second floor of our house. We also moved farm equipment off the yard to higher ground wherever we could find it, and hauled grain off to the elevator in Morris. We built up the dirt dike around our home and sandbagged at our other property. [Rosenort respondent #10]*

Individual community members also made decisions on how they were going to evacuate. They decided which family members would leave and which ones would

remain behind to mind the homestead. They also decided where to go, what to take, and what to leave behind.

Our family had already decided to leave town even before the evacuation was announced just as a precaution. We went to Steinbach where we stayed with friends. [Rosenort respondent #1]

After the first evacuation order was announced, we decided to send the children ahead of us to stay with friends in Niverville. In the meantime, we would stay as long as possible to fight the flood. Eventually, we got stranded at our house because of flooding and had to use a boat to escape. [Rosenort respondent #2]

When evacuation was announced, we decided to rent an apartment in Winnipeg instead of going to a host centre or to a friend's house. We felt that we would be more comfortable having our own place instead of sharing with others. [Rosenort respondent #7]

4.3.3 Government and NGO activities during the emergency response phase

Municipal Activities

The RM of Morris prepared for the flood by devising emergency plans, taking inventory of resources in order to know what was available and what would be needed, devising evacuation plans, and arranging host communities for evacuees. The RM's response activities included the provision of sandbags for building temporary dikes, and the equipment for building these dikes. They also coordinated diking (both sand and earthen dikes) activities around the municipality. Coordination involved setting up a priority list of who was to receive sandbags, and truck routes for sandbag transportation into different communities. The RM also hired a harbourmaster to conduct 'search and rescue operations' of people who may have become swamped or stranded in the flood.

The most significant decision made by the RM was to have a non-mandatory evacuation policy. The RM of Morris had devised an evacuation system where children under the age of 15, senior citizens, and community members with medical conditions

had to evacuate once the flood began. The others could stay as long as they had adequate food supplies, rescue equipment and kept in touch with the RM.

It is important to note that the plans and activities described above were conducted largely without consultation with community members. The implications of this will be discussed later on.

Provincial Activities

The two most prominent provincial government agencies involved in the emergency response phase were the Manitoba Emergency Management Organization (MEMO) and the Water Branch in the Manitoba Department of Conservation. MEMO was the central organization that coordinated all emergency efforts within provincial departments, and among provincial, federal and NGO agencies involved in the emergency. MEMO also held flood information sessions throughout the Red River Valley during preparation for the flood. MEMO's regional staff set up these meetings, and representatives from provincial, federal, and NGO organizations made presentations on their flood preparation activities to the public. The Water Branch was mainly responsible for preparing and maintaining community ring dikes. They also provided flood forecasts, and predictions of how high the water was going to rise.

One of the most significant decisions made by provincial authorities was the issuing of the mandatory evacuation order for all municipalities affected by the flood. The evacuation was to be implemented by local authorities, the RCMP, and the armed forces (Buckland and Rahman, 1997). This was done without consulting with the public and municipal officials. The implications of this decision will be discussed later on.

Federal Activities

The Federal Emergency Preparedness Coordinating Committee (FEPCC), chaired by OCIPEP, coordinated federal emergency support to Manitoba. FEPCC coordinated preparation and response activities within federal departments, and among federal and provincial government agencies. Apart from the Canadian Armed Forces and the RCMP, federal government agencies were in the background for the most part.

The Armed Forces put into place a program called "Operation Assistance". This was the largest Canadian military operation since the Korean War and probably the largest civil operation it had ever mounted (IJC, 1997). Operation assistance provided labour to assist in preparation and response activities such as filling sandbags and building dikes. They conducted some 'search and rescue operations' of people in trouble, and assisted in the evacuation of community members.

The RCMP mainly patrolled communities in order to maintain security once residents had evacuated and enforced evacuation by checking residents' houses to see if they had left. They also set up checkpoints to ensure that people did not go into evacuated or restricted areas.

Activities of NGOs

The two major NGOs involved in the emergency response phase of the 1997 flood were the Red Cross and the Salvation Army. In Rosenort, the involvement of these two organizations was not extensive. The Red Cross mainly carried out the registration of evacuees, while the Salvation Army provided food for volunteers working on the dikes. They also set up a distribution centre in the town of Morris to give out items such as bedding, clothes and toys.

4.3.4 Outcome

Community preparation and emergency response activities progressed mostly as planned because they involved decisions made by community members themselves. In some cases however, there were shortages of supplies such as sandbags, boats, and dike building equipment, which delayed the work that had to be done.

The mandatory evacuation order imposed by the province caused the most significant impact on the progress of community preparation and response activities because it interfered with community activities. It meant that people had to stop what they were doing and leave town.

Calls to evacuate only added more pressure to locals trying to save their homes and property. Some people were evacuated and their homes ended up flooding. [Rosenort respondents #3]

Evacuation made us less involved in the flood because we had to leave town. Yet as we were about to leave, we heard on the radio that more volunteers were needed to sandbag in the community. [Rosenort respondent #8]

Evacuation was not good. Too many people left, especially the men, even though there was still so much work left to be done. [Rosenort respondent #9]

The mandatory evacuation order was also a bone of contention because it was a 'top-down' provincial decision, imposed without consulting community members and municipal officials. Municipal officials had legal jurisdiction over the evacuation of municipalities. They had their own non-mandatory evacuation policy, which the province overruled. This put RM officials in a very difficult position because if they implemented the order, they would lose community support. Eventually, the Reeve of Morris refused to sign the evacuation order and left its implementation to the provincial government.

The actual implementation of mandatory evacuation was at issue. Some community respondents suggested that the government grossly exaggerated flood level

predictions in order to get people to leave their homes. Respondents noted that there was talk of a four to six feet 'wall' of water travelling towards the community. They also suggested that the RCMP used intimidation to enforce the evacuation order.

We ignored the evacuation order. The RCMP came around and told us to leave but we refused because our house and property would have been flooded out had we not stayed. The RCMP put a big red "X" on our window to show that we had been warned. They patrolled our house a few times and we felt like we were being watched. [Rosenort respondent #10]

In response to the mandatory evacuation order, some community members took matters into their own hands and refused to leave their homes (as reflected in the above comments), while others hid in their homes and cut off communication with emergency personnel.

My two sons-in-law did not evacuate. They hid out at my house so that they could keep an eye on the pumps to make sure that they kept working. [Rosenort respondent #3]

When the military came round evacuating people, I hid from them. I wanted to stay and watch over my house to make sure that it did not get flooded out. [Rosenort respondent # 8]

I first evacuated with my family but later decided to come back and check on my home. To get back into town, I evaded the roadblock that had been set up by the RCMP. [Rosenort respondent #9]

4.4 Emergency response in Drayton

4.4.1 Background

The city of Drayton is located in Pembina County, North Dakota, on the west bank of the Red River, 48 km south of the Canadian border and 72 km north of Grand Forks. Drayton is located on Interstate 29, a direct trade route between Canada and Mexico, making it an important crossroad for freight transportation and tourists. Founded in 1878, Drayton is one of the oldest communities in North Dakota. During the 1870s and

1880s, it evolved into an important steamboat stop for barges transporting goods and new settlers. The early steam boat commerce grew and prospered until the railroad came to town in 1887 (see-<http://www.draytonnd.com/>).

Today, Drayton has a population of 958 (Jensen, 1997), and its administrative structure consists of a body of elected councillors and a mayor. The main economic activity is the provision of goods and services to the surrounding agricultural community. Agricultural activities include sugar beet farming and processing, grain farming, and dairy and beef cattle farming.

Being on the banks of the Red, Drayton has experienced floods many times. To highlight this point, it is important to consider that Pembina County has had eight presidential declarations for flooding, and one for blizzards since 1993 (FEMA, 2003). In addition, in some years, the county has encountered spring, summer, and fall floods (Halcrow, 2003).

During the winter of 1996-1997, North Dakota experienced a record number of blizzards (8 major ones), resulting in snowfall of well over 254 cm (Jensen, 1997). The worst storm was a 3-day ice storm and blizzard, which occurred in the first week of April 1997, covering the entire eastern half of the state. In Drayton, the ice storm cut off electricity, and storm conditions made it impossible for city crews to create any backup system. In addition, residents found themselves with no heat as their home heating systems used electrical power. What was worse, not only did the ice storm add more snow to what had been there previously, but it also interfered with sandbagging and diking efforts that were already underway in the city. By the time Drayton recovered sufficiently to return to its preparation efforts, river levels had begun to rise.

4.4.2 Community activities during the emergency response phase

As in the case of Rosenort, community respondents identified the on-site activities listed on Table 5. These were categorized into two groups: activities that involved local group decision-making i.e. church groups and community service organizations (in this case the fire department) and activities that involved individual decision-making. These groups were further categorized by whether they occurred as the flood approached or during the flood itself.

Table 5: Examples of community decisions and activities in Drayton during the emergency response phase.

Emergency Response Activities		
Types of Decisions	As the flood approached (preparation)	During the flood (response)
Local group decisions	<ul style="list-style-type: none"> • Sandbagging activities. • Provision of dike building equipment. 	<ul style="list-style-type: none"> • Building of sandbag and earthen dikes. • Assisting in evacuation of town. • Provision of information. • Watching over parsonage.
Individual decisions	<ul style="list-style-type: none"> • Participating in the building of the city dike. • Moving furniture to upper levels of house. • Moving farm equipment, farm animals, and grain out of town or to higher ground. 	<ul style="list-style-type: none"> • Patrolling the city dike. • Attending the city's pre-evacuation town meeting. • Participating in the building of the 'Great Wall of Drayton'. • Sandbagging. • Watching over pumps. • Cooking for family members and others that were helping out.

The 'local group decisions' category identified in Table 5 refers to the involvement of some community respondents in preparation and response activities as part of local church groups and community service organizations. Some of the local groups in which community respondents were involved included the Drayton United Methodist Church and the Drayton fire department. The United Methodist Church was primarily involved in sandbagging and dike building activities in the city. However, because the Church is

located near the banks of the Red River, its involvement did not go beyond this as it was in danger of being flooded. Church members had to concentrate on moving furniture and office equipment out of town, and keeping watch over the parsonage.

The fire department was part of the emergency team formulated by the city. As part of this team, they provided some of their equipment to be used in building dikes, and they also supervised dike-building crews in different parts of town. A representative of the fire department was installed in the EOC to provide information to the public and other agencies. The fire department also carried out some rescue activities, and helped in evacuating the town.

The 'individual decisions' category outlined in Table 5 refers to individual preparation and response activities. Community respondents reported that as the flood approached, they participated in the city's efforts to build a temporary earth dike around the city. During the flood, community members assisted the city in patrolling the dike to ensure that it did not break. Community respondents also reported participating in the city's pre-evacuation meeting. The city had devised an evacuation plan and had called a town meeting to discuss it, and receive public input. There was high turnout for the meeting and several issues were discussed. These included things that one was required to do before leaving town such as the shutting down of electricity, who to notify, and what one was allowed to take when leaving town. Community respondents were generally satisfied with this meeting. The following are comments from some community respondents about the meeting:

The Mayor called a town meeting at the gym in the school here in town. She provided information on what might happen with dikes and water levels, and what to do when leaving town. People got a chance to comment and ask questions.

Some people left immediately after the meeting and others stayed until the evacuation siren went off. [Drayton respondent #1]

Most of the people understood the danger that existed if the dike broke. Others did not understand the hydraulics of water. They thought that if they were far away from the riverbank, on the westside of the City, they would be fine. However, after the meeting, I think that these people understood the situation much better. [Drayton respondent #4]

The building of the 'Great Wall of Drayton' outlined in Table 5, was perhaps the most significant effort that community members described as part of their individual response activities. In order to raise Drayton's dike protection by 4 feet, the Corps of Engineers decided to add a 3.2 km plywood wall on top of the city dike (Jensen, 1997). This effort was remarkable because it occurred after residents had been evacuated. The Mayor had to call residents that were still in the area, and other volunteers back into town to build the wall. The residents and volunteers were to go back into town with any hammers, pile drivers, and electric saws that they had in their possession. The Mayor also appealed for residents who had experience with cooking for large crowds, to come back into town and help prepare food for the volunteers. The turnout was large, and the wall was finished within 24 hours of initiating construction.

Community respondents also described other individual preparation and response activities as outlined in Table 5. For example, as the flood approached, respondents described preparation activities such as moving furniture to upper levels of their houses, moving farm animals, equipment, and grain out of town or to higher ground. During the flood, respondents described response activities such as sandbagging around their homes for extra protection, watching pumps to make sure that they kept functioning, and cooking for family members, friends, and others who were assisting in preparation and response efforts.

4.4.3 Government and NGO activities during the emergency response phase

City and County Activities

Unlike Rosenort, Drayton does not have a ring dike. As such, the Mayor and city council decided and planned to build a temporary earth ring dike around the city. The city provided the supplies and equipment that would be needed to carry out this exercise. In addition, the city appointed an emergency team to coordinate specific tasks related to the building of the city dike. This team consisted of locals who were thought to have experience in dealing with floods. There was no consultation with the public as to which community members would be part of this team. Members of the emergency team conducted tasks such as flood and volunteer coordination. The flood coordinator coordinated sandbagging and dike-building activities around the city, and the volunteer coordinator coordinated volunteers conducting various preparation and response activities around the city. The emergency team also alerted residents when it was time to evacuate the city.

With regard to evacuation, in the wake of the disaster in Grand Forks, the Governor of North Dakota had prepared a mandatory evacuation order for the cities of Drayton and Pembina. The Mayors of both towns were called to several emergency meetings, and were told to have their evacuation plans ready to facilitate this imminent order. Drayton did not have an evacuation plan. The town was given 24 hours to organize and develop a plan to physically move about 1000 residents, provide temporary shelter for evacuees, and arrange for the provision of food, medical services and security for the abandoned town. After devising the evacuation plan, city officials held the town meeting discussed earlier to explain this evacuation plan to residents and obtain feedback

The county government was also involved in community efforts to fight the flood. First, in 1992, the county had formulated a basic countywide disaster plan, which was signed through resolution by cities in Pembina County. The plan established a broad concept for conducting response and recovery operations when an emergency or a disaster threatened, or occurred anywhere in the county.

Second, during the 1997 flood, the county government acted as a conduit among city, state and federal officials, and the public. For example, in the spring of 1997 just prior to the flood, the county organized and held information sessions similar to the ones held in Manitoba in several communities. City, state, and federal officials, and the general public attended these sessions. These sessions discussed and informed the public of on-going flood preparation efforts in the county. The Governor had also left the enforcement of the mandatory evacuation under the discretion of county officials. However, after consultations with Drayton officials, the county made the decision not to enforce the order but to modify it instead. The reasons for this modification will be discussed later.

Third, the county paid for some of the supplies used in preparation and response efforts. They also continuously worked with city flood and volunteer coordinators to ensure that they had all the resources needed to fight the flood.

State Activities

Apart from the Governor's office, another prominent state government agency involved in the emergency response phase was the North Dakota Department of Emergency Management (DEM). In 1997, DEM mainly coordinated state activities carried out in preparation and response to the flood. For example, they coordinated

efforts of the state to provide cities and townships with resources such as technical advice on predicting and fighting the flood, and equipment and supplies for building dikes. DEM also kept the public updated on the state-wide flood situation.

In addition to DEM, one other state agency was interviewed: the North Dakota State Water Commission (SWC). The SWC was mainly involved in the recovery phase of the flood, particularly in the area of flood insurance. However, during the emergency it issued permits for dikes and other flood control works, and also provided DEM with technical assistance on how to protect important infrastructure such as hospitals.

Another state agency involved in the flood was the North Dakota National Guard. Its role, particularly in Drayton, was to assist the city in evacuating residents and to provide security after evacuation. It also helped in sandbagging activities, and patrolled the city dike.

Federal Activities

The two primary federal agencies involved in emergency response were FEMA and the United States Army Corps of Engineers. FEMA was the main body that coordinated all the federal departments that were assisting in providing resources during the emergency response phase. It was the body that provided information to local, state, and NGO officials on where to get federal resources. FEMA also had programs that provided rent money to evacuees while they waited to see when they would be returning to their homes. In Drayton, FEMA was more prominent during the recovery phase. For example, after the flood of 1997, FEMA enacted a program that removed structures and houses along the banks of the Red River in order to reduce flood vulnerability.

The U.S. Corps of Engineers featured prominently in efforts to fight the flood. In

Drayton, it was responsible for building the city dike and plywood wall mentioned earlier. It also provided technical assistance on how to maintain these structures. However, the involvement of the Corps was somewhat controversial as will be discussed later.

Another important federal agency that was indirectly involved in the flood was the National Weather Service. The Weather Service issued weather forecasts, flood predictions and warnings through the media to the public. Community members used this information to prepare and respond to the flood.

Activities of NGOs

As in Rosenort, the two major NGOs involved in the 1997 flood were the Red Cross and the Salvation Army. Again, as in Rosenort, their involvement in the response phase was not extensive as both organizations concentrated on Grand Forks, which had been devastated by the flood. The Red Cross mainly provided funds to small communities to assist in procuring whatever resources that were needed to fight the flood. However, in some cases, it also provided food to community residents that had been evacuated. In Drayton, Red Cross provided food to community members who were returning after evacuation.

The Salvation Army was more visible in Drayton than the Red Cross. It provided meals to residents, volunteers, and organizations working on the dike.

4.4.4 Outcome

As mentioned earlier, while community response activities progressed, the Governor of North Dakota announced a mandatory evacuation order for Drayton. However, before the Governor's mandatory evacuation order could be enacted, the city

officials evacuated the town when a crack was found in a part of the city dike. At 2.30 a.m. Tuesday April 22nd 1997, fire sirens sounded and emergency teams went door to door alerting people to evacuate (Valley News & Views, 1997).

It was at this point that controversy broke out. The Corps of Engineers wanted to open the dike and flood the city. They thought that the damage would be much worse if the dike broke by itself. However, the Mayor and city council objected to such drastic action, maintaining that town members' property and livelihoods were at stake. After extensive discussions among city officials and representatives of the Corps, it was agreed that the Corps would re-evaluate the situation. Fortunately, by daylight the Corps had deemed the crack repairable. Although repairs began immediately, there was a shortage of people to do the work. The Mayor had to appeal for help from residents still in the area and volunteers from neighbouring communities.

With these efforts at hand, people wanted to continue working on the dike. However, the Governor's mandatory evacuation order was still pending. The Mayor consulted with county officials and the order was modified. Residents and volunteers were allowed to continue with their work during the day but had to leave town at night. Community respondents also mentioned that they were able to check up on their homes. Thus in the end, the Governor's order did not interfere with any community evacuation order as in Rosenort.

4.5 Summary

During the Red River flood of 1997, community members in both Rosenort and Drayton were closely involved in the emergency response phase as demonstrated by the decisions they made and the activities they carried out. In Rosenort, three groups of

activities were identified: activities that involved local group decision-making, activities that involved neighbourhood decision-making, and activities that involved individual decision-making. In Drayton, there were two key community activities identified: activities that involved local group decision-making and activities that involved individual decision-making.

There were also government and NGO activities in both Rosenort and Drayton. In particular, there was "top-down" provincial/state involvement in evacuation. For example, in Manitoba, provincial authorities imposed a mandatory evacuation order of all municipalities affected by the flood. In Rosenort, there was dissatisfaction among community residents and municipal officials with this evacuation order for several reasons. First, it was mandatory. Community respondents maintained that provincial authorities did not take into account that residents had the experience to deal with floods, and could take care of themselves. Secondly, there was no consultation with residents or municipal officials before the order was imposed. Third, the manner in which the evacuation was carried out was at issue. Respondents complained that intimidation was used in order to get people to leave town.

The "top-down" manner of the imposition of the mandatory order also resulted in confusion among municipal officials and community members as to who was really in charge of evacuation. Legally, municipal officials had jurisdiction over evacuation yet provincial officials were able to overrule the municipal non-mandatory evacuation system and impose a mandatory system. This created even more confusion for community members because on one hand they had been told that they could stay and protect their property, and then suddenly, on the other hand, they had to leave town. Further

exacerbating the situation, was the uncertainty that community members faced as a result of not knowing what would happen to their homes and property after evacuation. The result was that some community members took matters into their own hands either by refusing to leave or by hiding in their homes.

In North Dakota, the Governor had called for the mandatory evacuation of Drayton following the devastation of Grand Forks. However, in contrast to Rosenort, there was three-way consultation among city officials, county officials and the state government about the enforcement of the Governor's order, resulting in its modification to allow community members and volunteers to continue with on-site activities (e.g. building of the "Great Wall" of Drayton). However, there was controversy in Drayton when the Corps of Engineers wanted to open the dike and flood the city. City officials disagreed with this course of action, maintaining that town members' property and livelihoods were at stake, and had to be considered. Again, they were able to resolve this controversy by consulting with the Corps and convincing them to look for a better solution.

It is important to emphasize that the 1997 flood was a stressful event for all parties involved. A lot of hard work had to be done to prepare for the flood, most of which was manual and back breaking in nature. In addition, members of the community were faced with the real possibility that despite their efforts, when the floodwaters arrived, they would lose their homes, businesses, and other properties. Local government officials had to contend with preparing and responding to the flood as members of the community themselves, while at the same time discharging their official duties. In addition to this, they had to face the reaction of the community when unfavourable decisions were made, regardless of whether these decisions were from outside the community or not. Senior

government officials had to make tough decisions that were unpopular (i.e. provincial/state mandatory evacuation orders).

The confusion, controversies, and stress of the 1997 Red River flood crystallize the issue of better emergency preparedness planning. Neither of the two communities had long-standing emergency plans. Both Rosenort and Drayton had emergency plans that were informal, and had been devised by civic leaders during preparation for the flood, with no community consultation. There is no doubt that comprehensive emergency preparedness planning at the local level that involved the public and other levels of government, would have reduced some of the stress and controversy experienced in 1997.

CHAPTER FIVE: IMPROVING PUBLIC INVOLVEMENT IN THE EMERGENCY RESPONSE PHASE

5.1 Introduction

Results of the interviews show that community involvement in emergency response in the two cases was similar. Community members in both Rosenort and Drayton had a high level of control during the emergency response phase as demonstrated by the decisions they made and the activities they carried out. However, in Rosenort, community members lost this control when they were ordered to evacuate, and could not continue with their on-site activities. Some community members tried to regain this control by refusing to evacuate. The situation in Drayton was different because they had to evacuate when a part of their city dike cracked. However, residents were later allowed back into town during the day to continue with local response activities, and to check on their homes.

Community members in both towns felt that evacuation was by far the most important decision made during the emergency response phase on the 1997 flood. They had little say over evacuation despite being involved in flood preparation and response activities. Given the importance of the decision to evacuate, this chapter considers a broader public role in that decision as well as in other emergency response planning.

5.2 Community involvement in evacuation planning

It was unanimous among community respondents in Rosenort that the decision to evacuate should be a joint one between government officials and community members. Even the community members who thought that it was a tough decision maintained that they wanted some kind of input into the decision although they could not say how this

would be done. The reason for wanting a joint decision could be attributed to respondents' view that they had the most at stake.

The government should have asked people if it was okay to evacuate especially since their property was at stake. Evacuation was tough and added to the stress of the situation because we did not know what would happen to our business and our house. [Rosenort respondent #1]

There should have been more consultation with people because community members are the ones that have to clean up the mess after the government is long gone. [Rosenort respondent #3]

There should have been more information given out on evacuation. We just heard the announcement over the radio and were expected to obey it. We experienced a lot of anxiety because of not knowing what would happen to our home when we left town. [Rosenort respondent #7]

Another reason for wanting a joint decision could be attributed to respondents' view that as long time residents of the community, they know what to do during an emergency flood situation.

The locals should have had more say in the decision to evacuate. The government did not consider that we have lived here for a while and have experienced floods many times before. Because of this experience, we know what to do when it floods. [Rosenort respondent #8]

We had a lot of frustration with evacuation. We did not agree with it because we had fought floods before and knew what to do. So for outsiders to come in and tell us what to do, it was a little hard to take. People should have been given the choice to stay. [Rosenort respondent #10]

When asked about public safety, a majority of community respondents maintained that they did not feel overly concerned about the potential danger that could occur during a flood.

This is not the Mississippi. Flood onset is slow. We do not get a great wall of water that would endanger our lives. [Rosenort respondent #8]

Again experience was cited as a reason for feeling this way. Moreover, community respondents said that with rescue equipment at hand, any dangerous situations could be

avoided. It is important to note that the threat of flooding was not imminent in Rosenort because the town is not on the banks of the Red River unlike Drayton.

In Drayton, there was more of a range of views on community involvement in the decision to evacuate. These ranged from no involvement (40% of community respondents), to joint decision-making (50% of community respondents), to statements that it should be left to individuals decide whether to evacuate or not (10% of community respondents).

Community respondents who said that no public involvement was necessary substantiated their statements by saying that the local government officials should make the decision instead of state officials because local leaders tend to be long-term residents of the community. As long-term residents, they tend to have learned how to deal with floods unlike state officials who tend not to be from the community, and therefore do not have a lot of practical experience with floods.

We trust people who have lived in the community for long because they have experienced floods before. In 1997, they knew more about water levels than the National Weather Service. [Drayton respondent #2]

If the dike had broken in 1997, a lot of people would have been in danger especially old people. There are only two ways out of Drayton, north and south. These tend to flood very fast so evacuation is prudent. There has to be someone in authority because of the potential danger. However, local leaders should make the call. They have more information than state and federal government because of having lived in the community for a number of years. [Drayton respondent #3]

Another reason for leaving the decision in the hands of the local officials was that they are easily accessible to the public because of the small size of the community. Community members would not have the same easy access to state officials, and therefore would not be able to raise their concerns with these officials at almost any time.

As in Rosenort, community respondents who said that there should be a joint

decision on evacuation maintained that public input was important because locals had more at stake than any other group involved in the emergency. They further suggested the setting up of a public forum where evacuation could be discussed. Interestingly, in both Rosenort and Drayton, community respondents who wanted a joint decision regarding evacuation also mentioned that they wanted the outcome of any public forum to be favourable towards non-mandatory evacuation. In the end, both groups (those who preferred a joint decision and those who said that local government should make the decision) were basically implying the same thing: that the decision to evacuate should remain in the hands of the locals.

Those who mentioned that evacuation should be an individual rather than a government decision supported this view by saying that it was their right under the constitution to protect their property. When asked about the issue of safety, they maintained that they were not concerned about physical injury or loss of life. However, they suggested that individuals who wanted to stay and protect their property should sign waivers saying that they were responsible for themselves.

There could be several reasons to explain the difference in the dominance of views about public involvement in the evacuation decision between Rosenort and Drayton. First, there was more of a 'command-and-control' approach regarding evacuation in Rosenort than in Drayton. As discussed earlier, the lack of public consultation in Rosenort did not sit well with residents and the local government. Had provincial authorities at least held a pre-evacuation meeting such as the one held in Drayton, they might have had more support for their decision. Second, stemming from the lack of consultation between local and provincial government, there was some

confusion as to who was in charge of evacuation. At first the municipality was in charge, and implemented a non-mandatory evacuation policy which community members generally supported. Then suddenly, the provincial government stepped in and overruled the RM's evacuation system, imposing their own mandatory order. There might have been less confusion, if the local government would have been included in the province's decision.

In Drayton, the situation was different because city officials were in constant communication with other levels of government, and as such were able to enact decisions that did not conflict. For example, city officials knew that the Governor was going to call for the mandatory evacuation of Drayton. It was not a surprise like in Rosenort. City officials were also able to consult with the county government about the enforcement of this mandatory order, and got them (county officials) to modify the order to allow residents back into the community.

The city and its residents also faced the potential danger of being flooded when there was a crack in the city dike. Further compounding this crisis was the solution proposed by the Corps of Engineers to open the dike and flood the city. Again, city officials were able to consult with the Corps of Engineers and convince them not to cut the dike, a favourable decision for the city and its residents. Therefore, there was better overall collaboration among different government levels and agencies in Drayton than in Rosenort.

Another reason for the difference in the dominance of views between Rosenort and Drayton about public involvement in the decision to evacuate could be attributed to the catastrophic devastation of Grand Forks. People in Drayton remembered what dike

failure (which the city nearly experienced) could mean for a city and its people. The disaster in Grand Forks also indirectly affected the city of Drayton because it was (and still is) Drayton's main shopping, legal, financial and medical centre. In addition, there were many community members in Drayton that had (and still have) family members or friends living in Grand Forks.

We had some initial complaints about evacuation, but after what happened in Grand Forks, it was good thing that the city did not take a chance. [Drayton respondent #1]

It is not surprising that the view of senior government officials in both jurisdictions on public involvement in evacuation decision-making was that they should not be involved. The reason given was that the public does not have the pertinent information to make this type of decision.

I don't think that there should be any public involvement in the decision. It should be left to higher officials who have more information from various sources. [North Dakota Government respondent #3]

However, one could argue that it is for precisely this reason (lack of information) that the public should be involved. In Rosenort, for example, the public was not made aware of the reasoning behind the mandatory order. All they heard was that a four to six feet "wall" of water was travelling towards the community. This information was perceived as more of a scare tactic than a helpful piece of information. If the public had been given more information on the mandatory order prior to evacuation, maybe this would have created more support for the decision. The experience in Drayton demonstrates that there is room to involve people in a discussion, at least on what the evacuation plan entails.

Government respondents maintained that the Red River flood of 1997 was an extreme event, which no one had ever experienced before.

People have been through floods before so they may think that they know how to deal with any flood. But the 1997 flood was different. It far exceeded people's expectations. They had never experienced a flood like this before. So I think that for prudence's sake, it is better to leave the decision to elected officials. The public could be involved beforehand in any planning activities and exercises at the local level. [North Dakota government respondent #2]

Government respondents also maintained that during an emergency, the situation is unpredictable. For example, sudden changes in the weather could cause hazardous conditions, or in the case of existing dikes, breaches could occur (as happened in Drayton) therefore compromising public safety. In addition, once a community is surrounded by water, it becomes difficult to access it in order to provide resources to people who may still be in the community. It is therefore always wise to consider public safety above all other issues. Furthermore, if public safety becomes compromised because of lack of evacuation, the government will in all likelihood be held accountable.

In the end however, government respondents conceded that the public should be made aware of the reasons behind evacuation.

The public can be involved from an educational point. They should be told why they are being evacuated. We should make sure that they understand the threat. [Manitoba government respondent #3]

People should be made aware of why they are being evacuated. For example, before the flood, press releases from the responsible entity should be issued to raise awareness. During the event itself, people should be reminded of the rules of evacuation. [North Dakota government respondent #3]

5.3 Opportunities for community involvement in government emergency preparedness planning

In Manitoba, local-level units such as rural municipalities are required to develop their own emergency preparedness plan according to the perceived needs and environmental and social conditions in the area (Haque, 2000). However, in 1997, the RM of Morris did not have such a plan in place before the flood began. It was during

preparation for the flood that municipal officials devised an informal emergency plan, without any public consultation. There was no opportunity for the general public to participate in any planning efforts. Therefore, it not surprising that during interviews, community respondents were not sure whether or not there was an emergency plan during the 1997 flood.

Unlike the RM of Morris, Pembina had a countywide disaster plan prior to the 1997 flood. During its development, there was opportunity for the public in Drayton and other cities and townships to be involved in public meetings held throughout the county to discuss elements of this plan. Although public turnout for these meetings was low, the plan was enacted in 1992. This meant that plans that might affect emergency flood response had been laid out with little public input. So in the end, although Pembina County had held public meetings, most community respondents were not aware of the resulting countywide disaster plan.

One of the main reasons cited by Drayton community respondents for the lack of attendance of the county public meetings, was that other people, particularly civic leaders, would attend these public meetings, and they (community respondents) would eventually be informed of what had been discussed. This response was not surprising, given that the community is small and everybody knows each other. Therefore, community members will almost always “have the ear” of a civic leader. This response implies a strong community reliance on its leaders as echoed by the following comments:

The city leaders are representative enough of the locals that we don't need everyone to be involved in a planning effort. When the need arises, people will always automatically help and don't need to be asked. [Drayton respondent #4]

I was not aware of the county plan in 1997, but I knew that city officials had a plan of what they were going to do because they had gone through floods many times before. [Drayton respondent #5]

At the city level, there was no opportunity for the general public to participate in emergency planning because Drayton did not have an emergency plan before the flood of 1997. As in the RM of Morris, informal emergency plans were devised by city officials during preparation for the flood, with no public input. However, during preparation for the 1997 flood, the general public in both Rosenort and Drayton had the opportunity to participate in the flood information sessions mentioned earlier, held by provincial and county officials respectively. Again, public attendance for these sessions was low in both towns. One of the main reasons given for the low turnout was that as long time residents of the Red River Valley, community respondents already knew how to deal with floods and were busy with their own flood preparations. Another reason for low attendance implied in Rosenort particularly, was that community respondents did not perceive the flood to pose a threat to the extent that they would not be able to handle it. This sentiment again could stem from community experience with past floods.

This is not the Mississippi. Flood onset is slow. We do not get a great wall of water that would endanger our lives. [Rosenort respondent #8]

In the final analysis, it is safe to suggest that the content of the flood sessions and the county public meetings for that matter, influenced whether public attendance was high or low. Perhaps if the flood sessions and the county public meetings had been about evacuation, the turnout would have been high as shown in Drayton's pre-evacuation meeting.

5.4 Public perception of its role in the emergency response phase

It is important to find out the understanding of the public of their role, and the role of government, in the emergency response phase as it may affect how the public responds to government decisions.

Community respondents in Rosenort and Drayton agreed that they were the primary on-site responders as stipulated by emergency rules and regulations (in both Canada and the United States). However, they implied that it was more important to be recognized as the ones with the most at stake during a flood emergency, and therefore share in decision-making with their respective governments.

Community respondents felt that the role of the government should be to support community members by providing whatever resources were needed during an emergency.

I think that the government should help out when the community is in need. [Rosenort respondent #4]

In 1997, I expected the government to help us out and they did. [Rosenort respondent #9]

I expect the government to provide us with resources for flood preparation and response and then let the locals fight the flood. [Rosenort respondent #10]

In '97, I expected the government to do their job and provide us with resources to fight the flood. [Drayton respondent #2]

We expected the government to give us accurate water level projections. The predictions provided in 1997 were pretty off. [Drayton respondent #3]

In both jurisdictions, the view of government officials was different. While government respondents agreed that community members were the primary responders, responsible for preparation and response activities in their communities, they disagreed on the involvement of the public specifically in decisions that might affect public safety.

On such decisions, government respondents maintained that someone in government needs to take charge of the situation because of its potential danger. As mentioned before, they proposed instead that community members be kept informed of these decisions.

Therefore, there was a difference in views among community respondents and government officials as to how the role of the public in the emergency response phase translates when important decisions have to be made.

5.5 Public involvement in emergency response planning since the 1997 flood

As mentioned earlier, local-level units such as rural municipalities are required to develop emergency preparedness plans. However, as was the case in 1997, there is no emergency preparedness plan for the RM of Morris today. Municipal officials are working on emergency response planning but the process has not progressed very far. One of the main reasons cited for this slow progress is the lack of staff capacity to conduct RM business as well as work on an emergency plan. The RM has requested assistance from the provincial government. In response, MEMO has appointed an emergency preparedness advisor. The role of the advisor is to serve as a contact point for communities wishing to participate in the Federal Joint Emergency Preparedness Program (JEPP), provincial and federal training programs, and public education programs aimed at raising awareness and preparedness in each of the regions (www.ManitobaEMO.ca). However, this is not what the RM of Morris had in mind. They want someone who can provide practical advice on how to write out the plan. At the time of this research, the RM of Morris had neither put anything down on paper nor conducted any consultations with the public.

In Drayton, emergency planning has gone only as far as identifying and defining

some of the tasks that need to be done in preparation for an emergency. The general public has not yet been involved in this process. Only certain groups such as the fire department have been involved. When asked why there has been limited public involvement thus far, the city maintains that there is low public interest in emergency planning because there is no emergency. However, if the city used the issue of evacuation, it is most likely that they would find a lot of public interest, and could use this interest as a stepping stone towards the discussion of other emergency planning issues.

County and state governments have also been involved in emergency planning but on the broader scope of disaster planning. In collaboration with FEMA, they have established a program called Project Impact to help build disaster resistant communities. Part of this program is to ensure that counties make disaster plans with the involvement of the public. To this end, countywide public meetings have been held to discuss issues of disaster planning such as mitigation and preparation for disasters. Once again, there has been low turnout at these meetings. Again, the issue of evacuation could have been used to draw out more people to these meetings.

5.6 Summary

During the flood of 1997, community members were highly involved in flood preparation and response activities, yet despite this involvement they had no control over evacuation. Community respondents viewed evacuation as the most important decision made, and desired to be involved in it either directly or indirectly through their local elected leaders. One of the main reasons for wanting to be involved in the decision was that community respondents felt that they had the most at stake. The view of the

government was different. They maintained that in the interest of public safety, government should make the decision. Community members could still be involved, but only as far as being informed of the reasons behind the decision.

With regard to community involvement in emergency preparedness planning, there was no opportunity for community members to be involved, as both towns did not even have long standing emergency plans. However, there was some opportunity for community members to be involved in provincial/county flood information sessions held in the spring of 1997, prior to the flood. However, there was low public turnout for these sessions. One of the main reasons given for the low turnout was that community respondents felt that they had the experience to deal with floods having been long-term residents in their communities.

Currently, local governments in Rosenort and Drayton are working on devising emergency response plans. However, the public in both cases has not yet been involved in this process. In Rosenort, one of the reasons given for this lack of public involvement is that staff capacity to conduct RM business as well as work on emergency plans is limited. In Drayton, the reason given is that there is low public interest in the process because there is no emergency right now.

In the final analysis, the lack of progress in emergency preparedness planning is unfortunate because it implies that the same contentious issues that arose during the emergency response phase of the 1997 flood would probably arise again if there were a flood in the future.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Overview

There are three phases of flood management: **planning and mitigation, emergency flood response, and post flood recovery.** The planning stage involves the assessment of a variety of mitigation measures for possible implementation in order to reduce flood damages in a region. The emergency flood response stage involves two phases: preparedness and response.

'Preparedness' involves planning and preparation. Planning involves setting the procedures that are going to be used to save lives and minimize damage when an emergency occurs. It includes the establishment of flood forecasting, monitoring and warning systems, evacuation procedures, and public information services. Preparation involves activities carried out right before the onset of a flood event and may include activities such as sandbagging, diking, and moving items to higher ground.

'Response' occurs after the onset of a flood event and is defined as the actions taken to save lives and prevent further damage in an emergency situation. Response includes activities such as evacuation, search and rescue, and the provision of basic necessities to flood victims. The post flood recovery phase involves actions taken to return the community to normal following a disaster. It includes evaluation of damages, repairing, replacing, or rebuilding property, and the provision of flood assistance or compensation to victims.

Emergency flood response is a controversial phase in flood management due to decisions made on issues such as evacuation and mitigation. For example, during the emergency response phase of the 1997 Red River flood, the lack of public involvement

with regard to mandatory evacuation created uncertainty and dissatisfaction among floodplain residents. Therefore, the purpose of this study was to investigate whether more public involvement during the emergency response phase of flood management would minimize uncertainty and dissatisfaction, and improve overall flood management. The specific objectives were to:

- Identify and describe key publics, government agencies, and civic organizations involved in emergency flood response.
- Determine the understanding of the public of their role in emergency flood response.
- Identify and describe interaction among key participants during emergency flood response.
- Evaluate public involvement practices in the emergency response phase.
- Make recommendations to improve public involvement in the emergency response phase.

The objectives were addressed using data from document and literature reviews, and qualitative semi-structured interviews. This chapter provides conclusions and recommendations for improving public involvement in the emergency response phase of flooding.

6.2 Key parties involved in emergency flood response

The study revealed that community members in both towns viewed themselves as first responders in a flood emergency. As such, during the emergency response phase of the 1997 flood, they sandbagged, built earth dikes, moved furniture to higher ground, and watched water pumps, in an attempt to protect their property from rising flood waters.

Most government respondents agreed that community members were first responders. As such, the government played a supporting role (for the most part) by providing resources such as sandbags, dike building equipment, and boats in order to fight the flood.

NGO agencies (although not highly involved in Rosenort or Drayton) and thousands of volunteers from different towns and cities were also involved in emergency response. NGOs provided essential relief support such as food and clothing, while volunteers provided labour.

The roles that community members, government and NGO agencies, and volunteers played in the emergency response phase of the 1997 flood should be enhanced as outlined below for future flood emergencies.

6.3 Opportunities for public involvement in emergency flood response

As mentioned above, the role of community members was critical during the emergency response phase of the 1997 flood. Community members in both towns were involved in activities to protect their individual property. There were also public participation opportunities available to community members in both towns. In Rosenort for example, people had the chance to participate in neighbourhood groups involved in the planning and building of neighbourhood dikes. In Drayton, people had the chance to participate in the town's pre-evacuation meeting. These opportunities are important because people had the chance to be involved in activities that were for the good of the whole community. These types of community participation opportunities should be increased and supported in future flood emergencies.

The public in both towns did not have the opportunity to be involved in the decision to evacuate. Provincial and state officials called for the mandatory evacuation of the two communities in order to protect them from the danger of rising floodwaters. This was a key decision that impacted the ability of locals to carry out their response activities, yet was made without public input or input from local government officials.

In Rosenort, the lack of public involvement resulted in a lot of dissatisfaction and confusion among community members and municipal officials. In Drayton however, after the repair of the broken city dike, there was consultation among city, county and state officials about the enforcement of the state's mandatory order. This resulted in the modification of the order, which allowed community members back into the town to continue with response activities.

The dissatisfaction in Rosenort demonstrates that a 'command-and-control' method of making critical decisions is not an effective way of managing emergencies. Of course issues of evacuation that affect public safety cannot be left in the hands of individuals. However, the public still needs to be somehow involved in this decision. One way of doing this would be to hold a town meeting similar to the one held in Drayton during the 1997 flood. During the meeting, elements of an evacuation plan and any other issues of concern could be discussed among authorities and the public. Other similar participatory techniques such as open houses, conferences, and workshops could also be employed (Praxis, 1988).

In some cases however, there may not be enough time during a flood emergency to hold town meetings, open houses and other similar public participation forums. This is where the importance of emergency preparedness planning prior to a flood event

becomes clear. Emergency preparedness planning provides an umbrella under which experts, the public and different levels of government could jointly discuss contentious issues such as evacuation. During planning for example, criteria for carrying out evacuation could be explored and agreed upon by all parties as outlined in the preparedness discussion below. This would reduce confusion and dissatisfaction during a flood emergency.

Public involvement activities could be further enhanced if the following recommendations were implemented:

- 1) *There should be a clearer definition of jurisdiction between local and provincial governments.*
- 2) *Local governments should remain in control of their jurisdiction. They tend to know the situation at hand best as they tend to be long time residents of their communities.*
- 3) *Decision-makers need to recognize that community members have a lot at stake during a flood emergency. They also need to recognize that generally, community members are not helpless victims who must be rescued by force. Based on past flood experiences, they are usually capable of protecting themselves. Therefore, decision-makers should be more understanding and involve "the first responders" as much as possible in decision-making.*
- 4) *In order to ensure overall effective emergency management, there needs to be more collaboration among the key parties.*

6.4 Opportunities for public involvement in emergency preparedness

The opportunities for public involvement in emergency planning prior to the flood were limited in both towns. None of the two communities had long-standing emergency plans. The plans used in 1997 were informal, and had been devised by local government officials during preparation for the flood, with no public involvement.

What is even more disturbing is that despite the devastation caused by the 1997 Red River flood, there has been little emergency preparedness planning in either

community since then. The implication is that if a flood of the magnitude of 1997 or higher occurred today, the same contentious issues of 1997 would probably erupt. Therefore, decision-makers and the public need to recognize that emergency planning is a good way of promoting emergency preparedness and reducing flood vulnerability.

As mentioned in the section above, emergency preparedness planning provides an opportunity for experts, decision-makers, and the public to discuss issues of contention. Public involvement in emergency preparedness planning could be modelled after Connor's (1985) ladder of citizen participation. For example, decision-makers could begin by raising public awareness about a proposed emergency preparedness plan. This could be done using methods such as public notification through the local paper and the local radio, and by putting up flyers in local businesses like the post office and local restaurants.

Next, decision-makers could employ an information-feedback mechanism in order to receive public input. For example, they could hold a series of town meetings to discuss different aspects of the proposed plan (e.g. tasks to be carried out during the emergency, appointment of emergency team members and their assigned roles, number of resources to be allocated for the emergency, and the development of an evacuation plan) and receive feedback from the public. In order to ensure fairness, decision-makers could also set up a phone line or a post office box so that people who cannot make it to the meetings can still have a chance to submit their comments. There should be enough time allocated in order to do this.

Based on public feedback, changes to the proposed plan could then be made, and further public consultations held to discuss the adjusted plan. Again these consultations

could be done through public town meetings. These meetings should use consensus-building exercises or dispute resolution tactics in order to resolve or reduce any lingering disagreements about the adjusted plan.

Finally, awareness of the final plan should be raised by notifying the public through the local newspaper and the local radio. The plan should then be made available to anyone who wants to read it. This could be done by placing it in municipal offices, local fire halls and local libraries. More importantly, the public should know where to find the plan if they need to read it.

There is no guarantee that there will be public interest in the above exercise. In fact one of the concerns raised by local government officials in the study was that it was difficult for them to get the public interested in emergency planning when there was no emergency. However, this issue may be resolved by including evacuation planning as part of overall emergency planning. The study revealed that the public viewed evacuation as the one of the most important decisions made during the 1997 flood. As such, evacuation could be used to drum up initial public interest, and this could then lead to public interest in other aspects of emergency planning.

More resources should be provided by the provincial government to local governments to assist them in emergency planning. In fact, the study revealed that in Rosenort/RM of Morris, lack of staff capacity was one of the reasons for the slow progress in emergency planning. Therefore, provincial and municipal officials need to work together to appoint someone that both sides can agree on, to assist in devising emergency plans. The duties of such an appointee should be clearly spelt out and understood by all.

Apart from involving the public in emergency preparedness planning, another way of involving the public in emergency preparedness is by providing them with information that enables them to be better prepared for a flood event. One tool that is currently being used to do this in Manitoba is the Web-Based Decision Support System (Government of Manitoba, 2003). This is a federal-provincial program that uses Geographic Information Systems (GIS) based tools to determine the level of protection required to defend people and property against various flood scenarios. This information is made accessible to emergency personnel and the general public over a provincially managed Internet site. However, one important factor that has been overlooked in this program is that a cable modem is needed for quick access to the Internet. This is a requirement that some Red River Valley residents (outside of Winnipeg) do not have. They rely on phone modems, which tend to be slow and inconvenient, to access the Internet. Therefore, other alternative methods of providing the public with emergency preparedness information should be explored.

6.5 Concluding Remarks

Public involvement in the emergency response phase of flooding is not well recognized, yet it should be. The study demonstrated that not only is the public highly involved in this phase, but public involvement in decision-making is also critical to ensuring emergency policies that are effective. Therefore, more should be done to enhance public involvement in the emergency response phase.

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APPENDICES

APPENDIX 1

LIST OF DOCUMENTARY SOURCES

DOCUMENTARY SOURCES

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APPENDIX 2
INFORMATION LETTER FOR MANITOBA

INFORMATION LETTER

Natural Resources Institute
70 Dysart Road
Winnipeg, Manitoba
Canada, R3T 2N2

My name is Jacqueline Wachira and I am a graduate student at the Natural Resource Institute at the University of Manitoba. I am currently undertaking research for the thesis component of my Master's degree in Natural Resource Management.

The purpose of my research is to investigate how the public can be better involved in the emergency response phase of flood management. The specific objectives are to:

- Identify and describe key publics, government agencies, and civic organizations involved in emergency flood response.
- Determine the understanding of key publics of their role in emergency flood response.
- Identify and describe the degree of interaction among key participants during emergency flood response.
- Evaluate emergency response procedures in relation to public participation.
- Make recommendations to improve public involvement in the emergency response phase of a flood.

In order to accomplish this task, information will be gathered through interviews with government and non-governmental agencies, local groups, and individuals involved in the Red River Flood of 1997. The interviews will take approximately one hour and will cover a range of topics pertaining to your experiences during the Red River Flood of 1997. In the course of the interview, please feel free to ask questions or terminate the interview at any time. In the event that you do not wish to answer a specific question, simply respond "no comment". Your responses will be held in strict confidence, and the results of the study will be aggregated with no reference made to specific participants.

This research has been approved by the Joint-Faculty Research Ethics Board of the University of Manitoba. Any questions regarding the research study may be directed to either the principle investigator (Jacqueline Wachira: (204)), the research advisor (Dr John Sinclair: (204)) or to the University of Manitoba Office of Research Services (Margaret Bowman: (204)).

Sincerely,
Jacqueline Wachira

APPENDIX 3
INFORMATION LETTER FOR NORTH DAKOTA

INFORMATION LETTER

Natural Resources Institute
70 Dysart Road
Winnipeg, Manitoba
Canada, R3T 2N2

My name is Jacqueline Wachira and I am a graduate student at the Natural Resource Institute at the University of Manitoba. I am currently undertaking research for the thesis component of my Master's degree in Natural Resource Management.

The purpose of my research is to investigate how the public can be better involved in the emergency response phase of flood management. The specific objectives are to:

- Identify and describe key publics, government agencies, and civic organizations involved in emergency flood response.
- Determine the understanding of key publics of their role in emergency flood response.
- Identify and describe the degree of interaction among key participants during emergency flood response.
- Evaluate emergency response procedures in relation to public participation.
- Make recommendations to improve public involvement in the emergency response phase of a flood.

In order to accomplish this task, information will be gathered through interviews with government and non-governmental agencies, local groups, and individuals involved in the Red River Flood of 1997. The interviews will take approximately one hour and will cover a range of topics pertaining to your experiences during the Red River Flood of 1997. In the course of the interview, please feel free to ask questions or terminate the interview at any time. In the event that you do not wish to answer a specific question, simply respond "no comment". Your responses will be held in strict confidence, and the results of the study will be aggregated with no reference made to specific participants.

This research is supported through the Government of Canada Community University Research Alliance (CURA) Program. The results of this study will be shared with researchers at the North Dakota State University where the Natural Resource Institute has a joint project considering the social impacts of flooding in the Red River Valley.

This research has been approved by the Joint-Faculty Research Ethics Board of the University of Manitoba. Any questions regarding the research study may be directed to either the principle investigator (Jacqueline Wachira: (204) _____), the research advisor (Dr John Sinclair: (204) _____) or to the University of Manitoba Office of Research Services (Margaret Bowman: (204) _____).

Sincerely,
Jacqueline Wachira

APPENDIX 4**INTERVIEW GUIDE FOR GOVERNMENT OFFICIALS**

INTERVIEW GUIDE FOR GOVERNMENT OFFICIALS

General Questions

1. From your point of view, what were the key emergency response activities that you engaged in during the flood of 1997? Please list them.
2. Since the flood, would you add any other key activities?

Timing of Participation

1. When did you begin preparing for the emergency response activities listed earlier?
2. Were any other groups and/or individuals involved at this preparation stage? If so, how were they involved? If not, what were the reasons for not involving anyone else at this stage?

Breadth of Participation

1. Who was involved in the actual emergency response activities?
2. Who did you communicate and interact with the most during the emergency?
3. Are there any key groups that were or should have been communicated with during the flood?

Degree of Participation

1. How did you communicate and interact with other stakeholders and the general public? Were you satisfied with this communication and interaction? If yes or no, what were your reasons?
2. What do you think was expected of you during the emergency?
3. What was your perception of the roles of other players (individuals, community members, local groups, and the public) during the emergency? Did this perception influence your communication and interaction with these players? If so, how?

Other Questions

1. What were some of the problems that you experienced when preparing and responding to the flood?
2. What would you have liked to see happen throughout the preparation and response phases of the flood?
3. The decision to evacuate is always controversial and difficult, do you see any way to involve the public more in this decision in order to reduce the controversy? If so, how can they be more involved?

APPENDIX 5
INTERVIEW GUIDE FOR NGOs AND LOCAL GROUPS

INTERVIEW GUIDE FOR NGOs AND LOCAL GROUPS

General Questions

1. Were you involved in the flood of 1997?
2. In your opinion, what were the key emergency response activities that you engaged in during the flood of 1997?
3. Since the flood, would you add any other key activities?

Timing of Participation

1. When did you begin to prepare for the emergency response activities mentioned above?
2. How did you prepare for the flood?
3. Who did you communicate with the most during the preparation for the flood? Did this communication increase or decrease as the flood progressed?
4. Were you involved in developing the emergency response plan for your community? Have you ever read it?

Breadth of Participation

1. Did you communicate and interact with other groups, stakeholders and the general public? If so, how did you do this? Were you satisfied with this communication and interaction? If yes or no, what were your reasons?

Degree of Participation

1. To what extent were you involved in emergency flood response? Were there any factors that kept you from being more involved in emergency flood response? If so, what were they?

2. What was your perception of the roles of other players (individuals, community members, local groups, and the public) during the emergency? Did this perception influence your communication and interaction with these players? If so, how?
2. What do you think was expected of you during the flood?

Other Questions

1. What were some of the problems that you experienced when preparing and responding to the flood?
2. What would you have liked to see happen throughout the preparation and response phases of the flood?
3. How might NGOs and local groups be more involved in emergency flood response activities?

APPENDIX 6
INTERVIEW GUIDE FOR THE PUBLIC

INTERVIEW GUIDE FOR THE PUBLIC

General Questions

1. Were you living in this community during the flood of 1997?
2. Do you remember any key emergency response activities implemented by NGOS, local groups, and government agencies? If so, please list them.
3. Were you satisfied with this list of activities? If not, what other activities would you add to the list?

Timing of Participation

1. When did you begin to prepare for the flood?
2. How did you prepare for the flood?
3. Who did you communicate with the most during the preparation for the flood? Did this communication increase or decrease as the flood progressed?
4. Were you involved in developing the emergency response plan for your community? Have you ever read it?
5. How would the role of the public in emergency response be recognized in emergency response planning?

Breadth of Participation

1. What groups were you most involved with during preparation and response to the flood?
2. Who did you rely on the most?
3. Are there any key groups that should have been more involved in emergency response activities during the flood?

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4. To what extent were you involved in emergency flood response? Were there any factors that kept you from being more involved in emergency flood response? If so, what were they?

Degree of Participation

1. What activities did you carry out in preparation and response to the flood?
2. What do you think was expected of you during the flood?
3. How did you communicate and interact with government agencies, NGOS, local groups, and the general public? Were you satisfied with this communication and interaction? If yes or no, what were your reasons?
4. What was your perception of the roles of other players (individuals, community members, local groups, and the public) during the emergency? Did this perception influence your communication and interaction with these players? If so, how?

Other Questions

1. What were some of the problems that you experienced when preparing and responding to the flood?
2. What would you have liked to see happen throughout the preparation and response phases of the flood?
3. The decision to evacuate is always controversial, do you see any way to involve the public more in this decision in order to reduce the controversy? If so, how can they be more involved?